CONTRACT DOCUMENTS FOR:

ITB # 19-026

TRUMAN WATERFRONT PARK
PHASE 1B – BUILDING 1287 & FIELD

JULY 2019

MAYOR: TERI JOHNSTON

COMMISSIONERS:

GREG DAVILA

BILLY WARDLOW

JIMMY WEEKLEY

CLAYTON LOPEZ

SAM KAUFMAN

MARY LOU HOOVER

PREPARED BY:
K2M Design, Inc.
ARCHITECT

CITY OF KEY WEST

KEY WEST, FLORIDA

CONTRACT DOCUMENTS

For

TRUMAN WATERFRONT PARK PHASE 1B – BUILDING 1287 & FIELD

****

CONSISTING OF:
BID REQUIREMENTS
CONTRACT FORMS
CONDITIONS OF THE CONTRACT
GENERAL REQUIREMENTS
DRAWINGS

*****

KEY WEST, FLORIDA

JULY 2019

Table of Contents

Page No.

PART 1 - BIDDING REQUIREMENTS

INVITATION TO BID	1
INSTRUCTIONS TO BIDDER	3
PROPOSAL FORM	9
FLORIDA BID BOND	17
ANTI – KICKBACK AFFIDAVIT	19
NON-COLLUSION AFFIDAVIT	20
FLORIDA STATUTES, ON PUBLIC ENTITY CRIMES	21
INDEMNIFICATION FORM	24
LOCAL VENDORS FORM	25
DOMESTIC PARTNERSHIP AFFIDAVIT	26
CONE OF SILENCE AFFIDAVIT	27

PART 2 - CONTRACT

CONTRACT	29
PERFORMANCE BOND	31
PAYMENT BOND	33

PART 3 - CONDITIONS OF THE CONTRACT

GENERAL CONDITIONS	36
SUPPLEMENTARY CONDITIONS	66

PART 4 - GENERAL REQUIREMENTS & TECHNICAL SPECIFICATIONS

PART 5 – DRAWINGS

APPENDICES

SITE SURVEY
GEOTECHNICAL REPORT
SOIL AND GROUNDWATER MANAGEMENT PLAN
PAL AND STABLE LEAD BASED PAINT REPORT
PAL BUILDING ASBESTOS REPORT
TRUMAN WATERFRONT PARK FRUIT TREE GROVE DRAWINGS

PART 1

BIDDING REQUIREMENTS

INVITATION TO BID

Sealed bids for the City of Key West ITB # 19-026 TRUMAN WATERFRONT PARK PHASE 1B – BUILDING 1287 AND FIELD, addressed to the City of Key West, will be received at the Office of the City Clerk, 1300 White Street., Key West Florida, 33040 until 3:00 p.m. on **Wednesday, August 28th, 2019** and then will be publicly opened and read. Any bids received after the time and date specified will not be considered.

Please submit one (1) original, and two (2) flash drives each with one single PDF file of the sections entitled "Bidding Requirements" and "Contract Forms". Bid package is to be enclosed in a sealed envelope, clearly marked on the outside "ITB # 19-026 TRUMAN WATERFRONT PARK PHASE 1B – BUILDING 1287 AND FIELD**" addressed and delivered to the City Clerk at the address noted above.**

The project contemplated consists of providing all site work, materials, equipment and labor necessary to accomplish the following:

Provide labor, materials, equipment to complete Truman Waterfront Park Phase 1B. The scope includes the partial demo and remodel of Building 1287 and associated sitework and utilities, a new soccer field, dog park, and fruit tree grove, new sidewalk and new landscaping, per the provided drawings including, but not limited to, permitting, landscaping, fencing, hardscape, irrigation, maintenance and warranty.

Drawings and Specifications may be obtained from Demand Star by Onvia or City of Key West. Please contact Demand Star at www.demandstar.com or call 1-800-711-1712 or www.cityofkeywest-fl.gov

A MANDATORY Pre - Bid meeting will be held on **August 7th, 2019** at 11 a.m. in Room 216 Key West City Hall 1300 White Street, Key West, Florida

EACH BID MUST BE SUBMITTED ON THE PRESCRIBED FORM AND ACCOMPANIED BY BID SECURITY AS PRESCRIBED IN THE INSTRUCTIONS TO BIDDERS, PAYABLE TO THE CITY OF KEY WEST, FLORIDA, IN AN AMOUNT NOT LESS THAN FIVE (5) PERCENT OF THE AMOUNT BID.

THE BIDDER MUST BE A LICENSED CONTRACTOR BY THE STATE OF FLORIDA AND SUBMIT PROOF OF SUCH WITH THE BID.

The successful Bidder shall furnish documentation showing that he is in compliance with the licensing requirements of the State and the provisions of Chapter 66 Section 87 of the Code of Ordinances of the City of Key West; within 10 days following the Notice of Award and must demonstrate that he holds at a minimum, the following licenses & certificates;

A. City of Key West Business Tax License Receipt
B. A valid State of Florida Contractor Certification

All bid bonds, insurance contracts, and certificates of insurance shall be either executed by or countersigned by a licensed resident agent of the Surety or Insurance Company having his place of business in the State of Florida, and in all ways complying with the insurance laws of the State of Florida. Further, the said Surety or Insurance Company shall be duly licensed and qualified to do business in the State of Florida.

Before a Contract will be awarded for the work contemplated herein, the CITY will conduct such investigation as is necessary to determine the performance record and ability of the apparent low Bidder to perform the size and type of work specified under this Contract. Upon request, the Bidder shall submit such information as deemed necessary by the CITY to evaluate the Bidder's qualifications.

Any request for information concerning this project must be made in writing, per City of Key West Ordinance Section 2-773, Cone of Silence, to Albi Balliu, Senior Project Manager, at aballiu@cityofkeywest-fl.gov**.**

As stated above at the time of the bid submittal the Bidder must provide satisfactory documentation of State Licenses. The Bidder shall furnish documentation showing that he is in compliance with the licensing requirements of County, and City licenses as would be required within ten days of the award. The successful Bidder must also be able to satisfy the CITY Attorney as to such insurance coverage and legal requirements as may be demanded by the Bid in question. The CITY may reject bids for any and/or all of the following reasons: (1) for budgetary reasons, (2) if the bidder misstates or conceals a material fact in its bid, (3) if the bid does not strictly conform to the law or is non-responsive to the bid requirements, (4) if the bid is conditional, or (5) if a change of circumstances occurs making the purpose of the bid unnecessary to the CITY. The CITY may also waive any minor formalities or irregularities in any bid, (6) if such rejection is in the best interest of the CITY.

INSTRUCTIONS TO BIDDERS

1. CONTRACT DOCUMENTS

A. FORMAT

The Contract Documents are divided into parts, divisions, and sections for convenient organization and reference. Generally, there has been no attempt to divide the sections into work performed by the various building trades, work by separate subcontractors, or work required for separate facilities in the project.

B. DOCUMENT INTERPRETATION

The separate sections contained within these Contract Documents are intended to be mutually cooperative and to provide all details reasonably required for the execution of the proposed work.

Should there be any doubt as to the meaning or intent of said Contract Documents, the Bidder should request of the ARCHITECT, in writing (at least ten (10) calendar days prior to bid opening) an interpretation thereof. Any interpretation or change in said Contract Documents will be made only in writing in the form of Addenda to the documents which will be available to all registered holders of Contract Documents via Demand star. Bidders shall submit with their Bids, or indicate receipt of, all Addenda. The CITY will not be responsible for any other explanation or interpretations of said Documents.

2. GENERAL DESCRIPTION OF THE PROJECT

A general description of the work to be done is contained in the Invitation to Bid. The scope is specified in applicable parts of these Contract Documents.

3. QUALIFICATION OF CONTRACTORS

The prospective Bidders must meet the statutorily prescribed requirements before award of Contract by the CITY. Bidders must hold or obtain all licenses and/or certificates as required by the State and Local Statutes to bid and perform the work specified herein.

4. BIDDER'S UNDERSTANDING

Each Bidder must inform himself of the conditions relating to the execution of the work, and it is assumed that he will inspect the site and make himself thoroughly familiar with all the Contract Documents. Failure to do so will not relieve the successful Bidder of his obligation to enter a Contract and complete the contemplated work in strict accordance with the Contract Documents. It shall be the Bidder's obligation to verify for himself and to his complete satisfaction all information concerning site and subsurface conditions.

The CITY will make available to prospective Bidders upon request and at the office of the ARCHITECT, prior to bid opening, any information that they may have as to subsurface

conditions and surface topography at the worksite.

Each Bidder shall inform himself of, and the Bidder awarded a Contract shall comply with, federal, state, and local laws, statutes, and ordinances relative to the execution of the work. This requirement includes, but is not limited to, applicable regulations concerning minimum wage rates, nondiscrimination in the employment of labor, protection of public and employee safety and health, environmental protection, the protection of natural resources, fire protection, burning and non-burning requirements, permits, fees, and similar subjects.

5. TYPE OF BID

A. LUMP SUM

The Bid for the work is to be submitted on a lump sum basis. Lump sum prices shall be submitted for each of the two (2) Notice to Proceeds (NTP) and cumulative total. All items required to complete the work specified but not included in the Proposal shall be considered incidental to those set forth in the Proposal.

The Bidder shall submit a Schedule of Values for each NTP with the Proposal. It shall be broken down by bid items listed in the Bid Proposal Form to be used as a basis for payment.

6. PREPARATION OF BIDS

A. GENERAL

All blank spaces in the BID form must be filled in, as required, preferably in BLACK ink. All price information shall be shown in both words and figures where required. No changes shall be made in the phraseology of the forms. Written amounts shall govern in case of discrepancy between the amounts stated in writing and the amounts stated in figures. In case of discrepancy between unit prices and extended totals, unit prices shall prevail.

Any BID shall be deemed informal which contains omissions, erasures, alterations, or additions of any kind, or prices uncalled for, or in which any of the prices are obviously unbalanced, or which in any manner shall fail to conform to the conditions of the published Invitation to Bid.

Only one BID from any individual, firm, partnership, or corporation, under the same or different names, will be considered. Should it appear to the CITY that any Bidder is interested in more than one Bid for work contemplated; all Bids in which such Bidder is interested will be rejected.

B. SIGNATURE

The Bidder shall sign his BID in the blank space provided therefore. If Bidder is a

corporation, the legal name of the corporation shall be set forth above, together with the signature of the officer or officers authorized to sign Contracts on behalf of the corporation. If Bidder is a partnership, the true name of the firm shall be set forth above, together with the signature of the partner or partners authorized to sign Contracts in behalf of the partnership. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a notarized power-of-attorney must be on file with the CITY prior to opening of Bids or submitted with the Bid, otherwise the Bid will be regarded as not properly authorized.

C. SPECIAL BIDDING REQUIREMENTS

The Bidder's attention is brought to the hiring practices and licenses and permits of the City of Key West. These are defined in the addition to Article 39, ORDINANCES, PERMITS, AND LICENSES, as set forth in the Supplementary Conditions.

The Bidder shall submit with his Bid his experience record showing his experience and expertise in the specified work. Such experience record shall provide at least five current or recent projects (within the past 5 years) of similar work, within the State Florida and preferably Monroe County. For each project the following information shall be provided:

1. Description and location of work.
2. Contract amount.
3. Dates work was performed.
4. Owner and name of Owner's contact person and phone number.
6. Designer and name of Designer's contact person and phone number.

The bidder shall submit with his bid a list of items to be performed by his own labor and that performed by subcontractors or others.

D. ATTACHMENTS

Bidder shall complete and submit the following forms with his bid:

Anti-Kickback Affidavit
Non-Collusion Affidavit
Public Entity Crimes Form
Indemnification Form
City of Key West Business License Tax Receipt
Local Vendors Form
Domestic Partnership Affidavit
Cone of Silence Affidavit

E. PUBLIC ENTITY CRIMES FORM

Pursuant to the requirements of Chapter 287.133, Laws of Florida, pertaining to the sworn statement on Public Entity Crimes and the Convicted Vendor List, all Bidders shall submit

a signed and notarized statement with their Bid on the form provided herein.

7. STATE AND LOCAL SALES AND USE TAXES

Unless the Supplementary Conditions contains a statement that the CITY is exempt from state sales tax on materials incorporated into the work due to the qualification of the work under this Contract, the Contractor, as required by the laws and statutes of the state and its political subdivisions, shall pay all state and local sales and use taxes. Prices quoted in the Bid shall include all nonexempt sales and use taxes, unless provision is made in the Bid form to separately itemize the tax.

8. SUBMISSION OF BIDS

All BIDS must be submitted not later than the time prescribed, at the place, and in the manner set forth in the Invitation to Bid. BIDS must be made on the BID forms provided herewith, **submit one (1) ORIGINAL and two (2) FLASH DRIVES each containing a single PDF file of the entire bid package.**

Each BID must be submitted in a sealed envelope, so marked as to indicate the Bidder's name and its contents (project name and number) without being opened, and addressed in conformance with the instructions in the Invitation to Bid.

9. MODIFICATION OR WITHDRAWAL OF BIDS

Prior to the time and date designated for receipt of BIDS, any BID submitted may be withdrawn by notice to the party receiving BIDS at the place designated for receipt of BIDS. Such notice shall be in writing (letter or email) over the signature of the Bidder. No BID may be withdrawn after the time scheduled for opening of BIDS, unless the time specified in paragraph AWARD OF CONTRACT of these Instructions to Bidders shall have elapsed.

10. BID SECURITY

BIDS must be accompanied by cash, a certified check, or cashier's check drawn on a bank in good standing, or a bid bond issued by a Surety authorized to issue such bonds in the state where the work is located, in the amount of five (5) percent of the total amount of the Bid submitted. This bid security shall be given as a guarantee that the Bidder will not withdraw his BID for a period of ninety (90) days after bid opening, and that if awarded the Contract, the successful Bidder will execute the attached Contract and furnish properly executed Performance and Payment Bonds, each in the full amount of the Contract price within the time specified. Agent and Surety phone numbers must be provided.

The Attorney-in-Fact who executes this bond in behalf of the Surety must attach a notarized copy of his power-of-attorney as evidence of his authority to bind the Surety on the date of execution of the bond. Where State Statute requires, certification by a resident agent shall also be provided.

If the Bidder elects to furnish a Bid Bond, he shall use the Bid Bond form bound herewith, or one conforming substantially thereto in form and content.

11. RETURN OF BID SECURITY

Within 15 days after the award of the Contract, the CITY will return the bid securities to all Bidders whose BIDS are not to be further considered in awarding the Contract. Retained bid securities will be held until the Contract has been finally executed, after which all bid securities, other than Bidders' bonds and any guarantees, which have been forfeited, will be returned to the respective Bidders whose Bids they accompanied.

12. AWARD OF CONTRACT

Within 90 calendar days after the opening of Bids, the CITY will accept one of the Bids or will act in accordance with the following paragraphs. The acceptance of the Bid will be by written notice of award, mailed to the office designated in the Bid, or delivered to the Bidder's representative. In the event of failure of the lowest responsive, responsible Bidder to sign the Contract, provide additional documents, insurance certificate(s) and evidence of holding required licenses and certificates, the Owner may award the Contract to the next lowest responsive, responsible Bidder. Such award, if made, will be made within 120 days after the opening of Bids.

The CITY reserves the right to accept or reject any or all Bids, and to waive any informalities and irregularities in said Bids.

13. BASIS OF AWARD

The award will be made by the Owner on the basis of the BID from the lowest, responsive, responsible BIDDER which, in the Owner's sole and absolute judgment will best serve the interest of the Owner.

14. EXECUTION OF CONTRACT

The successful Bidder shall, within 10 working days after receiving Notice of Award, sign and deliver to the CITY an original Contract and two (2) copies in the form hereto attached, together with the insurance certificate as required in the Contract Documents and evidence of holding required licenses and certificates. Within 10 working days after receiving the signed Contract from the successful Bidder, the City's authorized agent will sign the Contract. Signature by both parties constitutes execution of the Contract.

The contract shall be executed on the basis on available funding and respective NTP lump sum fees, starting with NTP 1. NTP 2 will follow as the final Phase IB component as exercised by approved change order.

16. FAILURE TO EXECUTE CONTRACT AND FURNISH BID BOND

The Bidder who has a Contract awarded to him and who fails to promptly and properly execute the Contract shall forfeit the bid security that accompanied his bid, and the bid security shall be retained as liquidated damages by the CITY, and it is agreed that this said sum is a fair estimate of the amount of damages the CITY will sustain in case the Bidder fails to enter into a Contract. Bid

security deposited in the form of cash, a certified check, or cashier's check shall be subject to the same requirement as a Bid Bond.

17. TIME OF COMPLETION

The time of completion of the work to be performed under this Contract is the essence of the Contract. Delays and extensions of time may be allowed in accordance with the provisions stated in the General Conditions.

When the Contractor receives a Notice to Proceed, he shall commence work as soon as possible and shall complete all work within the number of calendar days stipulated in this Bid.
The term of this contract will not exceed **540 calendar** days as follows:

NTP 1:	270 days
NTP 2:	270 days
	540 days

NTP completion days may overlap based on funding and date of respective Notice to Proceed, but in no circumstance shall the total contract term exceed 540 calendar days.

NOTE TO BIDDER: Use preferably BLACK ink for completing this BID form.

BID PROPOSAL FORM

To:	The City of Key West
Address:	1300 White Street, Key West, Florida 33040
Project Title:	TRUMAN WATERFRONT PARK PHASE 1B – BUILDING 1287 AND FIELD - ITB # 19-026

Bidder's contact person for additional information on this BID:

Company Name: _____

Contact Name & Telephone #: _____

Email Address: _____

BIDDER'S DECLARATION AND UNDERSTANDING

The undersigned, hereinafter called the Bidder, declares that the only persons or parties interested in this Bid are those named herein, that this Bid is, in all respects, fair and without fraud, that it is made without collusion with any official of the Owner, and that the Bid is made without any connection or collusion with any person submitting another Bid on this Contract.

The Bidder further declares that he has carefully examined the Contract Documents for the construction of the project, that he has personally inspected the site, that he has satisfied himself as to the quantities involved, including materials and equipment, and conditions of work involved, including the fact that the description of the quantities of work and materials, as included herein, is brief and is intended only to indicate the general nature of the work and to identify the said quantities with the detailed requirements of the Contract Documents, and that this Bid is made according to the provisions and under the terms of the Contract Documents, which Documents are hereby made a part of this Bid.

CONTRACT EXECUTION

The Bidder agrees that if this Bid is accepted, he will, within 10 days, not including Sundays and legal holidays, after Notice of Award, sign the Contract in the form annexed hereto, and will at that time, deliver to the Owner evidence of holding required licenses and certificates, and will, to the extent of his Bid, furnish all machinery, tools, apparatus, and other means of construction and do the work and furnish all the materials necessary to complete all work as specified or indicated in the Contract Documents.

CERTIFICATES OF INSURANCE

Bidder agrees to furnish the Owner, before commencing the work under this Contract, the certificates of insurance as specified in these Documents.

START OF CONSTRUCTION AND CONTRACT COMPLETION TIME
The Bidder further agrees to begin work within 14 calendar days after the date of the initial Notice to Proceed and to complete the project, in all respects within:

NTP 1: 270 calendar days after the Notice of Award
NTP 2: 270 calendar days after the date of the respective Notice to Proceed

NTP 2 is anticipated to be issued prior to October 31, 2020. The total contract term shall not exceed 540 calendar days.

LIQUIDATED DAMAGES

In the event the Bidder is awarded the Contract and shall fail to complete the work within the time limit or extended time limit agreed upon, as more particularly set forth in the Contract Documents, liquidated damages shall be paid to the Owner at the rate of $1,000.00 per day for all work awarded until the work has been satisfactorily completed as provided by the Contract Documents.

ADDENDA

The Bidder hereby acknowledges that he has received Addenda No's. _____, _____,
____, _____, ____, ____, _____, _____, _____, _____, _____, _____,
(Bidder shall insert No. of each Addendum received) and agrees that all addenda issued are hereby made part of the Contract Documents, and the Bidder further agrees that his Bid(s) includes all impacts resulting from said addenda.

SALES AND USE TAXES

The Bidder agrees that all federal, state, and local sales and use taxes are included in the stated bid prices for the work.

LUMP SUM

The Bidder further proposes to accept as full payment for the work proposed herein the amounts computed under the provisions of the Contract Documents and based on the following lump sum amounts. The Bidder agrees that the lump sum represent a true measure of the labor and materials required to perform the work, including all allowances for overhead and profit for each type and unit of work called for in these Contract Documents.

1. NTP 1 BASE BID

1 LS $_____

TOTAL NTP 1 **$_____**

2. NTP 2 BASE BID

1 LS $_____

TOTAL NTP 2 **$_____**

TOTAL LUMP SUM BASE BID (SUM OF NTP 1 + NTP 2 TOTALS LISTED ABOVE):

$_____

_____Dollars & _____Cents
(amount written in words)

Payment for materials & equipment authorized by the Owner in a written Change Order but not listed in the Schedule of Values will be provided at suppliers' invoice plus 15 %.

List items to be performed by CONTRACTOR's own forces and the estimated total cost of these items. (Use additional sheets if necessary.)

Phase	**NTP - 1**	**NTP - 2**	**Total**
Mobilization			
General Conditions/Bonds			
Earthwork & Utilities			
Building Concrete			
Building Foundation & Slabs			
Building Masonry			
Siding & Windows			
Roofing			
Doors & Hardware			
Overhead and Sliding Doors			
Painting			
Building Plumbing			
Building Mechanical			

Building Electrical			
Temporary Horse Run & Stables			
Site lighting			
Site Landscaping			
Site Irrigation			
Site Earthwork & Utilities			
Site Concrete			
Site Pavements			
Foundation & Slabs			
Site Masonry			
Site Plumbing			
Site Electrical			
Art in Public Places			

NTP1 BID DEDUCT ALTERNATES

NOTE: OWNER HAS THE RIGHT TO ACCEPT OR REJECT ANY, ALL, OR NO BID ALTERNATE ITEMS. THE TOTAL OF BASE BID PLUS THE SUM OF OWNER SELECTED BID ALTERNATES WILL A BASIS OF EVALUATING LOW BIDDER AND BASIS OF AWARD.

1. Remove the secondary metal fencing surrounding the horse run.
   1 LS $_____
2. Install 5V crimp metal roof at horse stables as opposed to standing seam metal roof.
   1 LS $_____
3. Remove the secondary wood fencing surrounding the horse run.
   1 LS $_____
4. Existing storage rooms floors to remain – patch and repair as required. 2" Lightweight topper and epoxy paint to be excluded.
   1 LS $_____
5. Utilize Champion Bermuda grass at soccer field only. Remaining open space to be St. Augustine.
   1 LS $_____
6. Fencing around soccer field to be 4' high as opposed to 6' high.
   1 LS $_____
7. Exclude fencing surrounding soccer field.
   1 LS $_____

8. Horse run post lights to be replaced with solar cap lights, not hard-wired.
   1 LS $_____

9. Exclude horse run post lights.
   1 LS $_____

10. Fruit Tree Grove hardscape & fencing
    1 LS $_____

11. Soccer field sod to be Championship Bermuda as opposed to Supreme Paspalum.
    1 LS $_____

12. Design/Build of mechanical system for building (safe conditioned areas) utilizing (3) mechanical units only.
    1 LS $_____

13. Utilize synthetic grass (see specifications) at soccer field only.
    1 LS $_____

SUBCONTRACTORS

The Bidder further proposes that the following subcontracting firms or businesses will be awarded subcontracts for the following portions of the work if the Bidder is awarded the Contract:

_____
Name

_____, _____, _____, _____
Street City State Zip

Name

_____, _____, _____ ,_____
Street City State Zip

_____
Name

_____, _____, _____,_____

Street City State Zip

_____
Name

_____, _____, _____,_____
Street City State Zip

SURETY

_____ whose address is

_____, _____, _____,_____
Street City State Zip

BIDDER

The name of the Bidder submitting this Bid is

_____ doing business at

_____, _____, _____, _____
Street City State Zip

which is the address to which all communications concerned with this Bid and with the Contract shall be sent.

The names of the principal officers of the corporation submitting this Bid, or of the partnership, or of all persons interested in this Bid as principals are as follows:

_____ _____

_____ _____

_____ _____

_____ _____

If Sole Proprietor or Partnership

IN WITNESS hereto the undersigned has set his (its) hand this _____ day of _____ 2019.

_____
Signature of Bidder

_____
Title

If Corporation

IN WITNESS WHEREOF the undersigned corporation has caused this instrument to be executed and its seal affixed by its duly authorized officers this _____ day of _____ 2019.

(SEAL)

_____
Name of Corporation

By _____

Title _____
Attest_____

_____

Sworn and subscribed before this _____ day of _____, 20____

NOTARY PUBLIC, State of _____, at Large

My Commission Expires: _____

****

EXPERIENCE OF BIDDER

The Bidder states that he is an experienced CONTRACTOR and has completed similar projects within the last 5 years.

(List similar projects, with types, names of OWNERs, construction costs, ENGINEERs, and references with phone numbers. Use additional sheets if necessary.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

FLORIDA BID BOND

BOND NO. _____

AMOUNT: $ _____

KNOW ALL MEN BY THESE PRESENTS, that _____

_____

hereinafter called the PRINCIPAL, and _____

_____

a corporation duly organized under the laws of the State of _____

having its principal place of business at _____

_____in the State of _____,

and authorized to do business in the State of Florida, as SURETY, are held and firmly bound unto

_____

hereinafter called the OBLIGEE, in the sum of_____

DOLLARS ($_____) for the payment for which we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these present.

THE CONDITION OF THIS BOND IS SUCH THAT:

WHEREAS, the PRINCIPAL is herewith submitting his or its Bid for **ITB # 19-026 / TRUMAN WATERFRONT PARK PHASE 1B – BUILDING 1287 AND FIELD** said Bid, by reference thereto, being hereby made a part hereof.

WHEREAS, the PRINCIPAL contemplates submitting or has submitted a bid to the OBLIGEE for the furnishing of all labor, materials (except those to be specifically furnished by the CITY), equipment, machinery, tools, apparatus, means of transportation for, and the performance of the work covered in the Bid and the Contract Documents, entitled:

ITB 19-026 / TRUMAN WATERFRONT PARK PHASE 1B – BUILDING 1287 AND FIELD

WHEREAS, it was a condition precedent to the submission of said bid that a cashier's check, certified check, or bid bond in the amount of five (5) percent of the base bid be submitted with said bid as a guarantee that the Bidder would, if awarded the Contract, enter into a written Contract with the CITY for the performance of said Contract, within 10 working days after written notice having been given of the award of the Contract.

NOW, THEREFORE, the conditions of this obligation are such that if the PRINCIPAL within 10 consecutive calendar days after written notice of such acceptance, enters into a written Contract with the OBLIGEE and furnishes the Performance and Payment Bonds**,** each in an amount equal to 100 percent of the base bid, satisfactory to the CITY, then this obligation shall be void; otherwise the sum herein stated shall be due and payable to the OBLIGEE and the Surety herein agrees to pay said sum immediately upon demand of the OBLIGEE in good and lawful money of the United States of America, as liquidated damages for failure thereof of said PRINCIPAL.

Signed and sealed this _____ day of _____ ,2019.

PRINCIPAL

By_____

STATE OF _____)
: SS
COUNTY OF _____)

_____
SURETY

By _____

ANTI – KICKBACK AFFIDAVIT

STATE OF _____)
: SS
COUNTY OF _____)

I, the undersigned hereby duly sworn, depose and say that no portion of the sum herein bid will be paid to any employees of the City of Key West as a commission, kickback, reward or gift, directly or indirectly by me or any member of my firm or by an officer of the corporation.

By: _____

Sworn and subscribed before me this _____day of _____, 2019.

NOTARY PUBLIC, State of _____ at Large

My Commission Expires:

NON-COLLUSION AFFIDAVIT

STATE OF FLORIDA)
: SS
COUNTY OF MONROE)

I, the undersigned hereby declares that the only persons or parties interested in this Proposal are those named herein, that this Proposal is, in all respects, fair and without fraud, that it is made without collusion with any official of the Owner, and that the Proposal is made without any connection or collusion with any person submitting another Proposal on this Contract.

By: _____

Sworn and subscribed before me this

_____ day of _____, 2019.

_____

NOTARY PUBLIC, State of Florida at Large

My Commission Expires: _____

SWORN STATEMENT UNDER SECTION 287.133(3)(A)
FLORIDA STATUTES, ON **PUBLIC ENTITY CRIMES**

THIS FORM MUST BE SIGNED IN THE PRESENCE OF A NOTARY PUBLIC OR OTHER OFFICER AUTHORIZED TO ADMINISTER OATHS.

1. This sworn statement is submitted with Bid or Bid for _____

   _____

2. This sworn statement is submitted by_____
   (Name of entity submitting sworn statement)

   whose business address is _____

   _____

   and (if applicable) its Federal Employer Identification Number (FEIN) is_____

   _____

   (If the entity has no FEIN, include the Social Security Number of the individual

   signing this sworn statement _____

3. My name is _____
   (Please print name of individual signing)

   and my relationship to the entity named above is _____

4. I understand that a "public entity crime" as defined in Paragraph 287.133(1)(g), Florida Statutes, means a violation of any state or federal law by a person with respect to and directly related to the transaction of business with any public entity or with an agency or political subdivision of any other state or with the United States, including but not limited to, any bid or contract for goods or services to be provided to any public or an agency or political subdivision of any other state or of the United States and involving antitrust, fraud, theft, bribery, collusion, racketeering, conspiracy, material misrepresentation.

5. I understand that "convicted" or "conviction" as defined in Paragraph 287.133(1)(b), Florida Statutes, means a finding of guilt or a conviction of a public entity crime, with or without an adjudication guilt, in any federal or state trial court of record relating to charges brought by indictment information after July 1, 1989, as a result of a jury verdict, nonjury trial, or entry of a plea of guilty or nolo contendere.

6. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes, means

    a. A predecessor or successor of a person convicted of a public entity crime; or

    b. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

7. I understand that a "person" as defined in Paragraph 287.133(1)(8), Florida Statutes, means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which bids or applies to bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

8. Based on information and belief, the statement which I have marked below is true in relation to the entity submitting this sworn statement. (Please indicate which statement applies).

    ____Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor any affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989, AND (Please indicate which additional statement applies.)

    _____There has been a proceeding concerning the conviction before a hearing of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer did not place the person or affiliate on the convicted vendor list. (Please attach a copy of the final order.)

    _____The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of

    Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in the public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

_____The person or affiliate has not been put on the convicted vendor list. (Please describe any action taken by or pending with the Department of General Services.)

_____
(Signature)

_____
(Date)

STATE OF_____

COUNTY OF_____

PERSONALLY, APPEARED BEFORE ME, the undersigned authority,

_____who, after first being sworn by me, affixed his/her
(Name of individual signing)

Signature in the space provided above on this_____day of _____ , 2019.

My commission expires:

_____
NOTARY PUBLIC

INDEMNIFICATION

To the fullest extent permitted by law, the CONTRACTOR expressly agrees to indemnify and hold harmless the City of Key West, their officers, directors, agents, and employees (herein called the "indemnitees") from liabilities, damages, losses and costs, including, but not limited to, reasonable attorney's fees and court costs, such legal expenses to include costs incurred in establishing the indemnification and other rights agreed to in this Paragraph, to persons or property, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the CONTRACTOR, its Subcontractors or persons employed or utilized by them in the performance of the Contract. Claims by indemnitees for indemnification shall be limited to the amount of CONTRACTOR's insurance or $1 million per occurrence, whichever is greater. The parties acknowledge that the amount of the indemnity required hereunder bears a reasonable commercial relationship to the Contract and it is part of the project specifications or the bid documents, if any.

The indemnification obligations under the Contract shall not be restricted in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the CONTRACTOR under workers' compensation acts, disability benefits acts, or other employee benefits acts, and shall extend to and include any actions brought by or in the name of any employee of the CONTRACTOR or of any third party to whom CONTRACTOR may subcontract a part or all of the Work. This indemnification shall continue beyond the date of completion of the work.

CONTRACTOR: _____ SEAL:

_____
Address

_____
Signature

_____
Print Name

_____
Title

DATE: _____

LOCAL VENDOR CERTIFICATION PURSUANT TO CKW ORDINANCE 09-22 SECTION 2-798

The undersigned, as a duly authorized representative of the vendor listed herein, certifies to the best of his/her knowledge and belief, that the vendor meets the definition of a "Local Business." For purposes of this section, "local business" shall mean a business which:

a. Principle address as registered with the FL Department of State located within 30 miles of the boundaries of the city, listed with the chief licensing official as having a business tax receipt with its principle address within 30 miles of the boundaries of the city for at least one year immediately prior to the issuance of the solicitation.

b. Maintains a workforce of at least 50 percent of its employees from the city or within 30 miles of its boundaries.

c. Having paid all current license taxes and any other fees due the city at least 24 hours prior to the publication of the call for bids or request for Bids.

- Not a local vendor pursuant to Ordinance 09-22 Section 2-798
- Qualifies as a local vendor pursuant to Ordinance 09-22 Section 2-798

If you qualify, please complete the following in support of the self-certification & submit copies of your County and City business licenses. Failure to provide the information requested will result in denial of certification as a local business.

Business Name _____ Phone: _____

Current Local Address: _____ Fax:_____
(P.O Box numbers may not be used to establish status)

Length of time at this address:_____

_____ Date: _____
Signature of Authorized Representative

STATE OF_____ COUNTY OF_____

The foregoing instrument was acknowledged before me this _____day of_____, 2019.

By_____, of _____
(Name of officer or agent, title of officer or agent) (Name of corporation acknowledging)

or has produced identification_____as identification
(Type of identification)

_____
Signature of Notary

_____
Print, Type or Stamp Name of Notary

_____
Title or Rank

Return Completed form with
Supporting documents to:
City of Key West Purchasing

EQUAL BENEFITS FOR DOMESTIC PARTNERS AFFIDAVIT

STATE OF _____)
: SS
COUNTY OF _____)

I, the undersigned hereby duly sworn, depose and say that the firm of _____ provides benefits to domestic partners of its employees on the same basis as it provides benefits to employees' spouses per City of Key West Ordinance Sec. 2-799.

By: _____

Sworn and subscribed before me this

_____ Day of _____, 2019.

_____

NOTARY PUBLIC, State of _____ at Large

My Commission Expires: _____

CONE OF SILENCE AFFIDAVIT

STATE OF _____)
: SS
COUNTY OF _____)

I the undersigned hereby duly sworn depose and say that all owner(s), partners, officers, directors, employees and agents representing the firm of _____ have read and understand the limitations and procedures regarding communications concerning City of Key West issued competitive solicitations pursuant to City of Key West Ordinance Section 2-773 Cone of Silence.

Sworn and subscribed before me this

_____ Day of _____, 2019.

_____

NOTARY PUBLIC, State of _____ at Large

My Commission Expires: _____

PART 2

CONTRACT FORMS

CONTRACT

This Contract, made and entered into this _____ day of _____ 2019,

by and between the CITY OF KEY WEST, hereinafter called the "Owner", and_____

_____

hereinafter called the "Contractor";

WITNESSETH:

The Contractor, in consideration of the sum to be paid him by the Owner and of the covenants and agreements herein contained, hereby agrees at his own proper cost and expense to do all the work and furnish all the materials, tools, labor, and all appliances, machinery, and appurtenances for ITB 19-026 **TRUMAN WATERFRONT PARK PHASE 1B – BUILDING 1287 AND FIELD**, Key West, Florida to the extent of the Bid made by the Contractor, dated the _____ th day of_____2019, all in full compliance with the Contract Documents referred to herein.

The CONTRACT DOCUMENTS, including the signed copy of the BID, BID BOND, CONTRACT FORM, SUMMARY OF WORK, SPECIFICATIONS, DRAWINGS, GENERAL & SUPPLEMENTARY CONDITIONS OF THE CONTRACT.

In consideration of the performance of the work as set forth in these Contract Documents, the Owner agrees to pay to the Contractor the amount bid in the Bid as adjusted in accordance with the Contract Documents, or as otherwise herein provided, and to make such payments in the manner and at the times provided in the Contract Documents.

The Contractor agrees to complete the work within **540 calendar days** and to accept as full payment hereunder the amounts computed as determined by the Contract Documents and based on the said BID.

The Contractor agrees to remedy all defects appearing in the work or developing in the materials furnished and the workmanship performed under this Contract during the warranty period after the date of final acceptance of the work by the Owner, and further agrees to indemnify and save the Owner harmless from any costs encountered in remedying such defects.

It is agreed that the Contract, based upon the BID, shall be fully complete within the stated number of consecutive calendar days from the date the Notice to Proceed is issued.

In the event the Contractor fails to complete the work within the time limit or extended time limit agreed upon, as more particularly set forth in the Contract Documents, liquidated damages shall be paid at a rate of $1,000.00 per day. Sundays and legal holidays shall be included in determining days in default.

This contract will automatically expire upon completion of the project. Contractors warranty obligations remain in effect.

IN WITNESS WHEREOF, we, the parties hereto, each herewith subscribe the same this

_____ Day of _____, A.D., 2019.

CITY OF KEY WEST

By_____

Title__City Manager_____

CONTRACTOR

By_____

Title_____

FLORIDA PERFORMANCE BOND

BOND NO._____

AMOUNT: $_____

KNOW ALL MEN BY THESE PRESENTS, that in accordance with Florida Statutes Section

255.05, _____

with offices, at _____

hereinafter called the CONTRACTOR, (Principal), and _____

with offices, at _____

a corporation duly organized and existing under and by virtue of the laws of the State of _____ , hereinafter called the SURETY, and authorized to transact business within the State of Florida, as SURETY, are held and firmly bound CITY OF KEY WEST**,**

represented by its _____, hereinafter called the City (Obligee), in the sum of:

_____DOLLARS ($_____), lawful money of the United States of America, for the payment of which, well and truly be made to the CITY, and the CONTRACTOR and the SURETY bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the CONTRACTOR has executed and entered into a certain Contract hereto attached, with the CITY, dated _____,2019, to furnish at his own cost, charges, and expense all the necessary materials, equipment, and/or labor in strict and express accordance with said Contract and the Contract Documents as defined therein, all of which is made a part of said Contract by certain terms and conditions in said Contract more particularly mentioned, which Contract, consisting of the various Contract Documents is made a part of this Bond as fully and completely as if said Contract Documents were set forth herein;

NOW THEREFORE, the conditions of this obligation are such that if the above bounden CONTRACTOR:

1. Shall in all respects comply with the terms and conditions of said Contract and his obligation there under, including the Contract Documents (which include the permit form, coral relocation plan, specifications, and conditions as prepared by the CITY, invitation to bid, instructions to bidders, the CONTRACTOR'S bid as accepted by the above CITY, the bid and contract performance and payment bonds, and all addenda, if any, issued prior to the opening of bids),

being made a part of this bond by reference, at the times and in the manner prescribed in the contract; and

2. Promptly makes payments to all claimants, as defined in Section 255.05(1), Florida Statutes, supplying PRINCIPAL with labor, materials, or supplies, used directly or indirectly by PRINCIPAL in the prosecution of the work provided for in the contract; and

3. Pays CITY all losses, costs, expenses, damages, attorney's fees, including appellate proceedings, injury or loss of whatever kind and however arising including, without limitation, delay damages to which said CITY may be subject by reason of any wrongdoing, misconduct, want of care or skill, negligence, failure of performance, breach, failure to petition within the prescribed time, or default, including patent infringements, on the part of said CONTRACTOR, his agents or employees, in the execution or performance of said Contract; and

4. Performs the guarantee of all work and materials furnished under the contract for the time specified in the contract, then this obligation shall be void; otherwise, to remain in full force and effect for the term of said Contract.

AND, the said Surety for value received, hereby stipulates and agrees that no change involving any extension of time, or addition to the terms of the Contract Documents, or to the work to be performed, or materials to be furnished there under shall affect said obligation of said Surety on this Bond, and the said Surety does hereby waive notice of any such changes, extension of time, alterations, or additions of the terms of the Contract Documents, or to the work.

Any action instituted by a claimant under this bond for payment must be in accordance with the notice and time limitation provisions in Section 255.05(2), Florida Statutes.

IN WITNESS WHEREOF, the above parties bonded together have executed this instrument this day of _____,2019, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACTOR

_____

By:_____(Seal)

_____ Attest

SURETY

By _____(Seal)

_____ Attest

FLORIDA PAYMENT BOND

BOND NO_____

AMOUNT: $_____

KNOW ALL MEN BY THESE PRESENTS, that in accordance with Florida Statutes Section

255.05, _____

with offices at _____

hereinafter called the CONTRACTOR, (Principal), and

_____

with offices at _____

a corporation duly organized and existing under and by virtue of the laws of the State of _____ , hereinafter called the SURETY, and authorized to transact business within the State of Florida, as SURETY, are held and firmly bound CITY OF KEY WEST**,**

represented by its _____, hereinafter called the City (Obligee), in the sum of:

_____DOLLARS ($_____), lawful money of the United States of America, for the payment of which, well and truly be made to the CITY, and the CONTRACTOR and the SURETY bind themselves and each of their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents as follows:

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the CONTRACTOR has executed and entered into a certain Contract for

TRUMAN WATERFRONT PARK PHASE 1B – BUILDING 1287 AND FIELD

attached hereto, with the CITY, dated _____, 2019, to furnish at his own cost, charges, and expense the necessary materials, equipment, and/or labor in strict and express accordance with said Contract and the plans, drawings (if any), and specifications prepared by the CITY, all of which is made a part of said Contract by certain terms and conditions in said Contract more particularly mentioned, which Contract, consisting of the various Contract Documents specifically mentioned herein and relative hereto, is made a part of this Bond as fully and completely as if said Contract Documents were set forth herein.

NOW THEREFORE, the conditions of this obligation are such that if the above bounden CONTRACTOR shall in all respects comply with the terms and conditions of said Contract and his obligation thereunder, including the Contract Documents (which include the permit form, coral

relocation plan, the specifications, and conditions prepared by the CITY, invitation to bid, instructions to bidders, the CONTRACTOR'S bid as accepted by the CITY, the bid and contract and payment bonds, and all addenda, if any, issued prior to the opening of bids), and further that if said CONTRACTOR shall promptly make payments to all persons supplying materials, equipment, and/or labor, used directly or indirectly by said CONTRACTOR or SUBCONTRACTORs in the prosecution of the work for said contract is accordance with Florida Statutes, Section 255.05 or Section 713.23; Pays CITY all loss, damage, expenses, costs and attorney's fees, including appellate proceedings, that CITY sustains because of default by CONTRACTOR, then this obligation shall be void; otherwise to remain in full force and effect for the term of said contract, including and all guarantee periods as specifically mentioned in said Contract Documents.

AND, the said SURETY for value received, hereby stipulates and agrees that no change involving any extension of time, or addition to the terms of the Contract or to the work to be performed, or materials to be furnished thereunder, or in the Contract Documents and specifications accompanying the said contract shall affect said obligation of said SURETY on this Bond, and the said SURETY does hereby waive notice of any such changes, extension of time, alternations, or additions of the terms of the Contract, or to the work, to the Contract Documents, or to the specifications.

Claimant shall give written notice to the CONTRACTOR and the SURETY as required by Section 255.05 or Section 713.23, Florida Statutes. Any action instituted against the CONTRACTOR or SURETY under this bond for payment must be in accordance with the notice and time limitation provisions in Section 255.05(2) or Section 713.23, Florida Statutes.

IN WITNESS WHEREOF, the above parties bounded together have executed this instrument this _____ day of _____,2019, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACTOR

_____

By:_____(Seal)

_____

Attest

SURETY

By _____(Seal)

_____

Attest

PART 3

CONDITIONS OF THE CONTRACT

GENERAL CONDITIONS
CONTENTS

Article

DEFINITIONS

1. AS APPROVED
2. AS SHOWN, AND AS INDICATED
3. BIDDER
4. CONTRACT DOCUMENTS
5. CONTRACTOR
6. CONTRACT COMPLETION
7. DAYS
8. DRAWINGS
9. ARCHITECT
10. NOTICE
11. OR EQUAL
12. OWNER
13. PLANS
14. SPECIFICATIONS
15. NOTICE TO PROCEED
16. SUBSTANTIAL COMPLETION
17. WORK

CONTRACT DOCUMENTS

18. INTENT OF CONTRACT DOCUMENTS
19. DISCREPANCIES AND OMISSIONS
20. CHANGES IN THE WORK
21. EXAMINATION AND VERIFICATION OF CONTRACT DOCUMENTS
22. DOCUMENTS TO BE KEPT ON THE JOBSITE
23. ADDITIONAL CONTRACT DOCUMENTS
24. OWNERSHIP OF CONTRACT DOCUMENTS

THE ARCHITECT

25. AUTHORITY OF THE ARCHITECT
26. DUTIES AND RESPONSIBILITIES OF THE ARCHITECT
27. LIMITATIONS ON ARCHITECT'S RESPONSIBILITIES
28. REJECTED WORK
29. LINES AND GRADES
30. SUBMITTALS
31. DETAIL DRAWINGS AND INSTRUCTIONS

THE CONTRACTOR AND HIS EMPLOYEES

32. CONTRACTOR, AN INDEPENDENT AGENT
32. (a) ASSIGNMENT OF CONTRACT
33. SUBCONTRACTING
34. INSURANCE AND LIABILITY
    A. GENERAL
    B. CONTRACTOR AND SUB-CONTRACTOR INSURANCE
    C. COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE
    D. GENERAL LIABILITY INSURANCE (INCLUDING AUTOMOBILE)
    E. BUILDER'S RISK ALL RISK INSURANCE
    F. NO PERSONAL LIABILITY OF PUBLIC OFFICIALS
35. INDEMNITY
36. EXCLUSION OF CONTRACTOR CLAIMS
37. TAXES AND CHARGES
38. REQUIREMENTS OF STATE LAW FOR PUBLIC WORKS PROJECTS
39. CODES, ORDINANCES, PERMITS, AND LICENSES
40. SUPERINTENDENCE
41. RECEPTION OF ARCHITECT'S COMMUNICATIONS
42. SAFETY
43. PROTECTION OF WORK AND PROPERTY
44. RESPONSIBILITY OF CONTRACTOR TO ACT IN AN EMERGENCY
45. MATERIALS AND APPLIANCES
46. CONTRACTORS' AND MANUFACTURERS' COMPLIANCE WITH STATE SAFETY, OSHA AND OTHER CODE REQUIREMENTS
47. SUBSTITUTION OF MATERIALS
48. TESTS, SAMPLES, AND OBSERVATIONS
49. ROYALTIES AND PATENT
50. CONTRACTOR'S RIGHT TO TERMINATE CONTRACT
51. CORRECTION OF DEFECTIVE WORK DURING WARRANTY PERIOD

PROGRESS OF THE WORK

52. BEGINNING OF THE WORK
53. SCHEDULES AND PROGRESS REPORTS
54. PROSECUTION OF THE WORK
55. OWNER'S RIGHT TO RETAIN IMPERFECT WORK
56. OWNER'S RIGHT TO DO WORK
57. OWNER'S RIGHT TO TRANSFER EMPLOYMENT
58. DELAYS AND EXTENSION OF TIME
59. DIFFERING SITE CONDITION

GENERAL CONDITIONS
CONTENTS

Article

60. LIQUIDATED DAMAGES
61. OTHER CONTRACTS
62. USE OF PREMISES
63. SUBSTANTIAL COMPLETION DATE
64. PERFORMANCE TESTING
65. OWNER'S USE OF PORTION OF THE WORK
66. CUTTING AND PATCHING
67. CLEANING UP

PAYMENT

68. CHANGE ORDERS
A. UNIT PRICE
B.LUMP SUM
C. COST REIMBURSEMENT WORK
69. PARTIAL PAYMENTS
A. GENERAL
B. ESTIMATE
C. DEDUCTION FROM ESTIMATE
D. QUALIFICATIONS FOR PARTIAL PAYMENT FOR MATERIALS DELIVERED
E. PAYMENT
70. CLAIMS FOR EXTRA WORK
71. RELEASE OF LIENS OR CLAIMS
72. FINAL PAYMENT
73. NO WAIVER OF RIGHTS
74. ACCEPTANCE OF FINAL PAYMENT CONSTITUTES RELEASE

DEFINITIONS

Whenever in the Contract Documents the following terms are used, the intent and meaning shall be interpreted as follows:

1. AS APPROVED

The words "as approved", unless otherwise qualified, shall be understood to be followed by the words "by the ARCHITECT for conformance with the Contract Document".

2. AS SHOWN, AND AS INDICATED

The words "as shown" and "as Indicated" shall be understood to be followed by the words "on the Drawings".

3. BIDDER

The person or persons, partnership, firm, or corporation submitting a Bid for the work contemplated.

4. CONTRACT DOCUMENTS

The "Contract Documents" consist of the Bidding Requirements, Contract Forms, Conditions of the Contact, Specifications, Drawings, all modifications thereof incorporated into the Documents before their execution, Change Orders, and all other requirements incorporated by specific reference thereto. These form the Contract.

5. CONTRACTOR

The person or persons, partnership, firm, or corporation who enters into the Contract awarded him by the OWNER.

6. CONTRACT COMPLETION

The "Contract Completion" is the date the OWNER accepts the entire work as being in compliance with the Contract Documents, or formally waives nonconforming work to extent of nonconformity, and issues the final payment in accordance with the requirements set forth in Article, "Final Payment" of these General Conditions.

7. DAYS

Unless otherwise specifically stated, the term "days" will be understood to mean calendar days. Business day or working day means any day other than Saturday, Sunday, or legal holiday.

8. DRAWINGS

The term "Drawings" refers to the official Drawings, Profiles, cross sections, elevations, details, and other working drawings and supplementary drawings, or reproductions thereof, signed by the ARCHITECT, which shows the location, character, dimensions, and details of the work to be performed. Drawings may either be bound in the same book as the balance of the Contract Documents, or bound in separate sets, and are a part of the Contract Documents, regardless of the method of binding.

9. ARCHITECT

The person or organization identified as such in the Contract Documents. The Term "ARCHITECT" means ARCHITECT or his authorized representative.

10. NOTICE

The term "notice" or the requirement to notify, as used in the Contract Documents or applicable state or federal statutes, shall signify a written communication delivered in person or by registered mail to the individual, or to a member of the firm, or to an officer of the corporation for whom it is intended. Certified or registered mail shall be addressed to the last business address known to him

who gives the notice.

11. OR EQUAL

The term "or equal" shall be understood to indicate that the "equal" Product is equivalent to or better than the Product named in function, performance, reliability, quality, and general configuration. Determination of equality in reference to the Project design requirements will be made by the ARCHITECT. Such equal Products shall not be purchased or installed by the CONTRACTOR without written authorization.

12. OWNER

The person, organization, or public body identified as such in the Contract Documents.

13. PLANS (See Drawings)

14. SPECIFICATIONS

The term "Specifications" refers to those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards, and workmanship as applied to the work and certain administrative details applicable thereto. Where standard specifications, such as those of ASTM, AASHTO, etc., have been referred to, the applicable portions of such standard specifications shall become a part of these Contract Documents. If referenced specifications conflict with specifications contained herein, the requirements contained herein shall prevail.

15. NOTICE TO PROCEED

A written notice given by the OWNER to the CONTRACTOR (with a copy to the ARCHITECT) fixing the date on which the Contract time will commence to run and on which the CONTRACTOR shall start to perform his obligation under the Contract Documents. The Notice to Proceed will be given within 30 days following the execution of the Contract by the OWNER.

16. SUBSTANTIAL COMPLETION

"Substantial Completion" shall be that degree of completion of the Project or a defined portion of the Project, as evidenced by the ARCHITECT's written notice of Substantial Completion, sufficient to Provide the OWNER, at his discretion, the full-time use of the Project or defined portion of the Project for the purposes for which it was intended. "Substantial Completion" of an operating facility shall be that degree of completion that has Provided a minimum of 7 continuous days of successful, trouble-free, operation, which period shall begin after all performance and acceptance testing has been successfully demonstrated to the ARCHITECT. All equipment contained in the work, plus all other components necessary to enable the OWNER to operate the facility in a manner that was intended, shall be complete on the substantial completion date.

17. WORK

The word "work" within these Contract Documents shall include all material, labor, tools, and all appliances, machinery, transportation, and appurtenances necessary to perform and complete the Contract, and such additional items not specifically indicated or described which can be reasonably inferred as belonging to the item described or indicated and as required by good Practice to Provide a complete and satisfactory system or structure. As used herein, "Provide" shall be understood to mean "furnish and install, complete in-place ".

<u>CONTRACT DOCUMENTS</u>

18. INTENT OF CONTRACT DOCUMENTS

The Contract Documents are complementary, and what is called for by one shall be as binding as if called for by all. The intent of the Documents is to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any work, materials, or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not specifically called for. When words which have a well-known technical

or trade meaning are used to describe work, materials, or equipment, such words shall be interpreted in accordance with that meaning.

Reference to standard specifications, manuals, or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or laws or regulations in effect on the first published date of the Invitation to Bid, except as may be otherwise specifically stated. However, no Provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR, or ARCHITECT, or any of their consultants, agents, or employees from those set forth in the Contract Documents, nor shall it be effective to assign to ARCHITECT, or any ARCHITECT's consultants, agents, or employees, any duty or authority to supervise or direct the furnishing or performance of the work or any duty or authority to undertake responsibility contrary to the Provisions of Article LIMITATIONS ON ARCHITECT'S RESPONSIBILITIES.

19. DISCREPANCIES AND OMISSIONS

Any discrepancies or omissions found in the Contract Documents shall be reported to the ARCHITECT immediately. The ARCHITECT will clarify discrepancies or omissions, in writing, within a reasonable time.

In resolving inconsistencies among two or more sections of the Contract Documents, Precedence shall be given in the following order:

A. CONTRACT
B. BID
C. SUPPLEMENTARY CONDITIONS
D. INVITATION TO BID
E. INSTRUCTIONS TO BIDDERS
F. GENERAL CONDITIONS
G. SPECIFICATIONS
H. DRAWINGS

Addenda shall take Precedence over all sections referenced therein. Figure dimensions on Drawings shall take precedence over scale dimensions. Detailed Drawings shall take precedence over general Drawings.

20. CHANGES IN THE WORK

The OWNER, without notice to the Sureties and without invalidating the Contract, may order changes in the work within the general scope of the Contract by altering, adding to, or deducting from the work, the Contract being adjusted accordingly. All such work shall be executed under the conditions of the original Contract, except as specifically adjusted at the time of ordering such change.

In giving instructions, the ARCHITECT may order minor changes in the work not involving extra cost and not inconsistent with the purposes of the Project, but otherwise, except in an emergency endangering life and Property, additions or deductions from the work shall be performed only in pursuance of an approved Change Order from the OWNER, countersigned by the ARCHITECT.

If the work is reduced by alterations, such action shall not constitute a claim for damages based on loss of anticipated Profits.

21. EXAMINATION AND VERIFICATION OF CONTRACT DOCUMENTS

The CONTRACTOR shall thoroughly examine and become familiar with all of the various parts of these Contract Documents and determine the nature and location of the work, the general and local conditions, and all other matters, which can in any way affect the work under this Contract. Failure to make an examination necessary for this determination shall not release the CONTRACTOR from the obligations of this Contract. No verbal agreement or conversation with any officer, agent, or employee of the OWNER or with the ARCHITECT either before or after the execution of this Contract shall affect or modify any of the terms or obligations herein contained.

22. DOCUMENTS TO BE KEPT ON THE JOBSITE

The CONTRACTOR shall keep one copy of the Contract Documents on the job- site, in good order, available to the ARCHITECT

and to his representatives.

The CONTRACTOR shall maintain on a daily basis at the jobsite, and make available to the ARCHITECT on request, one current record set of the Drawings which have been accurately marked to indicate all modifications in the completed work that differ from the design information shown on the Drawings. Upon Substantial completion of the work, the CONTRACTOR shall give the ARCHITECT one complete set of these marked up record Drawings.

23. ADDITIONAL CONTRACT DOCUMENTS

Copies of Contract Documents or Drawings may be obtained on request from the ARCHITECT and by paying the actual cost of reproducing the Contract Documents or Drawings.

24. OWNERSHIP OF CONTRACT DOCUMENTS

All portions of the Contract Documents, and copies thereof furnished by the ARCHITECT are instruments of service for this Project. They are not to be used on other work and are to be returned to the ARCHITECT on request at the completion of the work. Any reuse of these materials without specific written verification or adaptation by the ARCHITECT will be at the risk of the user and without liability or legal expense to the ARCHITECT. Such user shall hold the ARCHITECT harmless from any and all damages, including reasonable attorneys' fees, from any and all claims arising from any such reuse. Any such verification and adaptation shall entitle the ARCHITECT to further compensation at rates to be agreed upon by the user and the ARCHITECT.

<u>THE ARCHITECT</u>

25. AUTHORITY OF THE ARCHITECT

The ARCHITECT will be the OWNER's representative during the construction period. His authority and responsibility will be limited to the Provisions set forth in these Contract Documents. The ARCHITECT will have the Authority to reject work that does not conform to the Contract Documents. However, neither the ARCHITECT's authority to act under this Provision, nor any decision made by him in good faith either to exercise or not to exercise such authority, shall give rise to any duty or responsibility of the ARCHITECT to the CONTRACTOR, any SUBCONTRACTOR, their respective Sureties, any of their agents or employees, or any other person performing any of the work.

26. DUTIES AND RESPONSIBILITIES OF THE ARCHITECT

The ARCHITECT will make visits to the site at intervals appropriate to the various stages of construction to observe the Progress and quality of the work and to determine, in general, if the work is proceeding in accordance with the intent of the Contract Documents. He will not make comprehensive or continuous review or observation to check quality or quantity of the work, and he will not be responsible for construction means, methods, techniques, sequences, or Procedures, or for safety Precautions and Programs in connection with the work. Visits and observations made by the ARCHITECT shall not relieve the CONTRACTOR of his obligation to conduct comprehensive inspections of the work and to furnish materials and perform acceptable work, and to provide adequate safety Precautions, in conformance with the intent of the Contract.

The ARCHITECT will make recommendations to the OWNER, in writing, on all claims of the OWNER or the CONTRACTOR arising from interpretation or execution of the Contract Documents. Such recommendations will be of factual and/or technical nature, and will not include the legal interpretation of the Contract Documents. Any necessary legal interpretation of the Contract Document will be made by the OWNER. Such recommendation shall be necessary before the CONTRACTOR can receive additional money under the terms of the Contract. Changes in work ordered by the ARCHITECT shall be made in compliance with Article CHANGES IN THE WORK.
One or more Project representatives may be assigned to observe the work. It is understood that such Project representatives shall have the authority to issue notice of nonconformance and make decisions within the limitations of the authority of the ARCHITECT. The CONTRACTOR shall furnish all reasonable assistance required by the ARCHITECT or Project representatives for Proper observation of the work. The above-mentioned Project representatives shall not relieve the CONTRACTOR of his obligations to conduct comprehensive inspections of the work and to furnish materials and perform acceptable work, and to provide adequate safety Precautions, in conformance with the intent of the Contract.

27. LIMITATIONS ON ARCHITECT'S RESPONSIBILITIES

ARCHITECT will not be responsible for CONTRACTOR's means, methods, techniques, sequences, or Procedures of construction, or the safety Precautions and Programs incident thereto, and ARCHITECT will not be responsible for CONTRACTOR's failure to perform or furnish the work in accordance with the Contract Documents.

ARCHITECT will not be responsible for the acts or omissions of CONTRACTOR or of any SUBCONTRACTOR, any supplier, or of any other person or organization performing or furnishing any of the work.

Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved", or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "Proper", or "satisfactory", or adjectives of like effect or import are used to describe a requirement, direction, review or judgment of ARCHITECT as to the work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to ARCHITECT any duty or authority to supervise or direct the furnishing or performance of the work or any duty or authority to undertake responsibility contrary to the Provisions of this Article.

28. REJECTED WORK

Any defective work or nonconforming materials or equipment that may be discovered at any time prior to expiration of the warranty period shall be removed and replaced by work which shall conform to the Provisions of the Contract Documents. Any material condemned or rejected shall be removed at once from the Project site.

Failure on the part of the ARCHITECT to condemn or reject bad or inferior work or to note nonconforming materials or equipment on CONTRACTOR submittals shall not be construed to imply acceptance of such work. The OWNER shall reserve and retain all of its rights and remedies at law against the CONTRACTOR and its Surety for correction of any and all latent defects discovered after the guarantee period.

29. LINES AND GRADES

Lines and grades shall be established as provided in the supplementary conditions. All stakes, marks, and other reference information shall be carefully preserved by the CONTRACTOR, and in case of their careless or unnecessary destruction or removal by him or his employees, such stakes, marks, and other information shall be replaced at the CONTRACTOR's expense.

30. SUBMITTALS

After checking and verifying all field measurements and after complying with applicable Procedures specified in Division I, GENERAL REQUIREMENTS, CONTRACTOR shall submit to ARCHITECT, in accordance with the schedule for submittals for review, shop drawings, electrical diagrams, and catalog cuts for fabricated items and manufactured items (including mechanical and electrical equipment), which shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submittal. All submittals shall be identified as ARCHITECT may require. The data shown shall be complete with respect to quantities, dimensions specified, performance and design criteria, materials, and similar data to enable ARCHITECT to review the information. CONTRACTOR shall also submit to ARCHITECT for review, with such promptness as to cause no delay in work, all samples required by the Contract Documents. All samples shall have been checked by and accompanied by a specific written indication that CONTRACTOR has satisfied CONTRACTOR's responsibilities under the Contract Documents with respect to the review of the submission and shall be identified clearly as to material, supplier, pertinent data such as catalog numbers and the use for which intended.

Before submission of each submittal, CONTRACTOR shall have determined and verified all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar data with respect thereto and reviewed or coordinated each submittal with other submittals and with the requirements of the work and the Contract Documents.

At the time of each submission, CONTRACTOR shall give ARCHITECT specific written notice of each variation that the submittal may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on each shop drawing submitted to ARCHITECT for review and approval of each variation.

ARCHITECT will review submittals with reasonable Promptness, but ARCHITECT's review will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences, or Procedures of construction (except where a specific means, method, technique, sequence, or Procedure of construction is indicated in or required by the Contract Documents) or to safety Precautions or Programs incident thereto. The review of a separate item as such will not indicate review of the assembly in which the item functions. CONTRACTOR shall make corrections required by ARCHITECT, and shall return the required number of corrected copies of shop drawings and submit as required new samples for review. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ARCHITECT on Previous submittals.

ARCHITECT's review of submittals shall not relieve CONTRACTOR from the responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ARCHITECT's attention to each such variation at the time of submission and ARCHITECT has given written approval of each such variation by a specific written notation thereof incorporated therein or accompanying the shop drawing or sample approval; nor will any approval by ARCHITECT relieve CONTRACTOR from responsibility for errors or omissions in the shop drawings or from responsibility for having complied with the Provisions herein.
Where a shop drawing or sample is required by the specifications, any related work performed prior to ARCHITECT's review and approval of the pertinent submission shall be at the sole expense and responsibility of the CONTRACTOR.

31. DETAIL DRAWINGS AND INSTRUCTIONS

The ARCHITECT will furnish, with reasonable Promptness, additional instructions by means of Drawings or otherwise, if, in the ARCHITECT's opinion, such are required for the Proper execution of the work. All such Drawings and instructions will be consistent with the Contract Documents, true developments thereof, and reasonably inferable there from.

<u>THE CONTRACTOR AND HIS EMPLOYEES</u>

32. CONTRACTOR, AN INDEPENDENT AGENT

The CONTRACTOR shall independently perform all work under this Contract and shall not be considered as an agent of the OWNER or of the ARCHITECT, nor shall the CONTRACTOR's SUBCONTRACTORS or employees be subagents of the OWNER or of the ARCHITECT.

33. SUBCONTRACTING

Unless modified in the Supplementary Conditions, within 10 days after the execution of the Contract, the CONTRACTOR shall submit to the ARCHITECT the names of all SUBCONTRACTORS Proposed for the work, including the names of any SUBCONTRACTORS that were submitted with the Bid. The CONTRACTOR shall not employ any SUBCONTRACTORS to which the OWNER may object to as lacking capability to properly perform work of the type and scope anticipated.

The CONTRACTOR is as fully responsible to the OWNER for the acts and omissions of his SUBCONTRACTORS and of persons either directly or indirectly employed by them as he is for the acts and omissions of persons directly employed by him.

Nothing contained in the Contract Documents shall create any contractual relationship between any SUBCONTRACTOR and the OWNER or ARCHITECT.

34. INSURANCE AND LIABILITY

A. GENERAL

The CONTRACTOR shall provide (from insurance companies acceptable to the OWNER) the insurance coverage designated hereinafter and pay all costs before commencing work under this Contract. The CONTRACTOR shall furnish the OWNER with certificates of insurance specified herein showing the type, amount class of operations covered, effective dates, and date of expiration of policies, and containing substantially the following statement:
"The insurance covered by this certificate shall not be canceled or materially altered, except after 30 days' written notice has been received by the OWNER."

In case of the breach of any Provision of this Article, the OWNER, at his option, may take out and maintain, at the expense of the CONTRACTOR, such insurance as the OWNER may deem Proper and may deduct the cost of such insurance from any monies which may be due or become due the CONTRACTOR under this Contract.

B. CONTRACTOR AND SUBCONTRACTOR INSURANCE

The CONTRACTOR shall not commence work under this Contract until he has obtained all the insurance required hereunder and such insurance has been reviewed by the OWNER, nor shall the CONTRACTOR allow any SUBCONTRACTOR to commence work on his subcontract until insurance specified below has been obtained. Review of the insurance by the OWNER shall not relieve or decrease the liability of the CONTRACTOR hereunder.

C. COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE

The CONTRACTOR shall maintain during the life of this Contract the statutory amount of Workmen's Compensation Insurance, in addition, Employer's Liability Insurance in an amount as specified in the Supplementary Conditions, for each occurrence, for all of his employees to be engaged in work on the Project under this Contract. In case any such work is subcontracted, the CONTRACTOR shall require the SUBCONTRACTOR to provide similar Workmen's Compensation and Employer's Liability Insurance for all of the SUBCONTRACTOR's employees to be engaged in such work.

D. GENERAL LIABILITY INSURANCE (INCLUDING AUTOMOBILE)

The CONTRACTOR shall maintain during the life of this Contract such general liability, completed operations and Products liability, and automobile liability insurance as will Provide coverage for claims for damages for personal injury, including accidental death, as well as for claims for Property damage, which may arise directly or indirectly from performance of the work under this Contract. The general liability policy shall include contractual liability assumed by the CONTRACTOR under Article **INDEMNITY.** Coverage for Property damage shall be on a "broad form" basis with no exclusions for "X, C & U". The amount of insurance to be provided shall be as specified in the Supplementary Conditions.

In the event any work under this Contract is performed by a SUBCONTRACTOR, the CONTRACTOR shall be responsible for any liability directly or indirectly arising out of the work performed by the SUBCONTRACTOR; to the extent such liability is not covered by the SUBCONTRACTOR's insurance.

The OWNER and ARCHITECT, their officers, agents, and employees shall be named as Additional Insured's on the CONTRACTOR's and any SUBCONTRACTOR's general liability and automobile liability insurance policies for any claims arising out of work performed under this Contract.

E. BUILDERS RISK ALL RISK INSURANCE

Unless otherwise modified in the Supplementary Conditions, the CONTRACTOR shall secure and maintain during the life of this Contract, Builders Risk All Risk Insurance coverage in an amount equal to the full value of the facilities under construction. Such insurance shall include coverage for earthquake, landslide, flood, collapse, loss due to the results of faulty workmanship or design, and all other normally covered risks, and shall provide for losses to be paid to the CONTRACTOR, OWNER, and ARCHITECT as their interests may appear.

The OWNER and ARCHITECT, their officers, agents, and employees shall be named as additional insured's on the CONTRACTOR's and any SUBCONTRACTOR's Builders Risk All Risk insurance policies for any claims arising out of work performed under this Contract.

This insurance shall include a waiver of subrogation as to the ARCHITECT, the OWNER, the CONTRACTOR, and their respective officers, agents, employees and SUBCONTRACTORS.

F. NO PERSONAL LIABILITY OF PUBLIC OFFICIALS

In carrying out any of the Provisions hereof in exercising any authority granted by the Contract, there will be no personal liability upon any public official.

35. INDEMNITY

To the maximum extent permitted by law, the CONTRACTOR shall indemnify and defend the OWNER and the ARCHITECT, and their officers, employees, agents, and sub-consultants, from all claims and losses, including attorney's fees and litigation costs arising out of Property losses or health, safety, personal injury, or death claims by the CONTRACTOR, its SUBCONTRACTORS of any tier, and their employees, agents, or invitees regardless of the fault, breach of Contract, or negligence of the OWNER or ARCHITECT, excepting only such claims or losses that have been adjudicated to have been caused solely by the negligence of the OWNER or the ARCHITECT and regardless of whether or not the CONTRACTOR is or can be named a party in a litigation.

36. EXCLUSION OF CONTRACTOR CLAIMS

In performing its obligations, the ARCHITECT and its consultants may cause expense for the CONTRACTOR or its SUBCONTRACTORS and equipment or material suppliers. However, those parties and their sureties shall maintain no direct action against the ARCHITECT, its officers, employees, agents, and consultants for any claim arising out of, in connection with, or resulting from the ARCHITECT services performed or required to be performed.

37. TAXES AND CHARGES

The CONTRACTOR shall withhold and pay any and all sales and use taxes and all withholding taxes, whether State or Federal, and pay all Social Security charges and also all State Unemployment Compensation charges, and pay or cause to be withheld, as the case may be, any and all taxes, charges, or fees or sums whatsoever, which are now or may hereafter be required to be paid or withheld under any laws.

38. REQUIREMENTS OF STATE LAW FOR PUBLIC WORKS PROJECTS

When the Contract Documents concern public works of the state or any county, municipality, or political subdivision created by its laws, the applicable statutes shall apply. All parties to this Contract shall determine the contents of all applicable statutes and comply with their Provisions throughout the performance of the Contract.

39. CODES, ORDINANCES, PERMITS AND LICENSES

The CONTRACTOR shall keep himself fully informed of all local codes and ordinances, as well as state and federal laws, which in any manner affect the work herein specified. The CONTRACTOR shall at all times comply with said codes and ordinances, laws, and regulations, and Protect and indemnify the OWNER, the ARCHITECT and their respective employees, and its officers and agents against any claim or liability arising from or based on the violation of any such laws, ordinances, or regulations. All permits, licenses and inspection fees necessary for Prosecution and completion of the work shall be secured and paid for by the CONTRACTOR, unless otherwise specified.

40. SUPERINTENDENCE

The CONTRACTOR shall keep at the project site, competent supervisory personnel. The CONTRACTOR shall designate, in writing, before starting work, a Project superintendent who shall be an employee of the CONTRACTOR and shall have complete authority to represent and to act for the CONTRACTOR. ARCHITECT shall be notified in writing prior to any change in superintendent assignment. The CONTRACTOR shall give efficient supervision to the work, using his best skill and attention. The CONTRACTOR shall be solely responsible for all construction means, methods, techniques, and Procedures, and for providing adequate safety Precautions and coordinating all portions of the work under the Contract. It is specifically understood and agreed that the ARCHITECT, its employees and agents, shall not have control or charge of and shall not be responsible for the construction means, methods, techniques, procedures, or for providing adequate safety precautions in connection with the work under Contract.

41. RECEPTION OF ARCHITECT'S COMMUNICATIONS

The superintendent shall receive for the CONTRACTOR all communications from the ARCHITECT. Communications of major importance will be confirmed in writing upon request from the CONTRACTOR.

The ARCHITECT may schedule Project meetings for the purposes of discussing and resolving matters concerning the various elements of the work. Time and place for these meetings and the names of persons required to be Present shall be as determined by the ARCHITECT. CONTRACTOR shall comply with these attendance requirements and shall also require his SUBCONTRACTORS to comply.

42. SAFETY

The CONTRACTOR shall be solely and completely responsible for conditions of the jobsite, including safety of all persons (including employees) and Property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. Safety Provisions shall conform to U.S. Department of Labor (OSHA), and all other applicable federal, state, county, and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent requirement shall be followed. The CONTRACTOR's failure to thoroughly familiarize himself with the aforementioned safety Provisions shall not relieve him from compliance with the obligations and penalties set forth therein.

The CONTRACTOR shall develop and maintain for the duration of this Contract, a safety Program that will effectively incorporate and implement all required safety Provisions. The CONTRACTOR shall appoint an employee who is qualified and authorized to supervise and enforce compliance with the safety Program. The duty of the ARCHITECT to conduct construction review of the work does not include review or approval of the adequacy of the CONTRACTOR's safety Program, safety supervisor, or any safety measures taken in, on, or near the construction site. The CONTRACTOR, as a part of his safety Program, shall maintain at his office or other well-known place at the jobsite, safety equipment applicable to the work as Prescribed by the aforementioned authorities, all articles necessary for giving first-aid to the injured, and shall establish the Procedure for the immediate removal to a hospital or a doctor's care of persons (including employees) who may be injured on the jobsite.

If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the ARCHITECT and the OWNER. In addition, the CONTRACTOR must promptly report in writing to the ARCHITECT all accidents whatsoever arising out of, or in connection with, the performance of the work whether on, or adjacent to, the site, giving full details and statements of witnesses.

If a claim is made by anyone against the CONTRACTOR or any SUBCONTRACTOR on account of any accident, the CONTRACTOR shall promptly report the facts in writing to the ARCHITECT, giving full details of the claim.

43. PROTECTION OF WORK AND PROPERTY

The CONTRACTOR shall at all times safely guard and Protect from damage the OWNER's Property, adjacent Property, and his own work from injury or loss in connection with this Contract. All facilities required for Protection by federal, state, or municipal laws and regulations and local conditions must be provided and maintained. The CONTRACTOR shall Protect his work and materials from damage due to the nature of the work, the elements, carelessness of other CONTRACTORs, or from any cause whatever until the completion and acceptance of the work. All loss or damages arising out of the nature of the work to be done under these Contract Documents, or from any unforeseen obstruction or defects which may be encountered in the Prosecution of the work, or from the action of the elements, shall be sustained by the CONTRACTOR.

44. RESPONSIBILITY OF CONTRACTOR TO ACT IN AN EMERGENCY

In case of an emergency which threatens loss or injury of Property, and/or safety of life, the CONTRACTOR shall act, without previous instructions from the OWNER or ARCHITECT, as the situation may warrant. The CONTRACTOR shall notify the ARCHITECT thereof immediately thereafter. Any claim for compensation by the CONTRACTOR, together with substantiating documents in regard to expense, shall be submitted to the OWNER through the ARCHITECT and the amount of compensation shall be determined by agreement.

45. MATERIALS AND APPLIANCES

Unless otherwise stipulated, the CONTRACTOR shall Provide and pay for all materials, labor, water, tools, equipment, heat, light, fuel, power, transportation, construction equipment and machinery, appliances, telephone, sanitary facilities, temporary facilities and other facilities and incidentals necessary for the execution and completion of the work.

Unless otherwise specified, all materials shall be new, and both workmanship and materials shall be of good quality. The

CONTRACTOR shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

In selecting and/or approving equipment for installation in the Project, the OWNER and ARCHITECT assume no responsibility for injury or claims resulting from failure of the equipment to comply with applicable federal, state, and local safety codes or requirements, or the safety requirements of a recognized agency, or failure due to faulty design concepts, or defective workmanship and materials.

46. CONTRACTORS' AND MANUFACTURERS' COMPLIANCE WITH STATE SAFETY, OSHA, AND OTHER CODE REQUIREMENTS

The completed work shall include all necessary permanent safety devices, such as machinery guards and similar ordinary safety items required by the state and federal (OSHA) industrial authorities and applicable local and national codes. Further, any features of the work subject to such safety regulations shall be fabricated, furnished, and installed (including OWNER-furnished equipment) in compliance with these requirements. CONTRACTORs and manufacturers of equipment shall be held responsible for compliance with the requirements included herein. CONTRACTORs shall notify all equipment suppliers and SUBCONTRACTORS of the Provisions of this Article.

47. SUBSTITUTION OF MATERIALS

Except for OWNER-selected equipment items, and items where no substitution is clearly specified, whenever any material, article, device, Product, fixture, form, type of construction, or Process is indicated or specified by patent or Proprietary name, by name of manufacturer, or by catalog number, such specifications shall be deemed to be used for the purpose of establishing a standard of quality and facilitating the description of the material or Process desired. This Procedure is not to be construed as eliminating from competition other Products of equal or better quality by other manufacturers where fully suitable in design, and shall be deemed to be followed by the words "or equal". The CONTRACTOR may, in such cases, submit complete data to the ARCHITECT for consideration of another material, type, or Process that shall be substantially equal in every respect to that so indicated or specified. Substitute materials shall not be used unless approved in writing. The ARCHITECT will be the sole judge of the substituted article or material.

48. TESTS, SAMPLES, AND OBSERVATIONS

The CONTRACTOR shall furnish, without extra charge, the necessary test pieces and samples, including facilities and labor for obtaining the same, as requested by the ARCHITECT. When required, the CONTRACTOR shall furnish certificates of tests of materials and equipment made at the point of manufacture by a recognized testing laboratory.

The OWNER, ARCHITECT, and authorized government agents, and their representatives shall at all times be Provided safe access to the work wherever it is in Preparation or Progress, and the CONTRACTOR shall Provide facilities for such access and for observations, including maintenance of temporary and permanent access.

If the Specifications, laws, ordinances, or any public authority require any work, to be specially tested or approved, the CONTRACTOR shall give timely notice of its readiness for observations. If any work should be covered up without approval or consent of the ARCHITECT, it shall, if required by the ARCHITECT, be uncovered for examination at the CONTRACTOR's expense.
Reexamination of questioned work may be ordered by the ARCHITECT, and, if so ordered, the work shall be uncovered by the CONTRACTOR. If such work is found to be in accordance with the Contract Documents, the OWNER will pay the cost of uncovering, exposure, observation, inspection, testing and reconstruction. If such work is found to be not in accordance with the Contract Documents, the CONTRACTOR shall correct the defective work, and the cost of reexamination and correction of the defective work shall be paid by the CONTRACTOR.

49. ROYALTIES AND PATENTS

The CONTRACTOR shall pay all royalty and licenses fees, unless otherwise specified. The CONTRACTOR shall defend all suits or claims for infringement of any patent rights and shall save the OWNER and the ARCHITECT harmless from any and all loss, including reasonable attorneys' fees, on account thereof.

50. CONTRACTOR'S RIGHT TO TERMINATE CONTRACT

If the work should be stopped under an order of any court or other public authority for a period of more than 3 months, through no act or fault of the CONTRACTOR, its SUBCONTRACTORS, or respective employees or if the ARCHITECT should fail to make recommendation for payment to the OWNER or return payment request to CONTRACTOR for revision within 30 days after it is due, or if the OWNER should fail to pay the CONTRACTOR within 30 days after time specified in Article PARTIAL PAYMENTS, any sum recommended by the ARCHITECT, then the CONTRACTOR may, upon 15 days' written notice to the OWNER and the ARCHITECT, stop work or terminate this Contract and recover from the OWNER payment for all acceptable work performed and reasonable termination expenses, unless said default has been remedied.

51. CORRECTION OF DEFECTIVE WORK DURING WARRANTY PERIOD

The CONTRACTOR hereby agrees to make, at his own expense, all repairs or replacements necessitated by defects in materials or workmanship, Provided under terms of this Contract, and pay for any damage to other works resulting from such defects, which become evident within 2 years after the date of final acceptance of the work or within 2 years after the date of substantial completion established by the ARCHITECT for specified items of equipment, or within such longer period as may be Prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents. Un-remedied defects identified for correction during the warranty period but remaining after its expiration shall be considered as part of the obligations of the warranty. Defects in material, workmanship, or equipment which are remedied as a result of obligations of the warranty shall subject the remedied portion of the work to an extended warranty period of 2 years after the defect has been remedied.

The CONTRACTOR further assumes responsibility for a similar guarantee for all work and materials provided by SUBCONTRACTORS or manufacturers of packaged equipment components. The effective date for the start of the guarantee or warranty period for equipment qualifying as substantially complete is defined in Article SUBSTANTIAL COMPLETION, AND Article SUBSTANTIAL COMPLETION DATE, in these General Conditions.

The CONTRACTOR also agrees to hold the OWNER and the ARCHITECT harmless from liability of any kind arising from damage due to said defects. The CONTRACTOR shall make all repairs and replacements promptly upon receipt of written order for same from the OWNER. If the CONTRACTOR fails to make the repairs and replacements promptly, or in an emergency where delay would cause serious risk, or loss, or damage, the OWNER may have the defective work corrected or the rejected work removed and replaced, and the CONTRACTOR and his Surety shall be liable for the cost thereof.

PROGRESS OF THE WORK

52. BEGINNING OF THE WORK

Following execution of the Contract, the CONTRACTOR shall meet with the OWNER and ARCHITECT relative to his arrangements for prosecuting the work.

53. SCHEDULES AND PROGRESS REPORTS

Prior to starting the construction, the CONTRACTOR shall Prepare and submit to the ARCHITECT, a Progress schedule showing the dates on which each part or division of the work is expected to be started and finished, and a Preliminary schedule for submittals. The Progress schedule for submittals shall be brought up to date and submitted to the ARCHITECT at the end of each month or at such other times the ARCHITECT may request.

The CONTRACTOR shall forward to the ARCHITECT, at the end of each month, an itemized report of the delivery status of major and critical items of purchased equipment and material, including shop drawings and the status of shop and field fabricated work. These Progress reports shall indicate the date of the purchase order, the current percentage of completion, estimated delivery, and cause of delay, if any.

If the completion of any part of the work or the delivery of materials is behind the submitted Progress schedule, the CONTRACTOR shall submit in writing a plan acceptable to the OWNER and ARCHITECT for bringing the work up to schedule.

The OWNER shall have the right to withhold Progress payments for the work if the CONTRACTOR fails to update and submit the Progress schedule and reports as specified.

54. PROSECUTION OF THE WORK

It is expressly understood and agreed that the time of beginning, rate of Progress, and time of completion of the work are the essence of this Contract. The work shall be prosecuted at such time, and in or on such part or parts of the Project as may be required, to complete the Project as contemplated in the Contract Documents and the Progress schedule.

If the CONTRACTOR desires to carry on work at night or outside the regular hours, he shall give timely notice to the ARCHITECT to allow satisfactory arrangements to be made for observing the work in Progress.

55. OWNER'S RIGHT TO RETAIN IMPERFECT WORK

If any part or portion of the work completed under this Contract shall Prove defective and not in accordance with the Drawings and Specifications, and if the imperfection in the same shall not be of sufficient magnitude or importance as to make the work dangerous or unsuitable, or if the removal of such work will create conditions which are dangerous or undesirable, the OWNER shall have the right and authority to retain such work but will make such deductions in the final payment therefore as may be just and reasonable.

56. OWNER'S RIGHT TO DO WORK

Should the CONTRACTOR neglect to Prosecute the work in conformance with the Contract Documents or neglect or refuse at his own cost to remove and replace work rejected by the ARCHITECT, then the OWNER may notify the Surety of the condition, and after 10 days' written notice to the CONTRACTOR and the Surety, or without notice if an emergency or danger to the work or public exists, and without Prejudice to any other right which the OWNER may have under Contract, or otherwise, take over that portion of the work which has been improperly or non-timely executed, and make good the deficiencies and deduct the cost thereof from the payments then or thereafter due the CONTRACTOR.

57. OWNER'S RIGHT TO TRANSFER EMPLOYMENT

If the CONTRACTOR should abandon the work or if he should persistently or repeatedly refuse or should fail to make prompt payment to SUBCONTRACTORS for material or labor, or to persistently disregard laws, ordinances, or to prosecute the work in conformance with the Contract Documents, or otherwise be guilty of a substantial violation of any Provision of the Contract or any laws or ordinance, then the OWNER may, without Prejudice to any other right or remedy, and after giving the CONTRACTOR and Surety 10 days' written notice, transfer the employment for said work from the CONTRACTOR to the Surety. Upon receipt of such notice, such Surety shall enter upon the Premises and take possession of all materials, tools, and appliances thereon for the purpose of completing the work included under this contract and employ by Contract or otherwise, any qualified person or persons to finish the work and Provide the materials therefore, in accordance with the Contract Documents, without termination of the continuing full force and effect of this contract. In case of such transfer of employment to such Surety, the Surety shall be paid in its own name on estimates according to the terms hereof without any right of the CONTRACTOR to make any claim for the same or any part thereof.

If, after the furnishing of said written notice to the Surety, the CONTRACTOR and the Surety still fail to make reasonable Progress on the performance of the work, the OWNER may terminate the employment of the CONTRACTOR and take possession of the Premises and of all materials, tools, and appliances thereon and finish the work by whatever method he may deem expedient and charge the cost thereof to the CONTRACTOR and the Surety. In such case, the CONTRACTOR shall not be entitled to receive any further payment until the work is finished. If the expense of completing the Contract, including compensation for additional managerial and administrative services, shall exceed such unpaid balance, the CONTRACTOR and the Surety shall pay the difference to the OWNER.

58. DELAYS AND EXTENSION OF TIME

If the CONTRACTOR is delayed in the Progress of the work by any act or neglect of the OWNER or the ARCHITECT, or by any separate CONTRACTOR employed by the OWNER, or by strikes, lockouts, fire, adverse weather conditions not reasonably

anticipated, or acts of Nature, and if the CONTRACTOR, within 48 hours of the start of the occurrence, gives written notice to the OWNER of the cause of the potential delay and estimate of the possible time extension involved, and within 10 days after the cause of the delay has been remedied, the CONTRACTOR gives written notice to the OWNER of any actual time extension requested as a result of the aforementioned occurrence, then the Contract time may be extended by change order for such reasonable time as the ARCHITECT determines. It is agreed that no claim shall be made or allowed for any damages, loss, or expense which may arise out of any delay caused by the above referenced acts or occurrences other than claims for the appropriate extension of time. No extension of time will be granted to the CONTRACTOR for delays occurring to parts of the work that have no measurable impact on the completion of the total work under this Contract. No extension of time will be considered for weather conditions reasonably anticipated for the area in which the work is being performed. Reasonably anticipated weather conditions will be based on official records of monthly Precipitation and other historical data. Adverse weather conditions, if determined to be of a severity that would impact Progress of the work, may be considered as cause for an extension of Contract completion time.

Delays in delivery of equipment or material purchased by the CONTRACTOR or his SUBCONTRACTORS, including OWNER-selected equipment shall not be considered as a just cause for delay, unless the OWNER determines that for good cause the delay is beyond the control of the CONTRACTOR. The CONTRACTOR shall be fully responsible for the timely ordering, scheduling, complete the work is the per-diem rate, as stipulated in the Bid. The said amount is hereby agreed upon as a reasonable estimate of the costs, which may be accrued by the OWNER after the expiration of the time of completion. It is expressly under- stood and agreed that this amount is not to be considered in the nature of a penalty, but as liquidated damages which have accrued against the CONTRACTOR. The OWNER shall have the right to deduct such damages from any amount due, or that may become due the CONTRACTOR, or the amount of such damages shall be due and collectible from the CONTRACTOR or Surety.

59. DIFFERING SITE CONDITIONS

The CONTRACTOR shall promptly, and before the conditions are disturbed, give a written notice to the OWNER and ARCHITECT of:

A. subsurface or latent physical conditions at the site which differ materially from those indicated in this contract,
B. unknown physical conditions at the site, of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

The ARCHITECT will investigate the site conditions promptly after receiving the notice. If the conditions do materially so differ and cause an increase or decrease in the CONTRACTOR's cost of, or the time required for, performing any part of the work under this Contract, whether or not changed as a result of the conditions, and equitable adjustment shall be made under this Article and the Contract modified in writing accordingly.

No request by the CONTRACTOR for an equitable adjustment to the Contract under this Article will be allowed, unless the CONTRACTOR has given the written notice required; provided that the time prescribed above for giving written notice may be extended by the OWNER.

No request by the CONTRACTOR for an equitable adjustment to the Contract for differing site conditions will be allowed if made after final payment under this Contract.

60. LIQUIDATED DAMAGES

Should the CONTRACTOR fail to complete the work, or any part thereof, in the time agreed upon in the Contract or within such extra time as may have been allowed for delays by extensions granted as Provided in the Contract, the CONTRACTOR shall reimburse the OWNER for the additional expense and damage for each calendar day, Sundays and legal holidays included, that the Contract remains uncompleted after the Contract completion date. It is agreed that the amount of such additional expense and damage incurred by reason of failure to complete the work is the per-diem rate, as stipulated in the Bid. The said amount is hereby agreed upon as a reasonable estimate of the costs which may be accrued by the OWNER after the expiration of the time of completion. It is expressly under- stood and agreed that this amount is not to be considered in the nature of a penalty, but as liquidated damages which have accrued against the CONTRACTOR. The OWNER shall have the right to deduct such damages from any amount due, or that may become due the CONTRACTOR, or the amount of such damages shall be due and collectible from the CONTRACTOR or Surety.

61. OTHER CONTRACTS

The OWNER reserves the right to let other Contracts in connection with the work. The CONTRACTOR shall afford other CONTRACTORs reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate his work with theirs.
If any part of the work under this Contract depends for Proper execution or results upon the work of any other CONTRACTOR, utility service company or OWNER, the CONTRACTOR shall inspect and Promptly report to the ARCHITECT in writing any patent or apparent defects to deficiencies in such work that render it unsuitable for such Proper execution and results. The CONTRACTOR's failure to so report shall constitute and acceptance of the work by others as being fit and Proper for integration with work under this Contract, except for latent or non-apparent defects and deficiencies in the work.

62. USE OF PREMISES

The CONTRACTOR shall confine his equipment, the storage of materials and the operation of his workers to limits shown on the Drawings or indicated by law, ordinances, permits, or directions of the ARCHITECT, and shall not unreasonably encumber the Premises with his materials. The CONTRACTOR shall provide, at his own expense, the necessary rights-of-way and access to the work, which may be required outside the limits of the OWNER's Property and shall furnish the ARCHITECT copies of permits and agreements for use of the Property outside that provided by the OWNER.

The CONTRACTOR shall not load nor permit any part of the structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the work or adjacent Property to stresses or Pressures that will endanger it.

63. SUBSTANTIAL COMPLETION DATE

The ARCHITECT may issue a written notice of substantial completion for the purpose of establishing the starting date for specific equipment guarantees, and to establish the date that the OWNER will assume the responsibility for the cost of operating such equipment. Said notice shall not be considered as final acceptance of any portion of the work or relieve the CONTRACTOR from completing the remaining work within the specified time and in full compliance with the Contract Documents. See SUBSTANTIAL COMPLETION under DEFINITIONS of these General Conditions.

64. PERFORMANCE TESTING

Operating equipment and systems shall be performance tested in the Presence of the ARCHITECT to demonstrate compliance with the specified requirements. Performance testing shall be conducted under the specified design operating conditions or under such simulated operating conditions as recommended or approved by the ARCHITECT. Schedule such testing with the ARCHITECT at least one week in advance of the planned date for testing.

65. OWNER'S USE OF PORTIONS OF THE WORK

Following issuance of the written notice of Substantial Completion, the OWNER may initiate operation of the facility. Such use shall not be considered as final acceptance of any portion of the work, nor shall such use be considered as cause for an extension of the Contract completion time, unless authorized by a Change Order issued by the OWNER.

66. CUTTING AND PATCHING

The CONTRACTOR shall do all cutting, fitting, or patching of his work that may be required to make its several parts come together Properly and fit it to receive or be received by work of other CONTRACTORs shown upon or reasonably implied by the Drawings.

67. CLEANING UP

The CONTRACTOR shall, at all times, keep Property on which work is in Progress and the adjacent Property free from accumulations of waste material or rubbish caused by employees or by the work. Upon completion of the construction, the CONTRACTOR shall remove all temporary structures, rubbish, and waste materials resulting from his operations.

PAYMENT

68. PAYMENT FOR CHANGE ORDERS

The OWNER's request for quotations on alterations to the work shall not be considered authorization to proceed with the work expediting, delivery, and installation of all equipment and materials. Within a reasonable period after the CONTRACTOR submits to the OWNER a written request for an extension of time, the ARCHITECT will Present his written opinion to the OWNER as to whether an extension of time is justified, and, if so, his recommendation as to the number of days for time extension. The OWNER will make the final decision on all requests for extension of time.

Prior to the issuance of a formal Change Order, nor shall such request justify any delay in existing work. Quotations for alterations to the work shall include substantiating documentation with an itemized breakdown of CONTRACTOR and SUBCONTRACTOR costs, including labor, material, rentals, approved services, overhead, and profit. OWNER may require detailed cost data in order to substantiate the reasonableness of the proposed costs.

Any compensation paid in conjunction with the terms of a Change Order shall comprise total compensation due the CONTRACTOR for the work or alteration defined in the Change Order. By signing the Change Order, the CONTRACTOR acknowledges that the stipulated compensation includes payment for the work or alteration plus all payment for the interruption of schedules, extended overhead, delay, or any other impact claim or ripple effect, and by such signing specifically waives any reservation or claim for additional compensation in respect to the subject Change Order.

At the OWNER's option, payment or credit for any alterations covered by a Change Order shall be determined by one or a combination of the methods set forth in A, B, or C below, as applicable:

A. UNIT PRICES

Those unit Prices stipulated in the Bid shall be utilized where they are applicable. In the event the Change Order results in a change in the original quantity that is materially and significantly different from the original bid quantity, a new unit Price shall be negotiated upon demand of either party. Unit Prices for new items included in the Change Order shall be negotiated and mutually agreed upon.

B. LUMP SUM

A total lump sum for the work negotiated and mutually acceptable to the CONTRACTOR and the OWNER. Lump sum quotations for modifications to the work shall include substantiating documentation with an itemized breakdown of CONTRACTOR and SUBCONTRACTOR costs, including labor, material, rentals, approved services, overhead, and Profit, all calculated as specified under "C" below.

C. COST REIMBURSEMENT WORK

The term "cost reimbursement" shall be understood to mean that payment for the work will be made on a time and expense basis, that is, on an accounting of the CONTRACTOR's forces, materials, equipment, and other items of cost as required and used to do the work.

If the method of payment cannot be agreed upon Prior to the beginning of the work, and the OWNER directs by written Change Order that the work be done on a cost reimbursement basis, then the CONTRACTOR shall furnish labor, and furnish and install equipment and materials necessary to complete the work in a satisfactory manner and within a reasonable period of time. For the work performed, payment will be made for the documented actual cost of the following:

1. Labor including foremen for those hours they are assigned and participating in the cost reimbursement work (actual payroll cost, including wages, fringe benefits as established by negotiated labor agreements, labor insurance, and labor taxes as established by law). No other fixed labor burdens will be considered, unless approved in writing by the OWNER.
2. Material delivered and used on the designated work, including sales tax, if paid by the CONTRACTOR or his SUBCONTRACTOR.
3. Rental or equivalent rental cost of equipment, including necessary transportation for items having a value in excess of

$100. Rental or equivalent rental cost will be allowed for only those days or hours during which the equipment is in actual use. Rental and transportation allowances shall not exceed the current rental rates prevailing in the locality. The rentals allowed for equipment will, in all cases, be understood to cover all fuel, supplies, repairs, and renewals, and no further allowances will be made for those items, unless specific agreement to that effect is made.

4. Additional bond, as required and approved by the OWNER.
5. Additional insurance (other than labor insurance) as required and approved by the OWNER.

In addition to items 1 through 5 above, an added fixed fee for general overhead and Profit shall be negotiated and allowed for the CONTRACTOR (or approved SUBCONTRACTOR) actually executing the Cost Reimbursement work.

An additional fixed fee shall be negotiated and allowed the CONTRACTOR for the administrative handling of portions of the work that are executed by an approved SUBCONTRACTOR. No additional fixed fee will be allowed for the administrative handling of work executed by a SUBCONTRACTOR of a SUBCONTRACTOR, unless by written permission from the OWNER.

The added fixed fees shall be considered to be full compensation, covering the cost of general supervision, overhead, Profit, and any other general expense. The CONTRACTOR's records shall make clear distinction between the direct costs of work paid for on a cost reimbursement basis and the costs of other work. The CONTRACTOR shall furnish the ARCHITECT report sheets in duplicate of each day's cost reimbursement work no later than the working day following the performance of said work. The daily report sheets shall itemize the materials used, and shall cover the direct cost of labor and the charges for equipment rental, whether furnished by the CONTRACTOR, SUBCONTRACTOR or other forces. The daily report sheets shall provide names or identifications and classifications of workers, the hourly rate of pay and hours worked, and also the size, type, and identification number of equipment and hours operated.

Material charges shall be substantiated by valid copies of vendors' invoices. Such invoices shall be submitted with the daily report sheets, or, if not available, they shall be submitted with subsequent daily report sheets. Said daily report sheets shall be signed by the CONTRACTOR or his authorized agent.

The OWNER reserves the right to furnish such materials and equipment as he deems expedient and the CONTRACTOR shall have no claim for profit or added fees on the cost of such materials and equipment. To receive partial payments and final payment for cost reimbursement work, the CONTRACTOR shall submit to the ARCHITECT, detailed and complete documented verification of the CONTRACTOR's and any of his SUBCONTRACTORS' actual costs involved in the cost reimbursement work. Such costs shall be submitted within 30 days after said work has been performed.

69. PARTIAL PAYMENTS

A. GENERAL

Nothing in this Article shall be construed to affect the right, hereby reserved, to reject the whole or any part of the aforesaid work, should such work be later found not to comply with the Provisions of the Contract Documents. All estimated quantities of work for which partial payments have been made are subject to review and correction on the final estimate. Payment by the OWNER and acceptance by the CONTRACTOR of partial payments based on periodic estimates of quantities of work performed shall not, in any way, constitute acceptance of the estimated quantities used as a basis for computing the amounts of the partial payments.

B. ESTIMATE

At least 30 days before each Progress payment falls due, as specified in the Supplementary Conditions, the CONTRACTOR shall submit to the ARCHITECT a detailed estimate of the amount earned during the Preceding month for the separate portions of the work, and request payment. As used in this Article, the words "amount earned" means the value, on the date of the estimate for partial payment, of the work completed in accordance with the Contract Documents, and the value of approved materials delivered to the Project site suitable stored and Protected Prior to incorporation into the work.

ARCHITECT will, within 7 days after receipt of each request for payment, either indicate in writing a recommendation of payment and present the request to OWNER, or return the request to CONTRACTOR indicating in writing ARCHITECT's reasons for refusing to recommend payment. In the latter case, CONTRACTOR may, within 7 days, make the necessary corrections and resubmit the request.

ARCHITECT may refuse to recommend the whole or any part of any payment if, in his opinion, it would be incorrect to make such representations to OWNER. ARCHITECT may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended to such an extent as may be necessary in ARCHITECT's opinion to protect the OWNER from loss because:

1. The work is defective, or completed work has been damaged requiring correction or replacement;

2. Written claims have been made against OWNER or Liens have been filed in connection with the work;
3. The Contract Price has been reduced because of Change Orders;

4. OWNER has been required to correct defective work or complete the work in accordance with Article OWNER'S RIGHT TO DO WORK;

5. Of CONTRACTOR's unsatisfactory Prosecution of the work in accordance with the Contract Documents; or

6. CONTRACTOR's failure to make payment to SUBCONTRACTORS or for labor, materials, or equipment.

C. DEDUCTION FROM ESTIMATE

Unless modified in the Supplementary Conditions, deductions from the estimate will be as described below:

1. The OWNER will deduct from the estimate, and retain as part security, 10 percent of the amount earned for work satisfactorily completed. A deduction and retainage of 10 percent will be made on the estimated amount earned for approved items of material delivered to and properly stored at the jobsite but not incorporated into the work. When the work is 50 percent complete, the OWNER may reduce the retainage to 5 percent of the dollar value of all work satisfactorily completed to date provided the CONTRACTOR is making satisfactory progress and there is no specific cause for a greater retainage. The OWNER may reinstate the retainage up to 10 percent if the OWNER determines, at his discretion, that the CONTRACTOR is not making satisfactory progress or where there is other specific cause for such withholding.

D. QUALIFICATION FOR PARTIAL PAYMENT FOR MATERIALS DELIVERED

Unless modified in the Supplementary Conditions, qualification for partial payment for materials delivered but not yet incorporated into the work shall be as described below:

1. Materials, as used herein, shall be considered to be those items which are fabricated and manufactured material and equipment. No consideration shall be given to individual purchases of less than $200 for any one item.

2. To receive partial payment for materials delivered to the site, but not incorporated in the work, it shall be necessary for the CONTRACTOR to include a list of such materials on the Partial Payment Request. At his sole discretion, the ARCHITECT may approve items for which partial payment is to be made. Partial payment shall be based on the CONTRACTOR's actual cost for the materials as evidenced by invoices from the supplier. Proper storage and Protection shall be provided by the CONTRACTOR, and as approved by the ARCHITECT. Final payment shall be made only for materials actually incorporated in the work and, upon acceptance of the work, all materials remaining for which advance payments had been made shall revert to the CONTRACTOR, unless otherwise agreed, and partial payments made for these items shall be deducted from the final payment for the work.

3. CONTRACTOR warrants and guarantees that title to all work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER at the time of payment free and clear of all liens, claims, security interests, and encumbrances.
4. If requested by the ARCHITECT, the CONTRACTOR shall provide, with subsequent pay requests, invoices receipted by the supplier showing payment in full has been made.

E. PAYMENT

After deducting the retainage and the amount of all previous partial payments made to the CONTRACTOR from the amount earned, the amount due will be made payable to the CONTRACTOR. Recommendations for payment received by the OWNER less than 9 days Prior to the scheduled day for payment will not be Processed or paid until the following month.

70. CLAIMS FOR EXTRA WORK

In any case where the CONTRACTOR deems additional time or compensation will become due him under this Contract for circumstances other than those defined in Article DELAYS AND EXTENSION OF TIME, the CONTRACTOR shall notify the ARCHITECT, in writing, of his intention to make claim for such time or compensation before he begins the work on which he bases the claim, in order that such matters may be settled, if possible, or other appropriate action taken. The notice of claim shall be in duplicate, in writing, and shall state the circumstances and the reasons for the claim, but need not state the amount. If such notification is not given or if the ARCHITECT is not afforded proper facilities by the CONTRACTOR for keeping strict account of actual cost, then the CONTRACTOR hereby agrees to waive the claim for such additional time or compensation. Such notice by the CONTRACTOR, and fact that the ARCHITECT has kept account of the cost as aforesaid, shall not in any way be construed as proving the validity of the claim.

No extension of time will be granted to the CONTRACTOR for delays resulting from extra work that have no measurable impact on the completion of the total work under this Contract. Claims for additional time or compensation shall be made in itemized detail and submitted, in writing, to the OWNER and ARCHITECT within 10 days following completion of that portion of the work for which the CONTRACTOR bases his claim. Failure to make the claim for additional compensation in the manner and within the time specified above shall constitute waiver of that claim. In case the claim is found to be just, it shall be allowed and paid for as provided in Article PAYMENT FOR CHANGE ORDERS.

71. RELEASE OF LIENS OR CLAIMS

The CONTRACTOR shall indemnify and hold harmless the OWNER from all claims for labor and materials furnished under this Contract. Prior to the final payment, the CONTRACTOR shall furnish to the OWNER, as part of his final payment request, a certification that all of the CONTRACTOR's obligations on the project have been satisfied and that all monetary claims and indebtedness have been paid. The CONTRACTOR shall furnish complete and legal effective releases or waivers, satisfactory to the OWNER, of all liens arising out of or filed in connection with the work.

72. FINAL PAYMENT

Upon completion of all the work under this Contract, the CONTRACTOR shall notify the ARCHITECT, in writing, that he has completed his part of the Contract and shall request final payment. Upon receipt of such notice the ARCHITECT will inspect and, if acceptable, submit to the OWNER his recommendation as to acceptance of the completed work and as to the final estimate of the amount due the CONTRACTOR. Upon approval of this final estimate by the OWNER and compliance by the CONTRACTOR with Provisions in Article **RELEASE OF LIENS OR CLAIMS,** and other Provisions as may be applicable, the OWNER shall pay to the CONTRACTOR all monies due him under the Provisions of these Contract Documents.

73. NO WAIVER OF RIGHTS

Neither the inspection by the OWNER, through the ARCHITECT or any of his employees, nor any order by the OWNER for payment of money, nor any payment for, or acceptance of, the whole or any part of the work by the OWNER or ARCHITECT, nor any extension of time, nor any possession taken by the OWNER or its employees, shall operate as a waiver of any Provision of this Contract, or any power herein reserved to the OWNER, or any right to damages herein Provided, nor shall any waiver of any breach in this Contract be held to be a waiver of any other or subsequent breach. Acceptance or final payment shall not be final and conclusive with regards to latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards the OWNER's rights under the warranty.

74. ACCEPTANCE OF FINAL PAYMENT CONSTITUTES RELEASE

The acceptance by the CONTRACTOR of the final payment shall release the OWNER and the ARCHITECT, as representatives of the OWNER, from all claims and all liability to the CONTRACTOR for all things done or furnished in connection with the work, and every act of the OWNER and others relating to or arising out of the work except claims Previously made in writing and still

unsettled. No payment, however, final or otherwise, shall operate to release the CONTRACTOR or his Sureties from obligations under this Contract and the Performance Bond, Payment Bond, and other bonds and warranties, as herein provided.

SUPPLEMENTARY CONDITIONS

The General Conditions are hereby revised as follows:

ARTICLE 9 "ARCHITECT"

Delete Article "ARCHITECT" in its entirety and substitute the following:

The person or organization identified as such in the Contract Documents. The Term "ARCHITECT" means authorized OWNER's representative.

ARTICLE 32 "CONTRACTOR, AN INDEPENDENT AGENT"

Add the following:

A. ASSIGNMENT OF CONTRACT

Assignment of any part or the whole of this Contract shall be subject to review and approval of the City Commission

ARTICLE 34 "INSURANCE & LIABILITY"

Delete Articles 34 A, B,C, D & E and substitute the following:

Contractor shall maintain limits no less than those stated below:

CONTRACTOR is to secure, pay for, and file with the City of Key West, prior to commencing any work under the Contract, all certificates for workers' compensation, public liability, and property damage liability insurance, and such other insurance coverages as may be required by specifications and addenda thereto, in at least the following minimum amounts with specification amounts to prevail if greater than minimum amounts indicated. Notwithstanding any other provision of the Contract, the CONTRACTOR shall provide the minimum limits of liability insurance coverage as follows:

Auto Liability	$1,000,000	Combined Single Limit
General Liability	$3,000,000	Aggregate (Per Project)
	$2,000,000	Products Aggregate
	$1,000,000	Any One Occurrence
	$1,000,000	Personal Injury
	$ 300,000	Fire Damage/Legal
Workers Compensation	Statutory	
Employers Liability	$1,000,000/$1,000,000/$1,000,000	

CONTRACTOR shall furnish an original Certificate of Insurance indicating, and such policy providing coverage to, City of Key West named as an additional insured on a PRIMARY and NON CONTRIBUTORY basis utilizing an ISO standard endorsement at least as broad as CG 2010 (11/85) or its equivalent, (combination of CG 20 10 07 04 and CG 20 37 07 04, providing coverage for completed operations, is acceptable) including a waiver of subrogation clause in favor of City of Key West on all policies. CONTRACTOR will maintain the General Liability and Umbrella Liability insurance coverages summarized above with coverage continuing in full force including the additional insured endorsement until at least 3 years beyond completion and delivery of the work contracted herein.

Notwithstanding any other provision of the Contract, the CONTRACTOR shall maintain complete workers' compensation coverage for each and every employee, principal, officer, representative, or agent of the CONTRACTOR who is performing any labor, services, or material under the Contract. Further, CONTRACTOR shall additionally maintain the above noted minimum limits of coverage.

CONTRACTOR's insurance policies shall be endorsed to give 30 days' written notice to the City of Key West in the event of cancellation or material change, using form CG 02 24, or its equivalent.

Certificates of Insurance submitted to the City of Key West will not be accepted without copies of the endorsements being requested. This includes additional insured endorsements, cancellation/material change notice endorsements, and waivers of subrogation. PLEASE ADVISE YOUR INSURANCE AGENT ACCORDINGLY.

CONTRACTOR will comply with any and all safety regulations required by any agency or regulatory body including but not limited to OSHA. CONTRACTOR will notify City of Key West immediately by telephone at (305) 809-3811 any accident or injury to anyone that occurs on the jobsite and is related to any of the work being performed by the CONTRACTOR.

Add the following Article:

G. SURETY AND INSURER QUALIFICATIONS

All bonds, insurance contracts, and certificates of insurance shall be either executed by or countersigned by a licensed resident agent of the Surety or insurance company, having his place of business in the State of Florida, and in all ways complying with the insurance laws of the State of Florida. Further, the said Surety or Insurance Company shall be duly licensed and qualified to do business in the State of Florida. If requested, Contractor shall Provide Proof of Florida Licensure for all insurance companies. The City of Key West shall be named as Additional Insured on the insurance certificates.

ARTICLE 35 "INDEMNITY"

Delete Article "INDEMNITY" in its entirety and substitute the following:

INDEMNITY

To the fullest extent permitted by law, the CONTRACTOR expressly agrees to indemnify and hold harmless the City of Key West, their officers, directors, agents, and employees (herein called the "indemnitees") from liabilities, damages, losses and costs, including, but not limited to, reasonable attorney's fees and court costs, such legal expenses to include costs incurred in establishing the indemnification and other rights agreed to in this Paragraph, to persons or property, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the CONTRACTOR, its Subcontractors or persons employed or utilized by them in the performance of the Contract. Claims by indemnitees for indemnification shall be limited to the amount of CONTRACTOR's insurance or $1 million per occurrence, whichever is greater. The parties acknowledge that the amount of the indemnity required hereunder bears a reasonable commercial relationship to the Contract and it is part of the project specifications or the bid documents, if any. The indemnification obligations under the Contract shall not be restricted in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the CONTRACTOR under workers' compensation acts, disability benefits acts, or other employee benefits acts, and shall extend to and include any actions brought by or in the name of any employee of the CONTRACTOR or of any third party to whom CONTRACTOR may subcontract a part or all the Work. This indemnification shall continue beyond the date of completion of the work.

ARTICLE 39 "CODES, ORDINANCES, PERMITS, AND LICENSES"

Add the following:

A. NOISE ORDINANCE

City of Key West has a noise ordinance that allows working hours between 8:00 AM to 7:00 PM, Monday through Friday. No work should be performed during weekends or City Holidays, State Holidays and National Holidays. Any construction operations outside these hours and these days will require a variance from the City of Key West Commission.

B. "LICENSES"

THE BIDDER MUST BE A LICENSED CONTRACTOR BY THE STATE OF FLORIDA AND SUBMIT PROOF OF SUCH WITH THE BID.

1. Within 10 days of Notice of Award, the successful Bidder must represent that he holds all applicable, county, and City of Key West licenses and permits required to do business as a contractor with respect to the work described in the Contract Documents.

2. Further, the successful Bidder must, within 10 days of Notice of Award, furnish documentation showing that, as a minimum, he has complied with the provisions of Chapter 18 of the Code of Ordinances of the City of Key West to enter the Agreement contained in the Contract Documents.

3. Specifically, within 10 days after Notice of Award, the successful Bidder must demonstrate that he holds, as a minimum, the following licenses and certificates:

   a.) City of Key West Tax License Receipt;
   b.) A valid Certificate of Competency issued by the Chief Building Official of Key West, Florida
   c.) A valid occupational license issued by the City of Key West, Florida.

ARTICLE 40 “SUPERINTENDENCE”

Add the following sub article:

The CONTRACTOR shall keep at the project site, competent supervisory personnel, able to read, write and speak English to effectively communicate with City staff.

ARTICLE 42 "SAFETY"

Add the following sub article:

OCCUPATIONAL SAFETY AND HEALTH

The Contractor shall observe and comply with all applicable local, state, and federal occupational safety and health regulations during the prosecution of work under this Contract. In addition, full compliance by the Contractor with the U.S. Department of Labor's Occupational Safety and Health Standards, as established in Public Law 91-596, will be required under the terms of this Contract.

ARTICLE 43 "PROTECTION OF WORK AND PROPERTY"

Add the following Article:

HISTORIC PRESERVATION

The Contractor shall comply with Florida's Archives and Historic Act (Florida Statutes, Chapter 267) and the regulations of the local historic preservation board as applicable and protect against the potential loss or destruction of significant historical or archaeological data, sites, and properties in connection with the project.

ARTICLE 57 “OWNERS RIGHT TO TRANSFER EMPLOYMENT”

Add the following Article:

TERMINATION FOR CONVENIENCE AND RIGHT OF SUSPENSION

A. Owner shall have the right to terminate this Contract without cause by written notice of Termination to the Contractor. In the event of such termination for convenience, the Contractor’s recovery against the Owner shall be limited to that portion of the Contract amount earned through

the date of termination, together with any retainage withheld and reasonable termination expenses incurred. Contractor shall not be entitled to any other or further recovery against the Owner, including, but not limited to, damages or any anticipated profit on portions of the Work not performed.

B. The Owner shall have the right to suspend all or any portions of the Work upon giving the Contractor prior written notice of such suspension. If all or any portion of the Work is so suspended, the Contractor shall be entitled to reasonable costs, expenses and time extension associated with the suspension.

ARTICLE 60 "LIQUIDATED DAMAGES"

Delete Article "LIQUIDATED DAMAGES" in its entirety and substitute the following:
LIQUIDATED DAMAGES

Should the Contractor fail to complete the work or any part thereof in the time agreed upon in the Contract Documents or within such extra time as may have been allowed for delays by extensions granted as provided in the Contract, the Contractor shall reimburse the Owner for the additional expense and damage for each calendar day that project outlined in Contract Documents remains uncompleted after the completion date. Liquidated damages shall be assessed. It is agreed that the amount of such additional expense and damage incurred by reason of failure to complete the work is the per diem rate as stipulated in the Bid. The said amount is hereby agreed upon as a reasonable estimate of the costs which may be accrued by the Owner after the expiration of the time of completion. It is expressly understood and agreed that this amount is not to be considered in the nature of a penalty but as liquidated damages, which have accrued against the Contractor. The Owner shall have the right to deduct such damages from any amount due or that may become due the Contractor or the amount of such damages shall be due and collectible from the Contractor.

ARTICLE 68 “PAYMENT”

Sub article C. “COST REIMBURSEMENT WORK”

Delete the third & fourth paragraph in its entirety & substitute the following;

In addition to 1 through 5 above, an added fixed fee of 15 percent (%) for general overhead & profit shall be allowed for the CONTRACTOR (or approved SUBCONTRACTOR) executing the Cost Reimbursement work.
An additional fixed fee of 5 % will be allowed the CONTRACTOR for the administrative handling of portions of the work that are executed by an approved SUBCONTRACTOR. No additional fixed fee will be allowed for the administrative handling of work executed by the SUBCONTRACTOR of a SUBCONTRACTOR.

ARTICLE 69 "PARTIAL PAYMENTS"

Delete the first paragraph of Sub Article B. "ESTIMATE" and substitute the following:

No more than once each month the Contractor shall submit to the ARCHITECT a detailed estimate of the amount earned during the preceding month for the separate portions of the work and request payment. As used in this Article the words "amount earned" means the value, on the date of the estimate, for partial payment of the work completed in accordance with the Contract Documents and the value of approved materials delivered to the project site suitably stored and protected prior to incorporation into the work. Payment will be made by the Owner to the Contractor within 40 days receipt of the written recommendation of payment from the ARCHITECT.

Sub Article C. “DEDUCTION FROM ESTIMATE

Delete third sentence in its entirety and substitute add the following;

1. When the work is 90 per cent complete, the OWNER may reduce the retainage to 5 percent of the dollar value of all work satisfactorily completed to date provided the CONTRACTOR is making satisfactory progress and there is no specific cause for greater retainage.

Delete Sub article E. "PAYMENT" in its entirety and substitute the following:

After deducting the retainage and the amount of all previous partial payments made to the Contractor from the amount earned the amount due will be made payable to the Contractor. Recommendations for payment received by the Owner less than 40 days prior to the scheduled day for payment will not be processed or paid until the following month.

ARTICLE 72 "FINAL PAYMENT"
Delete Article "FINAL PAYMENT" in its entirety and substitute the following:

FINAL PAYMENT

Upon completion of the work the Contractor shall notify the ARCHITECT, in writing, that he has completed it and shall request final payment. The Contractor shall be responsible for keeping an accurate and detailed record of his actual construction. Upon completion of construction and before final acceptance and payment the Contractor shall furnish the ARCHITECT as-built drawings of his construction. Upon receipt of a request for final payment and the as-built drawings the ARCHITECT will inspect and, if acceptable, submit to the Owner his recommendation as to acceptance of the completed work and as to the final estimate of the amount due the Contractor. Upon approval of this final estimate by the Owner and compliance by the Contractor with provisions in Article RELEASE OF LIENS OR CLAIMS, and other provisions as may be applicable, the Owner shall pay to the Contractor all monies due him under the provisions of these Contract Documents.

A. Acceptance and Final Payment

Whenever the Contractor has completely performed the work provided for under the Contract and the ARCHITECT has performed a final inspection and made final acceptance and subject to the terms of the ARCHITECT will prepare a final estimate showing the value of the work as soon as the ARCHITECT makes the necessary measurements and computations. The ARCHITECT will

correct all prior estimates and payments in the final estimate and payment. The OWNER will pay the estimate, less any sums that the OWNER may have deducted or retained under the provisions of the Contract, as soon as practicable after final acceptance of the work, provided the Contractor has met the requirements of (1) through (4) below.

1. The Contractor has agreed in writing to accept the balance due or refund the overpayment, as determined by the OWNER, as full settlement of his account under the Contract and of all claims in connection therewith, or the Contractor, accepted the balance due or refunded the overpayment, as determined by the OWNER, with the stipulation that his acceptance of such payment or the making of such refund does not constitute any bar, admission, or estoppel, or have any effect as to those payments in dispute or the subject of a pending claim between the Contractor and the OWNER. To receive payment based on a FINAL PAYMENT CERTIFCATE, The Contractor further agrees, by submitting a FINAL PAYMENT CERTIFICATE that any pending or future arbitration claim or suit is limited to those particulars, including the itemized amounts, defined in the original FINAL PAYMENT CERTIFICATE , and that he will commence with any such arbitration claim or suit within 15 calendar days from and after the time of final PAYMENT of the work and that his failure to file a formal claim within this period constitutes his full acceptance of the ARCHITECT's final estimate and payment. The overpayment refund check from the Contractor, if required, will be considered a part of any Acceptance Letter executed.

2. The Contractor has properly maintained the project, as specified hereinbefore.

3. The Contractor has furnished a sworn affidavit to the effect that the Contractor has paid all bills and no suits are pending (other than those exceptions listed, if any) in connection with work performed under the Contract and that the Contractor has not offered or made any gift or gratuity to, or made any financial transaction of any nature with, any employee of the OWNER in the performance of the Contract.

4. Final payment will not be released until the City receives Certified As-built drawings in Auto Cad & Adobe format as well as:

As-Built Drawing Standards:

All supplied data collections, as-builts, drawings and files to be compatible with esri ArcGIS 10.2.2 Software. The current computing environment consists of:
- *Microsoft SQL Server - Windows 7/Server 2008 - ESRI GIS Platform*

Interfaces and Integrations: The City of Key West uses a number of software applications critical to its core operation and mission. The proposed mobile asset data collection solution will need to interface or integrate with these existing platforms. - Arc Collector- ArcGIS Online - ArcMap 10.2

END OF SECTION

PART 4

GENERAL REQUIREMENTS & TECHNICAL SPECIFICATIONS

SECTION 00 0101
PROJECT TITLE PAGE
PROJECT MANUAL

FOR

18070 - TRUMAN WATERFRONT PHASE 1B - BUILDING 1287 AND FIELD

K2M DESIGN PROJECT NUMBER: 18070

CITY OF KEY WEST

21 QUAY ROAD
BUILDING 1287
KEY WEST , FLORIDA 33040

DATE: FEBRUARY 28, 2019

PREPARED BY: ERICA POOLE

K2M DESIGN INC.

END OF SECTION 00 0101

SECTION 00 0103
PROJECT DIRECTORY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Identification of project team members and their contact information.

1.02 OWNER:

A. Name: City of Key West.
   1. Address Line 1: 1300 White Street.
   2. City: Key West.
   3. State: Florida.
   4. Zip Code: 33040.
   5. Telephone: 305-809-3967.

B. Primary Contact: All correspondence from the Contractor to the K2M Design Inc. will be through this party, unless alternate arrangements are mutually agreed upon at preconstruction meeting.
   1. Title: City Engineer.
   2. Name: TBD.
   3. Email: TBD.

1.03 CONSULTANTS:

A. Civil Engineering Consultant:
   1. Company Name: Perez Engineering & Development.
      a. Address Line 1: 1010 Kennedy Drive.
      b. Address Line 2: #201.
      c. City: Key West.
      d. State: Florida.
      e. Zip Code: 33040.
      f. Telephone: 305-293-9440.

B. Structural Engineering Consultant:
   1. Company Name: Meridian Engineering LLC.
      a. Address Line 1: 201 Front Street.
      b. Address Line 2: Suite 203.
      c. City: Key West.
      d. State: Florida.
      e. Zip Code: 33040.
      f. Telephone: 305-293-3263.

1.04 KEY CONTACTS:

A. AT&T
   1. David Stapleton - Regional Manager
      a. Email: ds274d@att.com
      b. Telephone: 678-675-2000

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 00 0103

SECTION 00 0102
PROJECT INFORMATION

PART 1 GENERAL

1.01 PROJECT IDENTIFICATION

A. Project Name: 18070 - Truman Waterfront Phase 1B - Building 1287 And Field, located at:
   21 Quay Road.
   Building 1287.
   Key West, Florida 33040.

B. The Owner, hereinafter referred to as City of Key West: City of Key West

C. City of Key West's Project Manager: TBD.
   1. Department: Engineering.
   2. Address: 1300 White Street.
   3. City, State, Zip: Key West, FL.
   4. Phone/Fax: 305-809-3967.
   5. E-mail: TBD.

1.02 NOTICE TO PROSPECTIVE DESIGN-BUILDERS

A. These documents constitute an Invitation to Bid to and request for qualifications from General Contractors for the construction of the project described below.

B. Notice Date: As noted in City of Key West Front End.

1.03 PROJECT DESCRIPTION

A. Contract Scope: Construction, demolition, and renovation.

B. Contract Terms: Lump sum (fixed price, stipulated sum).

1.04 PROJECT CONSULTANTS

A. The Engineer, hereinafter referred to as K2M Design Inc.: Steven S. Grasley.
   1. Address: 1150 Virginia Street.
   2. City, State, Zip: Key West, FL 33043.
   3. Phone/Fax: 305-307-5840.
   4. E-mail: epoole@k2mdesign.com.

B. The Civil Engineer, hereinafter referred to as Perez Engineering & Development
   1. Address: 1010 Kennedy Drive #201.
   2. City, State, Zip: Key West, FL 33043.
   3. Phone/Fax: 305-293-9440.
   4. E-mail: aperez@perezeng.com.

1.05 PROCUREMENT DOCUMENTS

A. Availability of Documents: Complete sets of procurement documents may be obtained:
   1. From Demand Star by Onvia or City of Key West website http://www.cityofkeywest-fl.gov/egov/apps/document/center.egov?view=item;id=5100. For bid package access on Demand Star, please contact Onvia at www.demandstar.com or call 1-800-711-1712.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 00 0102

TABLE OF CONTENTS

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

00 0101 PROJECT TITLE PAGE
00 0102 PROJECT INFORMATION
00 0103 PROJECT DIRECTORY
00 0110 TABLE OF CONTENTS
00 3100 AVAILABLE PROJECT INFORMATION

DIVISION 01 - GENERAL REQUIREMENTS

01 1000 SUMMARY
01 2000 PRICE AND PAYMENT PROCEDURES
01 3000 ADMINISTRATIVE REQUIREMENTS
01 4523 SITE TESTING SERVICES
01 5213 FIELD OFFICES & SHEDS

DIVISION 02 - EXISTING CONDITIONS

02 4100 DEMOLITION

DIVISION 03 - CONCRETE

03 0516 UNDERSLAB VAPOR BARRIER
03 1000 CONCRETE FORMING AND ACCESSORIES
03 1521 TERMITE BARRIER
03 2000 CONCRETE REINFORCING
03 3000 CAST-IN-PLACE CONCRETE
03 5400 CAST UNDERLAYMENT

DIVISION 04 - MASONRY

04 0511 MORTAR AND MASONRY GROUT
04 2000 UNIT MASONRY

DIVISION 05 - METALS

05 5213 PIPE AND TUBE RAILINGS
05 5305 GRATINGS AND FLOOR PLATES

DIVISION 06 - WOOD, PLASTICS, AND COMPOSITES

06 0573 WOOD TREATMENT
06 1000 ROUGH CARPENTRY
06 1753 SHOP-FABRICATED WOOD TRUSSES
06 2000 FINISH CARPENTRY

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

07 1300 SHEET WATERPROOFING
07 2100 THERMAL INSULATION
07 2119 FOAMED-IN-PLACE INSULATION
07 4113 METAL ROOF PANELS

07 4646 FIBER-CEMENT SIDING
07 6200 SHEET METAL FLASHING AND TRIM
07 7200 ROOF ACCESSORIES
07 9200 JOINT SEALANTS

DIVISION 08 - OPENINGS

08 1113 HOLLOW METAL DOORS AND FRAMES
08 1116 ALUMINUM DOORS AND FRAMES
08 3323 OVERHEAD COILING DOORS
08 5113 ALUMINUM WINDOWS
08 7100 DOOR HARDWARE

DIVISION 09 - FINISHES

09 0561 COMMON WORK RESULTS FOR FLOORING PREPARATION
09 2116 GYPSUM BOARD ASSEMBLIES
09 3000 TILING
09 5100 ACOUSTICAL CEILINGS
09 9113 EXTERIOR PAINTING
09 9123 INTERIOR PAINTING
09 9600 HIGH-PERFORMANCE COATINGS

DIVISION 10 - SPECIALTIES

10 2113.13 METAL TOILET COMPARTMENTS
10 2800 TOILET, BATH, AND LAUNDRY ACCESSORIES

DIVISION 22 - PLUMBING

22 0516 EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING
22 0517 SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING
22 0523 GENERAL-DUTY VALVES FOR PLUMBING PIPING
22 0529 HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
22 0553 IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
22 0719 PLUMBING PIPING INSULATION
22 1005 PLUMBING PIPING
22 3000 PLUMBING EQUIPMENT
22 4000 PLUMBING FIXTURES

DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

23 0529 HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT
23 0593 TESTING, ADJUSTING, AND BALANCING FOR HVAC
23 0713 DUCT INSULATION
23 2300 REFRIGERANT PIPING
23 3100 HVAC DUCTS AND CASINGS
23 3700 AIR OUTLETS AND INLETS
23 8126.13 SMALL-CAPACITY SPLIT-SYSTEM AIR CONDITIONERS

DIVISION 26 - ELECTRICAL

26 0519 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26 0526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26 0533.13 CONDUIT FOR ELECTRICAL SYSTEMS
26 0553 IDENTIFICATION FOR ELECTRICAL SYSTEMS
26 0923 LIGHTING CONTROL DEVICES
26 2100 LOW-VOLTAGE ELECTRICAL SERVICE ENTRANCE
26 2726 WIRING DEVICES
26 5133 LUMINAIRES, BALLASTS, AND DRIVERS - LUTRON
26 5600 EXTERIOR LIGHTING

DIVISION 31 - EARTHWORK

31 1000 SITE CLEARING AND GRUBBING
31 2300 TRENCH EXCAVATION AND FILL
31 2319 DEWATERING
31 2500 EROSION AND SEDIMENTATION CONTROLS
31 6329 DRILLED CONCRETE PIERS AND SHAFTS

DIVISION 32 - EXTERIOR IMPROVEMENTS

32 1216 ASPHALT PAVING
32 1600 SIDEWALKS, CURBS & GUTTERS
32 1726 TACTILE WARNING SURFACING
32 3119 DECORATIVE METAL FENCES AND GATES

DIVISION 33 - UTILITIES

33 1100 WATER UTILITY DISTRIBUTION PIPING
33 1200 WATER UTILITY DISTRIBUTION EQUIPMENT
33 1300 DISINFECTING OF WATER UTILITY DISTRIBUTION
33 3923 SANITARY SERVICE CONNECTIONS
33 4101 STORM PIPING
33 4413 STORM STRUCTURES

SECTION 00 3100

AVAILABLE PROJECT INFORMATION

PART 1 GENERAL

1.01 EXISTING CONDITIONS

A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders but will not be part of the Contract Documents, as follows:

B. Site Survey: Entitled Topographic Survey, dated 07/30/2018.
   1. Refer to Drawings. K2M Design will provide CAD file upon request.
   2. This survey identifies grade elevations prepared primarily for the use of K2M Design Inc. in establishing new grades and identifying natural water shed.

C. Geotechnical Report: Entitled Report of Geotechnical Exploration, dated April 25, 2018.
   1. Refer to Drawings.
   2. This report identifies properties of below grade conditions and offers recommendations for the design of foundations, prepared primarily for the use of K2M Design Inc..
   3. This report, by its nature, cannot reveal all conditions that exist on the site. Should subsurface conditions be found to vary substantially from this report, changes in the design and construction of foundations will be made, with resulting credits or expenditures to the Contract Price accruing to City of Key West.

1.02 PERMITS

A. City of Key West has obtained the following permits and/or approvals, that are required to be secured prior to commencement of construction work on this project:
   1. Planning Commission approvals.
   2. Historic Architectural Review Commission (HARC) commission approvals.
   3. Truman Waterfront Advisory Board (TWAB) approvals.
   4. Tree Commission approvals.
   5. City Commission approvals.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

3.01 OBTAINMENT OF PERMITS

A. Contractor to obtain the following required permits, at no cost to City of Key West:
   1. Keys Energy approval of drawings prior to permit submittal
   2. Building Permit for all trades.
   3. Tree Commission removal and landscape permits..
   4. HARC Coordination approvals throughout the duration of construction, as required.
   5. any additional required permitting and utility coordination, permits, and impact fees..

B. Building Permit Procedures: When required to obtain this permit:
   1. Complete and file permit application(s) with appropriate agency.
   2. Pay required fees.
   3. Advise K2M Design Inc. if submission of modified documents is necessary to have the authorities having jurisdiction complete the plan review and approval process. Submit modified documents expeditiously.
   4. Do not commence execution of any item of work for which a permit has not been obtained.

END OF SECTION 00 3100

SECTION 01 1000

SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: 18070 - Truman Waterfront Phase 1B - Building 1287 And Field

B. City of Key West's Name: City of Key West.

C. K2M Design Inc.'s Name: K2M Design Inc..

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a stipulated lump sum as described in Document 00 5200 - Agreement Form.

1.03 DESCRIPTION OF BUILDING 1287 ALTERATIONS WORK

A. Scope of demolition and removal work is indicated on drawings.

B. Scope of alterations work is indicated on drawings.

C. Plumbing: Replace existing system with new construction.

D. HVAC: Replace existing system with new construction.

E. Electrical Power and Lighting: Replace existing system with new construction.

F. Fire Alarm: Replace existing system with new construction.

G. Telephone: Replace existing system with new construction.

H. Security System: Replace existing system with new construction.

I. City of Key West will remove the following items before start of work:
   1. Police Athletic League gym equipment and boxing ring.
   2. Key West Mounted Police horses, trailers, and equipment/supplies.
   3. City of Key West Public Works storage equipment, tools, etc.

J. Contractor shall remove and deliver the following to City of Key West prior to start of work:
   1. Existing air conditioning units and air handlers..
   2. Existing wall mounted fans in horse stable areas.

1.04 DESCRIPTION OF FIELD AND LANDSCAPING WORK.

A. Scope of demolition and removal work is indicated on drawings.

B. Scope of alterations work is indicated on drawings.

C. City of Key West will remove the following items before start of work:
   1. Police Athletic League gym equipment and boxing ring.
   2. Key West Mounted Police horses, trailers, and equipment/supplies.
   3. City of Key West Public Works storage equipment, tools, etc.
   4. Dog agility equipment.
   5. Public works vehicles and trailers.

1.05 WORK BY OWNER

A. Items noted NIC (Not in Contract) will be supplied and installed by City of Key West after Project Completion. Some items include:
   1. Movable cabinets.
   2. Furnishings.
   3. Small equipment.
   4. Rugs.
   5. Artwork.
   6. Shelving Units.

1.06 OWNER OCCUPANCY

A. City of Key West intends to occupy the Project by the date stated in the Agreement as the contract completion date.

B. Cooperate with City of Key West to minimize conflict and to facilitate City of Key West's operations.

C. Schedule the Work to accommodate City of Key West occupancy.

1.07 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

B. Provide access to and from site as required by law and by City of Key West:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.

1.08 WORK SEQUENCE

A. Construct Work in stages during the construction period:
   1. Stage 1: Demolition.
   2. Stage 2: Building 1287, Utilities & Pavement.
   3. Stage 3: Field & Landscaping.

B. NTP 1
   1. Demolition of building elements and immediate site surrounding building for construction.
   2. Demolition of existing site pavement and fencing, and original Fort Zacharay Taylor entrance structure.
   3. Building 1287 interior/exterior elements.
   4. Utility trencing, runs, and connections including but not limited to sewer, water, electrical, and cable. Existing underground utilities to be abandonned shall be removed and capped off as required.
   5. Soccer field and horse run lighting.
   6. Contractor to maintain field to the North of existing retention ponds on West point of site for City use.

C. NTP 2
   1. Parking areas.
   2. Pathways.
   3. Sidewalk scope.
   4. Soccer field and surrounding grass field areas.
   5. Horse run.
   6. Dog park.
   7. Landscaping and Fruit Tree Grove.
   8. Fencing.

D. Coordinate construction schedule and operations with City of Key West.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 1000

SECTION 01 2000

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

1.02 SCHEDULE OF VALUES

A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to K2M Design Inc. for approval.

C. Forms filled out by hand will not be accepted.

D. See ITB #19-006 Page 11 for Schedule of Values.

1.03 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to K2M Design Inc. for approval.

C. Forms filled out by hand will not be accepted.

D. Execute certification by signature of authorized officer.

E. Submit one electronic and three hard-copies of each Application for Payment.

1.04 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 2000

SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.

B. Electronic document submittal service.

C. Preconstruction meeting.

D. Progress meetings.

E. Progress photographs.

F. Coordination drawings.

G. Number of copies of submittals.

H. Requests for Interpretation (RFI) procedures.

I. Submittal procedures.

1.02 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 7000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.

1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
2. Contractor and K2M Design Inc. are required to use this service.
3. It is Contractor's responsibility to submit documents in allowable format.
4. Subcontractors, suppliers, and K2M Design Inc.'s consultants will be permitted to use the service at no extra charge.
5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

3.02 PRECONSTRUCTION MEETING

A. City of Key West will schedule a meeting after Notice of Award.

B. Attendance Required:

1. City of Key West.
2. K2M Design Inc..
3. Contractor.
4. Listed Subcontractors.

C. Agenda:
   1. Execution of City of Key West-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
   5. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   6. Scheduling.

D. Record minutes and distribute copies within two days after meeting to participants, with electronic PDF copies to K2M Design Inc., City of Key West, participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.

B. Attendance Required:
   1. Contractor.
   2. K2M Design Inc..
   3. Contractor's superintendent.
   4. Major subcontractors.

C. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Maintenance of progress schedule.
   7. Corrective measures to regain projected schedules.
   8. Planned progress during succeeding work period.
   9. Maintenance of quality and work standards.
   10. Effect of proposed changes on progress schedule and coordination.
   11. Other business relating to work.

D. Record minutes and distribute copies within two days after meeting to participants, with electronic PDF copies to K2M Design Inc., City of Key West, participants, and those affected by decisions made.

3.04 PROGRESS PHOTOGRAPHS

A. Submit photographs with each application for payment, taken not more than 3 days prior to submission of application for payment.

B. Photography Type: Digital; electronic files.

C. Provide photographs of site and construction throughout progress of work produced by an experienced photographer, acceptable to K2M Design Inc..

D. In addition to periodic, recurring views, take photographs of each of the following events:

E. Views:
   1. Provide non-aerial photographs from four cardinal views at each specified time, until date of Substantial Completion.
   2. Consult with K2M Design Inc. for instructions on views required.
   3. Provide factual presentation.
   4. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

F. Digital Photographs: 24 bit color, minimum resolution of 1024 by 768, in JPG format; provide files unaltered by photo editing software.
   1. Delivery Medium: Via email.
   2. File Naming: Include project identification, date and time of view, and view identification.
   3. PDF File: Assemble all photos into printable pages in PDF format, with 2 to 3 photos per page, each photo labeled with file name; one PDF file per submittal.
   4. Hard Copy: Printed hardcopy (grayscale) of PDF file and point of view sketch.

3.05 COORDINATION DRAWINGS

A. Provide information required by Project Coordinator for preparation of coordination drawings.

B. Review drawings prior to submission to K2M Design Inc..

3.06 REQUESTS FOR INTERPRETATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in the Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Whenever possible, request clarifications at the next appropriate project progress meeting, with response entered into meeting minutes, rendering unnecessary the issuance of a formal RFI.

C. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of the Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
   2. Prepare using software provided by the Electronic Document Submittal Service.
   3. Combine RFI and its attachments into a single electronic file. PDF format is preferred.

D. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
   1. Indicate current status of every RFI. Update log promptly and on a regular basis.
   2. Note dates of when each request is made, and when a response is received.
   3. Highlight items requiring priority or expedited response.

E. Review Time: K2M Design Inc. will respond and return RFIs to Contractor within seven calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.

F. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to City of Key West.
   1. Notify K2M Design Inc. within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.07 SUBMITTAL SCHEDULE

A. Submit to K2M Design Inc. for review a schedule for submittals in tabular format.

3.08 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to K2M Design Inc. for review for the limited purpose of checking for compliance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.09 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Sustainability design submittals and reports.
   3. Certificates.
   4. Test reports.
   5. Inspection reports.
   6. Manufacturer's instructions.
   7. Manufacturer's field reports.
   8. Other types indicated.

B. Submit for K2M Design Inc.'s knowledge as contract administrator or for City of Key West.

3.10 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

D. Final Property Survey.

E. Submit for City of Key West's benefit during and after project completion.

3.11 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by K2M Design Inc..
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.12 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a separate transmittal for each item.
   2. Transmit using approved form.
      a. Use Contractor's form, subject to prior approval by K2M Design Inc..
   3. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
   4. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
   5. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
      a. Send submittals in electronic format via email to K2M Design Inc..

6. Schedule submittals to expedite the Project, and coordinate submission of related items.
    a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
    b. For sequential reviews involving K2M Design Inc.'s consultants, City of Key West, or another affected party, allow an additional 7 days.
    c. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to K2M Design Inc.'s approval, allow an additional 30 days.
7. Provide space for Contractor and K2M Design Inc. review stamps.
8. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
9. Submittals not requested will be recognized, and will be returned "Not Reviewed",

B. Product Data Procedures:
1. Submit only information required by individual specification sections.
2. Collect required information into a single submittal.
3. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting the Contract Documents and coordinating related work.
2. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
1. Transmit related items together as single package.
2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.

3.13 SUBMITTAL REVIEW

A. Submittals for Review: K2M Design Inc. will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: K2M Design Inc. will acknowledge receipt and review. See below for actions to be taken.

C. K2M Design Inc.'s actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.

D. K2M Design Inc.'s and consultants' actions on items submitted for review:
1. Authorizing purchasing, fabrication, delivery, and installation:
    a. "Approved", or language with same legal meaning.
    b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
        1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
    c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
        1) Resubmit corrected item, with review notations acknowledged and incorporated. Resubmit separately, or as part of project record documents.
        2) Non-responsive resubmittals may be rejected.
2. Not Authorizing fabrication, delivery, and installation:
    a. "Revise and Resubmit".
        1) Resubmit revised item, with review notations acknowledged and incorporated.
        2) Non-responsive resubmittals may be rejected.
    b. "Rejected".
        1) Submit item complying with requirements of Contract Documents.

E. K2M Design Inc.'s and consultants' actions on items submitted for information:
1. Items for which no action was taken:

a. "Received" - to notify the Contractor that the submittal has been received for record only.

2. Items for which action was taken:
   a. "Reviewed" - no further action is required from Contractor.

END OF SECTION 01 3000

SECTION 01 4523

SITE TESTING SERVICES

PART 1- GENERAL

1.01 WORK INCLUDED

A. The CONTRACTOR shall employ and pay for the services of a qualified commercial independent testing laboratory acceptable to the ENGINEER and the OWNER to perform specified services.

B. Inspection, sampling, and testing is required for:
   1. Trench excavation and backfill.
   2. Paving and surfacing.
   3. Cast-in-place concrete.

C. Employment of a testing laboratory shall in no way relieve the CONTRACTOR of his obligation to perform work in accordance with the Contract.

D. Site preparation shall be in accordance with the recommendations of the Report of Geotechnical Exploration prepared by Nutting Engineers, dated, April 2018.

E. PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE “SOIL AND GROUND WATER MANAGEMENT PLAN”, DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

PART 2- PRODUCTS

2.01 SUBMITTALS

A. Submit six copies of reports of inspections and tests to ENGINEER promptly upon completion of inspections and tests, including:
   1. Date issued.
   2. Project title and OWNER's job number.
   3. Testing laboratory name and address.
   4. Name and signature of inspector.
   5. Date of inspection or sampling.
   6. Record of temperature and weather.
   7. Date of test.
   8. Location of inspection or test.
   9. Identification of product and specification section.
   10. Type of inspection or test.
   11. Observations regarding compliance with the Contract Documents.

B. This report shall be signed and sealed by a registered professional engineer licensed in the State of Florida, and qualified to perform such services.

PART 3- EXECUTION

3.01 LABORATORY DUTIES - LIMITATIONS OF AUTHORITY

A. Cooperate with the OWNER and contractor; provide qualified personnel promptly on notice.

B. Perform specified inspections, sampling, and testing of materials and methods of construction:
   1. Comply with specified standards; ASTM, other recognized standards, authorized and as specified.
   2. Ascertain compliance with requirements of Contract Documents.

C. Notify the OWNER immediately of irregularities or deficiencies of work which are observed during performance of services. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by the OWNER.

D. Submit copies of all test reports.

E. Contractor shall cooperate with the testing personnel and provide access to the work.

F. Contractor shall provide incidental labor and facilities for the testing personnel.

3.02 ON SITE TESTING

A. On site testing must be performed by certified staff, by state approved agencies and must be approved by a Professional Engineer licensed in the State of Florida.

3.03 SUMMARY OF TESTING

TYPE	FREQUENCY	RESPONSIBILITY	COMMENTS
ASPHALT DENSITY	2 IN PARKING LOT	CONTRACTOR	AS REQUIRED BY ENGINEER
CONCRETE	EVERY 72 CYDS	CONTRACTOR	BATCH TICKET HAS TO BE FROM BATCH COMPUTER MACHINE
TRENCH COMPACTION TEST	PER SECTION 31 23 00	CONTRACTOR	
SUB BASE COMPACTION TEST	2 IN PARKING LOT	CONTRACTOR	
BASE COMPACTION TEST	2 IN PARKING LOT	CONTRACTOR	
HYDROSTATIC TEST	EVERY NEW PIPE AND STRUCTURE	CONTRACTOR	
DEFLECTION TEST	EVERY PIPE OR AS REQUIRED BY THE ENGINEER	CONTRACTOR	CONTRACTOR TO SUPPLY EQUIPMENT FOR TEST
LAMPING TEST	EVERY PIPE OR AS REQUIRED BY THE ENGINEER	CONTRACTOR WITH CITY INSPECTOR	CONTRACTOR TO SUPPLY EQUIPMENT FOR TEST

A. Testing and inspection of new gravity sanitary sewer pipe shall be in accordance with Section 33 31 13.

END OF SECTION 01 4523

SECTION 01 5213
FIELD OFFICES AND SHEDS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary facilities for City of Key West Mounted Police Department & Horses

PART 2 PRODUCTS

2.01 CONSTRUCTION

A. Construction (Mounted Police): Structurally sound, secure, weather resistant cover for horse stalls. Must maintain dry ground area under cover. Fenced in paddock area for temporary horse run. Square footage and location to be determined by Contractor and City of Key West Mounted Police Department, in coordination with the City of Key West Project Manager. Maintain during progress of Work; remove when no longer needed.

PART 3 EXECUTION

3.01 PREPARATION

A. Fill and grade sites for temporary structures to provide drainage away from stall area.

3.02 INSTALLATION

A. Install horse covered area and fencing ready for occupancy 30 days prior to start of construction.

B. Employee Residential Occupancy: Not allowed on City of Key West's property.

3.03 REMOVAL

A. At completion of Work remove buildings, foundations, utility services, and debris. Restore areas.

END OF SECTION 01 5213

SECTION 02 4100
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition as noted on Construction Documents..

B. Selective demolition of built site elements.

C. Selective demolition of building elements for alteration purposes.

D. Abandonment and removal of existing utilities and utility structures as noted.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Sequencing and staging requirements.

B. Section 01 1000 - Summary: Description of items to be salvaged or removed for re-use by Contractor.

C. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

D. Section 01 6000 - Product Requirements: Handling and storage of items removed for salvage and relocation.

E. Section 31 1000 - Site Clearing: Vegetation and existing debris removal.

F. Section 31 2200 - Grading: Topsoil removal.

G. Section 31 2323 - Fill: Filling holes, pits, and excavations generated as a result of removal operations.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Site Plan: Showing:
   1. Vegetation to be protected.
   2. Areas for temporary construction and field offices.

C. Project Record Documents: Accurately record actual locations of capped and active utilities and subsurface construction.

1.05 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.
   1. Minimum of 5 years of documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fill Material: As specified in Section 31 2323 - Fill.

PART 3 EXECUTION

3.01 SCOPE

A. Remove paving and curbs as required to accomplish new work.

B. Within area of new construction, remove foundation walls and footings to a minimum of 6 feet feet below finished grade.

C. Outside area of new construction, remove foundation walls and footings to a minimum of 2 feet below finished grade.

D. Remove fences and gates.

E. Remove other items indicated, for salvage, relocation, recycling, and repurposing.

F. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 2200.

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Submit required Florida Department of Environmental Protection - Notice of Demolition or Asbestos Renovation Form - submittal may be online or with mail-in form. Contractor to comply with required notice timeframe and FDEP requirements.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   5. Provide, erect, and maintain temporary barriers and security devices.
   6. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   7. Do not close or obstruct roadways or sidewalks without permit.
   8. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
   9. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

C. Do not begin removal until receipt of notification to proceed from City of Key West.

D. Do not begin removal until built elements to be salvaged or relocated have been removed.

E. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.

F. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

G. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

H. If hazardous materials are discovered during removal operations, stop work and notify K2M Design Inc. and City of Key West; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

I. Partial Removal of Paving and Curbs: Neatly saw cut at right angle to surface.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to City of Key West.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to City of Key West.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to K2M Design Inc. before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

C. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.

D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Verify that abandoned services serve only abandoned facilities before removal.
   3. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

E. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.
   4. Patch as specified for patching new work.

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION 02 4100

SECTION 03 0516
UNDERSLAB VAPOR BARRIER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sheet vapor barrier under concrete slabs on grade.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories: Forms and accessories for formwork.

B. Section 03 2000 - Concrete Reinforcing.

C. Section 03 3000 - Cast-in-Place Concrete: Preparation of subgrade, granular fill, placement of concrete.

1.03 REFERENCE STANDARDS

A. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2011 (Reapproved 2017).

B. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products.

C. Test Data: Submit report of tests showing compliance with specified requirements.

D. Samples: Submit samples of underslab vapor barrier to be used.

E. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent construction.

PART 2 PRODUCTS

2.01 MATERIALS

A. Underslab Vapor Barrier:
   1. Water Vapor Permeance: Not more than 0.010 perms, maximum.
   2. Complying with ASTM E1745 Class A.
   3. Thickness: 10 mils.
   4. Basis of Design:
      a. Stego Industries LLC; Stego Wrap Vapor Barrier (10-mil): www.stegoindustries.com/#sle.
      b. Or approved equal.

B. Accessory Products: Vapor barrier manufacturer's recommended tape, adhesive, mastic, etc., for sealing seams and penetrations in vapor barrier.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surface over which vapor barrier is to be installed is complete and ready before proceeding with installation of vapor barrier.

3.02 INSTALLATION

A. Install vapor barrier in accordance with manufacturer's instructions and ASTM E1643.

B. Install vapor barrier under interior slabs on grade; lap sheet over footings and seal to foundation walls.

C. Lap joints minimum 6 inches.

D. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.

E. No penetration of vapor barrier is allowed except for reinforcing steel and permanent utilities.

F. Repair damaged vapor retarder before covering with other materials.

END OF SECTION 03 0516

SECTION 03 1000
CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formwork for cast-in place concrete, with shoring, bracing and anchorage.

B. Openings for other work.

C. Form accessories.

D. Form stripping.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Concrete Reinforcing.

B. Section 04 2000 - Unit Masonry: Reinforcement for masonry.

C. Section 31 2316 - Excavation: Shoring and underpinning for excavation.

1.03 REFERENCE STANDARDS

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).

B. ACI 301 - Specifications for Structural Concrete; 2016.

C. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2017).

D. ACI 347R - Guide to Formwork for Concrete; 2014.

E. ASME A17.1 - Safety Code for Elevators and Escalators; 2016.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

G. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

H. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2013.

I. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2013.

J. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2018.

K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

L. PS 1 - Structural Plywood; 2009.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on void form materials and installation requirements.

C. Shop Drawings: Indicate pertinent dimensions, materials, bracing, and arrangement of joints and ties.

D. Permanent Insulated Foam Panel Formwork Shop Drawings: Include calculations or selections from manufacturer's prescriptive design tables that indicate compliance with applicable building code and manufacturer's requirements.
   1. Include test reports for performance criteria specified.
   2. Include the design engineer's stamp or seal on each sheet of shop drawings.

E. Designer's Qualification Statement.

F. Design Data: As required by authorities having jurisdiction.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with Highways standards of the State of Florida.

B. Designer Qualifications: Design formwork under direct supervision of a Professional Engineer experienced in design of concrete formwork and licensed in Florida.

C. Maintain one copy of each installation standard on site throughout the duration of concrete work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver prefabricated forms and installation instructions in manufacturer's packaging.

B. Store prefabricated forms off ground in ventilated and protected manner to prevent deterioration from moisture.

C. Protect plastic foam products from damage and exposure to sunlight.

PART 2 PRODUCTS

2.01 FORMWORK - GENERAL

A. Provide concrete forms, accessories, shoring, and bracing as required to accomplish cast-in-place concrete work.

B. Design and construct concrete that complies with design with respect to shape, lines, and dimensions.

C. Chamfer outside corners of beams, joists, columns, and walls.

D. Comply with applicable state and local codes with respect to design, fabrication, erection, and removal of formwork.

E. Comply with relevant portions of ACI 347R, ACI 301, and ACI 318.

F. Comply with Highways standards of the State of Florida.

G. Use the following form types:
   1. Elevated Floor Slabs: Prefabricated glass fiber pan forms, treated for exposed to view finish.
   2. Elevated Floor/Roof Slabs: Permanent prefabricated foam panel formwork; formwork to remain.

2.02 WOOD FORM MATERIALS

A. Form Materials: At the discretion of the Contractor.

B. Softwood Plywood: PS 1, C Grade, Group 2.

C. Softwood Plywood: PS 1, B-B High Density Concrete Form Overlay, Class I.

D. Plywood: Douglas Fir species; solid one side grade; sound undamaged sheets with clean, true edges.

E. Lumber: Southern Yellow Pine species; #2 grade; with grade stamp clearly visible.

2.03 REMOVABLE PREFABRICATED FORMS

A. Manufacturers:
   1. Alabama Metal Industries Corporation: www.amico-online.com/#sle.
   2. Molded Fiber Glass Construction Products Co: www.mfgcp.com/#sle.
   3. S-Form; Aluminum Formwork Systems: www.s-form.us/#sle.
   4. SureVoid Products, Inc: www.surevoid.com/#sle.
   5. Or approved equal.

B. Preformed Steel Forms: Minimum 16 gage, 0.0598 inch thick, matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

C. Preformed Aluminum Forms: ASTM B221 (ASTM B221M), 6061-T6 alloy, matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

D. Preformed Plastic Forms: Thermoplastic polystyrene form liner, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished surfaces.

E. Glass Fiber Fabric Reinforced Plastic Forms: Matched, tight fitting, stiffened to support weight of concrete without deflection detrimental to tolerances and appearance of finished concrete surfaces.

F. Pan Type: Glass fiber, of size and profile indicated.

G. Tubular Column Type: Round, spirally wound laminated fiber material, surface treated with release agent, non-reusable, of sizes indicated.

H. Void Forms: Moisture resistant treated paper faces, biodegradable, structurally sufficient to support weight of wet concrete mix until initial set; 2 inches thick.

2.04 FORMWORK ACCESSORIES

A. Form Ties: Removable type, galvanized metal, fixed length, cone type, with waterproofing washer, 1 inch back break dimension, free of defects that could leave holes larger than 1 inch in concrete surface.

B. Form Release Agent: Capable of releasing forms from hardened concrete without staining or discoloring concrete or forming bugholes and other surface defects, compatible with concrete and form materials, and not requiring removal for satisfactory bonding of coatings to be applied.
   1. Composition: Colorless reactive, mineral oil-based, soy-based, or vegetable-oil based compound.
   2. Do not use materials containing diesel oil or petroleum-based compounds.
   3. VOC Content: In compliance with applicable local, State, and federal regulations.
   4. Products:
      a. SpecChem, LLC; Bio Strip WB (water-based): www.specchemllc.com/#sle.
      b. W. R. Meadows, Inc; Duogard: www.wrmeadows.com/#sle.
      c. Or approved equal.

C. Dowel Sleeves: Plastic sleeve and nailable plastic base for smooth, round, steel load-transfer dowels.
   1. Products:
      a. BoMetals, Inc: www.bometals.com/#sle.
      b. Or approved equal.

D. Filler Strips for Chamfered Corners: Rigid plastic type; ¾” by ¾” inch size; maximum possible lengths.

E. Dovetail Anchor Slot: Galvanized steel, at least 22 gage, 0.0299 inch thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.

F. Flashing Reglets: Galvanized steel, at least 22 gage, 0.0299 inch thick, longest possible lengths, with alignment splines for joints, foam filled, release tape sealed slots, anchors for securing to concrete formwork.

G. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.

H. Embedded Anchor Shapes, Plates, Angles and Bars: As specified in Section 05 1200.

I. Waterstops: Rubber, minimum 1,750 psi tensile strength, minimum 50 degrees F to plus 175 degrees F working temperature range, 9 inch wide, maximum possible lengths, ribbed profile, preformed corner sections, heat welded jointing.

J. Waterstops: Preformed mineral colloid strips, 3/8 inch thick, moisture expanding.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

3.02 EARTH FORMS

A. Earth forms are not permitted.

B. Hand trim sides and bottom of earth forms. Remove loose soil prior to placing concrete.

3.03 ERECTION - FORMWORK

A. Erect formwork, shoring and bracing to achieve design requirements, in accordance with requirements of ACI 301.

B. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.

C. Install permanent insulated foam panel formwork per manufacturer's recommendations.

D. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

E. Align joints and make watertight. Keep form joints to a minimum.

F. Obtain approval before framing openings in structural members that are not indicated on drawings.

G. Install void forms in accordance with manufacturer's recommendations. Protect forms from moisture or crushing.

H. Coordinate this section with other sections of work that require attachment of components to formwork.

I. If formwork is placed after reinforcement, resulting in insufficient concrete cover over reinforcement, request instructions from K2M Design Inc. before proceeding.

3.04 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.05 INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Provide formed openings where required for items to be embedded in passing through concrete work.

B. Locate and set in place items that will be cast directly into concrete.

C. Coordinate with work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other work.

D. Install accessories in accordance with manufacturer's instructions, so they are straight, level, and plumb. Ensure items are not disturbed during concrete placement.

E. Install waterstops in accordance with manufacturer's instructions, so they are continuous without displacing reinforcement. Heat seal joints so they are watertight.

F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.

G. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

3.06 FORM CLEANING

A. Clean forms as erection proceeds, to remove foreign matter within forms.

B. Clean and protect permanent insulated concrete foam panel formwork per manufacturer's recommendations.

C. Clean formed cavities of debris prior to placing concrete.
   1. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
   2. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.07 FORMWORK TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 117, unless otherwise indicated.

B. Construct permanent insulated foam panel formwork to maintain tolerances required by ACI 301.

C. Construct and align formwork for elevator hoistway in accordance with ASME A17.1.

D. Camber slabs and beams 1/4 inch per 10 feet.

E. Camber slabs and beams in accordance with ACI 301.

3.08 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and to verify that supports, fastenings, wedges, ties, and items are secure.

C. Do not reuse wood formwork more than 7 times for concrete surfaces to be exposed to view. Do not patch formwork.

3.09 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

C. Store removed forms to prevent damage to form materials or to fresh concrete. Discard damaged forms.

END OF SECTION 03 1000

SECTION 03 1521
TERMITE BARRIER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Termite-resistant vapor barrier sheet.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Vapor barrier placement under concrete slab-on-grade.

1.03 PRICE AND PAYMENT PROCEDURES

A. Termite Barrier: By the square foot of installed termite barrier.

1.04 REFERENCE STANDARDS

A. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2011 (Reapproved 2017).

B. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.06 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing this type of work and:
   1. Having minimum of 2 years documented experience.
   2. Approved by manufacturer of treatment materials.
   3. Licensed in Florida.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 TERMITE BARRIER SHEET

A. Termite-Resistant Vapor Barrier Sheet: Plastic sheet complying with ASTM E1745, Class C; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs, and for exclusion of subterranean termites.

B. Accessory Products: Barrier sheet manufacturer's recommended tape, adhesive, etc., for sealing seams and penetrations in termite barrier.

C. Manufacturer: Stego Technology LLC; Pango Wrap with Pango Tape: www.stegoindustries.com/#sle.

D. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that soil surfaces are unfrozen.

B. Verify final grading is complete.

3.02 INSTALLATION - BARRIER SHEET

A. Comply with ASTM E1643.

B. Lap joints 6 inches, minimum. Seal joints, seams, penetrations, and edges at adjacent materials with manufacturer's recommended products and follow manufacturer's written instructions.

3.03 PROTECTION

A. Protect sheet materials from damage after completed installation.

B. Repair damage to installed sheet materials with manufacturer's recommended products and according to the manufacturer's written instructions.

END OF SECTION 03 1521

SECTION 03 2000
CONCRETE REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcing steel for cast-in-place concrete.

B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories.

B. Section 03 3000 - Cast-in-Place Concrete.

C. Section 04 2000 - Unit Masonry: Reinforcement for masonry.

D. Section 31 6329 - Drilled Concrete Piers and Shafts: Reinforcement for drilled pier foundations.

1.03 PRICE AND PAYMENT PROCEDURES

A. See Section 01 2200 - Unit Prices, for additional unit price requirements.

B. Bar Reinforcement: By the ton. Includes reinforcement, placement, and accessories.

C. Welded Wire Reinforcement: By the square foot. Includes welded wire reinforcement, placement, and accessories.

1.04 REFERENCE STANDARDS

A. ACI 301 - Specifications for Structural Concrete; 2016.

B. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2017).

C. ACI SP-66 - ACI Detailing Manual; 2004.

D. ASTM A1094/A1094M - Standard Specification for Continuous Hot-Dip Galvanized Steel Bars for Concrete Reinforcement; 2016.

E. ASTM A184/A184M - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement; 2017.

F. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2016.

G. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009a (Reapproved 2014).

H. ASTM A704/A704M - Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement; 2017.

I. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement; 2016.

J. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2016.

K. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars; 2017.

L. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement; 2014.

M. ASTM A996/A996M - Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement; 2016.

N. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2017.

O. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars; 2015.

P. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel; 2011.

Q. CRSI (DA4) - Manual of Standard Practice; 2009.

R. CRSI (P1) - Placing Reinforcing Bars; 2011.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
   1. Prepare shop drawings under seal of a Professional Structural Engineer experienced in design of work of this type and licensed in Florida.

C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

D. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

1.06 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301.
   1. Maintain one copy of each document on project site.

B. Provide K2M Design Inc. with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection.

C. Welders' Certificates: Submit certifications for welders employed on the project, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
   1. Galvanized in accordance with ASTM A767/A767M, Class I.
   2. Continuously galvanized in accordance with ASTM A1094/A1094M.

B. Stirrup Steel: ASTM A615/A615M, Grade 60 (60,000 psi) galvanized.

C. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gage, 0.0508 inch.
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.
   3. Provide stainless steel components for placement within 1-1/2 inches of weathering surfaces. https://www.masonrymagazine.com/blog/2017/03/24/tech-talk-mortar-field-testin

2.02 RE-BAR SPLICING:

A. Coupler Systems: Mechanical devices for splicing reinforcing bars; capable of developing full steel reinforcing design strength in tension and compression.
   1. Products:
      a. Dayton Superior Corporation; Bar Lock Coupler System: www.daytonsuperior.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

B. Dowel Bar Splicer with Dowel-Ins: Mechanical devices for connecting dowels; capable of developing full steel reinforcing design strength in tension and compression.
   1. Products:
      a. Dayton Superior Corporation; Dowel Bar Splicer D101A with Straight Dowel-In: www.daytonsuperior.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

C. Taper Tie Hole Plug: Mechanical device for plugging tie holes; anchors optional flush or recessed grout.
   1. Products:
      a. Dayton Superior Corporation; A58 Sure Plug: www.daytonsuperior.com/#sle.

b. Substitutions: See Section 01 6000 - Product Requirements.

D. Grout: Cementitious, non-metallic, non-shrink grout for use with manufacturer's grout sleeve reinforcing bar coupler system.
   1. Products:
      a. Dayton Superior Corporation; Sleeve-Lock Grout: www.daytonsuperior.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.03 FABRICATION

A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.

B. Welding of reinforcement is not permitted.

C. Welding of reinforcement is permitted only with the specific approval of K2M Design Inc.. Perform welding in accordance with AWS D1.4/D1.4M.
   1. Galvanized Reinforcement: Clean surfaces, weld and re-protect welded joint in accordance with CRSI (DA4).

D. Fabricate and handle epoxy-coated reinforcing in accordance with ASTM D3963/D3963M.

E. Locate reinforcing splices not indicated on drawings at point of minimum stress.
   1. Review locations of splices with K2M Design Inc..

PART 3 EXECUTION

3.01 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position.

B. Do not displace or damage vapor barrier.

C. Accommodate placement of formed openings.

D. Maintain concrete cover around reinforcing as follows:
   1. Beams: 2 inch
   2. Column Ties: 2 inch.
   3. Walls (exposed to weather or backfill): 3 inch.
   4. Footings and Concrete Formed Against Earth: 3 inch.
   5. Slabs on Fill: 3 inch.

E. Comply with applicable code for concrete cover over reinforcement.

F. Bond and ground all reinforcement to requirements of Section 26 0526.

3.02 FIELD QUALITY CONTROL

A. An independent testing agency, as specified in Section 01 4000 - Quality Requirements, will inspect installed reinforcement for conformance to contract documents before concrete placement.

3.03 SCHEDULES

A. Reinforcement For Superstructure Framing Members: Deformed bars, unfinished.

B. Reinforcement For Foundation Wall Framing Members and Slab-on-Grade: Deformed bars and welded wire reinforcement, galvanized finish.

C. Reinforcement For Parking Structure Framing Members: Deformed bars, epoxy coated finish.

END OF SECTION 03 2000

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete building frame members.

B. Concrete for composite floor construction.

C. Elevated concrete slabs.

D. Floors and slabs on grade.

E. Concrete shear walls, elevator shaft walls, and foundation walls.

F. Joint devices associated with concrete work.

G. Miscellaneous concrete elements, including equipment pads, equipment pits, light pole bases, flagpole bases, thrust blocks, and manholes.

H. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories: Forms and accessories for formwork.

B. Section 03 2000 - Concrete Reinforcing.

C. Section 03 3511 - Concrete Floor Finishes: Densifiers, hardeners, applied coatings, and polishing.

D. Section 03 3523 - Exposed Aggregate Concrete Finishing.

E. Section 03 3533 - Stamped Concrete Finishing: Additional requirements for patterned concrete surfaces.

F. Section 07 9200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

G. Section 07 9513 - Expansion Joint Cover Assemblies.

H. Section 31 3116 - Termite Control: Field-applied termiticide and mildewcide for concrete surfaces.

I. Section 32 1313 - Concrete Paving: Sidewalks, curbs and gutters.

1.03 PRICE AND PAYMENT PROCEDURES

A. Cast-in-place concrete work will be paid for by the unit price method.

B. See Section 01 2200 - Unit Prices, for additional unit price requirements.

C. Concrete - Slab-on-Fill or Slab-on-Grade: Includes formwork as specified in Section 03 1000, reinforcement as specified in Section 03 2000, concrete, placement accessories, consolidating and leveling, troweling, and curing. Measurement by:
   1. Square foot.
   2. Cubic yard.

D. Concrete - Vertical in Forms: Includes formwork as specified in Section 03 1000, reinforcement as specified in Section 03 2000, concrete, placement accessories, consolidating, and curing. Measurement by:
   1. Square foot.
   2. Cubic yard.

E. Concrete - Miscellaneous Locations: Includes formwork as specified in Section 03 1000, reinforcement as specified in Section 03 2000, concrete, placement accessories, consolidating, and curing. Measurement by:
   1. Square foot.
   2. Cubic yard.

F. Concrete - Grouting: Includes preparation of substrate, grout, placement, consolidating, troweling, and curing. Measurement by the cubic yard.

G. Construction Joint Devices: Includes component, accessories, and installation. Measurement by the linear foot.

1.04 REFERENCE STANDARDS

A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).

B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; 1991 (Reapproved 2009).

C. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete; 1998 (Reapproved 2004).

D. ACI 301 - Specifications for Structural Concrete; 2016.

E. ACI 302.1R - Guide to Concrete Floor and Slab Construction; 2015.

F. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).

G. ACI 305R - Guide to Hot Weather Concreting; 2010.

H. ACI 306R - Guide to Cold Weather Concreting; 2016.

I. ACI 308R - Guide to External Curing of Concrete; 2016.

J. ACI 318 - Building Code Requirements for Structural Concrete and Commentary; 2014 (Errata 2017).

K. ACI 347R - Guide to Formwork for Concrete; 2014.

L. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2016.

M. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2016.

N. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars; 2017.

O. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement; 2014.

P. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2017.

Q. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2012.

R. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2016, with Editorial Revision (2016).

S. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2018.

T. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2017a.

U. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2016a.

V. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2015a.

W. ASTM C150/C150M - Standard Specification for Portland Cement; 2018.

X. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2016.

Y. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2016.

Z. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).

AA. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2011.

AB. ASTM C330/C330M - Standard Specification for Lightweight Aggregates for Structural Concrete; 2017a.

AC. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2017.

AD. ASTM C579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes; 2001 (Reapproved 2012).

AE. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2015.

AF. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2014.

AG. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures; 2016.

AH. ASTM C845/C845M - Standard Specification for Expansive Hydraulic Cement; 2012.

AI. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2015.

AJ. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.

AK. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2013.

AL. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2014a.

AM. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete; 2010a (Reapproved 2015).

AN. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2015.

AO. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2014.

AP. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete; 2011.

AQ. ASTM C1582/C1582M - Standard Specification for Admixtures to Inhibit Chloride-Induced Corrosion of Reinforcing Steel in Concrete; 2011, with Editorial Revision (2017).

AR. ASTM D471 - Standard Test Method for Rubber Property--Effect of Liquids; 2016a.

AS. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2015.

AT. ASTM D8139 - Standard Specification for Semi-Rigid, Closed-Cell Polypropylene Foam, Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction; 2017.

AU. ASTM D994/D994M - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type); 2011 (Reapproved 2016).

AV. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2004, with Editorial Revision (2013).

AW. ASTM D1752 - Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2004a (Reapproved 2013).

AX. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting; 2015.

AY. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars; 2015.

AZ. ASTM E11 - Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves; 2017.

BA. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a, with Editorial Revision (2013).

BB. ASTM E1155 - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers; 2014.

BC. ASTM E1155M - Standard Test Method for Determining F(F) Floor Flatness and F(L) Floor Levelness Numbers (Metric); 2014.

BD. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2011 (Reapproved 2017).

BE. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017.

BF. ASTM E1993/E1993M - Standard Specification for Bituminous Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs; 1998, with Editorial Revision (2013).

BG. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

BH. COE CRD-C 48 - Method of Test for Water Permeability of Concrete; 1992.

BI. COE CRD-C 513 - COE Specifications for Rubber Waterstops; 1974.

BJ. COE CRD-C 572 - Corps of Engineers Specifications for Polyvinylchloride Waterstop; 1974.

BK. ICC-ES AC380 - Acceptance Criteria for Termite Physical Barrier Systems; 2014, with Editorial Revision (2017).

BL. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

BM. NSF 61 - Drinking Water System Components - Health Effects; 2017.

BN. NSF 372 - Drinking Water System Components - Lead Content; 2016.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
   1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
   2. For chemical-resistant waterstops, provide data on ASTM D471 test results.

C. Mix Design: Submit proposed concrete mix design.
   1. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
   2. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.
   3. Indicate proposed mix design complies with fiber reinforcing manufacturer's written recommendations.

D. Samples for Pigment Color Selection: Submit manufacturer's complete sample chip set, including pigment number and required dosage rate for each color.

E. Verification Samples: Submit sample chips of specified colors indicating pigment numbers and required dosage rates, for subsequent comparison to installed concrete.

F. Samples: Submit samples of underslab vapor retarder to be used.

G. Samples: Submit two, 12 inch long samples of waterstops and construction joint devices.

H. Test Reports: Submit report for each test or series of tests specified.

I. Test Reports: Submit termite-resistant sheet manufacturer's summary of independent laboratory and field testing for effectiveness in subterranean termite exclusion.

J. Manufacturer's Installation Instructions: For concrete accessories, indicate installation procedures and interface required with adjacent construction.

K. Sustainable Design Submittals: If any wood or wood-based form materials, including supports, are permanently installed in the project, submit documentation required for sustainably harvested wood as specified in Section 01 6000 - Product Requirements.

L. Sustainable Design Submittal: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete cast in place, mix design(s) used showing the quantity of portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used.

M. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

N. Warranty: Submit manufacturer warranty and ensure forms have been completed in City of Key West's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI 301 and ACI 318.
   1. Maintain one copy of each document on site.

B. Follow recommendations of ACI 305R when concreting during hot weather.

C. Follow recommendations of ACI 306R when concreting during cold weather.

D. For slabs required to include moisture vapor reduction admixture (MVRA), do not proceed with placement unless manufacturer's representative is present for every day of placement.

1.07 MOCK-UP

A. Construct and erect mock-up panel for architectural concrete surfaces indicated to receive special treatment or finish as result of formwork.
   1. Panel Size: Sufficient to illustrate full range of treatment.
   2. Panel Size: 6 by 6 feet.
   3. Panel Size: As indicated on drawings.
   4. Number of Panels: Two.
   5. Locate as indicated on drawings.

B. If requested by K2M Design Inc., cast concrete against mock-up panel. Obtain acceptance of resulting surface finish prior to erecting formwork.

C. Accepted mock-up panel is considered basis of quality for the finished work. Keep mock-up exposed to view for duration of concrete work.

D. Mock-up may remain as part of the Work.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Slabs with Moisture Vapor Reducing Admixture (MVRA): Provide warranty to cover the cost of flooring failures due to moisture migration from slabs for ten years.
   1. Include cost of repair or removal of failed flooring, placement of topical moisture remediation system, and replacement of flooring with comparable flooring system.
   2. Provide warranty by manufacturer of MVRA matching terms of flooring adhesive or primer manufacturer's material defect warranty.

C. Moisture Emission Reducing Curing and Sealing Compound: Provide warranty to cost of flooring delamination failures for 10 years.
   1. Include cost of repair or removal of failed flooring, remediation with a moisture vapor impermeable surface coating, and replacement of flooring with comparable flooring system.

D. Termite-Resistant Vapor Barrier Sheet: Provide five year manufacturer's limited warranty.

PART 2 PRODUCTS

2.01 FORMWORK

A. Comply with requirements of Section 03 1000.

2.02 REINFORCEMENT MATERIALS

A. Comply with requirements of Section 03 2000.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
   1. Acquire cement for entire project from same source.

B. Blended, Expansive Hydraulic Cement: ASTM C845/C845M, Type K.
   1. Manufacturers:
      a. CTS Cement Manufacturing Corporation; Type K Cement: www.ctscement.com/#sle.
      b. Euclid Chemical Company; EUCON MSA: www.euclidchemical.com/#sle.
      c. Substitutions: See Section 01 6000 - Product Requirements.

C. Fine and Coarse Aggregates: ASTM C33/C33M.
   1. Acquire aggregates for entire project from same source.

D. Lightweight Aggregate: ASTM C330/C330M.

E. Fly Ash: ASTM C618, Class C or F.

F. Calcined Pozzolan: ASTM C618, Class N.

G. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.

2.04 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Air Entrainment Admixture: ASTM C260/C260M.

2.05 ACCESSORY MATERIALS

A. Underslab Vapor Retarder: Sheet material complying with ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
   1. Installation: Comply with ASTM E1643.
   2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
   3. Manufacturers:
      a. Fortifiber Building Systems Group; Moistop Ultra 10: www.fortifiber.com/#sle.
      b. Fortifiber Building Systems Group; Moistop Ultra 15: www.fortifiber.com/#sle.
      c. Inteplast Group; Barrier-Bac VB-250: www.barrierbac.com/#sle.
      d. Inteplast Group; Barrier-Bac VB-350: www.barrierbac.com/#sle.
      e. ISI Building Products; Viper II Platinum 8-mil (Class A): www.viper2.com/#sle.
      f. ISI Building Products; Viper VaporCheck II 15-mil (Class A): www.isibp.com/#sle.
      g. ISI Building Products; Viper VaporCheck II 10-mil (Class A): www.isibp.com/#sle.

B. Termite-Resistant Vapor Barrier Sheet: Plastic sheet complying with ASTM E1745, Class C; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs, and for exclusion of subterranean termites.
   1. Installation: Comply with ASTM E1643.
   2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, prefabricated boots, etc., for sealing seams and penetrations.
   3. Manufacturers:
      a. Stego Industries, LLC; Pango Wrap with Pango Tape: www.stegoindustries.com/#sle.

C. Termite-Excluding Underslab Barrier and Waterproofing Membrane: Composite sheet of polyethylene film, termite-excluding barrier sealant, and non-woven polypropylene fabric.

1. Total Thickness: 95 mils (0.095 inch).
2. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.
3. Water Vapor Permeance: 0.03 perm, maximum, when tested in accordance with ASTM E96/E96M.
4. Accessory Products: Manufacturer's recommended flexible sealant tape, adhesive, mastic, etc., for sealing seams and penetrations.
5. Manufacturers:
   a. Polyguard Barrier Systems, a division of Polyguard Products, Inc; TERM Underslab Barrier: www.polyguardbarriers.com/#sle.

D. Insulated Underslab Vapor Retarder: Multi-layer product of high density closed-cell foam and high density polyethylene bubble sandwiched between outer layers of aluminum-reinforced polyethylene or equivalent, stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. The use of single ply polyethylene is prohibited.
   1. Installation: Comply with ASTM E1643.
   2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.

E. Underslab Waterproofing and Vapor Retarder: Semi-rigid bituminous membrane, seven-ply, complying with ASTM E1993/E1993M.
   1. Composition: Weather-resistant coated, permanently bonded bituminous core board composed of an inner core, suspended and sealed within high melt point asphalt-impregnated felt, with glass mat liner and polyethylene anti-stick sheet.
   2. Permeance: 0.002 perms, maximum.
   3. Tensile Strength: 140 pounds-force/inch, minimum.
   4. Puncture Resistance: 90 pounds-force, minimum, when tested in accordance with ASTM E154/E154M.
   5. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
   6. Manufacturers:
      a. W. R. Meadows, Inc; PRECON-Blindside/Underslab Membrane: www.wrmeadows.com/#sle.
      b. W. R. Meadows, Inc; PREMOULDED MEMBRANE VAPOR SEAL with PLASMATIC CORE: www.wrmeadows.com/#sle.

F. Composite Underslab Vapor Retarder: Composite sheet of plastic film laminated with non-woven geotextile fabric and complying with ASTM E1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs.
   1. Installation: Comply with ASTM E1643.
   2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
   3. Manufacturers:
      a. Inteplast Group; Barrier-Bac VBC-350: www.barrierbac.com/#sle.

G. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Grout: Comply with ASTM C1107/C1107M.
   2. Height Change, Plastic State; when tested in accordance with ASTM C827/C827M:
      a. Maximum: Plus 4 percent.
      b. Minimum: Plus 1 percent.
   3. Minimum Compressive Strength at 48 Hours, ASTM C109/C109M: 2,000 pounds per square inch.
   4. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
   5. Minimum Compressive Strength at 28 Days, ASTM C109/C109M: 7,000 pounds per square inch.
   6. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.
   7. Products containing aluminum powder are not permitted.
   8. Flowable Products:

a. Kaufman Products Inc; SureGrout: www.kaufmanproducts.net/#sle.

9. Low-Slump, Dry Pack Products:

H. Non-Shrink Epoxy Grout: Moisture-insensitive, two-part; consisting of epoxy resin, non-metallic aggregate, and activator.

1. Composition: High solids content material exhibiting positive expansion when tested in accordance with ASTM C827/C827M.
   a. Maximum Height Change: Plus 4 percent.
   b. Minimum Height Change: Plus 1 percent.
2. Minimum Compressive Strength at 7 days, ASTM C579: 12,000 pounds per square inch.
3. Minimum Compressive Strength at 7 days, ASTM D695: 12,000 pounds per square inch.

I. Termite-Resistant Barrier Sealant: Solvent-based; single component, non-sag, non-skinning, non-hardening, non-bleeding; vapor-impermeable; intended for fully concealed applications.

1. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.
2. Manufacturers:
   a. Polyguard Barrier Systems, Inc, a division of Polyguard Products, Inc; TERM Sealant Barrier: www.polyguardbarriers.com/#sle.

J. Heavy Duty, Abrasion-Resistant Concrete Floor Topping:

1. Manufacturers:
   a. Euclid Chemical Company; EucoFloor 202: www.euclidchemical.com/#sle.
   b. L&M Construction Chemicals, Inc, a subsidiary of Laticrete International, Inc; EMERYTOP 400: www.lmcc.com/#sle.

K. Architectural Concrete Floor Topping and Resurfacer:

1. Minimum Compressive Strength at 28 Days, ASTM C109/C109M: 6,500 pounds per square inch.
2. Manufacturers:
   a. CTS Cement Manufacturing Corporation; TRU Self-Leveling: www.ctscement.com/#sle.
   b. CTS Cement Manufacturing Corporation; TRU PC Polished Concrete: www.ctscement.com/#sle.
   c. SpecChem, LLC; SpecLevel PCT: www.specchemllc.com/#sle.

L. Non-Shrink Epoxy Chocking Compound:

1. Manufacturers:
   a. Dayton Superior Corporation; Poxy-Chock: www.daytonsuperior.com/#sle.
   b. Dayton Superior Corporation; Pro-Poxy Chock: www.daytonsuperior.com/#sle.
   c. Kaufman Products Inc; K Pro HP Grout: www.kaufmanproducts.net/#sle.

2.06 BONDING AND JOINTING PRODUCTS

A. Latex Bonding Agent: Non-redispersable acrylic latex, complying with ASTM C1059/C1059M, Type II.

1. Manufacturers:
   a. Euclid Chemical Company; AKKRO-7T: www.euclidchemical.com/#sle.
   b. Kaufman Products Inc; SureBond: www.kaufmanproducts.net/#sle.
   c. Kaufman Products Inc; SureWeld: www.kaufmanproducts.net/#sle.
   d. SpecChem, LLC; Strong Bond Acrylic Bonder: www.specchemllc.com/#sle.
   e. W. R. Meadows, Inc; ACRY-LOK-: www.wrmeadows.com/#sle.

B. Epoxy Bonding System:

1. Complying with ASTM C881/C881M and of Type required for specific application.
2. Manufacturers:
   a. Adhesives Technology Corporation; Crackbond SLV-302, Crackbond LR-321, Crackbond LR-321 LPL, Ultrabond 2100 LPL, Ultrabond 2100, Ultrabond 1, Ultrabond 2, or Ultrabond HS200: www.atcepoxy.com/#sle.
   b. Euclid Chemical Company; DURAL FAST SET LV: www.euclidchemical.com/#sle.
   c. Euclid Chemical Company; DURALFLEX GEL: www.euclidchemical.com/#sle.

d. Euclid Chemical Company; DURALFLEX LV: www.euclidchemical.com/#sle.
e. Euclid Chemical Company; DURAL 452 GEL, DURAL 452 LV, or DURAL 452 MV: www.euclidchemical.com/#sle.
f. Dayton Superior Corporation; Slow Set Bonding Agent: www.daytonsuperior.com/#sle.
g. Kaufman Products Inc; SurePoxy HM EPL: www.kaufmanproducts.net/#sle.
h. Kaufman Products Inc; SurePoxy HM Class B: www.kaufmanproducts.net/#sle.
i. SpecChem, LLC; SpecPoxy 1000, SpecPoxy 2000, SpecPoxy 3000, or SpecPoxy 3000FS: www.specchemllc.com/#sle.
j. W. R. Meadows, Inc; Rezi-Weld Gel Paste, Rezi-Weld Gel Paste State, Rezi-Weld 1000: www.wrmeadows.com/#sle.

C. Acetate Bonding Agent: Non-redispersable polyvinyl acetate.
1. Manufacturers:
a. Larsen Products Corp; Weldcrete: www.larsenproducts.com/#sle.

D. Silane Hybrid Anchoring System:
1. Complying with ASTM C881/C881M and of Type required for specific application.
2. Manufacturers:
a. Adhesives Technology Corporation; ULTRABOND 365CC: www.atcepoxy.com/#sle.

E. Waterproofing Admixture Slurry: Slurry coat of Portland cement, sand, and crystalline waterproofing additive, mixed with water in proportions recommended by manufacturer to achieve waterproofing at cold joints in concrete.
1. Manufacturers:
a. W. R. Meadows, Inc; ADI-CON CW Plus: www.wrmeadows.com/#sle.
b. Xypex Chemical Corporation; XYPEX Concentrate: www.xypex.com/#sle.

F. Waterstops: Rubber, complying with COE CRD-C 513.
1. Configuration: As indicated on drawings.
2. Size: As indicated on drawings.

G. Reglets: Formed steel sheet, galvanized, with temporary filler to prevent concrete intrusion during placement.
1. Size: 1/2 inch throat, 1/2 inch deep.

H. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
1. Material: ASTM D1751, cellulose fiber.
2. Manufacturers:
a. Nomaco, Inc; Nomaflex Expansion Joint Filler with Void Cap Option: www.nomaco.com/#sle.
b. W. R. Meadows, Inc; Fiber Expansion Joint Filler with Snap-Cap: www.wrmeadows.com/#sle.

I. Termite-Excluding Slab Isolation Joint Filler: 1/2 inch thick, composite sheet of elastomeric membrane, embedded stainless steel termite-exclusion screen, adhesive on both sides, and a disposable, treated release sheet.
1. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.
2. Stainless Steel Mesh: ASTM E11; opening size 0.018 inch, maximum.
3. Manufacturers:
a. Polyguard Barrier Systems, Inc, a division of Polyguard Products, Inc; TERM Isolation Joint Barrier: www.polyguardbarriers.com/#sle.

J. Slab Contraction Joint Device: Preformed linear strip intended for pressing into wet concrete to provide straight route for shrinkage cracking.
1. Manufacturers:
a. W. R. Meadows, Inc; Speed-E-Joint: www.wrmeadows.com/#sle.

K. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches on center; ribbed steel stakes for setting.
   1. Provide removable plastic cap strip that forms wedge-shaped joint for sealant installation.
   2. Height: To suit slab thickness.

L. Dowel Sleeves: Plastic sleeve for smooth, round, steel load-transfer dowels.
   1. Manufacturers:

M. Plate Dowel System: Steel plate dowel and plastic dowel sleeve; with integral fasteners for attachment to formwork.

2.07 CURING MATERIALS

A. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
   1. Manufacturers:
      a. Dayton Superior Corporation; AquaFilm Concentrate J74: www.daytonsuperior.com/#sle.
      b. Euclid Chemical Company ; EUCOBAR: www.euclidchemical.com/#sle.
      c. Kaufman Products Inc; VaporAid: www.kaufmanproducts.net/#sle.
      d. SpecChem, LLC; SpecFilm Concentrate or SpecFilm: www.specchemllc.com/#sle.
      e. W. R. Meadows, Inc; Evapre or Evapre-RTU: www.wrmeadows.com/#sle.

B. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
   1. Application: Use at slab.
   2. Product dissipates within 4 to 6 weeks.
   3. Provide product containing fugitive red dye.
   4. Manufacturers:
      a. Dayton Superior Corporation; Resin Cure with Dye J11WD: www.daytonsuperior.com/#sle.
      b. Euclid Chemical Company; COLOR-CRETE CURE AND SEAL VOC: www.euclidchemical.com/#sle.
      c. Kaufman Products Inc; Thinfilm 420 Resin Base: www.kaufmanproducts.net/#sle.
      d. W. R. Meadows, Inc; 1100-Clear: www.wrmeadows.com/#sle.

C. Curing Agent, Water Replacement Type: Clear, water based, liquid water cure replacement agent complying with ASTM C309 standards for water retention, and with ACI 302.1R.
   1. Application: Use at slab.
   2. Manufacturers:
      a. Sinak Corporation; The CURE™WCE: www.sinak.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

D. Curing and Anti-Spalling Compound: Boiled linseed oil compound.
   1. Application: Use on roadway, bridge deck, parking deck, and ramps.
   2. Manufacturers:
      a. Dayton Superior Corporation; Anti Spall J33: www.daytonsuperior.com/#sle.
      b. Euclid Chemical Company; LINSEED OIL TREATMENT: www.euclidchemical.com/#sle.
      c. W. R. Meadows, Inc; Lin-Seal, Lin-Seal Emulsion, or Lin-Seal White: www.wrmeadows.com/#sle.

2.08 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
   1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.

B. Proportioning Structural Lightweight Concrete: Comply with ACI 211.2 recommendations.

1. Replace as much Portland cement as possible with fly ash, ground granulated blast furnace slag, silica fume, or rice hull ash as is consistent with ACI recommendations.

C. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
   1. For trial mixtures method, employ independent testing agency acceptable to K2M Design Inc. for preparing and reporting proposed mix designs.

D. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.

E. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.

F. Normal Weight Concrete:
   1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: 4,000 pounds per square inch.
   2. Fly Ash Content: Maximum 15 percent of cementitious materials by weight.
   3. Calcined Pozzolan Content: Maximum 10 percent of cementitious materials by weight.
   4. Silica Fume Content: Maximum 5 percent of cementitious materials by weight.
   5. Cement Content: Minimum 660 pounds per cubic yard.
   6. Water-Cement Ratio: Maximum 40 percent by weight.
   7. Total Air Content: 4 percent, determined in accordance with ASTM C173/C173M.
   8. Maximum Slump: 3 inches.
   9. Maximum Aggregate Size: 5/8 inch.

2.09 MIXING

A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.
   1. Colored Concrete: Add pigments in strict accordance with manufacturer's instructions to achieve consistent color from batch to batch.
   2. Fiber Reinforcement: Batch and mix as recommended by manufacturer for specific project conditions.

B. Transit Mixers: Comply with ASTM C94/C94M.

C. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Verify that forms are clean and free of rust before applying release agent.

B. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

C. Prepare existing concrete surfaces to be repaired according to ICRI 310.2R.

D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
   1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
   2. Use latex bonding agent only for non-load-bearing applications.

E. Where new concrete with integral waterproofing is to be bonded to previously placed concrete, prepare surfaces to be treated in accordance with waterproofing manufacturer's instructions. Saturate cold joint surface with clean water, and remove excess water before application of coat of waterproofing admixture slurry. Apply slurry coat uniformly with semi-stiff bristle brush at rate recommended by waterproofing manufacturer.

F. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

G. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
   1. Granular Fill Over Vapor Retarder: Cover vapor retarder with compactible granular fill as indicated on drawings. Do not use sand.
   2. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as indicated on drawings. Do not use sand.
   3. Install composite vapor retarder sheet with non-woven geotextile surface facing concrete.

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI 304R.

B. Place concrete for floor slabs in accordance with ACI 302.1R.

C. Notify K2M Design Inc. not less than 24 hours prior to commencement of placement operations.

D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

E. Ensure reinforcement, inserts, waterstops, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

F. Place concrete continuously without construction (cold) joints wherever possible; where construction joints are necessary, before next placement prepare joint surface by removing laitance and exposing the sand and sound surface mortar, by sandblasting or high-pressure water jetting.

G. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.

3.04 SLAB JOINTING

A. Locate joints as indicated on drawings.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
   1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.

D. Load Transfer Construction and Contraction Joints: Install load transfer devices as indicated; saw cut joint at surface as indicated for contraction joints.

E. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.

F. Construction Joints: Where not otherwise indicated, use metal combination screed and key form, with removable top section for joint sealant.

3.05 SEPARATE FLOOR TOPPINGS

A. Prior to placing floor topping, roughen substrate concrete surface and remove deleterious material. Broom and vacuum clean.

B. Place required dividers, edge strips, reinforcing, and other items to be cast in.

C. Apply bonding agent to substrate in accordance with manufacturer's instructions.

D. Apply sand and cement slurry coat on base course, immediately prior to placing toppings.

E. Place concrete floor toppings to required lines and levels.
   1. Place topping in checkerboard panels not to exceed 20 feet in either direction.

F. Screed toppings level, maintaining surface flatness of maximum 1:1000.

3.06 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. An independent testing agency, as specified in Section 01 4000, will inspect finished slabs for compliance with specified tolerances.

B. Maximum Variation of Surface Flatness:
   1. Exposed Concrete Floors: 1/4 inch in 10 feet.
   2. Under Seamless Resilient Flooring: 1/4 inch in 10 feet.
   3. Under Carpeting: 1/4 inch in 10 feet.

C. Correct the slab surface if tolerances are less than specified.

D. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.07 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch or more in height.

C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
   1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
   2. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.
   3. Cork Floated Finish: Immediately after form removal, apply grout with trowel or firm rubber float; compress grout with low-speed grinder, and apply final texture with cork float.

D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
   1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
   2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 302.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
   3. Decorative Exposed Surfaces: Trowel as described in ACI 302.1R; use steel-reinforced plastic trowel blades instead of steel blades to avoid black-burnish marks; decorative exposed surfaces include surfaces to be stained or dyed, pigmented concrete, surfaces to receive liquid hardeners, surfaces to receive dry-shake hardeners, surfaces to be polished, and all other exposed slab surfaces.
      a. Steel-Reinforced Plastic Trowel Blade Manufacturer: Wagman Metal Products, Inc: www.wagmanmetal.com/#sle.
   4. Chemical Hardener: See Section 03 3511.

E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

3.08 CURING AND PROTECTION

A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
   1. Normal concrete: Not less than seven days.
   2. High early strength concrete: Not less than four days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

D. Surfaces Not in Contact with Forms:

1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
   a. Ponding: Maintain 100 percent coverage of water over floor slab areas, continuously for 4 days.
   b. Spraying: Spray water over floor slab areas and maintain wet.
   c. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.
3. Final Curing: Begin after initial curing but before surface is dry.
   a. Moisture-Retaining Sheet: Lap strips not less than 3 inches and seal with waterproof tape or adhesive; secure at edges.
   b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.09 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.

E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.

F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

H. Slab Testing: Cooperate with manufacturer of specified moisture vapor reduction admixture (MVRA) to allow access for sampling and testing concrete for compliance with warranty requirements.

I. Permeability Test: Test concrete with waterproofing admixture according to COE CRD-C 48.

3.10 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to K2M Design Inc. and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the K2M Design Inc.. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of K2M Design Inc. for each individual area.

3.11 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

3.12 SCHEDULE - CONCRETE TYPES AND FINISHES

A. Foundation Walls: 4,000 pounds per square inch 28 day concrete, form finish with honeycomb filled surface.

B. Underside of Supported Floors and Structure Exposed to View: 4,000 pounds per square inch 28 day concrete, form finish with honeycomb filled surface.

C. Exposed Portico Structure: 4,000 pounds per square inch 28 day concrete, air entrained, smooth rubbed finish.

END OF SECTION 03 3000

SECTION 03 5400
CAST UNDERLAYMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Liquid-applied self-leveling floor underlayment.
   1. Use cementitious type at existing interior slabs.

1.02 RELATED REQUIREMENTS

A. Section 01 7000 - Execution and Closeout Requirements: Alteration project procedures; selective demolition for remodeling.

1.03 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2016a.

B. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2012.

C. ASTM C348 - Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars; 2014.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Manufacturer's Instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Keep dry and protect from direct sun exposure, freezing, and ambient temperature greater than 105 degrees F.

1.06 FIELD CONDITIONS

A. Do not install underlayment until floor penetrations and peripheral work are complete.

B. Maintain minimum ambient temperatures of 50 degrees F 24 hours before, during and 72 hours after installation of underlayment.

C. During the curing process, ventilate spaces to remove excess moisture.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 MATERIALS

A. Cast Underlayments, General:
   1. Comply with applicable code for combustibility or flame spread requirements.

B. Cementitious Underlayment: Blended cement mix, that when mixed with water in accordance with manufacturer's directions will produce self-leveling underlayment with the following properties:
   1. Compressive Strength: Minimum 3000 pounds per square inch after 28 days, tested per ASTM C109/C109M.
   2. Flexural Strength: Minimum 1000 psi after 28 days, tested per ASTM C348.
   3. Density: 125 pounds per cubic foot, nominal.
   4. Final Set Time: 1-1/2 to 2 hours, maximum.
   5. Thickness: Capable of thicknesses from feather edge to maximum 3-1/2 inch.
   6. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0 in accordance with ASTM E84.

C. Aggregate: Dry, well graded, washed silica aggregate, approximately 1/8 inch in size and acceptable to underlayment manufacturer.

D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to underlayment mix materials.

E. Primer: Manufacturer's recommended type.

F. Joint and Crack Filler: Latex based filler, as recommended by manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are clean, dry, unfrozen, do not contain petroleum byproducts, or other compounds detrimental to underlayment material bond to substrate.

3.02 PREPARATION

A. Remove substrate surface irregularities. Fill voids and deck joints with filler. Finish smooth.

B. Vacuum clean surfaces.

C. Prime substrate in accordance with manufacturer's instructions. Allow to dry.

D. Close floor openings.

3.03 APPLICATION

A. Install underlayment in accordance with manufacturer's instructions.

B. Place to 2 inch thickness, with top surface level to 1/8 inch in 10 ft.

C. For final thickness over 1-1/2 inches, place underlayment in layers. Allow initial layer to harden to the point where the material has lost its evaporative moisture. Immediately prime and begin application of the subsequent layer within 24 hours.

D. Place before partition installation.

E. Where additional aggregate has been used in the mix, add a top layer of neat mix (without aggregate), if needed to level and smooth the surface.

3.04 CURING

A. Once underlayment starts to set, prohibit foot traffic until final set has been reached.

B. Air cure in accordance with manufacturer's instructions.

3.05 PROTECTION

A. Protect against direct sunlight, heat, and wind; prevent rapid drying to avoid shrinkage and cracking.

B. Do not permit traffic over unprotected floor underlayment surfaces.

END OF SECTION 03 5400

SECTION 04 0511

MORTAR AND MASONRY GROUT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Mortar for masonry.

B. Grout for masonry.

1.02 RELATED REQUIREMENTS

A. Section 04 0100 - Maintenance of Masonry: Bedding and pointing mortar for masonry restoration work.

B. Section 04 2000 - Unit Masonry: Installation of mortar and grout.

C. Section 04 2001 - Masonry Veneer: Installation of mortar.

D. Section 04 2300 - Glass Unit Masonry: Installation of mortar.

E. Section 04 2500 - Unit Masonry Panels: Installation of mortar and grout.

F. Section 04 2600 - Single-Wythe Unit Masonry: Installation of mortar and grout.

G. Section 04 2723 - Cavity Wall Unit Masonry: Installation of mortar and grout.

H. Section 04 2900 - Engineered Unit Masonry: Installation of mortar and grout.

I. Section 04 4200 - Exterior Stone Cladding: Installation of mortar.

J. Section 04 4313 - Stone Masonry Veneer: Installation of mortar.

K. Section 04 7200 - Cast Stone Masonry: Installation of mortar.

L. Section 08 1113 - Hollow Metal Doors and Frames: Products and execution for grouting steel door frames installed in masonry.

M. Section 33 0513 - Manholes and Structures: Installation of mortar and grout.

1.03 REFERENCE STANDARDS

A. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2016.

B. ASTM C5 - Standard Specification for Quicklime for Structural Purposes; 2010.

C. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.

D. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2017a.

E. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2017.

F. ASTM C150/C150M - Standard Specification for Portland Cement; 2018.

G. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).

H. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2014a.

I. ASTM C387/C387M - Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar; 2015.

J. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.

K. ASTM C476 - Standard Specification for Grout for Masonry; 2018.

L. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2017.

M. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.

N. ASTM C1019 - Standard Test Method for Sampling and Testing Grout; 2016.

O. ASTM C1072 - Standard Test Method for Measurement of Masonry Flexural Bond Strength; 2013, with Editorial Revision (2014).

P. ASTM C1142 - Standard Specification for Extended Life Mortar for Unit Masonry; 1995 (Reapproved 2013).

Q. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar; 1992a (Reapproved 2014).

R. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2016.

S. ASTM E514/E514M - Standard Test Method for Water Penetration and Leakage Through Masonry; 2014a.

T. ASTM E518/E518M - Standard Test Methods for Flexural Bond Strength of Masonry; 2015.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C270 is to be used. Also include required environmental conditions and admixture limitations.

C. Samples: Submit two samples of mortar, illustrating mortar color and color range.

D. Reports: Submit reports on mortar indicating compliance of mortar to property requirements of ASTM C270 and test and evaluation reports per ASTM C780.

E. Reports: Submit reports on grout indicating compliance of component grout materials to requirements of ASTM C476 and test and evaluation reports to requirements of ASTM C1019.

F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

G. Manufacturer's Installation Instructions: Submit packaged dry mortar manufacturer's installation instructions.

1.05 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of the contract documents.
   1. Maintain one copy of each document on project site.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.07 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

B. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.

C. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

PART 2 PRODUCTS

2.01 MORTAR AND GROUT APPLICATIONS

A. At Contractor's option, mortar and grout may be field-mixed from packaged dry materials, made from factory premixed dry materials with addition of water only, or ready-mixed.

B. Mortar Color: Natural gray unless otherwise indicated.

C. Mortar Mix Designs: ASTM C270, Property Specification.
   1. Historic Exterior Masonry Pointing Mortar: Type O; color to match existing.
   2. Masonry below grade and in contact with earth: Type S.
   3. Exterior Masonry Veneer: Type N.
   4. Exterior Cavity Walls: Type S mortar with Type N pointing mortar.
   5. Engineered Masonry: Type M.
   6. Exterior, Loadbearing Masonry: Type N.

7. Exterior, Non-loadbearing Masonry: Type N.
8. Exterior Repointing Mortar: Type N with maximum 2 percent ammonium stearate or calcium stearate per cement weight.
9. Interior, Loadbearing Masonry: Type N.
10. Interior, Non-loadbearing Masonry: Type O.
11. Pointing Mortar for Prefaced or Specially Faced Unit Masonry: One part Portland cement, 1/8 part hydrated lime, and two parts graded (80 mesh) aggregate, proportioned by volume. Add aluminum tristearate, calcium stearate, or ammonium stearate equal to 2 percent of Portland cement by weight.
12. Glass Unit Masonry: Type N mortar and Type O pointing mortar.

D. Grout Mix Designs:
1. Bond Beams and Lintels: 3,000 psi strength at 28 days; 8-10 inches slump; provide premixed type in accordance with ASTM C 94/C 94M.
   a. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
   b. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.
2. Engineered Masonry: 3,000 psi strength at 28 days; 8-10 inches slump; provide premixed type in accordance with ASTM C 94/C 94M.
   a. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
   b. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

2.02 MATERIALS

A. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C387/C387M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
1. Type: Type N.
2. Color: Standard gray.
3. Water repellent mortar for use with water repellent masonry units.
4. Manufacturers:
   a. Amerimix, an Oldcastle brand; AMX 400: www.amerimix.com/#sle.
   b. Amerimix, an Oldcastle brand; AMX 410: www.amerimix.com/#sle.

B. Packaged Dry Material for Mortar for Unit Masonry: Premixed masonry cement and mason's sand; complying with ASTM C387/C387M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
1. Type: Type N.
2. Color: Standard gray.
3. Water repellent mortar for use with water repellent masonry units.
4. Manufacturers:
   a. Amerimix, an Oldcastle brand; AMX 500: www.amerimix.com/#sle.
   b. Amerimix, an Oldcastle brand; AMX 510: www.amerimix.com/#sle.
   c. The QUIKRETE Companies; QUIKRETE® Mason Mix: www.quikrete.com/#sle.

C. Packaged Dry Material for Mortar for Repointing: Premixed Portland cement, graded sand, and chemical admixtures complying with ASTM C91/C91M with the addition of water only.
1. Color: Natural gray.

D. Packaged Dry Material for Mortar for Repointing: Premixed Portland cement, hydrated lime, and graded sand; capable of producing Type O mortar in accordance with ASTM C270 with the addition of water only.
1. Color: Standard gray.
2. Manufacturers:
   a. Amerimix, an Oldcastle brand; AMX 420: www.amerimix.com/#sle.

E. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.
1. Type: Fine.

2. Manufacturers:
   a. Amerimix, an Oldcastle brand; AMX 600: www.amerimix.com/#sle.

F. Portland Cement: ASTM C150/C150M.
   1. Type: Type I - Normal; ASTM C150/C150M.
   2. Color: Standard gray.
   3. Manufacturers:
      a. Solomon Colors; Solomon Colors Concentrated A, H, and X Series: www.solomoncolors.com/#sle.

G. Masonry Cement: ASTM C91/C91M.
   1. Type: Type N; ASTM C91/C91M.
   2. Colored Mortar: Premixed cement as required to match K2M Design Inc.'s color sample.
   3. Manufacturers:
      a. Solomon Colors; Solomon Colors Concentrated A, H, and X Series: www.solomoncolors.com/#sle.

H. Hydrated Lime: ASTM C207, Type S.

I. Quicklime: ASTM C5, non-hydraulic type.

J. Mortar Aggregate: ASTM C144.

K. Grout Aggregate: ASTM C404.

L. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
   1. Color(s): As indicated on drawings.

M. Water: Clean and potable.

N. Accelerating Admixture: Nonchloride type for use in cold weather.

O. Moisture-Resistant Admixture: Water repellent compound designed to reduce capillarity.

P. Plasticizer: Provide submittal To Engineer of record.

Q. Retardant: Provide submittal to Engineer of record.

R. Bonding Agent: Latex type.

S. Integral Water Repellent Admixture: Polymeric liquid admixture added to mortar at the time of manufacture.
   1. Performance of Mortar with Integral Water Repellent:
      a. Water Permeance: When tested per ASTM E514/E514M and for a minimum of 72 hours:
         1) No water visible on back of wall above flashing at the end of 24 hours.
         2) No flow of water from flashing equal to or greater than 0.032 gallons per hour at the end of 24 hours.
         3) No more than 25% of wall area above flashing visibly damp at end of test.
      b. Flexural Bond Strength: ASTM C1072; minimum 10 percent increase.
      c. Compressive Strength: ASTM C1314; maximum 5 percent decrease.
      d. Drying Shrinkage: ASTM C1148; maximum 5 percent increase in shrinkage.
   2. Use only in combination with masonry units produced with integral water repellent admixture.

2.03 MORTAR MIXING

A. Ready Mixed Mortar: ASTM C1142, Type equivalent to that specified according to ASTM C270.

B. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.

C. Maintain sand uniformly damp immediately before the mixing process.

D. Colored Mortar: Proportion selected pigments and other ingredients to match K2M Design Inc.'s sample, without exceeding manufacturer's recommended pigment-to-cement ratio; mix in accordance with manufacturer's instructions, uniform in coloration.

E. Add admixtures in accordance with manufacturer's instructions; mix uniformly.

F. Do not use anti-freeze compounds to lower the freezing point of mortar.

G. If water is lost by evaporation, re-temper only within two hours of mixing.

2.04 GROUT MIXING

A. Mix grout in accordance with ASTM C94/C94M.

B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.

C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.

D. Do not use anti-freeze compounds to lower the freezing point of grout.

2.05 PRECONSTRUCTION TESTING

A. Testing will be conducted by an independent test agency, in accordance with provisions of Section 01 4000 - Quality Requirements.

B. Mortar Mixes: Test mortars prebatched by weight in accordance with ASTM C780 recommendations for preconstruction testing.
   1. Test results will be used to establish optimum mortar proportions and establish quality control values for construction testing.

C. Grout Mixes: Test grout batches in accordance with ASTM C1019 procedures.
   1. Test results will be used to establish optimum grout proportions and establish quality control values for construction testing.

PART 3 EXECUTION

3.01 PREPARATION

A. Apply bonding agent to existing concrete surfaces.

B. Plug clean-out holes for grouted masonry with brick masonry units. Brace masonry to resist wet grout pressure.

3.02 INSTALLATION

A. Install mortar and grout to requirements of section(s) in which masonry is specified.

B. Work grout into masonry cores and cavities to eliminate voids.

C. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.

D. Do not displace reinforcement while placing grout.

E. Remove excess mortar from grout spaces.

3.03 GROUTING

A. Use either high-lift or low-lift grouting techniques, at Contractor's option, subject to other limitations of contract documents.

B. Low-Lift Grouting:
   1. Limit height of pours to 12 inches.
   2. Limit height of masonry to 16 inches above each pour.
   3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
   4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.

C. High-Lift Grouting:
   1. Verify that horizontal and vertical reinforcement is in proper position and adequately secured before beginning pours.
   2. Brick: Limit pours to maximum 12 feet in height and 25 feet horizontally.
   3. Hollow Masonry: Limit lifts to maximum 4 feet and pours to maximum height of 24 feet.
   4. Place grout for spanning elements in single, continuous pour.

3.04 FIELD QUALITY CONTROL

A. An independent testing agency will perform field tests, in accordance with provisions of Section 01 4000 - Quality Requirements.

B. Test and evaluate mortar in accordance with ASTM C780 procedures.
   1. Test with same frequency as specified for masonry units.

C. Test and evaluate grout in accordance with ASTM C1019 procedures.
   1. Test with same frequency as specified for masonry units.

D. Prism Tests: Test masonry and mortar panels for compressive strength in accordance with ASTM C1314, and for flexural bond strength in accordance with ASTM C1072 or ASTM E518/E518M; perform tests and evaluate results as specified in individual masonry sections.

END OF SECTION 04 0511

SECTION 04 2000

UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete block.

B. Reinforcement and anchorage.

C. Flashings.

D. Lintels.

E. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories: Dovetail slots for masonry anchors.

B. Section 03 2000 - Concrete Reinforcing: Reinforcing steel for grouted masonry.

C. Section 03 3000 - Cast-in-Place Concrete: Installation of dovetail slots for masonry anchors.

D. Section 04 0511 - Mortar and Masonry Grout.

E. Section 06 1000 - Rough Carpentry: Nailing strips built into masonry.

F. Section 07 2500 - Weather Barriers: Water-resistive barriers or air barriers applied to the exterior face of the backing sheathing or masonry.

G. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

A. ASTM A1 - Standard Specification for Carbon Steel Tee Rails; 2000 (Reapproved 2018).

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

C. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2016.

D. ASTM A580/A580M - Standard Specification for Stainless Steel Wire; 2016.

E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2016.

F. ASTM A641/A641M - Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2009a (Reapproved 2014).

G. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

H. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

I. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2016.

J. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2017.

K. ASTM B370 - Standard Specification for Copper Sheet and Strip for Building Construction; 2012.

L. ASTM C27 - Standard Classification of Fireclay and High-Alumina Refractory Brick; 1998 (Reapproved 2013).

M. ASTM C34 - Standard Specification for Structural Clay Load-Bearing Wall Tile; 2017.

N. ASTM C56 - Standard Specification for Structural Clay Nonloadbearing Tile; 2013.

O. ASTM C62 - Standard Specification for Building Brick (Solid Masonry Units Made From Clay or Shale); 2017.

P. ASTM C67/C67M - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile; 2018.

Q. ASTM C73 - Standard Specification for Calcium Silicate Brick (Sand-Lime Brick); 2017.

R. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2016a.

S. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.

T. ASTM C126 - Standard Specification for Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units; 2016.

U. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2017.

V. ASTM C140/C140M - Standard Test Methods of Sampling and Testing Concrete Masonry Units and Related Units; 2017a.

W. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2017.

X. ASTM C150/C150M - Standard Specification for Portland Cement; 2018.

Y. ASTM C199 - Standard Test Method for Pier Test for Refractory Mortars; 1984 (Reapproved 2016).

Z. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).

AA. ASTM C212 - Standard Specification for Structural Clay Facing Tile; 2017.

AB. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2017a.

AC. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2014a.

AD. ASTM C315 - Standard Specification for Clay Flue Liners and Chimney Pots; 2007 (Reapproved 2016).

AE. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.

AF. ASTM C476 - Standard Specification for Grout for Masonry; 2018.

AG. ASTM C530 - Standard Specification for Structural Clay Nonloadbearing Screen Tile; 2013.

AH. ASTM C652 - Standard Specification for Hollow Brick (Hollow Masonry Units Made From Clay or Shale); 2017a.

AI. ASTM C744 - Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units; 2016.

AJ. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2017.

AK. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.

AL. ASTM C1072 - Standard Test Method for Measurement of Masonry Flexural Bond Strength; 2013, with Editorial Revision (2014).

AM. ASTM C1148 - Standard Test Method for Measuring the Drying Shrinkage of Masonry Mortar; 1992a (Reapproved 2014).

AN. ASTM C1261 - Standard Specification for Firebox Brick for Residential Fireplaces; 2013, with Editorial Revision (2017).

AO. ASTM C1283 - Standard Practice for Installing Clay Flue Lining; 2015.

AP. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2016.

AQ. ASTM C1405 - Standard Specification for Glazed Brick (Single Fired, Brick Units); 2016.

AR. ASTM C1634 - Standard Specification for Concrete Facing Brick; 2017.

AS. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2016.

AT. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2017.

AU. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015.

AV. ASTM E11 - Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves; 2017.

AW. ASTM E514/E514M - Standard Test Method for Water Penetration and Leakage Through Masonry; 2014a.

AX. BIA Technical Notes No. 7 - Water Penetration Resistance - Design and Detailing; 2017.

AY. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls; 2017.

AZ. BIA Technical Notes No. 28B - Brick Veneer/Steel Stud Walls; 2005.

BA. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2017.

BB. ICC-ES AC380 - Acceptance Criteria for Termite Physical Barrier Systems; 2014, with Editorial Revision (2017).

BC. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2016.

BD. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

D. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.

E. Test Reports: Concrete masonry manufacturer's test reports for units with integral water repellent admixture.

F. Maintenance Materials: Furnish the following for City of Key West's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Glazed Units: 50 of each type, size, and color combination.
   3. Extra Pre-Faced Units: 50 of each type, size, and color combination.

1.06 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of the contract documents.
   1. Maintain one copy of each document on project site.

B. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum three years of documented experience.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 MOCK-UP

A. Construct a masonry wall as a mock-up panel sized 8 feet long by 6 feet high; include mortar, accessories, structural backup, and flashings (with lap joint, corner, and end dam) in mock-up.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depth of 8 inches.
   2. Size: Standard units with nominal face dimensions of 16 by 8 inches and nominal depths as indicated on drawings for specific locations.
   3. Special Shapes: Provide non-standard blocks configured for corners.
      a. Provide bullnose units for outside corners.
   4. Load-Bearing Units: ASTM C90, normal weight.
      a. Hollow block, as indicated.
      b. Exposed Faces: Manufacturer's standard color and texture where indicated.
      c. Pattern: Vertical single score.
      d. Pattern: Vertically ribbed and split.
      e. Manufacturers:
         1) The Concrete Products Group; Spec-Brik: www.concreteproductsgroup.com/#sle.
         2) The Concrete Products Group; Polished and Textured Collection: www.concreteproductsgroup.com/#sle.
         3) Substitutions: See Section 01 6000 - Product Requirements.
   5. Non-Loadbearing Units: ASTM C129.
      a. Hollow block, as indicated.
      b. Lightweight.
   6. Units with Integral Water Repellent: Concrete block units as specified in this section with polymeric liquid admixture added to concrete masonry units at the time of manufacture.
      a. Performance of Units with Integral Water Repellent:
         1) Water Permeance: When tested per ASTM E514/E514M and for a minimum of 72 hours.
            (a) No water visible on back of wall above flashing at the end of 24 hours.
            (b) No flow of water from flashing equal to or greater than 0.032 gallons per hour at the end of 24 hours.
            (c) No more than 25 percent of wall area above flashing visibly damp at end of test.
         2) Flexural Bond Strength: ASTM C1072; minimum 10 percent increase.
         3) Compressive Strength: ASTM C1314; maximum 5 percent decrease.
         4) Drying Shrinkage: ASTM C1148; maximum 5 percent increase in shrinkage.
      b. Use only in combination with mortar that also has integral water repellent admixture.
      c. Use water repellent admixtures for masonry units and mortar by a single manufacturer.
      d. Manufacturers:
         1) Amerimix, an Oldcastle brand; CMU with Rainbloc GP: www.amerimix.com/#sle.

2.02 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.

B. Hydrated Lime: ASTM C207, Type S.

C. Grout Aggregate: ASTM C404.

D. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.

2.03 REINFORCEMENT AND ANCHORAGE

A. Reinforcing Steel: Grade 60, as specified in Section 03 2000; size as indicated on drawings; galvanized finish.

B. Flexible Anchors: 2-piece anchors that permit differential movement between masonry and building frame, sized to provide not less than 5/8 inch of mortar coverage from masonry face.

C. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
   1. Anchor plates: Not less than 0.075 inch thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
   2. Wire ties: Manufacturer's standard shape, 0.1875 inch thick.
   3. Vertical adjustment: Not less than 3-1/2 inches.

2.04 FLASHINGS

A. Metal Flashing Materials: Copper, as specified in Section 07 6200.

B. Metal Flashing Materials:
   1. Copper Flashing: ASTM B370, 060 soft annealed; 20 oz/sq ft thick; natural finish.
   2. Stainless Steel Flashing: ASTM A666, Type 304, soft temper; 26 gage, 0.0187 inch thick; finish 2B to 2D.
   3. Prefabricated Metal Flashing: Smooth fabricated 12 oz/sq ft copper flashing for surface mounted conditions.

C. Combination Asphaltic Flashing Materials - Copper:
   1. Copper/Asphalt Flashing: 3 oz/sq ft copper sheet coated with elastic asphalt compound on both sides.
      a. Manufacturers:
         1) Advanced Building Products, Inc; Copper Fabric Flashing: www.advancedbuildingproducts.com/#sle.
   2. Copper/Kraft Paper Flashings: 3 oz/sq ft sheet copper bonded between two sheets of fiber-reinforced asphalt treated Kraft paper.

D. Combination Non-Asphaltic Flashing Materials - Copper:

E. Copper/Polymer Film or Fabric Flashing: 3 oz/sq ft copper sheet laminated between two sheets of polymer or fiberglass fiber-reinforced film.
   1. Manufacturers:
      a. Advanced Building Products, Inc.; Copper Sealtite 2000: www.advancedbuildingproducts.com/#sle.
      b. Hohmann & Barnard, Inc; Copper-Fabric NA: www.h-b.com/#sle.
      c. York Manufacturing, Inc; Multi-Flash 500 Series: www.yorkmfg.com/#sle.

F. Copper/Polymer Film or Fabric Flashing - Self-Adhering: 3 oz/sq ft copper sheet bonded on inward facing side to a sheet of polymer or fiberglass fabric that has a clear adhesive with a removable release liner.

G. Copper/Polymer Fabric Drainage Plane Flashing System : 3 oz/sq ft copper sheet bonded with rubber-based adhesive between one sheet of polymer fabric and one sheet of non-woven drainage material.
   1. Manufacturers:
      a. STS Coatings, Inc; www.stscoatings.com/#sle.
      b. York Manufacturing, Inc; Flash-Vent: www.yorkmfg.com/#sle.

H. Combination Non-Asphaltic Flashing Materials - Stainless Steel:
   1. Stainless Steel Flashing - Self-adhering: ASTM A240/A240M; 2 mil type 304 stainless steel sheet with 8 mil of butyl adhesive and a removable release liner.
      a. Manufacturers:

1) STS Coatings, Inc: www.stscoatings.com/#sle.
2) VaproShield, LLC: www.vaproshield.com/#sle.
3) York Manufacturing, Inc; York 304: www.yorkmfg.com/#sle.

I. Stainless Steel/Polymer Fabric Flashing: ASTM A240/A240M; 2 mil type 304 stainless steel sheet bonded on one side to one sheet of polymer fabric.
1. Manufacturers:
a. Hohmann & Barnard, Inc; Mighty-Flash Stainless Flashing: www.h-b.com/#sle.
b. WIRE-BOND: www.wirebond.com/#sle.
c. York Manufacturing, Inc; Multi-Flash SS: www.yorkmfg.com/#sle.

J. Stainless Steel/Polymer Fabric Flashing - Self-adhering: ASTM A240/A240M; 2 mil type 304 stainless steel sheet bonded on inward facing side to a sheet of polymer fabric that has a clear adhesive with a removable release liner.
1. Manufacturers:
a. Hohmann & Barnard, Inc: www.h-b.com/#sle.
b. WIRE-BOND: www.wirebond.com/#sle.

K. Stainless Steel/Polymer Fabric Drainage Plane Flashing: ASTM A240/A240M; 2 mil type 304 stainless steel sheet bonded between one sheet of polymer fabric and one sheet of non-woven drainage material.
1. Manufacturers:
a. STS Coatings, Inc: www.stscoatings.com/#sle.
b. York Manufacturing, Inc; Flash-Vent SS: www.yorkmfg.com/#sle.

L. Stainless Steel/Polymer Fabric Drainage Plane Flashing - Self-Adhering: ASTM A240/A240M; 2 mil type 304 stainless steel sheet with 8 mil of butyl adhesive and a removable release liner on one side and a sheet of non-woven drainage material bonded to the other side.
1. Manufacturers:
a. York Manufacturing, Inc: www.yorkmfg.com/#sle.

M. Membrane Asphaltic Flashing Materials:
1. Rubberized Asphalt Flashing: Self-adhering polymer modified asphalt sheet; 40 mils (0.040 inch) minimum total thickness; 8 mil cross-laminated polyethylene bonded to adhesive rubberized asphalt, with a removable release liner.
a. Manufacturers:
1) Advanced Building Products, Inc; Strip-N-Flash: www.advancedbuildingproducts.com/#sle.
2) Heckmann Building Products, Inc: www.heckmannbuildingprods.com/#sle
3) WIRE-BOND: www.wirebond.com/#sle.
4) York Manufacturing, Inc; York Seal: www.yorkmfg.com/#sle.

N. Membrane Non-Asphaltic Flashing Materials:
1. Composite Polymer Flashings - Self-Adhering: Composite polyethylene; 40 mil thick with pressure-sensitive adhesive and release paper.
a. Manufacturers:
1) Hohmann & Barnard, Inc; Textroflash: www.h-b.com/#sle.
2) Hyload, Inc: www.hyload.com/#sle.

O. EPDM Flashing: ASTM D4637/D4637M, Type I, 0.040 inch thick.
1. Manufacturers:
a. Heckmann Building Products, Inc: www.heckmannbuildingprods.com/#sle
b. Hohmann & Barnard, Inc: www.h-b.com/#sle.
c. WIRE-BOND: www.wirebond.com/#sle.

P. Factory-Fabricated Flashing Corners and Ends: Stainless steel.
1. Manufacturers:
a. Hohmann & Barnard, Inc: www.h-b.com/#sle.
b. Mortar Net Solutions: www.mortarnet.com/#sle.
c. York Manufacturing, Inc: www.yorkmfg.com/#sle.

Q. Flashing Sealant/Adhesives: Silicone, polyurethane, or silyl-terminated polyether/polyurethane or other type required or recommended by flashing manufacturer; type capable of adhering to type of flashing used.
   1. Manufacturers, Synthetic Rubber Products:
      a. Mortar Net Solutions: www.mortarnet.com/#sle.
   2. Manufacturers, Modified Polyether Products:
      a. Mortar Net Solutions: www.mortarnet.com/#sle.
      b. York Manufacturing, Inc; UniverSeal US-100 Liquid Tape: www.yorkmfg.com/#sle.

R. Termination Bars: Stainless steel; compatible with membrane and adhesives.

S. Drip Edge: Stainless steel; angled drip with hemmed edge; compatible with membrane and adhesives.

T. Lap Sealants and Tapes: As recommended by flashing manufacturer; compatible with membrane and adhesives.

2.05 ACCESSORIES

A. Preformed Control Joints: Rubber material. Provide with corner and tee accessories, fused joints.
   1. Manufacturers:
      a. Blok-Lok Limited: www.blok-lok.com/#sle.
      b. Hohmann & Barnard, Inc: www.h-b.com/#sle.
      c. WIRE-BOND: www.wirebond.com/#sle.

B. Joint Filler: Closed cell polyvinyl chloride; oversized 50 percent to joint width; self expanding; in maximum lengths available.
   1. Manufacturers:
      a. Hohmann & Barnard, Inc: www.h-b.com/#sle.
      b. WIRE-BOND: www.wirebond.com/#sle.

C. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
   1. Full-Height Airspace Maintenance and Drainage Material: Mesh panels, fitted between masonry ties.
      a. Manufacturers:
         1) Advanced Building Products, Inc.; Mortairvent-CW: www.advancedbuildingproducts.com/#sle.
         2) CavClear/Archovations, Inc; CavClear Masonry Mat: www.cavclear.com/#sle.
         3) CavClear/Archovations, Inc; CavClear Polyisocyanurate Insulation System: www.cavclear.com/#sle.

D. Building Paper: ASTM D226/D226M, Type I ("No.15") asphalt felt.

E. Nailing Strips: Softwood lumber, preservative treated; as specified in Section 06 1000.

F. Nailing Strips: Softwood lumber, preservative treated for moisture resistance, dovetail shape, sized to masonry joints.

G. Weeps:
   1. Type: Polyester mesh.
   2. Color(s): As indicated on drawings.
   3. Color(s): As selected by K2M Design Inc. from manufacturer's full range.
   4. Manufacturers:
      a. Advanced Building Products, Inc: www.advancedbuildingproducts.com/#sle.
      b. Blok-Lok Limited: www.blok-lok.com/#sle.
      c. CavClear/Archovations, Inc: www.cavclear.com/#sle.
      d. Hohmann & Barnard, Inc: www.h-b.com/#sle.
      e. Mortar Net Solutions: www.mortarnet.com/#sle.
      f. WIRE-BOND: www.wirebond.com/#sle.

H. Cavity Vents:
   1. Type: Preformed aluminum vents with sloping louvers.
   2. Color(s): As indicated on drawings.
   3. Color(s): As selected by K2M Design Inc. from manufacturer's full range.
   4. Manufacturers:
      a. Advanced Building Products, Inc: www.advancedbuildingproducts.com/#sle.
      b. Blok-Lok Limited: www.blok-lok.com/#sle.
      c. CavClear/Archovations, Inc: www.cavclear.com/#sle.
      d. Hohmann & Barnard, Inc: www.h-b.com/#sle.
      e. Mortar Net Solutions: www.mortarnet.com/#sle.
      f. WIRE-BOND: www.wirebond.com/#sle.

I. Termite-Excluding Weep and Vent:
   1. Type: Polytetrafluoroethylene (PTFE) vent body with stainless-steel mesh closure.
   2. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.
   3. Stainless Steel Mesh: ASTM E11 ; opening size 0.018 inch, maximum.
   4. Products:
      a. Polyguard Barrier Systems, Inc, a division of Polyguard Products, Inc; TERM Weep and Vent Barrier: www.polyguardbarriers.com/#sle.

J. Drainage Fabric: Polyester or polypropylene mesh.
   1. Manufacturers:
      a. Advanced Building Products, Inc.; Mortairvent: www.advancedbuildingproducts.com/#sle.
      b. Mortar Net Solutions: www.mortarnet.com/#sle.
      c. York Manufacturing, Inc; Weep Armor Weep Vent Protection: www.yorkmfg.com/#sle.

K. Multicomponent Cavity Wall Drainage System: Combination mortar diverter, flashing and weep system.
   1. Membrane Type: Thermoplastic vinyl.
   2. Drip Edge: Galvanized steel with factory applied, high-performance organic coating.
   3. Drip Edge Color: Selected by K2M Design Inc. from manufacturer's standard custom range.
   4. Termination Bar: Polyvinyl chloride (PVC).
   5. System Unit Length: 5 feet, 6 inches.
   6. Manufacturers:
      a. Mortar Net Solutions: www.mortarnet.com/#sle.

L. Chimney Cap: Precast concrete, sized to cover chimney construction plus additional overhang for drip on four sides, thickness as indicated, sloped from flue opening to edges for natural drainage.

M. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.06 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
   1. Masonry below grade and in contact with earth: Type S.
   2. Exterior, loadbearing masonry: Type N.
   3. Exterior, non-loadbearing masonry: Type N.
   4. Interior, loadbearing masonry: Type N.
   5. Interior, non-loadbearing masonry: Type O.

B. Colored Mortar: Proportion selected pigments and other ingredients to match K2M Design Inc.'s sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

C. New Mortar for Old Brick: Proportioned by volume only; not more than 20 percent of the total volume of Portland cement and lime combined shall be Portland cement.

1. Sand: Match original mortar as closely as possible in color, size, and texture, without use of other additives.
2. Do not use modern additives unless permitted in writing by K2M Design Inc..
3. Repointing Mortar: Use proportions from 1 part lime to 2 parts sand with no Portland cement, up to 2 parts Portland cement to 3 parts lime to 6 parts sand.
4. White Portland Cement: Use for repointing mortar where Portland cement is permitted.
5. Use mortar within 30 minutes after final mixing; do not add more water after the initial mix is prepared.

D. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

E. Admixtures: Add to mixture at manufacturer's recommended rate and in accordance with manufacturer's instructions; mix uniformly.

F. Mixing: Use mechanical batch mixer and comply with referenced standards.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
1. Bond: Running.
2. Coursing: One unit and one mortar joint to equal 8 inches.
3. Mortar Joints: Concave.

3.05 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

D. Remove excess mortar and mortar smears as work progresses.

E. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.

F. Interlock intersections and external corners, except for units laid in stack bond.

G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

H. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

I. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.

J. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.

K. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

L. Lay clay tile flue linings vertically, embedded in concrete block units.
   1. Install in accordance with ASTM C1283.
   2. Extend above chimney cladding 8 inches.

M. Place precast chimney cap atop chimney masonry; mortar into place; seal to protruding flue.

3.06 WEEPS/CAVITY VENTS

A. Install weeps in veneer and cavity walls at 24 inches on center horizontally on top of through-wall flashing above shelf angles and lintels and at bottom of walls.

B. Install cavity vents in veneer and cavity walls at 32 inches on center horizontally below shelf angles and lintels and near top of walls.

3.07 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.

C. Install cavity mortar control panels continuously throughout full height of exterior masonry cavities during construction of exterior wythe, complying with manufacturer's installation instructions.
   1. Verify that airspace width is no more than 3/8 inch greater than panel thickness.
   2. Hold cavity mortar control panel tight to face wythe.
   3. Install horizontally between joint reinforcement.
   4. Stagger end joints in adjacent rows.
   5. Fit to perimeter construction and penetrations without voids.

D. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.08 REINFORCEMENT AND ANCHORAGE - GENERAL, SINGLE WYTHE MASONRY, AND CAVITY WALL MASONRY

A. Unless otherwise indicated on drawings or specified under specific wall type, install horizontal joint reinforcement 16 inches on center.

B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place continuous joint reinforcement in first and second joint below top of walls.

D. Embed longitudinal wires of joint reinforcement in mortar joint with at least 5/8 inch mortar cover on each side.

E. Lap joint reinforcement ends minimum 6 inches.

F. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches on center.

G. Fasten anchors to structural framing and embed in masonry joints as masonry is laid. Unless otherwise indicated on drawings or closer spacing is indicated under specific wall type, space anchors at maximum of 36 inches horizontally and 24 inches vertically.

H. Embed ties and anchors in mortar joint and extend into masonry unit a minimum of 1-1/2 inches with at least 5/8 inch mortar cover to the outside face of the anchor.

3.09 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Masonry Back-Up: Embed anchors to bond veneer at maximum 16 inches on center vertically and 36 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

B. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 16 inches on center vertically and 24 inches on center horizontally. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

C. Stud Back-Up: Secure veneer anchors to stud framed back-up and embed into masonry veneer at maximum 1.77 sq ft of wall surface per anchor. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches on center.

D. Seismic Reinforcement: Connect veneer anchors with continuous horizontal wire reinforcement before embedding anchors in mortar.

3.10 REINFORCEMENT AND ANCHORAGES - MULTIPLE WYTHE UNIT MASONRY

A. Use individual metal ties installed in horizontal joints to bond wythes together. Provide ties spaced as indicated on drawings.

B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

3.11 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.
   1. Extend flashings full width at such interruptions and at least 6 inches, minimum, into adjacent masonry or turn up flashing ends at least 1 inch, minimum, to form watertight pan at non-masonry construction.
   2. Remove or cover protrusions or sharp edges that could puncture flashings.
   3. Seal lapped ends and penetrations of flashing before covering with mortar.

B. Terminate flashing up 8 inches minimum on vertical surface of backing:
   1. Install vertical leg of flashing behind water-resistive barrier sheet over backing.
   2. Install vertical leg of flashing over fluid-applied or self-adhered air/vapor barriers over backing or per manufacturer’s directions.
   3. Terminate vertical leg of flashing into bed joint in masonry or reglet in concrete.
   4. Anchor vertical leg of flashing into backing with a termination bar and sealant.
   5. Apply cap bead of sealant on top edge of self-adhered flashing.

C. Install flashing in accordance with manufacturer's instructions and BIA Technical Notes No. 7.

D. Extend metal flashings to within 1/2 inch of exterior face of masonry and adhere to top of stainless steel angled drip with hemmed edge.

E. Support flexible flashings across gaps and openings.

F. Extend plastic, laminated, EPDM, and all other flashings to within 1/2 inch of exterior face of masonry and adhere to top of stainless steel angled drip with hemmed edge.

G. Lap end joints of flashings at least 6 inches, minimum, and seal watertight with flashing sealant/adhesive.

3.12 GROUTED COMPONENTS

A. Reinforce bond beams, see drawings.

B. Reinforce columns, see drawings.

C. Lap splices minimum 24 bar diameters.

D. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

E. Place and consolidate grout fill without displacing reinforcing.

F. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.13 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

C. Size control joints as indicated on drawings; if not indicated, 3/4 inch wide and deep.

D. Form expansion joint as detailed on drawings.

3.14 BUILT-IN WORK

A. As work progresses, install built-in metal door frames and glazed frames and other items to be built into the work and furnished under other sections.

B. Install built-in items plumb, level, and true to line.

C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout.

1. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.

D. Do not build into masonry construction organic materials that are subject to deterioration.

3.15 TOLERANCES

A. Install masonry within the site tolerances found in TMS 402/602.

B. Maximum Variation from Alignment of Columns: 1/4 inch.

C. Maximum Variation From Unit to Adjacent Unit: 1/16 inch.

D. Maximum Variation from Plane of Wall: 1/4 inch in 10 ft and 1/2 inch in 20 ft or more.

E. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

F. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

G. Maximum Variation of Mortar Joint Thickness: Head joint, minus 1/4 inch, plus 3/8 inch.

H. Maximum Variation from Cross Sectional Thickness of Walls: 1/4 inch.

3.16 CUTTING AND FITTING

A. Cut and fit for chases. Coordinate with other sections of work to provide correct size, shape, and location.

B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.17 PARGING

A. Dampen masonry walls prior to parging.

B. Scarify each parging coat to ensure full bond to subsequent coat.

C. Parge masonry walls in two uniform coats of mortar to a total thickness of 3/4 inch.

D. Steel trowel surface smooth and flat with a maximum surface variation of 1/8 inch per foot.

E. Strike top edge of parging at 45 degrees.

3.18 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

B. Clay Masonry Unit Tests: Test each variety of clay masonry in accordance with ASTM C67/C67M requirements, sampling 5 randomly chosen units for each 50,000 installed.

C. Concrete Masonry Unit Tests: Test each variety of concrete unit masonry in accordance with ASTM C140/C140M for compliance with requirements of this specification.

D. Mortar Tests: Test each type of mortar in accordance with ASTM C780, testing with same frequency as masonry samples.

3.19 CLEANING

A. Remove excess mortar and mortar droppings.

B. Replace defective mortar. Match adjacent work.

C. Clean soiled surfaces with cleaning solution.

D. Use non-metallic tools in cleaning operations.

3.20 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

END OF SECTION 04 2000

SECTION 05 5213
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Balcony railings and guardrails.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Placement of anchors in concrete.

B. Section 04 2000 - Unit Masonry: Placement of anchors in masonry.

C. Section 06 2000 - Finish Carpentry: Wood handrail.

D. Section 09 2116 - Gypsum Board Assemblies: Placement of backing plates in stud wall construction.

E. Section 09 9113 - Exterior Painting: Paint finish.

F. Section 09 9123 - Interior Painting: Paint finish.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2014 (2015 Errata).

B. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.

C. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.

D. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.

E. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

F. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.

G. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2018.

H. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.

J. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2014.

K. ASTM B177/B177M - Standard Guide for Engineering Chromium Electroplating; 2011 (Reapproved 2017).

L. ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2012.

M. ASTM B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold-Finished Bar, Rod, and Wire (Metric); 2012.

N. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube; 2016.

O. ASTM B429/B429M - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube; 2010e1.

P. ASTM B483/B483M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Tubes for General Purpose Applications; 2013, with Editorial Revision (2014).

Q. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2013, with Editorial Revision.

R. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).

S. ASTM E2072 - Standard Specification for Photoluminescent (Phosphorescent) Safety Markings; 2014.

T. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2012.

U. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel; 2017.

V. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 1999 (Ed. 2004).

W. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

X. UL 1994 - Luminous Egress Path Marking Systems; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   2. Include the design engineer's seal and signature on each sheet of shop drawings.

C. Samples: Submit two,8 inch long samples of handrail. Submit two samples of elbow, wall bracket, and end stop.

D. Designer's Qualification Statement.

E. Fabricator's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in Florida, or personnel under direct supervision of such an engineer.

B. Welder Qualifications: Show certification of welders employed on the Work, verifying AWS qualification within the previous 12 months.

C. Fabricator Qualifications:
   1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 201.
   2. A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.
   3. A company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Handrails and Railings:
   1. Alumi-Guard: www.alumi-guard.com/#sle.
   2. C.R. Laurence Company, Inc; CRL Welded Post Railing Systems (WRS): www.crl-arch.com/#sle.
   3. Kee Safety, Inc; Kee Klamp (steel): www.keesafety.com/#sle.
   4. KaneSterling: www.sterlingdula.com/#sle.
   5. Superior Aluminum Products, Inc; Series 500: www.superioraluminum.com/#sle.
   6. The Wagner Companies: www.wagnercompanies.com/#sle.

B. Non-Weld Pipe Fittings:

1. Kee Safety, Inc; Kee Klamp (steel): www.keesafety.com/#sle.

C. Metal Rail Infill:
1. The G-S Company: www.g-sco.com/#sle.
2. The Western Group; Woven Wire: www.architecturalwire.com/#sle.

D. Photoluminescent Handrail Strips:
1. Safe-T-Nose, LLC: www.safetnose.com/#sle.

2.02 RAILINGS - GENERAL REQUIREMENTS

A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.

B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935.

C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E935.

D. Allow for expansion and contraction of members and building movement without damage to connections or members.

E. Dimensions: See drawings for configurations and heights.
1. Top Rails and Wall Rails: 1-1/2 inches diameter, round.
2. Top Rails and Wall Rails: Wood rails, specified in Section 06 2000.
3. Intermediate Rails: 1-1/2 inches diameter, round.
4. Intermediate Rails: 1-1/4 by 1 inch rectangular.
5. Posts: 1-1/2 inches diameter, round.
6. Posts: 1-1/2 inches square.
7. Balusters: 1/2 inch square solid bar.

F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.
1. For anchorage to concrete, provide inserts to be cast into concrete, for bolting anchors.
2. For anchorage to masonry, provide brackets to be embedded in masonry, for bolting anchors.
3. For anchorage to stud walls, provide backing plates, for bolting anchors.
4. Posts: Provide adjustable flanged brackets.

G. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

H. Photoluminescent Handrail Strips: Manufacturer's standard clear anodized aluminum extrusion with embedded photoluminescent strip, complies with UL 1994 and ASTM E2072.
1. Attachment: Provide manufacturer approved field applied adhesive, factory applied adhesive, and mechanical fasteners.

2.03 ALUMINUM MATERIALS

A. Aluminum Pipe: Schedule 40; ASTM B429/B429M, ASTM B241/B241M, or ASTM B483/B483M.

B. Aluminum Tube: Minimum wall thickness of 0.127 inch; ASTM B429/B429M, ASTM B241/B241M, or ASTM B483/B483M.

C. Solid Bars and Flats: ASTM B211 (ASTM B211M).

D. Non-Weld Mechanical Fittings: Slip-on cast aluminum, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.

E. Welding Fittings: No exposed fasteners; cast aluminum.

F. Straight Splice Connectors: Concealed spigot; cast aluminum.

G. Exposed Fasteners: No exposed bolts or screws.

H. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.

2.04 STEEL RAILING SYSTEM

A. Steel Tube: ASTM A500/A500M, Grade B cold-formed structural tubing.

B. Steel Pipe: ASTM A53/A53M, Grade B Schedule 80, black finish.

C. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.

D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.

E. Exposed Fasteners: Flush countersunk screws or bolts; consistent with design of railing.

F. Straight Splice Connectors: Steel concealed spigots.

G. Plastic Handrail Cover: Extruded PVC.
   1. Color(s): As indicated on drawings.
   2. Color(s): As selected by K2M Design Inc. from manufacturer's standard range.

H. Galvanizing: In accordance with requirements of ASTM A123/A123M.
   1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.

I. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

J. Chrome Plating: ASTM B177/B177M, nickel-chromium alloy, satin finish.

2.05 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

D. Welded Joints:
   1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
   2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
   3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Install continuous plastic handrail cover. Heat weld joints and trim smooth.

2.06 ALUMINUM FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils thick.

B. Class II Natural Anodized Finish: AAMA 611 AA-M12C22A31 Clear anodic coating not less than 0.4 mils thick.

C. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick.

D. Class I Color Anodized Finish: AAMA 611 AA-M12C22A44 Electrolytically deposited colored anodic coating not less than 0.7 mils thick.

E. Class II Color Anodized Finish: AAMA 611 AA-M12C22A32 Integrally colored anodic coating not less than 0.4 mils thick.

F. Class II Color Anodized Finish: AAMA 611 AA-M12C22A34 Electrolytically deposited colored anodic coating not less than 0.4 mils thick.

G. Pigmented Organic Coating System: AAMA 2603 polyester or acrylic baked enamel finish.

H. High Performance Organic Coating System: AAMA 2604 multiple coat, thermally cured fluoropolymer system.

I. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system.

J. Color: To be selected by K2M Design Inc. from manufacturer's standard line.

K. Color: As indicated on drawings.

L. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

C. Apply one coat of bituminous paint to concealed aluminum surfaces that will be in contact with cementitious or dissimilar materials.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

C. Install railings in compliance with ADA Standards for accessible design at applicable locations.

D. Anchor railings securely to structure.

E. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.

F. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION 05 5213

SECTION 05 5305
GRATINGS AND FLOOR PLATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flat surface floor plating.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. O'Neal ; www.onealsteel.com

B. Eagle National Steel ; www.eaglesteel.com.

C. Alro ; www.alro.com.

D. Or approved equal.

2.02 MATERIALS

A. Steel Floor Plate: ASTM A786/A786M; manufacturer's standard pattern.

2.03 FABRICATION

A. Top Surface: Non-slip.

2.04 FINISHES

A. Factory finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated on drawings.

3.02 INSTALLATION

A. Install components in accordance with manufacturer's instructions.

3.03 TOLERANCES

A. Maximum Space Between Adjacent Sections: 1/4 inch.

B. Maximum Variation From Top Surface Plane of Adjacent Sections: 1/4 inch

END OF SECTION 05 5305

SECTION 06 0573
WOOD TREATMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Site applied termiticide for wood materials.

B. Site applied termiticide for other building materials.

C. Site applied mildewcide for wood materials.

D. Site applied preservative treatment for wood materials.

E. Site applied fire-retardant treatment for wood materials.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete.

B. Section 06 1000 - Rough Carpentry: Factory treatment for wood products.

C. Section 06 1753 - Shop-Fabricated Wood Trusses: Factory treatment for wood products.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.

C. Warranty: Submit manufacturer warranty and ensure that forms have been completed in City of Key West's name and registered with manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Site Applied Termiticide and Mildewcide: Correct defective Work within a twenty-five year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 SITE-APPLIED WOOD TREATMENT

A. Site Applied Termiticide for Wood: Borate mineral salt based, spray applied, penetrating termiticide.

B. Site Applied Termiticide and Mildewcide: Borate mineral salt based, spray applied termiticide, mildewcide and mold growth preventative.

C. Site Applied Termiticide for Wood, Steel and Concrete: Borate mineral salt based, spray applied termiticide formulated for use on wood, steel, concrete and other building materials.
   1. Active Ingredient: 40% minimum disodium octaborate tetrahydrate (DOT).
   2. Carrier and Penetrant: Proprietary glycol solution.

D. Site Applied Mold Cleaner: Non-bleaching, oxidizer based formula with high-pH tolerant surfactant. Contains no sodium hydroxide or sodium hypochlorite.

PART 3 EXECUTION

3.01 PREPARATION

A. Remove dust, dirt and other contaminants from treatment surfaces. Remove tarpaulins, dropcloths, strippable protective films, etc., from areas to be treated Move equipment and stored materials that block or prevent product application.

3.02 INSTALLATION - GENERAL

A. Provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 SITE APPLIED WOOD TREATMENT

A. Comply with manufacturers written mixing and installation instructions.

B. Termiticide: Apply to foundations, structure and other items as listed.
   1. All structural wood and sill plates within 24 inches, minimum, of point of contact with foundation.
   2. All wood, wood based and cellulosic sheathing within 24 inches, minimum, of point of contact with foundation.
   3. Concrete foundations 2 inches, minimum, from sill plate.
   4. Open bath traps and concrete slab within 12 inches, minimum, of bath trap.
   5. All pipe and plumbing penetrations up to 24 inches, minimum, above slab and slab surface within 6 inches, minimum, of pipe or penetration.
   6. Concrete or masonry crawlspace walls up to 24 inches, minimum, from top of soil.
   7. Concrete or masonry basement walls up to 24 inches, minimum, from top of soil.
   8. Six inches, minimum, on either side of control joints and construction joints in slabs and joints between slabs and abutting material.

C. Mildewcide: Apply to wood and wood based building materials as listed.
   1. All structural wood and sill plates within 24 inches, minimum, of point of contact with foundation.
   2. All wood, wood based and cellulosic sheathing within 24 inches, minimum, of point of contact with foundation.

END OF SECTION 06 0573

SECTION 06 1000
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural dimension lumber framing.
B. Non-structural dimension lumber framing.
C. Rough opening framing for doors, windows, and roof openings.
D. Sheathing.
E. Roof-mounted curbs.
F. Roofing nailers.
G. Roofing cant strips.
H. Preservative treated wood materials.
I. Fire retardant treated wood materials.
J. Miscellaneous framing and sheathing.
K. Communications and electrical room mounting boards.
L. Concealed wood blocking, nailers, and supports.
M. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
B. Section 03 3000 - Cast-in-Place Concrete: Setting anchors in concrete.
C. Section 06 1323 - Heavy Timber Framing.
D. Section 06 1753 - Shop-Fabricated Wood Trusses.
E. Section 07 2500 - Weather Barriers: Water-resistive barrier over sheathing.
F. Section 07 6200 - Sheet Metal Flashing and Trim: Sill flashings.
G. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

A. ANSI A208.1 - American National Standard for Particleboard; 2009.
B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
C. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2017).
D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.
E. AWPA U1 - Use Category System: User Specification for Treated Wood; 2017.
F. ICC-ES AC380 - Acceptance Criteria for Termite Physical Barrier Systems; 2014, with Editorial Revision (2017).
G. PS 1 - Structural Plywood; 2009.
H. PS 2 - Performance Standard for Wood-Based Structural-Use Panels; 2010.
I. PS 20 - American Softwood Lumber Standard; 2015.
J. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17; 2015.
K. WWPA G-5 - Western Lumber Grading Rules; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.

C. Structural Composite Lumber: Submit manufacturer's published structural data including span tables, marked to indicate which sizes and grades are being used; if structural composite lumber is being substituted for dimension lumber or timbers, submit grading agency structural tables marked for comparison.

D. Samples: For rough carpentry members that will be exposed to view, submit two samples, 12 by12 inch in size illustrating wood grain, color, and general appearance.

E. ABAA Field Quality Control Submittals: Submit third-party reports of testing and inspection required by ABAA QAP.

F. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

G. ABAA Manufacturer Qualification: Submit documentation of current evaluation of proposed manufacturer and materials.

H. ABAA Installer Qualification: Submit documentation of current contractor accreditation and current installer certification. Keep copies of all contractor accreditation and installer certification on site during and after installation. Present on-site documentation upon request.

I. Warranty: Submit manufacturer warranty and ensure that forms have been completed in City of Key West's name and registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Air Barrier Association of America (ABAA) Quality Assurance Program (QAP); www.airbarrier.org/#sle:
   1. Installer Qualification: Use accredited contractor, certified installers, evaluated materials, and third-party field quality control audit.
   2. Manufacturer Qualification: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

B. Air Barrier Association of America (ABAA) Evaluated Materials Program (EAP); www.airbarrier.org/#sle: Use evaluated materials from a single manufacturer regularly engaged in air barrier material manufacture. Use secondary materials approved in writing by primary material manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a one year period after Date of Substantial Completion.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Southern Pine, unless otherwise indicated.
   2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service

for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

4. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

B. Lumber fabricated from old growth timber is not permitted.

C. Provide sustainably harvested wood; see Section 01 6000 - Product Requirements for requirements.

D. Provide wood harvested within a 500 mile radius of the project site.

E. Lumber salvaged from deconstruction or demolition of existing buildings or structures is permitted in lieu of sustainably harvested lumber provided it is clean, denailed, and free of paint and finish materials, and other contamination; identify source.

1. Where salvaged lumber is used for structural applications, provide lumber re-graded by an inspection service accredited by the American Lumber Standard Committee, Inc; www.alsc.org.

F. Lumber fabricated from recovered timber (abandoned in transit) is permitted in lieu of sustainably harvested lumber, unless otherwise noted, provided it meets the specified requirements for new lumber and is free of contamination; identify source.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).

B. Grading Agency: Redwood Inspection Service; RIS (GR).

C. Grading Agency: West Coast Lumber Inspection Bureau; WCLIB (GR).

D. Grading Agency: Western Wood Products Association; WWPA G-5.

E. Sizes: Nominal sizes as indicated on drawings, S4S.

F. Moisture Content: S-dry or MC19.

G. Stud Framing (2 by 2 through 2 by 6):

1. Species: Any allowed under referenced grading rules.
2. Species: Southern Pine.
3. Grade: No. 2.

H. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):

1. Machine stress-rated (MSR) as follows:
   a. Fb-single (minimum extreme fiber stress in bending): 1350 psi.
   b. E (minimum modulus of elasticity): 1,300,000 psi.
2. Species: Any allowed under grading rules.
3. Species: Southern Pine.
4. Grade: No. 1 & Btr.
5. Species and Grades: As indicated on drawings for various locations.

I. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:

1. Lumber: S4S, No. 2 or Standard Grade.
2. Boards: Standard or No. 3.

2.03 EXPOSED DIMENSION LUMBER

A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.

B. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).

C. Grading Agency: Redwood Inspection Service; RIS (GR).

D. Grading Agency: West Coast Lumber Inspection Bureau; WCLIB (GR).

E. Grading Agency: Western Wood Products Association; WWPA G-5.

F. Sizes: Nominal sizes as indicated on drawings.

G. Surfacing: S4S.

H. Moisture Content: S-dry or MC19.

I. Stud Framing (2 by 2 through 2 by 6):
   1. Species: Western Cedar.
   2. Grade: Clear.

J. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16):
   1. Species: Redwood.
   2. Grade: Select Heart.
   3. Species and Grades: As indicated on drawings for various locations.

2.04 TIMBERS FOR CONCEALED APPLICATIONS

A. Grading Agency: Southern Pine Inspection Bureau, Inc; SPIB (GR).

B. Grading Agency: West Coast Lumber Inspection Bureau; WCLIB (GR).

C. Grading Agency: Western Wood Products Association; WWPA G-5.

D. Sizes: Nominal sizes as indicated on drawings, S4S.

E. Moisture Content: S-dry (23 percent maximum).

F. Beams and Posts 5 inches and over in thickness:
   1. Species: Any allowed under referenced grading rules.
   2. Species: Douglas Fir-Larch.
   3. Species and Grade: Any that comply with the following design values in accordance with applicable building code:
      a. Fb-single (minimum extreme fiber stress in bending): 1200 psi.
      b. E (minimum modulus of elasticity): 1,500,000 psi.

2.05 EXPOSED TIMBERS

A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.

B. Moisture Content: Kiln-dry (20 percent maximum).

C. Surfacing: S4S.

D. Species: Redwood.

E. Grade: Clear Heart Structural.

2.06 STRUCTURAL COMPOSITE LUMBER

A. At Contractor's option, structural composite lumber may be substituted for concealed dimension lumber and timbers.

B. Structural Composite Lumber: Factory fabricated beams, headers, and columns, of sizes and types indicated on drawings; structural capacity as published by manufacturer.
   1. Columns: Use laminated veneer lumber, laminated strand lumber, or parallel strand lumber with manufacturer's published E (modulus of elasticity): 1,800,000 psi, minimum.
   2. Beams: Use laminated veneer lumber, laminated strand lumber, or parallel strand lumber with manufacturer's published E (modulus of elasticity): 1,800,000 psi, minimum.
   3. Headers Not Longer Than 48 inches: Use laminated veneer lumber, laminated strand lumber, or parallel strand lumber.
   4. Manufacturers:
      a. Boise Cascade Company: www.bc.com/#sle.
      b. Weyerhaeuser Company: www.weyerhaeuser.com/#sle.

2.07 EXPOSED BOARDS

A. Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.

B. Moisture Content: Kiln-dry (15 percent maximum).

C. Surfacing: S4S.

D. Species: Southern Pine.

E. Grade: No. 2, 2 Common, or Construction.

2.08 CONSTRUCTION PANELS

A. Subfloor/Underlayment Combination: Any PS 2 type, rated Single Floor.
   1. Bond Classification: Exterior.
   2. Span Rating: 48.
   3. Performance Category: 1-1/8 PERF CAT.
   4. Edges: Tongue and groove.

B. Subfloor/Underlayment Combination: Oriented strand board wood structural panel; PS 2, rated Single Floor.
   1. Bond Classification: Exterior.
   2. Performance Category: 19/32 PERF CAT.
   3. Span Rating: 20.
   4. Edges: Square.
   5. Edges: Tongue and groove.
   6. Surface Finish: Fully sanded face.
   7. Exposure Time: Sheathing will not delaminate or require sanding due to moisture absorption from exposure to weather for up to 200 days.
   8. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches, 19.2 inches and 24 inches on center, respectively.
   9. Warranty: Manufacturer's standard lifetime limited warranty against manufacturing defects and that panels will not delaminate or require sanding due to moisture absorption damage from exposure to weather for up to the stated period.
   10. Manufacturers:
      a. Georgia-Pacific LLC; DryGuard Enhanced OSB Sub-Floor: www.buildgp.com/#sle.
      b. Huber Engineered Woods, LLC; AdvanTech Flooring with AdvanTech Subfloor Adhesive: www.huberwood.com/#sle.
      c. Weyerhaeuser Company: www.weyerhaeuser.com/#sle.

C. Subflooring: Any PS 2 type, rated Sheathing.
   1. Bond Classification: Exterior.
   2. Span Rating: 48.
   3. Performance Category: 3/4 PERF CAT.

D. Subflooring: Particleboard, ANSI A208.1, Grade M-2 EXTERIOR GLUE waferboard; 3/4 inch thick, square edge.

E. Subflooring: Magnesium oxide board.
   1. Classification: PS 2, Exposure 1.
   2. Panel Thickness: 3/4 inch, nominal.
   3. Span: 24 inches, maximum.
   4. Fire Resistance: ASTM E84, Class A1; zero flame spread and zero smoke developed.
   5. Mold and Mildew Resistance: Zero growth when tested according to ASTM G21.
   6. Manufacturers:
      a. Extremegreen Building Products, LLC; Extremegreen® Sub-Flooring: www.extremegreenbp.com/#sle.

F. Underlayment: APA Underlayment; plywood, Exposure 2, 1/2 inch thick. Fully sanded faces at resilient flooring.

G. Underlayment: Particleboard, ANSI A208.1, Grade PBU.

H. Roof Sheathing: Any PS 2 type, rated Structural I Sheathing.
   1. Bond Classification: Exterior.
   2. Span Rating: 60.
   3. Performance Category: 3/4 PERF CAT.

I. Roof Sheathing: Particleboard, ANSI A208.1, Grade M-3 EXTERIOR GLUE; square edges, with panel clips.

J. Roof Sheathing: Oriented strand board wood structural panel; PS 2.
   1. Grade: Structural 1 Sheathing.
   2. Bond Classification: Exposure 1.
   3. Performance Category: 5/8 PERF CAT.
   4. Span Rating: 40/20.
   5. Edges: Square.
   6. Exposure Time: Sheathing will not delaminate or require sanding due to moisture absorption from exposure to weather for up to 500 days.
   7. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center, respectively.
   8. Warranty: Manufacturer's standard lifetime limited warranty against manufacturing defects and that panels will not delaminate or require sanding due to moisture absorption damage from exposure to weather for up to the stated period.
   9. Manufacturers:
      a. Huber Engineered Woods, LLC; AdvanTech Sheathing: www.huberwood.com/#sle.

K. Roof Sheathing: Oriented strand board wood structural panel; PS 2, with factory-applied fire-retardant treatment and fire-resistant cementitious facer.
   1. Grade: Structural 1 Sheathing.
   2. Bond Classification: Exposure 1.
   3. Performance Category: 5/8 PERF CAT.
   4. Span Rating: 40/20.
   5. Edges: Square.
   6. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center, respectively.
   7. Manufacturers:
      a. Louisiana-Pacific Corporation; FlameBlock: www.lpcorp.com/#sle.

L. Roof Sheathing: Wood construction panel laminated to insulation board.
   1. Construction Panel: 7/16 inch (11 mm) oriented strand board (OSB).
   2. Insulation Board: Polyisocyanurate foam plastic with cellulosic felt facer or glass fiber mat facer on major surface opposite construction panel.
   3. Finished Panel: Comply with ASTM C1289, Type V.
   4. Manufacturers:
      a. Hunter Panels: www.hunterpanels.com/#sle.

M. Roof Sheathing, Vented: Wood construction panel and 1 inch solid wood spacers attached to insulation board.
   1. Construction Panel: 7/16 inch (11 mm) oriented strand board (OSB).
   2. Insulation Board: Rigid polyisocyanurate (ISO) insulation board, ASTM C1289, Type II, Class 1 - Faced with glass fiber reinforced cellulosic felt facers on both major surfaces of the core foam.
   3. Manufacturers:
      a. Hunter Panels: www.hunterpanels.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

N. Wall Sheathing: Any PS 2 type.
   1. Bond Classification: Exterior.
   2. Grade: Structural I Sheathing.
   3. Span Rating: 24.
   4. Performance Category: 5/16 PERF CAT.
   5. Edge Profile: Square edge.

O. Wall Sheathing: Plywood, PS 1, Grade C-D, Exposure I.

P. Wall Sheathing: Particleboard, ANSI A208.1, Grade M-3 EXTERIOR GLUE.

Q. Wall Sheathing: Fiberboard, ASTM C208, Type IV, Grade 1 regular, square edges.

R. Wall Sheathing: See Section 09 2116.

S. Wall Sheathing: Gypsum, complying with requirements of ASTM C1396/C1396M for gypsum sheathing, V-shaped long edges, 5/8 inch Type X fire resistant.

T. Wall Sheathing: Glass mat faced gypsum, ASTM C1177/C1177M, 5/8 inch Type X fire resistant.
   1. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly.
   2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
   3. Edges: Square.
   4. Manufacturers:
      a. CertainTeed Corporation; GlasRoc Brand: www.certainteed.com/#sle.
      b. Georgia-Pacific Gypsum; DensGlass Sheathing: www.gpgypsum.com/#sle.

U. Wall Sheathing: Glass mat faced gypsum with integral water-resistive and air barrier, ASTM C1177/C1177M, 5/8 inch thick.
   1. Edges: Square.
   2. Water Vapor Permeance: 1 perm, minimum, when tested in accordance with ASTM E96/E96M.
   3. Air Permeance, Sheathing: 0.001 cfm per square foot, maximum, when tested in accordance with ASTM E2178.
   4. Air Permeance, Assembly: 0.04 cfm per square foot, maximum, when tested in accordance with ASTM E2357.
   5. Fluid-Applied Flashing: Approved by sheathing manufacturer.
   6. Warranty:
      a. Exposure: Manufacturer's standard; 12 months, against exposure damage, and dated from installation of product.
      b. Defect: Manufacturer's standard; 5 years, against manufacturing defects, and dated from purchase of product.
      c. Material: Manufacturer's standard; 5 years, dated from Date of Substantial Completion.
      d. Effective Drainage Warranty: 12 years, dated from installation of product, when sheathing is used as substrate under approved, water-managed exterior insulation finish system (EIFS).
   7. Manufacturers:
      a. Georgia-Pacific LLC; DensElement Barrier System: www.DensElement.com/#sle.
      b. Tremco Commercial Sealants & Waterproofing; Securock ExoAir 430 Panel: www.tremcosealants.com/#sle.
      c. Substitutions: See Section 01 6000 - Product Requirements.

V. Wall Sheathing: Oriented strand board wood structural panel; PS 2.
   1. Grade: Structural 1 Sheathing.
   2. Bond Classification: Exposure 1.
   3. Performance Category: 5/8 PERF CAT.
   4. Span Rating: 40/20.
   5. Edges: Square.
   6. Exposure Time: Sheathing will not delaminate or require sanding due to moisture absorption from exposure to weather for up to 500 days.
   7. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center, respectively.
   8. Warranty: Manufacturer's standard lifetime limited warranty against manufacturing defects and that panels will not delaminate or require sanding due to moisture absorption damage from exposure to weather for up to the stated period.
   9. Manufacturers:
      a. Huber Engineered Woods, LLC; AdvanTech Sheathing: www.huberwood.com/#sle.

W. Wall Sheathing: Oriented strand board structural wood panel with factory laminated water-resistive and air barrier layer.

1. Sheathing Panel: PS 2, Exposure 1.
    a. Size: 4 feet wide by 8 feet long.
    b. Grade: Sheathing.
    c. Performance Category: 7/16 PERF CAT.
    d. Span Rating: 24/16.
    e. Edge Profile: Square edge.
2. Integral Water-Resistive and Air Barrier: Sheet material qualifying as a Grade D water resistive barrier; complying with ICC-ES AC310.
3. Water Vapor Permeance of Water Resistive and Air Barrier: 12 to 16 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure B.
4. Maximum Allowable Air Leakage of Assembly, complying with ASTM E2357:
    a. Infiltration: 0.0072 cfm per square foot, maximum, at a pressure differential of 1.57 pounds per square foot.
    b. Exfiltration: 0.0023 cfm per square foot, maximum, at a pressure differential of 1.57 pounds per square foot.
5. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center, respectively.
6. Seam Tape: Manufacturer's standard pressure-sensitive, self-adhering, cold-applied, seam tape.
7. Warranty: Manufacturer's standard 30 year limited system warranty of:
    a. Performance: Panel and tape resistance to water penetration; tape adhesion.
    b. Material: Free from manufacturing defects and panel delamination.
8. Warranty: Manufacturer's standard, limited system warranty for:
    a. Residential Projects: Lifetime of the structure, limited to original owner.
    b. Commercial Projects: Two year; transferable.
9. Manufacturers:
    a. Georgia-Pacific LLC; ForceField® Air and Water Barrier System: www.buildgp.com/#sle.
    b. Huber Engineered Woods, LLC; ZIP System Roof/Wall Sheathing and ZIP System Seam Tape: www.huberwood.com/#sle.

X. Wall Sheathing: Oriented strand board wood structural panel; PS 2, with factory-applied fire-retardant treatment and fire-resistant cementitious facer.
1. Grade: Structural 1 Sheathing.
2. Bond Classification: Exposure 1.
3. Performance Category: 5/8 PERF CAT.
4. Span Rating: 40/20.
5. Edges: Square.
6. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center, respectively.
7. Manufacturers:
    a. Louisiana-Pacific Corporation; FlameBlock: www.lpcorp.com/#sle.
    b. Substitutions: See Section 01 6000 - Product Requirements.

Y. Wall Sheathing: Wood construction panel laminated to insulation board.
1. Construction Panel: 7/16 inch (11 mm) oriented strand board (OSB).
2. Insulation Board: Polyisocyanurate foam plastic with cellulosic felt facer or glass fiber mat facer on major surface opposite construction panel.
3. Finished Panel: Comply with ASTM C1289, Type V.
4. Manufacturers:
    a. Carlisle Coatings & Waterproofing, Inc; R2+ Base: www.carlisleccw.com/#sle.
    b. Hunter Panels; Xci Ply: www.hunterpanels.com/#sle.

Z. Wall Sheathing: High pressure laminated cellulose fiber construction panel laminated to insulation board.

1. Construction Panel with Insulation Board: Laminated cellulose fiberboard and polyisocyanurate foam plastic with coated, laminated paper facer on major surface opposite fiberboard.
2. Panel Thickness: 1 inch.
3. Manufacturers:
   a. Ox Engineered Products; Structural Insulated Sheathing (Styrofoam SIS): www.oxengineeredproducts.com/#sle.

AA. Wall Sheathing: Oriented strand board structural wood panel with factory laminated rigid plastic insulation board, and water-resistive and air barrier layer.
1. Sheathing Panel: PS 2, Exposure 1.
2. Insulation Board: Polyisocyanurate (ISO) insulation board; comply with ASTM C1289, Type II, Class 2 - Faced with coated polymer-bonded glass fiber mat facers on both major surfaces of the core foam.
3. Integral Water-Resistive and Air Barrier: Sheet material qualifying as a Grade D water resistive barrier; complying with ICC-ES AC310.
4. Water Vapor Permeance of Water Resistive and Air Barrier: 12 to 16 perms, minimum, when tested in accordance with ASTM E96/E96M Procedure B.
5. Maximum Allowable Air Leakage of Assembly, complying with ASTM E2357: 0.04 cubic foot per minute per square foot at a pressure differential of 1.57 pounds per square foot.
6. Provide fastening guide on top panel surface with separate markings indicating fastener spacing for 16 inches and 24 inches on center, respectively.
7. Edge Profile: Square.
8. Seam Tape: Manufacturer's standard pressure-sensitive, self-adhering, cold-applied, seam tape.
9. Warranty: Manufacturer's standard 30 year limited system warranty of:
   a. Performance: Panel and tape resistance to water penetration; tape adhesion.
   b. Material: Free from manufacturing defects and panel delamination.
10. Manufacturers:
   a. Huber Engineered Woods, LLC; ZIP System R-Sheathing: www.huberwood.com/#sle.

AB. Wall Sheathing: Extruded Polystyrene (XPS) board insulation, ASTM C578.
1. Board Size: 48 by 96 inch.
2. Board Thickness: 3/4 inch.
3. Board Edges: Tongue-and-groove.
4. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.0 (0.88) per 1 inch at 75 degrees F mean temperature using ASTM C177 test method.
5. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
6. Type and Board Density: Type IV, 1.45 pcf (23 kg/cu m), minimum.
7. Type and Water Absorption: Type IV, 0.3 percent by volume, maximum, by total immersion.

AC. Wall Sheathing: Polyisocyanurate (ISO) thermal board insulation with Classification indicated, in compliance with ASTM C1289.
1. Thickness: 3/4 inch minimum thickness.
2. Classifications:
   a. Type I: Faced with aluminum foil on both major surfaces of core foam.
      1) Class 1 - Non-reinforced core foam.
      2) Compressive Strength: 16 psi, minimum.
      3) Thermal Resistance, R-value: At 1-1/2 inch thick; 9.0 at 75 degrees F.
   b. Type II:
      1) Class 1 - Faced with glass fiber reinforced cellulistic felt facers on both major surfaces of core foam.
      2) Compressive Strength: Classes 1-2-3, Grade 1 - 16 psi (110 kPa), minimum.
      3) Thermal Resistance, R-value: At 1 inch thick; Class 1, Grades 1-2-3 - 5.6 (0.97) at 75 degrees F.

4) Thermal Resistance, R-value: At 1-1/2 inch thick; Class 1, Grades 1-2-3 - 8.4 (1.48) at 75 degrees F.
5) Thermal Resistance, R-value: At 2 inch thick; Class 1, Grades 1-2-3 - 11.2 (1.97) at 75 degrees F.

c. Type III: Faced with perlite insulation board on one major surface of core foam and glass fiber reinforced cellulosic felt or uncoated or coated polymer-bonded glass fiber mat facer on other major surface of core foam.
1) Compressive Strength: 16 psi, minimum.
2) Thermal Resistance, R-value: At 1-1/2 inch thick; 7.0 at 75 degrees F.

d. Type IV: Faced with cellulosic fiber insulating board on one major surface of core foam and glass fiber reinforced cellulosic felt or uncoated or coated polymer-bonded glass fiber mat facer on other major surface of core foam.
1) Compressive Strength: 16 psi, minimum.
2) Thermal Resistance, R-value: At 1-1/2 inch thick; 6.9 at 75 degrees F.

e. Type V: Faced with oriented strand board (OSB) or plywood on one major surface of core foam and glass fiber reinforced cellulosic felt or uncoated or coated polymer-bonded glass fiber mat facer on other major surface of core foam.
1) Compressive Strength: 16 psi, minimum.
2) Thermal Resistance, R-value: At 1-1/2 inch thick; 6.2 at 75 degrees F.

f. Type VII: Faced with glass mat faced gypsum board on one major surface of core foam and glass fiber reinforced cellulosic felt or uncoated or coated polymer-bonded glass fiber mat facer on other major surface of core foam.
1) Compressive Strength: 16 psi, minimum.
2) Thermal Resistance, R-value: At 1-1/2 inch thick; 7.0 at 75 degrees F.

3. Manufacturers:
a. Hunter Panels: www.hunterpanels.com/#sle.

AD. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

AE. Other Applications:
1. Plywood Concealed From View But Located Within Exterior Enclosure: PS 1, C-C Plugged or better, Exterior grade.
2. Plywood Exposed to View But Not Exposed to Weather: PS 1, A-D, or better.
3. Other Locations: PS 1, C-D Plugged or better.

2.09 ACCESSORIES

A. Fasteners and Anchors:
1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
2. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
3. Anchors: Toggle bolt type for anchorage to hollow masonry.

B. Die-Stamped Connectors: Hot dipped galvanized steel, sized to suit framing conditions.
1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.

C. Joist Hangers: Hot dipped galvanized steel, sized to suit framing conditions.
1. For contact with preservative treated wood in exposed locations, provide minimum G185 galvanizing complying with ASTM A653/A653M.

D. Sill Gasket on Top of Foundation Wall: 1/4 inch thick, plate width, closed cell plastic foam from continuous rolls.

E. Termite-Resistant Sill Plate Barrier: Self-adhesive, film-backed barrier with release sheet; adheres to concrete substrates and blocks termite access.
1. Thickness: 68 mils (0.068 inch).

2. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.
3. Water Vapor Permeance: 0.035 perm, maximum, when tested in accordance with ASTM E96/E96M.
4. Manufacturers:
   a. Polyguard Barrier Systems, Inc, a division of Polyguard Products, Inc; TERM Sill Plate Barrier: www.polyguardbarriers.com/#sle.

F. Termite-Resistant Sill Flashing: Self-adhesive membrane; polyethylene film bonded to sealant.
1. Thickness: 40 mils (0.040 inch).
2. Termite Resistance: 100 percent when tested in accordance with ICC-ES AC380.
3. Water Vapor Permeance: 0.035 perm, maximum, when tested in accordance with ASTM E96/E96M.
4. Manufacturers:
   a. Polyguard Barrier Systems, Inc, a division of Polyguard Products, Inc; TERM Flashing Barrier: www.polyguardbarriers.com/#sle.

G. Sill Flashing: As specified in Section 07 6200.

H. Subfloor Adhesives: Waterproof, air cure type, cartridge dispensed.
1. Manufacturers:
   a. Franklin International, Inc; Titebond PROvantage Weatherproof Subfloor Adhesive: www.titebond.com/#sle.
   b. Huber Engineered Woods, LLC; AdvanTech Subfloor Adhesive: www.huberwood.com/#sle.
   c. Liquid Nails, a brand of PPG Architectural Coatings; LN-902 Subfloor and Deck Construction Adhesive, 10 oz: www.liquidnails.com/#sle.

I. Construction Adhesives:
1. Manufacturers:
   a. Franklin International, Inc; Titebond Fast Set Polyurethane Construction Adhesive: www.titebond.com/#sle.

J. Water-Resistive Barrier: As specified in Section 07 2500.

2.10 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:
1. Manufacturers:
   a. Lonza Group: www.wolmanizedwood.com/#sle.
   b. Hoover Treated Wood Products, Inc: www.frtw.com/#sle.
   c. Koppers, Inc: www.koppersperformancechemicals.com/#sle.
   d. Viance, LLC; D-Blaze: www.treatedwood.com/#sle.
2. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
   a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
   b. Treat all exterior rough carpentry items.

c. Treat exposed exterior rough carpentry items, including stairways, balconies, and covered walkways
d. Do not use treated wood in direct contact with the ground.

3. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.
   a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
   b. All interior rough carpentry items are to be fire retardant treated.
   c. Treat rough carpentry items as indicated .
   d. Do not use treated wood in applications exposed to weather or where the wood may become wet.

C. Preservative Treatment:
1. Manufacturers:
   a. Lonza Group: www.wolmanizedwood.com/#sle.
   b. Koppers Performance Chemicals, Inc: www.koppersperformancechemicals.com/#sle.
   c. Viance, LLC; Preserve ACQ: www.treatedwood.com/#sle.
2. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative.
   a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
   b. Treat lumber exposed to weather.
   c. Treat lumber in contact with roofing, flashing, or waterproofing.
   d. Treat lumber in contact with masonry or concrete.
   e. Treat lumber less than 18 inches above grade.
   f. Treat lumber in other locations as indicated.
3. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative.
   a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
   b. Treat plywood in contact with roofing, flashing, or waterproofing.
   c. Treat plywood in contact with masonry or concrete.
   d. Treat plywood less than 18 inches above grade.
   e. Treat plywood in other locations as indicated.
4. Preservative Pressure Treatment of Lumber in Contact with Soil: AWPA U1, Use Category UC4A, Commodity Specification A using waterborne preservative.
   a. Preservative for Field Application to Cut Surfaces: As recommended by manufacturer of factory treatment chemicals for brush-application in the field.

PART 3 EXECUTION

3.01 PREPARATION

A. Install sill gasket under sill plate of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.

B. Coordinate installation of rough carpentry members specified in other sections.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 FRAMING INSTALLATION

A. Set structural members level, plumb, and true to line. Discard pieces with defects that would lower required strength or result in unacceptable appearance of exposed members.

B. Make provisions for temporary construction loads, and provide temporary bracing sufficient to maintain structure in true alignment and safe condition until completion of erection and installation of permanent bracing.

C. Install structural members full length without splices unless otherwise specifically detailed.

D. Comply with member sizes, spacing, and configurations indicated, and fastener size and spacing indicated, but not less than required by applicable codes and AWC (WFCM) Wood Frame Construction Manual.

E. Install horizontal spanning members with crown edge up and not less than 1-1/2 inches of bearing at each end.

F. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists; use metal joist hangers unless otherwise detailed.

G. Provide bridging at joists in excess of 8 feet span as detailed. Fit solid blocking at ends of members.

H. Frame wall openings with two or more studs at each jamb; support headers on cripple studs.

I. Advanced framing techniques for LEED v4 for Homes Credit:
   1. In exterior walls and common walls:
      a. Install no more than one horizontal 2x top plate on walls by aligning studs with joists and roof rafters.
      b. Place window and door headers in the rim joist.
      c. Install raised (directly beneath the top plate), single-ply headers not more than 2 inches nominal thickness in a 2x4 wall or 4 inches nominal thickness in a 2x6 wall, in accordance with International Residential Code 2012.
      d. Install structural insulated panels (SIPs) for walls.
   2. For interior and exterior walls:
      a. Size headers for actual loads.
      b. Use ladder blocking or drywall clips.
      c. Use two-stud corners or California corners.
   3. Space interior wall studs greater than 16 inches o.c..
   4. Space floor joists greater than 16 inches o.c. or SIPs.
   5. Space roof rafters greater than 16 inches o.c. or SIPs.

3.04 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

F. Provide the following specific non-structural framing and blocking:
   1. Cabinets and shelf supports.
   2. Wall brackets.

3. Handrails.
4. Grab bars.
5. Towel and bath accessories.
6. Wall-mounted door stops.
7. Chalkboards and marker boards.
8. Wall paneling and trim.
9. Joints of rigid wall coverings that occur between studs.

3.05 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

B. Provide wood curb at all roof openings except where specifically indicated otherwise. Form corners by alternating lapping side members.

3.06 INSTALLATION OF CONSTRUCTION PANELS

A. Subflooring/Underlayment Combination: Glue and nail to framing; staples are not permitted.

B. Subflooring: Glue and nail to framing; staples are not permitted.

C. Underlayment: Secure to subflooring with nails and glue.
1. At locations where resilient flooring will be installed, fill and sand splits, gaps, and rough areas.
2. Place building paper between floor underlayment and subflooring.

D. Roof Sheathing: Secure panels with long dimension perpendicular to framing members, with ends staggered and over firm bearing.
1. At long edges use sheathing clips where joints occur between roof framing members.
2. At long edges provide solid edge blocking where joints occur between roof framing members.
3. Nail panels to framing; staples are not permitted.

E. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using nails, screws, or staples.
1. Use plywood or other acceptable structural panels at building corners, for not less than 96 inches, measured horizontally.
2. Provide inlet diagonal bracing at corners.
3. Place water-resistive barrier horizontally over wall sheathing, weather lapping edges and ends.

F. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches on center on all edges and into studs in field of board.
1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
3. Install adjacent boards without gaps.
4. Size: 48 by 96 inches, installed horizontally at ceiling height.
5. Size and Location: As indicated on drawings.

G. Wall Sheathing and Roof Sheathing with Laminated Water-Resistive Barrier and Air Barrier: Secure to studs as recommended by manufacturer.
1. Install with laminated water-resistive and air barrier on exterior side of sheathing.
2. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
3. Use only mechanically attached and drainable EIFS and exterior insulation with wall sheathing with laminated water-resistive and air barrier.
4. Apply manufacturer's standard seam tape to joints between sheathing panels. Use tape gun or hard rubber roller as recommended by manufacturer.

3.07 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

B. Allow preservative to dry prior to erecting members.

3.08 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Surface Flatness of Floor: 1/8 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

C. Variation from Plane (Other than Floors): 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.09 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Coordination of ABAA Tests and Inspections:
   1. Provide testing and inspection required by ABAA QAP.
   2. Notify in ABAA writing of schedule for air barrier work. Allow adequate time for testing and inspection.
   3. Cooperate with ABAA testing agency.
   4. Allow access to air barrier work areas and staging.
   5. Do not cover air barrier work until tested, inspected, and accepted.

3.10 CLEANING

A. Waste Disposal: Comply with the requirements of Section 01 7419 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION 06 1000

SECTION 06 1753
SHOP-FABRICATED WOOD TRUSSES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated wood trusses for roof and floor framing.

B. Bridging, bracing, and anchorage.

C. Fire retardant treatment of wood.

D. Preservative treatment of wood.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 06 1000 - Rough Carpentry: Installation requirements for miscellaneous framing.

C. Section 06 1000 - Rough Carpentry: Material requirements for blocking, bridging, plates, and miscellaneous framing.

1.03 REFERENCE STANDARDS

A. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

B. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2017).

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

D. AWPA U1 - Use Category System: User Specification for Treated Wood; 2017.

E. RIS (GR) - Standard Specifications for Grades of California Redwood Lumber; 2000.

F. SPIB (GR) - Grading Rules; 2014.

G. TPI 1 - National Design Standard for Metal-Plate-Connected Wood Truss Construction; 2014.

H. TPI BCSI 1 - Building Component Safety Information Booklet: The Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses; 2015.

I. TPI DSB-89 - Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses; 1989.

J. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17; 2015.

K. WWPA G-5 - Western Lumber Grading Rules; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on plate connectors, bearing plates, and metal bracing components.

C. Shop Drawings: Show truss configurations, sizes, spacing, size and type of plate connectors, cambers, framed openings, bearing and anchor details, and bridging and bracing.
   1. Include identification of engineering software used for design.
   2. Provide shop drawings stamped or sealed by design engineer.
   3. Submit design calculations.

D. Designer's Qualification Statement.

E. Fabricator's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Perform design by or under direct supervision of a Professional Engineer experienced in design of this Work and licensed in Florida.

B. Fabricator Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Handle and erect trusses in accordance with TPI BCSI 1.

B. Store trusses in vertical position resting on bearing ends.

C. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Truss Plate Connectors:
   1. MiTek Industries, Inc: www.mii.com/#sle.
   2. Simpson Strong Tie ; www.strongtie.com.
   3. USP Structural Connectors ; www.uspconnectors.com
   4. Or approved equal.

B. Truss Fabricators:
   1. Deco Truss Company ; www.decotruss.com.
   2. Per contractor..

2.02 TRUSSES

A. Wood Trusses: Designed and fabricated in accordance with TPI 1 and TPI DSB-89 to achieve structural requirements indicated.
   1. Species and Grade: Southern Pine, SPIB (GR) Grade 2.
   2. Connectors: Steel plate.
   3. Structural Design: Comply with applicable code for structural loading criteria.
   4. Design Roof Live and Dead Load: 20 lbs/sq ft. & 15 lbs/sq ft
   5. Floor Deflection: 1/360, maximum.
   6. Roof Deflection: 1/240, maximum.
   7. Fire Retardance: Comply with applicable code(s); provide factory pressure treated wood.
   8. Decay Resistance: Provide factory preservative pressure treated wood.

2.03 MATERIALS

A. Lumber:
   1. Moisture Content: Between 7 and 9 percent.
   2. Lumber fabricated from old growth timber is not permitted.
   3. Provide sustainably harvested lumber, certified or labeled as specified in Section 01 6000.
   4. Provide lumber harvested within a 500 mile radius of the project site.
   5. Lumber salvaged from deconstruction or demolition of existing buildings or structures is permitted provided it is clean, denailed, and free of paint and finish materials, and other contamination; identify source.
      a. Where used for structural applications, provide lumber re-graded by an inspection service accredited by the American Lumber Standard Committee, Inc.
   6. Lumber fabricated from timber recovered from riverbeds or otherwise abandoned is permitted, unless otherwise noted, provided it is clean and free of contamination; identify source.
      a. Where used for structural applications, provide lumber re-graded by an inspection service accredited by the American Lumber Standard Committee, Inc.

B. Steel Connectors: ASTM A666, Type 304 stainless steel; die stamped with integral teeth; thickness as indicated.

C. Truss Bridging: Type, size and spacing recommended by truss manufacturer.

2.04 ACCESSORIES

A. Wood Blocking, Bridging, Plates, and Miscellaneous Framing: Softwood lumber, any species, construction grade, 19 percent maximum and 7 percent minimum moisture content.

B. Wood Blocking, Bridging, Plates, and Miscellaneous Framing: As specified in Section 06 1000.

C. Fasteners: Electrogalvanized steel, type to suit application.

D. Bearing Plates: Electrogalvanized steel.

2.05 WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

B. Fire Retardant Treatment, Exterior Type: AWPA U1, Use Category UCFB, Commodity Specification H, chemically treated and pressure impregnated, maximum flame spread index of 25 when tested in accordance with ASTM E84 and with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898; kiln dried after treatment to maximum moisture content of 19 percent for lumber and 15 percent for plywood.
   1. Marking: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.

C. Fire Retardant Treatment, Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated, maximum flame spread index of 25 when tested in accordance with ASTM E84 and with no evidence of significant combustion when test is extended for an additional 20 minutes; kiln dried after treatment to maximum moisture content of 19 percent for lumber and 15 percent for plywood.
   1. Marking: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   2. Products:
      a. Koppers, Inc: http://www.koppersperformancechemicals.com/#sle.
      b. Viance, LLC; D-Blaze: www.treatedwood.com/#sle.

D. Preservative Pressure Treatment of Lumber: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft retention.
   1. Kiln dry after treatment to maximum moisture content of 19 percent.
   2. Marking: Mark each piece with stamp of an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

E. Preservative Pressure Treatment of Plywood: AWPA U1, Use Category UC3B using waterborne preservative to 0.25 lb/cu ft retention.
   1. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
   2. Marking: Mark each piece with stamp of an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

F. Surface-Applied Wood Preservative:

G. Field-Applied Fire-Retardant Treatment:

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated on shop drawings.

B. Verify that supports and openings are ready to receive trusses.

3.02 PREPARATION

A. Coordinate placement of bearing items.

3.03 ERECTION

A. Install trusses in accordance with manufacturer's instructions and TPI DSB-89 and TPI BCSI 1; maintain a copy of each TPI document on site until installation is complete.

B. Set members level and plumb, in correct position.

C. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure plumb, and in true alignment until completion of erection and installation of permanent bracing.

D. Do not field cut or alter structural members without approval of K2M Design Inc..

E. Install permanent bridging and bracing.

F. Install headers and supports to frame openings required.

G. Frame openings between trusses with lumber in accordance with Section 06 1000.

H. Coordinate placement of decking with work of this section.

I. After erection, touch-up primed surfaces with primer consistent with shop coat.

3.04 SITE APPLIED WOOD TREATMENT

A. Treat all site-sawn cuts of pressure-treated wood using same type of treatment (i.e. preservative or fire-retardant).

B. Apply preservative treatment to non-pressure-treated wood wherever it will come into contact with cementitious materials, roofing, asphaltic materials, or metals.

C. Apply fire-retardant treatment to all exposed surfaces after erection.

D. Apply treatment in accordance with manufacturer's instructions.

E. Allow field-applied treatment to dry prior to erecting members.

3.05 TOLERANCES

A. Framing Members: 1/2 inch maximum, from true position.

END OF SECTION 06 1753

SECTION 06 2000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

B. Wood casings and moldings.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

C. Section _____: Cabinet hardware.

D. Section 09 9113 - Exterior Painting: Painting of finish carpentry items.

E. Section 09 9123 - Interior Painting: Painting of finish carpentry items.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

D. AWI (QCP) - Quality Certification Program; current edition at www.awiqcp.org.

E. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014, with Errata (2016).

F. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.1; 2016, with Errata (2017).

G. AWPA U1 - Use Category System: User Specification for Treated Wood; 2017.

H. PS 1 - Structural Plywood; 2009.

I. PS 20 - American Softwood Lumber Standard; 2015.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.

1. Provide the information required by AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS).

C. Samples: Submit two samples of wood trim 12 inch long.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Interior Woodwork Items:

1. Moldings, Bases, Casings, and Miscellaneous Trim: Clear white pine; prepare for paint finish.
2. Door, Glazed Light, and Pocket Door Frames: White birch; prepare for paint finish.
3. Window Sills: Clear fir; prepare for transparent finish.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.03 FASTENINGS

A. Concealed Joint Fasteners: Threaded steel.

2.04 ACCESSORIES

A. Primer: Alkyd primer sealer.

B. Wood Filler: Solvent base, tinted to match surface finish color.

2.05 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.06 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. Apply wood filler in exposed nail and screw indentations.

C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

D. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. System - 1, Lacquer, Nitrocellulose.
      b. Sheen: Flat.
   2. Opaque:
      a. System - 1, Lacquer, Nitrocellulose.
      b. Color: As selected by K2M Design Inc..
      c. Sheen: Flat.

E. Back prime woodwork items to be field finished, prior to installation.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

D. Install hardware in accordance with manufacturer's written instructions.

3.02 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

B. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.03 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

END OF SECTION 06 2000

SECTION 07 1300
SHEET WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sheet Waterproofing:
   1. Tyvek House Wrap
   2. Self-adhered TPO sheet membrane.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete substrate.

B. Section 03 4100 - Precast Structural Concrete: Grouting joints of precast concrete deck surfaces.

C. Section 03 4113 - Precast Concrete Hollow Core Planks: Grouting joints of precast concrete deck surfaces.

D. Section 07 2100 - Thermal Insulation: Insulation used for protective cover.

E. Section 07 6200 - Sheet Metal Flashing and Trim: Metal parapet, coping, and counterflashing.

F. Section 07 9200 - Joint Sealants: Sealing moving joints in waterproofed surfaces that are not required to be treated in this section.

1.03 ABBREVIATIONS

A. APP - Atactic Polypropylene.

B. CPE - Chlorinated Polyethylene.

C. EPDM - Ethylene Propylene Diene Monomer.

D. HDPE - High-Density Polyethylene.

E. IIR - Isobutene-Isoprene Rubber.

F. NRCA - National Roofing Contractors Association.

G. PUMA - Polyurethane-Methacrylate.

H. PVC - Polyvinyl Chloride.

I. SBS - Styrene-Butadiene-Styrene.

J. TPO - Thermoplastic Polyolefin.

1.04 REFERENCE STANDARDS

A. ASTM C836/C836M - Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course; 2015.

B. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016.

C. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).

D. ASTM D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers; 2000 (Reapproved 2012).

E. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2014.

F. ASTM D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact; 2014.

G. ASTM D751 - Standard Test Methods for Coated Fabrics; 2006 (Reapproved 2011).

H. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting; 2012.

I. ASTM D903 - Standard Test Method for Peel or Stripping Strength of Adhesive Bonds; 1998 (Reapproved 2010).

J. ASTM D1621 - Standard Test Method for Compressive Properties Of Rigid Cellular Plastics; 2016.

K. ASTM D1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test); 2008 (Reapproved 2015).

L. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2017.

M. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015e1.

N. ASTM D4068 - Standard Specification for Chlorinated Polyethylene (CPE) Sheeting for Concealed Water-Containment Membrane; 2015.

O. ASTM D4551 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Flexible Concealed Water-Containment Membrane; 2012.

P. ASTM D4637/D4637M - Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane; 2015.

Q. ASTM D5295/D5295M - Standard Guide for Preparation of Concrete Surfaces for Adhered (Bonded) Membrane Waterproofing Systems; 2014.

R. ASTM D5385/D5385M - Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes; 1993, with Editorial Revision (2014).

S. ASTM D5602/D5602M - Standard Test Method for Static Puncture Resistance of Roofing Membrane Specimens; 2011.

T. ASTM D6134 - Standard Specification for Vulcanized Rubber Sheets Used in Waterproofing Systems; 2007 (Reapproved 2013).

U. ASTM D6506/D6506M - Standard Specification for Asphalt Based Protection Board for Below-Grade Waterproofing; 2001, with Editorial Revision (2018).

V. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

W. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a, with Editorial Revision (2013).

X. ASTM F2130 - Standard Test Method for Measuring Repellency, Retention, and Penetration of Liquid Pesticide Formulation Through Protective Clothing Materials; 2011.

Y. ICC-ES AC380 - Acceptance Criteria for Termite Physical Barrier Systems; 2014, with Editorial Revision (2017).

Z. NRCA (WM) - The NRCA Waterproofing Manual; 2005.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for membrane and joint and crack sealants.

C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.

D. Certificate: Certify that products meet or exceed specified requirements.

E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and acceptable installation temperatures.

F. Warranty: Submit manufacturer warranty and ensure forms have been completed in City of Key West's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Membrane Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 MOCK-UP

A. Construct mock-up consisting of 100 sq ft of horizontal waterproofed panel; to represent finished work including internal and external corners.

B. Locate where directed.

C. Mock-up may remain as part of this Work.

1.08 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application and until liquid or mastic accessories have cured.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Contractor shall correct defective Work within a five year period after Date of Substantial Completion; remove and replace materials concealing waterproofing at no extra cost to City of Key West.

C. Provide five year manufacturer warranty for waterproofing failing to resist penetration of water.

PART 2 PRODUCTS

2.01 WATERPROOFING APPLICATIONS

A. Polyethylene Tyvek House Wrap:
   1. Location: Exterior wood frame walls..
   2. Cover with protection board.

B. Self-Adhered TPO Sheet Membrane:
   1. Location: roof truss.
   2. Cover with protection board.

2.02 MEMBRANE MATERIALS

A. Polyethylene Tyvek House Wrap: Install per manufacturer instruction.

B. Self-Adhered TPO Sheet Membrane: Composite membrane formed of reinforced TPO sheet with butyl alloy adhesive layer; recommended by manufacturer for direct concrete contact in negative-side waterproofing applications.
   1. Total Sheet Thickness: 70 mils (0.070 inch), minimum.
   2. TPO Thickness: 45 mils (0.045 inch), minimum.
   3. Adhesive Thickness: 0.025 inch, minimum.
   4. Field Seaming: Double-sided self-adhesive butyl-based tape.
   5. Tensile Strength: 1,500 psi at break, minimum, measured in accordance with ASTM D882.
   6. Elongation at Break: 325 percent, minimum, measured in accordance with ASTM D412.
   7. Water Vapor Permeance: 0.090 perm, maximum, measured in accordance with ASTM E96/E96M.
   8. Puncture Resistance: 375 pounds, minimum, measured in accordance with ASTM E154/E154M.
   9. Adhesives, Sealants, Tapes, and Accessories: As recommended by membrane manufacturer.
   10. Manufacturers:
      a. Carlisle Coatings & Waterproofing Inc; MiraPLY-H: www.carlisleccw.com/#sle.
      b. Carlisle Coatings & Waterproofing Inc; MiraPLY-V: www.carlisleccw.com/#sle.

C. Seaming Materials: As recommended by membrane manufacturer.

D. Membrane Sealant: As recommended by membrane manufacturer.

E. Termination Bars: Aluminum; compatible with membrane and adhesives.

F. Adhesives: As recommended by membrane manufacturer.

G. Thinner and Cleaner: As recommended by adhesive manufacturer, compatible with sheet membrane.

2.03 ATTACHMENT MATERIALS

A. As recommended by manufacturer.

2.04 ACCESSORIES

A. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and waterproofing materials.

B. Protection Board: Rigid insulation specified in Section 07 2100.

C. Protection Board: Provide type capable of preventing damage to waterproofing due to backfilling and construction traffic.
   1. Hardboard, 1/8 inch thick.
   2. Asphalt impregnated wood fiberboard, 1/4 inch thick.
   3. Polystyrene foam board, 1 inch thick.
   4. Multi-layer internally-reinforced asphaltic panels, 1/8 inch thick, nominal, complying with ASTM D6506/D6506M.
   5. Recycled or reclaimed closed-cell foam plastic with non-woven filter fabric cover; 1 inch thick.
   6. Semi-rigid glass fiber board; unaffected by water, freeze-thaw, fungus, or soil bacteria; containing no formaldehyde, phenol, acrylic, or artificial color; 3/4 inch thick, nominal.
   7. Products:
      a. Mar-flex Waterproofing & Building Products; Shockwave: www.mar-flex.com/#sle.
      b. W.R. Meadows, Inc; Protection Course: www.wrmeadows.com/#sle.

D. Drainage Panel: Drainage layer with geotextile filter fabric on earth side.
   1. Composition: Dimpled polystyrene core; polypropylene filter fabric.
   2. Products:
      a. Epro Services, Inc; ECODRAIN-MS: www.eproserv.com/#sle.
      b. Mar-flex Waterproofing & Building Products; ArmorDrain 110: www.mar-flex.com/#sle.
      c. Mar-flex Waterproofing & Building Products; ArmorDrain 150: www.mar-flex.com/#sle.
      d. Mar-flex Waterproofing & Building Products; ArmorDrain 400 Protection/Drainage Board: www.mar-flex.com/#sle.
      e. W.R. Meadows, Inc; Mel-Drain 5012: www.wrmeadows.com/#sle.

E. Cant Strips: Premolded composition material.

F. Flexible Flashings: Type recommended by membrane manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions are acceptable prior to starting this work.

B. Verify substrate surfaces are durable; free of matter detrimental to adhesion or application of waterproofing system.

C. Verify items that penetrate surfaces to receive waterproofing are securely installed.

3.02 PREPARATION

A. Protect adjacent surfaces from damage not designated to receive waterproofing.

B. Clean and prepare surfaces to receive waterproofing in accordance with manufacturer's instructions.

C. Do not apply waterproofing to surfaces unacceptable to membrane manufacturer.

D. Fill non-moving joints and cracks with a filler compatible with waterproofing materials.

E. Seal moving cracks with sealant and non-rigid filler, using procedures recommended by sealant and waterproofing manufacturers.

F. Prepare building expansion joints at locations as indicated on drawings.

G. Surfaces for Adhesive Bonding: Apply surface conditioner at a rate recommended by manufacturer, and protect conditioner from rain or frost until dry.

H. Concrete Surfaces for Adhesive Bonding: Prepare concrete substrate according to ASTM D5295/D5295M.
   1. Remove substances that inhibit adhesion including form release agents, curing compounds admixtures, laitance, moisture, dust, dirt, grease and oil.
   2. Repair surface defects including honeycombs, fins, tie holes, bug holes, sharp offsets, rutted cracks, ragged corners, deviations in surface plane, spalling and delaminations, as described in the reference standard.
   3. Remove and replace areas of defective concrete as specified in Section 03 3000.
   4. Prepare concrete for adhesive bonded waterproofing using mechanical or chemical methods described in the referenced standard.
   5. Test concrete surfaces as described in the referenced standards. Verify surfaces are ready to receive adhesive bonded waterproofing membrane system.

3.03 INSTALLATION - MEMBRANE

A. Install membrane waterproofing in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.

B. Roll out membrane, and minimize wrinkles and bubbles.

C. Self-Adhering Membrane: Remove release paper layer, and roll out onto substrate with a mechanical roller to provide full contact bond.

D. Adhesive Bonded Membrane: Apply adhesive in accordance with manufacturer's instructions, and bond sheet to substrate except in those areas directly over or within 3 inches of a control or expansion joint.

E. Torch Applied Membrane: Apply membrane by torch application, coated side down.

F. Mechanically Fastened Membrane: Install mechanical fasteners in accordance with manufacturer's instructions, and bond sheet to membrane discs.

G. Overlap edges and ends, minimum 3 inches, seal permanently waterproof by method recommended by manufacturer, and apply uniform bead of sealant to joint edge.

H. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.

I. Weather lap joints on sloped substrate in direction of drainage, and seal joints and seams.

J. Coordinate with drain installation; refer to Section 22 1006.

K. Install building expansion joints at locations as indicated on drawings.

L. Flexible Flashings: Seal items watertight that penetrate through waterproofing membrane with flexible flashings.

M. Extend membrane over cants and up intersecting surfaces at membrane perimeter minimum 6 inches above horizontal surface for first ply and 6 inches at subsequent plies laid in shingle fashion.

N. Seal membrane and flashings to adjoining surfaces.
   1. Install termination bar along edges.
   2. Install counterflashing over exposed edges.

3.04 INSTALLATION - DRAINAGE PANEL AND PROTECTION BOARD

A. Place drainage panel directly against membrane, butt joints, place to encourage drainage downward. Scribe and cut boards around projections, penetrations, and interruptions.

B. Place protection board directly against drainage panel; butt joints. Scribe and cut boards around projections, penetrations, and interruptions.

C. Adhere protection board to substrate with compatible adhesive.

3.05 FIELD QUALITY CONTROL

A. City of Key West will provide testing services in accordance with Section 01 4000 - Quality Requirements. Contractor shall provide temporary construction and materials for testing.

B. Upon completion of horizontal membrane installation, dam installation area in preparation for flood testing.

1. Flood to minimum depth of 1 inch with clean water, and after 48 hours inspect for leaks.
2. If leaking is found, remove water, repair leaking areas with new waterproofing materials as directed by K2M Design Inc.; repeat flood test, and repair damage to building.
3. When area is proven watertight, drain water and remove dam.

3.06 PROTECTION

A. Do not permit traffic over unprotected or uncovered membrane.

END OF SECTION 07 1300

SECTION 07 2100
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation and integral vapor retarder at cavity wall construction and walls noted on plans..

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 07 2119 - Foamed-In-Place Insulation: Plastic foam insulation other than boards.

C. Section 07 2500 - Weather Barriers: Separate air barrier and vapor retarder materials.

1.03 REFERENCE STANDARDS

A. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).

B. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2018.

C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2017.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

F. ASTM E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

1.05 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation on Inside of Framed Walls with Exposed Facer Providing Interior Finish: Glass-fiber-reinforced polyisocyanurate with exposed facers.

B. Insulation on Inside of Concrete and Masonry Exterior Walls: Extruded polystyrene (XPS) board.

2.02 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene (XPS) Board Insulation: Complies with ASTM C578 with either natural skin or cut cell surfaces.
   1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
   3. Type and Thermal Resistance, R-value: Type IV, 5.0 (0.88) per 1 inch thickness at 75 degrees F mean temperature.
   4. Manufacturers:
      a. Dow Chemical Company; STYROFOAM HIGHLOAD 40: www.dowbuildingsolutions.com/#sle.
      b. Kingspan Insulation LLC; GreenGuard XPS TYPE IV 25 PSI: www.trustgreenguard.com/#sle.

c. Owens Corning Corporation; FOAMULAR Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com/#sle.
d. Or approved equal.

B. Glass-Fiber-Reinforced Polyisocyanurate (ISO) Board Insulation with Facers Both Sides and Providing Interior Finish System: Rigid cellular foam, complying with ASTM C1289.
1. Compressive Strength: 16 psi, minimum.
2. Thermal Resistance, R-value: Type I, Class 2, at 1-1/2 inch thick; 9.0 at 75 degrees F.
3. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
4. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
5. Board Size: 48 inch by 96 inch.
6. Board Thickness: 1 inch.
7. Board Edges: Square.
8. Exposed Facer: 4 mil, 0.004 inch embossed white thermoset-coated aluminum.
9. Non-Exposed Facer: 1.25 mil, 0.00125 inch embossed aluminum.
10. Water Absorption: 0.1 percent by volume, maximum, by total immersion.
11. Manufacturers:
a. Dow Chemical Company; THERMAX Heavy Duty: www.dowbuildingsolutions.com/#sle.
b. Johns Manville ; www.jm.com
c. Insulfoam ; www.insulfoam.com
d. Or approved equal.

2.03 ACCESSORIES

A. Tape: Reinforced polyethylene film with acrylic pressure sensitive adhesive.
1. Application: Sealing of interior circular penetrations, such as pipes or cables.
2. Width: Are required for application.

B. Flashing Tape: Special polyolefin film with high performance adhesive.
1. Application: Interior window and door sill flashing tape.
2. Width: Are required for application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT EXTERIOR WALLS

A. Install boards horizontally on walls.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BOARD INSTALLATION AT CAVITY WALLS

A. Install boards to fit snugly between wall ties.

B. Install boards horizontally on walls.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.04 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION 07 2100

SECTION 07 2119
FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Foamed-in-place insulation.
   1. In roof cavities.

B. Protective intumescent coating.

1.02 REFERENCE STANDARDS

A. ASTM C518 - Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus; 2017.

B. ASTM D1621 - Standard Test Method for Compressive Properties Of Rigid Cellular Plastics; 2016.

C. ASTM D2842 - Standard Test Method for Water Absorption of Rigid Cellular Plastics; 2012.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

E. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials; 2016.

F. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

G. ASTM E2178 - Standard Test Method for Air Permeance of Building Materials; 2013.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.04 FIELD CONDITIONS

A. Do not apply foam when temperature is below that specified by the manufacturer for ambient air and substrate.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Foamed-In-Place Insulation:
   1. BASF Corporation; WALLTITE US Series Closed Cell: www.spf.basf.com/#sle.
   2. Icynene-Lapolla; Icynene ProSeal: www.icynene.com/#sle.
   3. Johns Manville; JM Corbond III Closed Cell Spray Polyurethane Foam: www.jm.com/#sle.
   4. Or approved equal..

2.02 MATERIALS

A. Foamed-In-Place Insulation: Medium-density, rigid or semi-rigid, open or closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.
   1. Regulatory Requirements: Comply with applicable code for flame and smoke, concealment, and overcoat limitations.
   2. Thermal Resistance: R-value of 5.0, minimum, per 1 inch thickness at 75 degrees F mean temperature when tested in accordance with ASTM C518.
   3. Water Vapor Permeance: Vapor retarder; 2 perms, maximum, when tested at intended thickness in accordance with ASTM E96/E96M, desiccant method.
   4. Water Absorption: Less than 2 percent by volume, maximum, when tested in accordance with ASTM D2842.
   5. Air Permeance: 0.04 cfm/sq ft, maximum, when tested at intended thickness in accordance with ASTM E2178 or ASTM E283 at 1.57 psf.
   6. Closed Cell Content: At least 90 percent.
   7. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/450, maximum, when tested in accordance with ASTM E84.

2.03 ACCESSORIES

A. Primer: As required by insulation manufacturer.

B. Protective Coating: Intumescent coating of type recommended by insulation manufacturer and as required to comply with applicable codes.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify work within construction spaces or crevices is complete prior to insulation application.

B. Verify that surfaces are clean, dry, and free of matter that may inhibit insulation or overcoat adhesion.

3.02 PREPARATION

A. Mask and protect adjacent surfaces from over spray or dusting.

B. Apply primer in accordance with manufacturer's instructions.

3.03 APPLICATION

A. Apply insulation in accordance with manufacturer's instructions.

3.04 FIELD QUALITY CONTROL

A. Inspection will include verification of insulation and overcoat thickness and density.

3.05 PROTECTION

A. Do not permit subsequent construction work to disturb applied insulation.

END OF SECTION 07 2119

SECTION 07 4113
METAL ROOF PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural roofing system of preformed steel panels.

B. Thermal roof insulation.

C. Attachment system.

D. Finishes.

E. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Roof sheathing.

B. Section 07 2100 - Thermal Insulation: Rigid roof insulation.

C. Section 07 9200 - Joint Sealants: Sealing joints between metal roof panel system and adjacent construction.

1.03 REFERENCE STANDARDS

A. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

C. ASTM C1363 - Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus; 2011.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

E. ASTM E1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference; 2005 (Reapproved 2017).

F. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Summary of test results, indicating compliance with specified requirements.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Specimen warranty.

C. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.
   1. Show work to be field-fabricated or field-assembled.

D. Test Reports: Indicate compliance of metal roofing system to specified requirements.

E. Warranty: Submit specified manufacturer's warranty and ensure that forms have been completed in City of Key West's name and are registered with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
   1. Accredited by IAS in accordance with IAS AC472.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Finish Warranty: Provide manufacturer's special warranty covering failure of factory-applied exterior finish on metal roof panels and agreeing to repair or replace panels that show evidence of finish degradation, including significant fading, chalking, cracking, or peeling within specified warranty period of five years from Date of Substantial Completion.

C. Waterproofing Warranty: Provide manufacturer's warranty for weathertightness of roofing system, including agreement to repair or replace roofing that fails to keep out water within specified warranty period of five years from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Roof Panels:
   1. Berridge Manufacturing Company; Cee-Lock: www.berridge.com/#sle.
   2. Englert, Inc; Series 2000: www.englertinc.com/#sle.
   3. Petersen Aluminum Corporation; Snap-Clad Panel: www.pac-clad.com/#sle.
   4. Or approved equal.

2.02 STRUCTURAL METAL ROOF PANELS

A. Structural Metal Roofing: Provide complete roofing assemblies, including roof panels, clips, fasteners, connectors, and miscellaneous accessories, tested for compliance with the following minimum standards:
   1. Structural Design Criteria: Provide panel assemblies designed to safely support design loads at support spacing indicated, with deflection not to exceed L/180 of span length(L) when tested in accordance with ASTM E1592.
      a. Dead Loads: Weight of roofing system.
      b. Live Loads: As required by ASCE 7.
   2. Overall: Complete weathertight system tested and approved in accordance with ASTM E1592.
   3. Thermal Movement: Design system to accommodate without deformation anticipated thermal movement over ambient temperature range of 100 degrees F.
   4. Thermal Performance: Provide thermal resistance through entire system, R-value of 15 deg F hr sq ft/BTU; 2 inch thick, when tested in accordance with ASTM C1363.

B. Metal Panels: Factory-formed panels with factory-applied finish.
   1. Type: Single skin, uninsulated.
   2. Steel Panels:
      a. Zinc-coated SS (structural steel) sheet complying with ASTM A653/A653M; minimum G60 galvanizing.
      b. Steel Thickness: Minimum 24 gage (0.024 inch).
   3. Profile: Standing seam, with minimum 1.0 inch seam height; concealed fastener system for field seaming with special tool.
   4. Texture: Smooth.
   5. Width: Maximum panel coverage of 16 inches.

2.03 ATTACHMENT SYSTEM

A. Concealed System: Provide manufacturer's standard stainless steel or nylon-coated aluminum concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.

2.04 FABRICATION

A. Panels: Provide field fabricated panels with applied finish and accessory items, using manufacturer's standard processes as required to achieve specified appearance and performance requirements.

B. Joints: Provide captive gaskets, sealants, or separator strips at panel joints to ensure weathertight seals, eliminate metal-to-metal contact, and minimize noise from panel movements.

2.05 FINISHES

A. Fluoropolymer Coating System: Manufacturer's standard multi-coat thermocured coating system, including minimum 70 percent fluoropolymer color topcoat with minimum total dry film thickness of 0.9 mil; color and gloss to match sample.

2.06 ACCESSORIES

A. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, and equipment curbs of the same material, thickness, and finish as used for the roofing panels. Items completely concealed after installation may optionally be made of stainless steel.

B. Rib and Ridge Closures: Provide prefabricated, close-fitting components of steel with corrosion resistant finish or combination steel and closed-cell foam.

C. Sealants:
   1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
   2. Concealed Sealant: Non-curing butyl sealant or tape sealant.
   3. Seam Sealant: Factory-applied, non-skinning, non-drying type.

D. Thermal Insulation: Provide flexible blanket, rigid, or semi-rigid type, faced with white, flexible, non-dusting vapor retarder tested for maximum flame spread index of 50, per ASTM E84; for installation using spacer blocks.
   1. Thickness: As indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation of preformed metal roof panels until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify K2M Design Inc. of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Broom clean wood sheathing prior to installation of roofing system.

B. Coordinate roofing work with provisions for roof drainage, flashing, trim, penetrations, and other adjoining work to assure that the completed roof will be free of leaks.

C. Coordinate installation of waterproof membrane over roof sheathing with 06 1000.

D. Remove protective film from surface of roof panels immediately prior to installation. Strip film carefully, to avoid damage to prefinished surfaces.

E. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by roof panel manufacturer.

F. Where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

3.03 INSTALLATION

A. Overall: Install roofing system in accordance with approved shop drawings and panel manufacturer's instructions and recommendations, as applicable to specific project conditions.

Anchor all components of roofing system securely in place while allowing for thermal and structural movement.

1. Install roofing system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.
2. Minimize field cutting of panels. Where field cutting is absolutely required, use methods that will not distort panel profiles. Use of torches for field cutting is absolutely prohibited.

B. Accessories: Install all components required for a complete roofing assembly, including flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, equipment curbs, rib closures, ridge closures, and similar roof accessory items.

C. Install roofing felt and building paper slip sheet on roof deck before installing preformed metal roof panels. Secure by methods acceptable to roof panel manufacturer, minimizing use of metal fasteners. Apply from eaves to ridge in shingle fashion, overlapping horizontal joints a minimum of 2 inches and side and end laps a minimum of 3 inches. Offset seams in building paper and seams in roofing felt.

D. Roof Panels: Install panels in strict accordance with manufacturer's instructions, minimizing transverse joints except at junction with penetrations.

1. Form weathertight standing seams incorporating concealed clips, using an automatic mechanical seaming device approved by the panel manufacturer.
2. Incorporate concealed clips at panel joints, and apply snap-on battens to provide weathertight joints.
3. Provide sealant tape or other approved joint sealer at lapped panel joints.
4. Install sealant or sealant tape, as recommended by panel manufacturer, at end laps and side joints.

E. Insulation: Install insulation between roof covering and supporting members to present a neat appearance. Fold, staple, and tape seams unless otherwise approved by K2M Design Inc..

1. Install batt insulation in locations that will be concealed from view.

3.04 CLEANING

A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

3.05 PROTECTION

A. Do not permit storage of materials or roof traffic on installed roof panels. Provide temporary walkways or planks as necessary to avoid damage to completed work. Protect roofing until completion of project.

B. Touch-up, repair, or replace damaged roof panels or accessories before Date of Substantial Completion.

END OF SECTION 07 4113

SECTION 07 4646
FIBER-CEMENT SIDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiber-cement siding.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Siding substrate.

B. Section 09 9113 - Exterior Painting: Field painting.

1.03 REFERENCE STANDARDS

A. ASTM C1186 - Standard Specification for Flat Fiber Cement Sheets; 2008 (Reapproved 2016).

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's data sheets on each product to be used, including:
   1. Manufacturer's requirements for related materials to be installed by others.
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods, including nail patterns.

B. Warranty: Submit copy of manufacturer’s warranty, made out in City of Key West’s name, showing that it has been registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products under waterproof cover and elevated above grade, on a flat surface.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide multi-year manufacturer warranty as indicated under Siding article sub-heading

PART 2 PRODUCTS

2.01 FIBER-CEMENT SIDING

A. Lap Siding: Individual horizontal boards made of cement and cellulose fiber formed under high pressure with integral surface texture, complying to ASTM C1186, Type A, Grade II; with machined edges, for nail attachment.
   1. Style: Standard lap style.
   2. Texture: Smooth.
   3. Length: 12 ft, nominal.
   4. Width (Height): 5-1/4 inches.
   5. Thickness: 5/16 inch, nominal.
   6. Finish: Factory applied primer.
   7. Color: As indicated on drawings.
   8. Warranty: 50 year limited; transferable.
   9. Manufacturers:
      a. Per submitted NOA or approved equal..

B. Soffit Panels: Smooth panels of same material and finish.
   1. Per NOA or approved equal. Paint per drawings.

2.02 ACCESSORIES

A. Trim: Same material and texture as siding.

B. Fasteners: Galvanized or corrosion resistant; length as required to penetrate minimum 1-1/4 inch.

PART 3 EXECUTION

3.01 NOTE: NONE OF THE EXECUTION, PREPARATION, AND INSTALLATION INFORMATION IN THESE SPECIFICATIONS IS TO CIMCUMVENT THE REQUIREMENTS OF THE APPROVED NOA. ALL MATERIALS, ASSEMBLIES, CLOCKING, ANCHORING, AND OTHER APPURTENANCES SHALL COMPLY EXACTLY WITH THE INSTRUCTION PER THE NOA.

3.02 EXAMINATION

A. Examine substrate, clean and repair as required to eliminate conditions that would be detrimental to proper installation.

B. Verify that water-resistive barrier has been installed over substrate completely and correctly.

C. Do not begin until unacceptable conditions have been corrected.

D. If substrate preparation is responsibility of another installer, notify K2M Design Inc. of unsatisfactory preparation before proceeding.

3.03 PREPARATION

A. Install Sheet Metal Flashing:
   1. Above door and window trim and casings.
   2. Above horizontal trim in field of siding.

3.04 INSTALLATION

A. Install in accordance with manufacturer's instructions and recommendations.
   1. Read warranty and comply with terms necessary to maintain warranty coverage.
   2. Use trim details indicated on drawings.
   3. Touch up field cut edges before installing.
   4. Pre-drill nail holes if necessary to prevent breakage.

B. Over Wood and Wood-Composite Sheathing: Fasten siding through sheathing into studs.

C. Allow space for thermal movement between both ends of siding panels that butt against trim; seal joint between panel and trim with specified sealant.

D. Joints in Horizontal Siding: Avoid joints in lap siding except at corners; where joints are inevitable stagger joints between successive courses.

E. Do not install siding less than 6 inches from surface of ground nor closer than 1 inch to roofs, patios, porches, and other surfaces where water may collect.

F. After installation, seal joints except lap joints of lap siding; seal around penetrations, and paint exposed cut edges.

G. Finish Painting: Refer to Section 09 9113.

3.05 PROTECTION

A. Protect installed products until Date of Substantial Completion.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 07 4646

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashings, gutters, and downspouts.

B. Sealants for joints within sheet metal fabrications.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing non-lap joints between sheet metal fabrications and adjacent construction.

1.03 REFERENCE STANDARDS

A. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.

B. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

C. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

E. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007, with Editorial Revision (2012).

F. CDA A4050 - Copper in Architecture - Handbook; current edition.

G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Sheet Metal Flashing and Trim Manufacturers:
   1. Same as roofing manufacturer, or approved equal..

2.02 SHEET MATERIALS

A. Pre-Finished Aluminum: ASTM B209 (ASTM B209M); 20 gage, (0.032 inch) thick; plain finish shop pre-coated with modified silicone coating.
   1. Modified Silicone Polyester Coating: Pigmented Organic Coating System, AAMA 2603; baked enamel finish system.

2.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch; miter and seam corners.

D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

F. Fabricate flashings to allow toe to extend 2 inches over roofing gravel. Return and brake edges.

2.04 GUTTER AND DOWNSPOUT FABRICATION

A. Gutters: SMACNA (ASMM), Semi-circular profile.

B. Downspouts: Round profile.

C. Gutters and Downspouts: Size indicated.

D. Accessories: Profiled to suit gutters and downspouts.
   1. Anchorage Devices: In accordance with SMACNA (ASMM) requirements.
   2. Gutter Supports: Brackets.
   3. Downspout Supports: Brackets.

E. Downspout Boots: Steel.

F. Seal metal joints.

2.05 ACCESSORIES

A. Fasteners: Stainless steel, with soft neoprene washers.

B. Primer: Zinc chromate type.

C. Concealed Sealants: Non-curing butyl sealant.

D. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

E. Plastic Cement: ASTM D4586/D4586M, Type I.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

3.03 INSTALLATION

A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..

B. Apply plastic cement compound between metal flashings and felt flashings.

C. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

D. Secure gutters and downspouts in place with concealed fasteners.

E. Slope gutters 1/4 inch per 10 feet, minimum.

F. Connect downspouts to downspout boots, and grout connection watertight.

END OF SECTION 07 6200

SECTION 07 7200
ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Curbs.

B. Equipment rails.

1.02 RELATED REQUIREMENTS

A. Section 07 4113 - Metal Roof Panels.

1.03 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

C. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Submit detailed layout developed for this project and provide dimensioned location and number for each type of roof accessory.
   1. Submit shop drawings sealed and signed by a Professional Engineer experienced in design of this type of work and licensed in Florida.

C. Warranty Documentation:
   1. Submit manufacturer warranty.
   2. Ensure that forms have been completed in City of Key West's name and registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store products under cover and elevated above grade.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 ROOF CURBS

A. Roof Curbs Mounting Assemblies: Factory fabricated hollow sheet metal construction, internally reinforced, and capable of supporting superimposed live and dead loads and designated equipment load with fully mitered and sealed corner joints welded or mechanically fastened, and integral counterflashing with top and edges formed to shed water.
   1. Roof Curb Mounting Substrate: Curb substrate consists of standing seam metal roof panel system.
   2. Sheet Metal Material:
      a. Aluminum: 0.080 inch minimum thickness, with 3003 alloy, and H14 temper.
   3. Roofing Cants: Provide integral sheet metal roofing cants dimensioned to begin slope at top of roofing system at 1:1 slope; minimum cant height 4 inches.
   4. Fabricate curb bottom and mounting flanges for installation directly on metal roof panel system to match slope and configuration of system.
      a. Extend side flange to next adjacent roof panel seam and comply with seam configurations and seal connection, providing at least 6 inch clearance between curb and metal roof panel flange allowing water to properly flow past curb.

b. Where side of curb aligns with metal roof panel flange, attach fasteners on upper slope of flange to curb connection allowing water to flow past below fasteners, and seal connection.
c. Maintain at least 12 inch clearance from curb, and lap upper curb flange on underside of down sloping metal roof panel, and seal connection.
d. Lap lower curb flange overtop of down sloping metal roof panel and seal connection.

5. Provide layouts and configurations indicated on drawings.

B. Equipment Rail Curbs: Straight curbs on each side of equipment, with top of curbs horizontal and level with each other for equipment mounting.
1. Height Above Finished Roof Surface: 8 inches, minimum.

C. Pipe, Duct, or Conduit Mounting Curbs: Vertical posts, minimum 8 inches square unless otherwise indicated.

2.02 NON-PENETRATING ROOFTOP SUPPORTS/ASSEMBLIES

A. Non-Penetrating Rooftop Support/Assemblies: Manufacturer-engineered and factory-fabricated, with pedestal bases that rest on top of roofing membrane, and not requiring any attachment to roof structure and not penetrating roofing assembly.
1. Design Loadings and Configurations: As required by applicable codes.
2. Support Spacing and Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
3. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
4. Hardware, Bolts, Nuts, and Washers: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A153/A153M.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify K2M Design Inc. of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.04 CLEANING

A. Clean installed work to like-new condition.

3.05 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 07 7200

SECTION 07 9200
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 2500 - Weather Barriers: Sealants required in conjunction with air barriers and vapor retarders.

B. Section 08 7100 - Door Hardware: Setting exterior door thresholds in sealant.

C. Section 09 2116 - Gypsum Board Assemblies: Sealing acoustical and sound-rated walls and ceilings.

1.03 REFERENCE STANDARDS

A. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Field Quality Control Plan: Submit at least two weeks prior to start of installation.

C. Field Quality Control Log: Submit filled out log for each length or instance of sealant installed, within 10 days after completion of inspections/tests; include bagged test samples and photographic records, if any.

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

B. Field Quality Control Plan:
   1. Visual inspection of entire length of sealant joints.
   2. Field testing agency's qualifications.
   3. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design: Sherwin Williams

B. Office Interior Joints:
   1. Sherwin Williams Caulk Sealant: 00WL1100A - Caulk - Powerhouse Sealant 11 Oz. White
   2. Or approved equal.

C. Self Leveling Sealant for Concrete Slabs:
   1. Sherwin Williams Caulk Sealant: SU2KL41GX - SU 2SL LIMESTONE 1.5
   2. Or approved equal.

D. Exterior Joints:
   1. Sherwin Williams Caulk Seallant: LX51H0010 - SU 1H WHITE 10.1 OZ
   2. Or approved equal.

2.02 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
      a. Wall expansion and control joints.

b. Joints between door, window, and other frames and adjacent construction.
c. Joints between different exposed materials.
d. Openings below ledge angles in masonry.
e. Other joints indicated below.

2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
   a. Joints between door, window, and other frames and adjacent construction.
   b. Other joints indicated below.
3. Do not seal the following types of joints.
   a. Intentional weepholes in masonry.
   b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
   c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
   d. Joints where installation of sealant is specified in another section.
   e. Joints between suspended panel ceilings/grid and walls.

2.03 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

B. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C1193.

C. Install bond breaker backing tape where backer rod cannot be used.

D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

E. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

3.04 FIELD QUALITY CONTROL

A. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

B. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

END OF SECTION 07 9200

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Fire-rated hollow metal doors and frames.

1.02 RELATED REQUIREMENTS

A. Section 08 7100 - Door Hardware.

1.03 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.

B. ASCE: American Society of Civil Engineers.

C. NFPA: National Fire Protection Association.

D. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ANSI/SDI A250.3 - Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames; 2007 (R2011).

C. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.

D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2014.

E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2016.

H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2017.

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

J. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

K. ITS (DIR) - Directory of Listed Products; current edition.

L. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.

M. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.

N. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2018.

O. UL (DIR) - Online Certifications Directory; Current Edition.

P. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.05 SUBMITTALS

A. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

B. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

1.06 QUALITY ASSURANCE

A. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Ceco Door, an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
   2. Curries, an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
   3. Fleming Door Products, an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
   4. Steelcraft, an Allegion brand; ____: www.allegion.com/#sle.
   5. Or approved equal.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory finished.

B. Interior Doors, Non-Fire Rated:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 1 - Standard-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
   2. Door Thickness: 1-3/4 inch, nominal.

C. Fire-Rated Doors:
   1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
      a. Level 1 - Standard-duty.
      b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
      c. Model 1 - Full Flush.
      d. Door Face Metal Thickness: 20 gage, 0.032 inch, minimum.
   2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
   3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
      a. Attach fire rating label to each fire rated unit.

4. Door Thickness: 1-3/4 inch, nominal.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Frame Finish: Factory primed and field finished.

C. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.
   1. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.

D. Door Frames, Fire-Rated: Knock-down type.
   1. Fire Rating: Same as door, labeled.
   2. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Factory Finish: Complying with ANSI/SDI A250.3, manufacturer's standard coating.
   1. Color: As indicated on drawings.

2.06 ACCESSORIES

A. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

B. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Install door hardware as specified in Section 08 7100.

E. Touch up damaged factory finishes.

3.03 TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.04 ADJUSTING

A. Adjust for smooth and balanced door movement.

3.05 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION 08 1113

SECTION 08 1116
ALUMINUM DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glazed aluminum doors.

B. Aluminum frames.

1.02 RELATED REQUIREMENTS

A. Section 07 2500 - Weather Barriers: Sealing door frame to weather barrier installed on adjacent construction.

B. Section 07 9200 - Joint Sealants: Sealing joints between door frames and adjacent construction.

C. Section 08 7100 - Door Hardware: Hardware for aluminum doors.

D. Section 08 8000 - Glazing: Glazing materials for aluminum doors and frames.

1.03 REFERENCE STANDARDS

A. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document); 2015.

B. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

C. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2017a.

D. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

F. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2014.

G. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric); 2014.

H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

J. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).

K. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2016).

L. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2017.

M. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2007 (Reapproved 2016).

N. FLA (FBC-B) - Florida Building Code: Building; 6th Edition (2017).

O. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

P. ITS (DIR) - Directory of Listed Products; current edition.

Q. Miami (APD) - Approved Products Directory; Miami-Dade County; Current Edition.

R. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2018.

S. UL (DIR) - Online Certifications Directory; Current Edition.

T. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Warranty: Submit manufacturer warranty and ensure that forms have been completed in City of Key West's name and registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver aluminum components in manufacturer's standard protective packaging, palleted, crated, or banded together.

B. Inspect delivered components for damage and replace. Repaired components will not be accepted.

C. Store components in clean, dry, indoor area, under cover in manufacturer's packaging until installation.

D. Protect materials and finish from damage during handling and installation.

1.06 FIELD CONDITIONS

A. Do not begin installation of interior aluminum components until space has been enclosed and ambient thermal conditions are being maintained at levels consistent with final project requirements.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Glazed Aluminum Doors:
   1. Per provided NOA or approved equal.

B. Aluminum Frames:
   1. Per provided NOA or approved equal.

2.02 DOORS AND FRAMES

A. Glazed Aluminum Doors: Extruded aluminum tube frame, full glazed, with middle rail; factory glazed.
   1. Thickness: 1-3/4 inches, nominal.
   2. Finish: Kynar Painted.
   3. Glazing: Impact Rated Glass per Miami-Dade/Florida requirements.

B. Aluminum Frames for Doors, Sidelights, or Transoms: Extruded aluminum, thermally broken hollow or C-shaped sections; no steel components.
   1. Finish: Same as doors.

C. Dimensions and Shapes: As indicated on drawings; dimensions indicated are nominal.

2.03 COMPONENTS

A. Tubular Doors: Extruded aluminum tubing, 1/8 inch minimum thickness, with heavy-duty plated steel through bolts in rails, glazing stops, and glazing gaskets.

B. Frames: Extruded aluminum shapes, not less than 0.062 inch thick, reinforced at hinge and strike locations.
   1. Corner Brackets: Extruded aluminum, fastened with stainless steel screws.
   2. Trim: Extruded aluminum, not less than 0.062 inch thick, removable snap-in type without exposed fasteners.

C. Door Hardware: Refer to Section 08 7100 for additional requirements.

2.04 PERFORMANCE REQUIREMENTS

A. Provide door assemblies that have been designed and fabricated in compliance with specified performance requirements.

B. Wind-Borne-Debris Resistance: Identical full-size glazed assembly without auxiliary protection, having Miami-Dade County approval - Miami (APD) for Large and Small Missile impact and pressure cycling at design wind pressure.

2.05 MATERIALS

A. Aluminum Sheet: ASTM B209 (ASTM B209M), alloy 5005, temper H14, stretcher leveled.

B. Extruded Aluminum: ASTM B221 (ASTM B221M), alloy 6063, temper T5, or alloy 6463, temper T5.

2.06 FINISHES

A. Superior Performing Organic Coatings: Multiple coats, thermally cured polyvinylidene fluoride (PVDF) system; AAMA 2605.
   1. Polyvinylidene fluoride (PVDF) multi-coat thermoplastic fluoropolymer coating system, with minimum 70 percent PVDF color topcoat and minimum dry film thickness 0.9 mil; color and gloss as indicated on drawings.
      a. Manufacturers:
         1) Sherwin-Williams Company; SHER-NAR 5000: oem.sherwin-williams.com/#sle.
         2) Valspar; Fluropon: www.valsparcoilextrusion.com/#sle.
         3) Or approved equal..

B. Color: As indicated on drawings.

2.07 ACCESSORIES

A. Fasteners: Aluminum, non-magnetic stainless steel, or other material warranted by manufacturer as non-corrosive and compatible with aluminum components.

B. Brackets and Reinforcements: Manufacturer's high-strength aluminum units where feasible, otherwise, non-magnetic stainless steel or steel hot-dip galvanized in compliance with ASTM A123/A123M.

C. Bituminous Coating: Cold-applied asphaltic mastic, compounded for 30-mil thickness per coat.

PART 3 EXECUTION

3.01 NOTE: NONE OF THE EXECUTION, PREPARATION, AND INSTALLATION INFORMATION IN THESE SPECIFICATIONS IS TO CIMCUMVENT THE REQUIREMENTS OF THE APPROVED NOA. ALL MATERIALS, ASSEMBLIES, CLOCKING, ANCHORING, AND OTHER APPURTENANCES SHALL COMPLY EXACTLY WITH THE INSTRUCTION PER THE NOA.

3.02 EXAMINATION

A. Verify that wall surfaces and openings are ready to receive frames and are within tolerances specified in manufacturer's instructions.

3.03 PREPARATION

A. Perform cutting, fitting, forming, drilling, and grinding of frames as required for project conditions.

B. Replace components with damage to exposed finishes.

C. Separate dissimilar metals to prevent electrolytic action between metals.

3.04 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and approved shop drawings.

B. Set frames plumb, square, level, and aligned to receive doors. Anchor frames to adjacent construction in strict accordance with manufacturer's recommendations and within specified tolerances.

C. Where aluminum surfaces contact metals other than stainless steel, zinc, or small areas of white bronze, protect from direct contact by painting dissimilar metal with heavy coating of bituminous paint.

D. Hang doors and adjust hardware to achieve specified clearances and proper door operation.

E. Install door hardware as specified in Section 08 7100.

3.05 CLEANING

A. Upon completion of installation, thoroughly clean door and frame surfaces in accordance with AAMA 609 & 610.

B. Do not use abrasive, caustic, or acid cleaning agents.

3.06 PROTECTION

A. Protect products of this section from damage caused by subsequent construction until Date of Substantial Completion.

B. Replace damaged or defective components that cannot be repaired to a condition indistinguishable from undamaged components.

END OF SECTION 08 1116

SECTION 08 3323
OVERHEAD COILING DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Overhead coiling doors, operating hardware, exterior; electrically operated.

B. Wiring from electric circuit disconnect to operator to control station.

1.02 RELATED REQUIREMENTS

A. Section 08 7100 - Door Hardware: Cylinder cores and keys.

B. Section 26 0583 - Wiring Connections: Power to disconnect.

1.03 REFERENCE STANDARDS

A. ITS (DIR) - Directory of Listed Products; current edition.

B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2014.

C. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2000, with Errata (2008).

D. UL (DIR) - Online Certifications Directory; Current Edition.

E. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. Product Data: Provide general construction, electrical equipment, component connections and details, and _____.

1.05 QUALITY ASSURANCE

A. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for purpose specified.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Overhead Coiling Doors:
   1. Clopay Building Products: www.clopaydoor.com/#sle.
   2. Wayne-Dalton, a Division of Overhead Door Corporation; ____: www.wayne-dalton.com/#sle.
   3. Raynor Garage Doors; http://www.raynor.com/products/commercial.cfm.
   4. Or approved equal

2.02 COILING DOORS

A. Exterior Coiling Doors: Aluminum slat curtain.
   1. Finish: Factory Finished.
   2. Electric operation.
   3. Locking Devices: Lock and latch handle on outside.

2.03 MATERIALS AND COMPONENTS

A. Curtain Construction: Interlocking slats.
   1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
   2. Curtain Bottom: Fitted with angles to provide reinforcement and positive contact in closed position.
   3. Weatherstripping: Moisture and rot proof, resilient type, located at jamb edges, bottom of curtain, and where curtain enters hood enclosure of exterior doors.

B. Lock Hardware:
   1. For motor operated units, additional lock or latching mechanisms are not required.

2. Latch Handle: Manufacturer's standard.

C. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

2.04 ELECTRIC OPERATION

A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
   1. Provide interlock switches on motor operated units.

B. Electric Operators:
   1. Mounting: Side mounted.
   2. Motor Enclosure:
   3. Motor Rating: 1/3 hp; continuous duty.
   4. Motor Voltage: 120 volts, single phase, 60 Hz.
   5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
   6. Controller Enclosure: NEMA 250, Type 1.
   7. Opening Speed: 12 inches per second.
   8. Brake: Adjustable friction clutch type, activated by motor controller.
   9. Manual override in case of power failure.
   10. Refer to Section 26 0583 for electrical connections.

C. Control Station: Provide standard three button (Open-Close-Stop) momentary-contact control device for each operator complying with UL 325.
   1. 24 volt circuit.
   2. Surface mounted, at interior door jamb.
   3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
      a. Primary Device: Provide electric sensing edge, wireless sensing, NEMA 1 photo eye sensors, or NEMA 4X photo eye sensors as required with momentary-contact control device.

D. Safety Edge: Located at bottom of coiling door, full width, electro-mechanical sensitized type, wired to stop and reverse door direction upon striking object, hollow neoprene covered.

PART 3 EXECUTION

3.01 NOTE: NONE OF THE EXECUTION, PREPARATION, AND INSTALLATION INFORMATION IN THESE SPECIFICATIONS IS TO CIMCUMVENT THE REQUIREMENTS OF THE APPROVED NOA. ALL MATERIALS, ASSEMBLIES, CLOCKING, ANCHORING, AND OTHER APPURTENANCES SHALL COMPLY EXACTLY WITH THE INSTRUCTION PER THE NOA.

3.02 EXAMINATION

A. Verify that opening sizes, tolerances and conditions are acceptable.

3.03 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install per provided NOA.

C. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

D. Coordinate installation of electrical service with Section 26 0583.

E. Complete wiring from disconnect to unit components.

F. Install enclosure and perimeter trim.

3.04 CLEANING

A. Clean installed components.

B. Remove labels and visible markings.

END OF SECTION 08 3323

SECTION 08 5113
ALUMINUM WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Extruded aluminum windows with fixed sash, operating sash, and infill panels.

B. Factory glazing.

C. Operating hardware.

D. Insect screens.

1.02 RELATED REQUIREMENTS

A. Section 08 8000 - Glazing.

1.03 REFERENCE STANDARDS

A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; 2017.

B. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; 2015.

C. ASTM E2112 - Standard Practice for Installation of Exterior Windows, Doors and Skylights; 2007 (Reapproved 2016).

D. FLA (PAD) - Florida Building Code Online - Product Approval Directory; Current Edition.

E. Miami (APD) - Approved Products Directory; Miami-Dade County; Current Edition.

1.04 SUBMITTALS

A. Product Data: Provide component dimensions, information on glass and glazing, internal drainage details, and descriptions of hardware and accessories.

B. Submit two samples of operating hardware.

C. Warranty: Submit manufacturer warranty and ensure that forms have been completed in City of Key West's name and registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of AAMA CW-10.

B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Aluminum Windows:
   1. Weathershield Windows & Doors; https://www.weathershield.com/Products/Hurricane-Impact
   2. Andersen Windows & Doors; https://www.andersenwindows.com/
   3. CGI Windows & Doors; http://cgiwindows.com/.
   4. Per provided NOA or approved equal.

2.02 WINDOWS

A. Aluminum Windows: Extruded aluminum frame and sash, factory fabricated, factory finished, with operating hardware, related flashings, and anchorage and attachment devices.
   1. Provide units factory glazed.
   2. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

3. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
4. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

B. Fixed, Non-Operable Type:
1. Location - Interior Wall
2. Construction: Non-thermally broken.
3. Glazing: Double; clear; transparent.
4. Exterior Finish: Factory Painted, White.
5. Interior Finish: Factory Painted, White.

C. Outswinging Casement Type:
1. Location - Exterior Wall
2. Construction: Thermally broken.
3. Provide screens.
4. Glazing: Double; clear; low-e.
5. Exterior Finish: Factory Painted, White.
6. Interior Finish: Factory Painted, White.
7. NOTE: NONE OF THE EXECUTION, PREPARATION, AND INSTALLATION INFORMATION IN THESE SPECIFICATIONS IS TO CIMCUMVENT THE REQUIREMENTS OF THE APPROVED NOA. ALL MATERIALS, ASSEMBLIES, CLOCKING, ANCHORING, AND OTHER APPURTENANCES SHALL COMPLY EXACTLY WITH THE INSTRUCTION PER THE NOA.

2.03 PERFORMANCE REQUIREMENTS

A. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:
1. Performance Class (PC): R.

B. Design Pressure (DP): In accordance with applicable codes.
1. Exterior window requirement only.

C. Wind-Borne-Debris Resistance: Identical full-size glazed assembly without auxiliary protection, having Miami-Dade County "Miami (APD)" approval for Large and Small Missile impact and pressure cycling at design wind pressure.
1. Exterior window requirement only.

2.04 COMPONENTS

A. Operable Sash Weatherstripping: Resilient plastic; permanently resilient, profiled to achieve effective weather seal.

B. Glazing Materials: Interior Windows - Double Pane

C. Glazing Materials: Exterior Window - As required by NOA.

D. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

2.05 MATERIALS

A. Interior Windows - Aluminum

B. Exterior Window - Per NOA or approved equal.

2.06 HARDWARE

A. Sash lock: Lever handle with cam lock.
1. Operable window requirement only.

B. Pulls: Manufacturer's standard type.

C. Limit Stops: Resilient rubber.

2.07 FINISHES

A. Finish Color: As indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wall openings and adjoining air and vapor seal materials are ready to receive aluminum windows.

3.02 INSTALLATION

A. Install windows in accordance with manufacturer's instructions.

B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.

D. Install sill and sill end angles.

E. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

F. Install operating hardware not pre-installed by manufacturer.

G. Install glass and infill panels in accordance with requirements specified in Section 08 8000.

3.03 ADJUSTING

A. Adjust hardware for smooth operation and secure weathertight closure.

3.04 CLEANING

A. Remove protective material from factory finished aluminum surfaces.

3.05 SCHEDULE

A. See Construction Documents

END OF SECTION 08 5113

SECTION 08 7100
DOOR HARDWARE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Hardware for aluminum doors.

B. Hardware for fire-rated doors.

C. Weatherstripping and gasketing.

D. Gate locks.

1.02 RELATED REQUIREMENTS

A. Section 08 1116 - Aluminum Doors and Frames.

B. Section 08 3323 - Overhead Coiling Doors: Door hardware, except cylinders.

1.03 REFERENCE STANDARDS

A. BHMA A156.1 - American National Standard for Butts and Hinges; 2016.

B. BHMA A156.2 - American National Standard for Bored and Preassembled Locks & Latches; 2017.

C. BHMA A156.3 - American National Standard for Exit Devices; 2014.

D. BHMA A156.4 - American National Standard for Door Controls - Closers; 2013.

E. BHMA A156.6 - American National Standard for Architectural Door Trim; 2015.

F. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; 2015.

G. BHMA A156.13 - American National Standard for Mortise Locks & Latches Series 1000; 2017.

H. BHMA A156.18 - American National Standard for Materials and Finishes; 2016.

I. BHMA A156.25 - American National Standard for Electrified Locking Devices; 2013.

J. BHMA A156.31 - American National Standard for Electric Strikes and Frame Mounted Actuators; 2013.

K. ITS (DIR) - Directory of Listed Products; current edition.

L. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.

M. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2018.

N. UL (DIR) - Online Certifications Directory; Current Edition.

O. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.

B. Keying Requirements Meeting:
   1. City of Key West will schedule meeting at project site prior to Contractor occupancy.
   2. Attendance Required:
      a. Contractor.
      b. City of Key West.
      c. Hardware Installer.
   3. Agenda:
      a. Establish keying requirements.
      b. Verify that keying and programming complies with project requirements.
      c. Establish keying submittal schedule and update requirements.

4. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
   a. Access control requirements.
5. Record minutes and distribute copies within two days after meeting to participants, with electronic PDF copies to K2M Design Inc., City of Key West, participants, and those affected by decisions made.
6. Deliver established keying requirements to manufacturers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion.
   1. Locksets and Cylinders: Three years, minimum.
   2. Other Hardware: Two years, minimum.

PART 2 PRODUCTS

2.01 DESIGN AND PERFORMANCE CRITERIA

A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.

B. Provide individual items of single type, of same model, and by same manufacturer.

C. Provide door hardware products that comply with the following requirements:
   1. Applicable provisions of federal, state, and local codes.
   2. Fire-Rated Doors: NFPA 80, listed and labeled by qualified testing agency for fire protection ratings indicated, based on testing at positive pressure in accordance with NFPA 252 or UL 10C.
   3. Hardware on Fire-Rated Doors: Listed and classified by UL (DIR), ITS (DIR), testing firm acceptable to authorities having jurisdiction, or _____ as suitable for application indicated.

2.02 HINGES

A. Hinges: Comply with BHMA A156.1, Grade 1.
   1. Provide hinges on every swinging door.
   2. Provide following quantity of butt hinges for each door:
      a. Doors up to 60 inches High: Two hinges.
      b. Doors From 60 inches High up to 90 inches High: Three hinges.
      c. Doors 90 inches High up to 120 inches High: Four hinges.
      d. Doors over 120 inches High: One additional hinge per each additional 30 inches in height.

2.03 EXIT DEVICES

A. Exit Devices: Comply with BHMA A156.3, Grade 1.
   1. Lever design to match lockset trim.
   2. Provide cylinder with cylinder dogging or locking trim.
   3. Provide exit devices properly sized for door width and height.
   4. Provide strike as recommended by manufacturer for application indicated.
   5. Provide UL (DIR) listed exit device assemblies for fire-rated doors and panic device assemblies for non-fire-rated doors.

2.04 ELECTRIC STRIKES

A. Electric Strikes: Comply with BHMA A156.31, Grade 1.

1. Provide UL (DIR) listed burglary-resistant electric strike; style to suit locks.
2. Provide non-handed 24 VDC electric strike suitable for door frame material and scheduled lock configuration.

2.05 LOCK CYLINDERS

A. Lock Cylinders: Provide key access on outside of each lock, unless otherwise indicated.
1. Provide cylinders from same manufacturer as locking device.
2. Provide cams and/or tailpieces as required for locking devices.

2.06 CYLINDRICAL LOCKS

A. Cylindrical Locks (Bored): Comply with BHMA A156.2, Grade 1, 4000 Series.
1. Bored Hole: 2-1/8 inch diameter.
2. Latchbolt Throw: 1/2 inch, minimum.
3. Backset: 2-3/4 inch unless otherwise indicated.
4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
a. Finish: To match lock or latch.

2.07 MORTISE LOCKS

A. Mortise Locks: Comply with BHMA A156.13, Grade 1, Security, 1000 Series.
1. Latchbolt Throw: 3/4 inch, minimum.
2. Deadbolt Throw: 1 inch, minimum.
3. Backset: 2-3/4 inch unless otherwise indicated.
4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
a. Finish: To match lock or latch.

2.08 ELECTROMECHANICAL LOCKS

A. Electromechanical Locks: Comply with BHMA A156.25, Grade 1.
1. Provide motor-driven or solenoid-driven locks, with strike that is applicable to frame.
2. Type: Mortise deadbolt.

2.09 DOOR PULLS AND PUSH PLATES

A. Door Pulls and Push Plates: Comply with BHMA A156.6.
1. Pull Type: Straight, unless otherwise indicated.
2. Push Plate Type: Flat, with square corners, unless otherwise indicated.
a. Edges: Beveled, unless otherwise indicated.
3. Material: Aluminum, unless otherwise indicated.

2.10 DOOR PULLS AND PUSH BARS

A. Door Pulls and Push Bars: Comply with BHMA A156.6.
1. Bar Type: Bar set, unless otherwise indicated.
2. Material: Aluminum, unless otherwise indicated.

2.11 COORDINATORS

A. Coordinators: Provide on doors having closers and self-latching or automatic flush bolts to ensure that inactive door leaf closes before active door leaf.
1. Type: Bar, unless otherwise indicated.
2. Material: Aluminum, unless otherwise indicated.
3. Ensure that coordination of other door hardware affected by placement of coordinators and carry bar is applied properly for completely operable installation.

2.12 CLOSERS

A. Closers: Comply with BHMA A156.4, Grade 1.
1. Type: Surface mounted to door.
2. Provide door closer on each exterior door.

2.13 OVERHEAD STOPS AND HOLDERS

A. Overhead Stops and Holders (Door Checks): Comply with BHMA A156.8, Grade 1.
   1. Provide stop for every swinging door, unless otherwise indicated.

2.14 PROTECTION PLATES

A. Protection Plates: Comply with BHMA A156.6.

B. Metal Properties: Aluminum.
   1. Metal, Extra Heavy Duty - Diamond Plate: Thickness 1/8 inch, minimum, with raised diamond plate surface.

C. Edges: Beveled, on four sides unless otherwise indicated.

D. Fasteners: Countersunk screw fasteners.

2.15 COAT HOOKS

A. Coat Hooks: Provide on room side of door, screw fastened.

B. Material: Brass.

2.16 GATE LATCH

A. Gate Latch: Provide to secure a gate used for traffic control to prevent pedestrian traffic into an area, located on inside of gate with turn piece.
   1. Material: Brass.

2.17 PADLOCKS

A. Padlocks: Solid extruded brass case with shackle that locks at heel and toe.
   1. Shackle Height: 3/4 inch, and width of opening is 7/8 inch.
   2. Shackle Material: Brass.
   3. Shackle Diameter: 1/4 inch.
   4. Lock Functions:
      a. Weather cover (WC).
      b. Cut-resistant shackle (XSPL).

2.18 FINISHES

A. Finishes: Provide door hardware of same finish, unless otherwise indicated.
   1. Primary Finish: 626; satin chromium plated over nickel, with brass or bronze base material (former US equivalent US26D); BHMA A156.18.
   2. Secondary Finish: 626; satin chromium plated over nickel, with brass or bronze base material (former US equivalent US26D); BHMA A156.18.
      a. Use secondary finish in kitchens, bathrooms, and other spaces containing chrome or stainless steel finished appliances, fittings, and equipment; provide primary finish on one side of door and secondary finish on other side if necessary.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Install hardware on fire-rated doors and frames in accordance with applicable codes and NFPA 80.

C. Use templates provided by hardware item manufacturer.

D. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.

E. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.02 CLEANING

A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

3.03 PROTECTION

A. Protect finished Work under provisions of Section 01 7000 - Execution and Closeout Requirements.

B. Do not permit adjacent work to damage hardware or finish.

END OF SECTION 08 7100

SECTION 09 0561

COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This section applies to floors identified in contract documents that are receiving the following types of floor coverings:
   1. Thin-set ceramic tile and stone tile.
   2. Epoxy Painted Finish.

B. Removal of existing floor coverings.

C. Preparation of new and existing concrete floor slabs for installation of floor coverings.

D. Testing of concrete floor slabs for moisture and alkalinity (pH).

E. Patching compound.

F. Remedial floor coatings.

1.02 RELATED REQUIREMENTS

A. Section 01 2300 - Alternates: Bid pricing for remediation treatments if required.

B. Section 03 3000 - Cast-in-Place Concrete: Limitations on curing requirements for new concrete floor slabs.

1.03 REFERENCE STANDARDS

A. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens); 2016a.

B. ASTM C472 - Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete; 1999 (Reapproved 2014).

C. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.05 SUBMITTALS

A. Testing Agency's Report:
   1. Description of areas tested; include floor plans and photographs if helpful.
   2. Summary of conditions encountered.
   3. Moisture and alkalinity (pH) test reports.
   4. Copies of specified test methods.
   5. Recommendations for remediation of unsatisfactory surfaces.
   6. Include certification of accuracy by authorized official of testing agency.
   7. Submit report directly to City of Key West.
   8. Submit report not more than two business days after conclusion of testing.

1.06 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Contractor's Responsibility Relating to Independent Agency Testing:
   1. Provide access for and cooperate with testing agency.
   2. Confirm date of start of testing at least 10 days prior to actual start.
   3. Allow at least 4 business days on site for testing agency activities.
   4. Notify City of Key West when specified ambient conditions have been achieved and when testing will start.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer's instructions and recommendations.

B. Deliver materials in manufacturer's packaging; include installation instructions.

PART 2 PRODUCTS

2.01 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
   1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
   2. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.

B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC. In the absence of any recommendation from flooring manufacturer, provide a product recommended by adhesive manufacturer as suitable for substrate and floor covering and for conditions present.

C. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of alkalinity (pH) found, and suitable for adhesion of flooring without further treatment.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Follow recommendations of testing agency.

B. Perform following operations in the order indicated:
   1. Preliminary cleaning.
   2. Specified remediation, if required.
   3. Patching, smoothing, and leveling, as required.
   4. Other preparation specified.
   5. Adhesive bond and compatibility test.
   6. Protection.

C. Remediations:
   1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
   2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.
   3. Excessive Alkalinity (pH): If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound over entire suspect floor area.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.

B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F1869 and as follows.

D. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet per 24 hours.

F. Report: Report the information required by the test method.

3.05 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.06 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.

C. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.

D. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.07 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with requirements and recommendations of floor covering manufacturer.

C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

D. Do not fill expansion joints, isolation joints, or other moving joints.

3.08 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.09 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

3.10 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION 09 0561

SECTION 09 2116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.

B. Metal stud wall framing.

C. Cementitious backing board.

D. Gypsum wallboard.

E. Joint treatment and accessories.

F. Acoustic (sound-dampening) wall and ceiling board.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

B. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

C. Section 09 3000 - Tiling: Tile backing board.

1.03 REFERENCE STANDARDS

A. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).

B. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2015.

C. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board; 2004 (Reapproved 2014).

D. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2014, with Editorial Revision (2015).

E. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2017.

F. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2017a.

G. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2015.

H. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2016.

I. ASTM C1047 - Standard Specification for Accessories For Gypsum Wallboard and Gypsum Veneer Base; 2014a.

J. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2013.

K. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

L. GA-216 - Application and Finishing of Gypsum Panel Products; 2016.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.05 QUALITY ASSURANCE

A. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Fire Rated Assemblies: Provide completed assemblies complying with applicable code.

2.02 METAL FRAMING MATERIALS

A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf.
   1. Studs: "C" shaped with flat or formed webs with knurled faces.
   2. Runners: U shaped, sized to match studs.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. American Gypsum Company: www.americangypsum.com/#sle.
   2. CertainTeed Corporation: www.certainteed.com/#sle.
   3. Continental Building Products: www.continental-bp.com/#sle.
   4. Or approved equal.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
   2. Thickness:
      a. Vertical Surfaces: 5/8 inch.

C. Backing Board For Wet Areas: One of the following products:
   1. Application: Surfaces behind tile in wet areas including tub and shower surrounds, shower ceilings, and _____.
   2. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
      a. Standard Type: Thickness 5/8 inch.
      b. Products:
         1) Georgia-Pacific Gypsum; DensShield Tile Backer.
         2) National Gypsum Company; Gold Bond eXP Tile Backer.
         3) Or approved equal.

2.04 GYPSUM WALLBOARD ACCESSORIES

A. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.

B. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.

C. High Build Drywall Surfacer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.

D. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inch in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion resistant.

E. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.

B. Studs: Space studs at 16 inches on center.
   1. Extend partition framing to structure where indicated and to ceiling in other locations.
   2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.

C. Blocking: Install wood blocking for support of:
   1. Framed openings.
   2. Plumbing fixtures.
   3. Toilet partitions.
   4. Toilet accessories.
   5. Wall mounted door hardware.

3.03 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

C. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

3.04 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.

B. Corner Beads: Install at external corners, using longest practical lengths.

3.05 JOINT TREATMENT

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
   2. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
   3. Level 3: Walls to receive textured wall finish.
   4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
   5. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.

B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch.

C. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.06 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION 09 2116

SECTION 09 3000
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

C. Tile for shower receptors.

D. Non-ceramic trim.

1.02 REFERENCE STANDARDS

A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2014.

B. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

C. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex-Portland Cement; 1999 (Reaffirmed 2010).

D. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 2009 (Revised).

E. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

F. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (Reaffirmed 2010).

G. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2010).

H. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2010).

I. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 1999 (Reaffirmed 2010).

J. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2010 (Reaffirmed 2016).

K. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2010).

L. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2010).

M. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 2013 (Revised).

N. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (Reaffirmed 2016).

O. ANSI A118.10 - American National Standard Specifications for Load Bearing, Bonded, Waterproof Membranes For Thin-Set Ceramic Tile And Dimension Stone Installation; 2014.

P. ANSI A118.15 - American National Standard Specifications for Improved Modified Dry-Set Cement Mortar; 2012.

Q. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2017.

1.03 SUBMITTALS

A. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

B. Samples: (4) Tiles per application to be provided for review.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.05 FIELD CONDITIONS

A. Do not install solvent-based products in an unventilated environment.

B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

PART 2 PRODUCTS

2.01 TILE

A. Manufacturers:
   1. As noted on plans, or approved equal.

2.02 TRIM AND ACCESSORIES

A. Non-Ceramic Trim: Brushed stainless steel, style and dimensions to suit application, for setting using tile mortar or adhesive.
   1. Manufacturers:
      a. Schluter-Systems: www.schluter.com/#sle.
      b. Genesis APS International: www.genesis-aps.com/#sle.
      c. Or approved equal.

2.03 SETTING MATERIALS

A. Manufacturers:
   1. ARDEX Engineered Cements: www.ardexamericas.com/#sle.
   2. Bostik Inc: www.bostik-us.com/#sle.
   3. LATICRETE International, Inc: www.laticrete.com/#sle.
   4. Merkrete, by Parex USA, Inc: www.merkrete.com/#sle.
   5. Or approved equal.

B. Improved Latex-Portland Cement Mortar Bond Coat: ANSI A118.15.
   1. Applications: Use this type of bond coat where indicated and where no other type of bond coat is indicated.
   2. Products:
      a. ARDEX Engineered Cements; S 28: www.ardexamericas.com/#sle.
      b. Custom Building Products; Complete Contact-LFT Premium Rapid Setting Large Format Tile Mortar, with Multi-Surface Bonding Primer: www.custombuildingproducts.com/#sle.
      c. LATICRETE International, Inc; LATICRETE 254 Platinum: www.laticrete.com/#sle.
      d. TEC, an H.B. Fuller Construction Products Brand; TEC 3N1 Performance Mortar: www.tecspecialty.com/#sle.
      e. Or approved equal.

2.04 GROUTS

A. Epoxy Grout: ANSI A118.3 chemical resistant and water-cleanable epoxy grout.
   1. Applications: Where indicated.
   2. Color(s): As selected by K2M Design Inc. from manufacturer's full line.
   3. Products:
      a. ARDEX Engineered Cements; ARDEX WA: www.ardexamericas.com/#sle.
      b. Custom Building Products; CEG-IG 100% Solids Industrial Grade Epoxy Grout: www.custombuildingproducts.com/#sle.

c. LATICRETE International, Inc; LATICRETE SPECTRALOCK PRO Premium Grout: www.laticrete.com/#sle.
d. Merkrete, by Parex USA, Inc; Merkrete Pro Epoxy: www.merkrete.com/#sle.
e. Stuart Dean Company, Inc; Marcoat GS: www.stuartdean.com/#sle.
f. TEC, an H.B. Fuller Construction Products Brand; TEC AccuColor EFX Epoxy Special Effects Grout: www.tecspecialty.com/#sle.
g. Or approved equal.

2.05 MAINTENANCE MATERIALS

A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
1. Applications: Between tile and plumbing fixtures.
2. Color(s): As selected by K2M Design Inc. from manufacturer's full line.
3. Products:
a. ARDEX Engineered Cements; ARDEX SX: www.ardexamericas.com/#sle.
b. Custom Building Products; Commercial 100% Silicone Caulk: www.custombuildingproducts.com/#sle.
c. LATICRETE International, Inc; LATICRETE LATASIL: www.laticrete.com/#sle.
d. Merkrete, by Parex USA, Inc; Merkrete Colored Caulking: www.merkrete.com/#sle.
e. Or approved equal.

2.06 ACCESSORY MATERIALS

A. Waterproofing Membrane at shower: Specifically designed for bonding to cementitious substrate under thick mortar bed or thin-set tile; complying with ANSI A118.10.
1. Fluid or Trowel Applied Type:
a. Material: Synthetic rubber or Acrylic.
b. Products:
1) ARDEX Engineered Cements; ARDEX 8+9: www.ardexamericas.com/#sle.
2) Custom Building Products; RedGard Crack Prevention and Waterproofing Membrane: www.custombuildingproducts.com/#sle.
3) TEC, an H.B. Fuller Construction Products Brand; TEC HydraFlex Waterproofing Crack Isolation Membrane: www.tecspecialty.com/#sle.
4) LATICRETE International, Inc; LATICRETE HYDRO BAN: www.laticrete.com/#sle.
5) Merkrete, by Parex USA, Inc; Merkrete Hydro Guard 2000: www.merkrete.com/#sle.
6) Or approved equal.

B. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 1/2 inch thick; 2 inch wide coated glass fiber tape for joints and corners.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

3.03 INSTALLATION - GENERAL

A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.13, manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install non-ceramic trim in accordance with manufacturer's instructions.

G. Sound tile after setting. Replace hollow sounding units.

H. Keep control and expansion joints free of mortar, grout, and adhesive.

I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

J. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.

3.05 INSTALLATION - SHOWERS AND BATHTUB WALLS

A. At bathtub walls install in accordance with TCNA (HB) Method B412, over cementitious backer units with waterproofing membrane.

B. Grout with standard grout as specified above.

3.06 INSTALLATION - WALL TILE

A. On exterior walls install in accordance with TCNA (HB) Method W244, thin-set over cementitious backer units, with waterproofing membrane.

B. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244, using membrane at toilet rooms.

3.07 CLEANING

A. Clean tile and grout surfaces.

3.08 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION 09 3000

SECTION 09 5100
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 26 5100 - Interior Lighting: Light fixtures in ceiling system.

1.03 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2017.

B. ASTM C635/C635M - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2017.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2014.

E. UL (FRD) - Fire Resistance Directory; Current Edition.

F. UL (GGG) - GREENGUARD Gold Certified Products; Current Edition.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustic Tiles/Panels:
   1. Armstrong World Industries, Inc: www.armstrong.com/#sle.
   2. Acoustic Ceiling Products, Inc: www.acpideas.com/#sle.
   3. CertainTeed Corporation: www.certainteed.com/#sle.
   4. Or approved equal.

B. Suspension Systems:
   1. Same as for acoustical units.

2.02 ACOUSTICAL UNITS

A. Acoustical Units - General: ASTM E1264, Class A.
   1. VOC Content: Certified as Low Emission by one of the following:
      a. Product listing in UL (GGG).

B. Glass Fiber Acoustical Panels Type A: Vinyl faced glass fiber, ASTM E1264 Type XII, with the following characteristics:
   1. Size: 12 by 24 inches.
   2. Thickness: 3/4 inches.
   3. Edge: Square.
   4. Surface Color: White.

C. Glass Fiber Acoustical Panels Type [B]: Vinyl faced glass fiber, ASTM E1264 Type XII, with the following characteristics:
   1. Size: 12 by 72 inches.
   2. Thickness: 3/4 inches.

2.03 SUSPENSION SYSTEM(S)

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required.

B. Exposed Steel Suspension System Type ____: Formed steel, commercial quality cold rolled; heavy-duty.
   1. Finish: White painted.

2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Perimeter Moldings: Same material and finish as grid.
   1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

A. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

B. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

C. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

D. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

E. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

F. Support fixture loads using supplementary hangers located within 6 inches of each corner, or support components independently.

G. Do not eccentrically load system or induce rotation of runners.

H. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.
   2. Overlap and rivet corners.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Make field cut edges of same profile as factory edges.

3.04 SCHEDULE

A. Per Construction Documents

END OF SECTION 09 5100

SECTION 09 9113
EXTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Materials for backpriming woodwork.

D. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.

E. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Floors, unless specifically indicated.
   6. Ceramic and other types of tiles.
   7. Glass.
   8. Concealed pipes, ducts, and conduits.

1.02 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2016.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2016.

D. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.

E. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.04 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes used in any individual system from the same manufacturer; no exceptions.

B. Paints:
   1. Base Manufacturer: Sherwin Williams.

C. Transparent Finishes:
   1. Base Manufacturer: Sherwin Williams.

D. Stains:
   1. Base Manufacturer: Sherwin Williams.

E. Primer Sealers: Same manufacturer as top coats.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready mixed, unless required to be a field-catalyzed paint.
   1. Where MPI paint numbers are specified, provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI categories, except as otherwise indicated.
   2. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   3. Supply each paint material in quantity required to complete entire project's work from a single production run.
   4. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content:
   1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

2.03 PAINT SYSTEMS - EXTERIOR

A. Stucco
   1. Basis of Design:
      a. Paint - Sherwin Williams LX11W0051 - LXN XP EW (2 Coats)
      b. Or approved equal.

B. Fiber-Cement Siding
   1. Basis of Design:
      a. Paint - Sherwin Williams LX11W0051 - LXN XP EW (2 Coats)
      b. Or approved equal.

C. Exterior Stable Doors
   1. Basis of Design:
      a. Paint - Sherwin Williams SD8T00200 - SPRDK LOG H&D FIN (2 Coats)
      b. Or approved equal.

D. Exterior Stable Fencing
   1. Basis of Design:
      a. Primer - Sherwin Williams B51W00620 - PrepRite® ProBlock® Interior/Exterior Latex Primer/Sealer White

b. Paint - Sherwin Williams K44W00051 - Resilience® Exterior Acrylic Latex Gloss Extra White (2 Coats)
c. Or approved equal.

E. Exterior Water Table
1. Basis of Design:
a. Primer - Sherwin Williams LX02W0050 - LXN C&M PRIMER WH
b. Paint - Sherwin Willaims B53W01151 - PI WB ALK UR SG EW (2 Coats)
c. Or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of paints and finishes until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
1. Exterior Plaster and Stucco: 12 percent.
2. Fiber Cement Siding: 12 percent.
3. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

F. Concrete:

G. Masonry:

H. Fiber Cement Siding: Remove dirt, dust and other foreign matter with a stiff fiber brush. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.

I. Exterior Gypsum Board: Fill minor defects with exterior filler compound. Spot prime defects after repair.

J. Exterior Plaster: Fill hairline cracks, small holes, and imperfections with exterior patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

K. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

3.03 APPLICATION

A. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance.

E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

F. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

3.06 COLOR SCHEDULE

A. As scheduled on Construction Documents.

END OF SECTION 09 9113

SECTION 09 9123
INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
   5. Floors, unless specifically indicated.
   6. Glass.
   7. Concealed pipes, ducts, and conduits.

1.02 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2016.

C. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.04 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Paints:
   1. Base Manufacturer: Sherwin Williams.

B. Primer Sealers: Same manufacturer as top coats.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready mixed, unless intended to be a field-catalyzed paint.
   1. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Supply each paint material in quantity required to complete entire project's work from a single production run.
   3. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content:
   1. Provide paints and finishes that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

2.03 PAINT SYSTEMS - INTERIOR

A. Interior Drywall Walls & Ceilings
   1. Basis of Design:
      a. Primer - Sherwin Williams B28W08000 - PVA Drywall Primer & Sealer White
      b. Paint - Sherwin Williams D16W00151 - Cashmere® Interior Acrylic Flat Enamel Extra White (2 Coats)
      c. Or approved equal.

B. Interior Trim
   1. Basis of Design:
      a. Primer - Sherwin Williams B79W00450 - Multi-Purpose Waterbased Acrylic-Alkyd Primer White
      b. Paint - Sherwin Williams B53W01151 - PI WB ALK UR SG EW (2 Coats)
      c. Or approved equal.

C. Interior Durrock Ceilings
   1. Basis of Design:
      a. Paint - Sherwin Williams D16W00151 - B66W01551 - PI MULTI ACR SG EW (2 Coats)
      b. Or approved equal.

D. Interior CMU Walls
   1. Basis of Design:
      a. Primer - Sherwin Williams B42W00150 - PI HD BLOCK FILLER
      b. Paint - B73W00311 - Pro Industrial Waterbased Epoxy Gloss (Part A) Extra White / Tint Base (2 Coats)
      c. Or approved equal.

E. Interior Durrock Walls
   1. Basis of Design:
      a. Primer - Sherwin Williams LX02W0050 - LXN C&M PRIMER WH
      b. Paint - B73W00311 - Pro Industrial Waterbased Epoxy Gloss (Part A) Extra White / Tint Base (2 Coats)
      c. Or approved equal.

2.04 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Gypsum Wallboard: 12 percent.
   2. Interior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Masonry:
   1. Prepare surface as recommended by top coat manufacturer.

F. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

G. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

3.03 APPLICATION

A. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

C. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

D. Sand wood and metal surfaces lightly between coats to achieve required finish.

E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

F. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

3.07 COLOR SCHEDULE

A. As scheduled on Construction Documents.

END OF SECTION 09 9123

SECTION 09 9600
HIGH-PERFORMANCE COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. High performance coatings.

B. Surface preparation.

1.02 RELATED REQUIREMENTS

A. Section 09 9113 - Exterior Painting.

1.03 REFERENCE STANDARDS

A. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of coating, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Coating Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

A. Do not install materials when temperature is below 55 degrees F or above 90 degrees F.

B. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.

C. Restrict traffic from area where coating is being applied or is curing.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. High-Performance Coatings:
   1. Basis of Design: Sherwin Williams.
      a. Epoxy Painted Floor - Storage Rooms
         1) Base Coat - Sherwin Williams B70W08111 - AS FPLX 8100 EXW A (2 Coats)
         2) Hardener - Sherwin Williams B70V08100 - AS FPLX 8100 B (2 Coats)
   2. Or approved equal.

2.02 TOP COAT MATERIALS

A. Coatings - General: Provide complete multi-coat systems formulated and recommended by manufacturer for the applications indicated, in the thicknesses indicated; number of coats specified does not include primer or filler coat.

B. Shellac: Pure, white type.

2.03 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of coated surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Do not begin application of coatings until substrates have been properly prepared.

C. Verify that substrate surfaces are ready to receive work as instructed by the coating manufacturer. Obtain and follow manufacturer's instructions for examination and testing of substrates.

D. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

3.02 PREPARATION

A. Clean surfaces of loose foreign matter.

B. Remove substances that would bleed through finished coatings. If unremovable, seal surface with shellac.

C. Remove finish hardware, fixture covers, and accessories and store.

D. Protect adjacent surfaces and materials not receiving coating from spatter and overspray; mask if necessary to provide adequate protection. Repair damage.

3.03 PRIMING

A. Apply primer to all surfaces, unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

3.04 COATING APPLICATION

A. Apply coatings in accordance with manufacturer's written instructions, to thicknesses specified and recommendations in "MPI Architectural Painting and Specification Manual".

B. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.

3.06 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. Clean surfaces immediately of overspray, splatter, and excess material.

C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.07 PROTECTION

A. Protect finished work from damage.

3.08 SCHEDULE

A. Colors: As indicated on Finish Schedule.

END OF SECTION 09 9600

SECTION 10 2113.13
METAL TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal toilet compartments.

B. Urinal and Vestibule screens.

C. Shower compartments.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Blocking and supports.

B. Section 10 2800 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

A. ASTM A424/A424M - Standard Specification for Steel, Sheet, for Porcelain Enameling; 2009a (Reapproved 2016).

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

A. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall, floor, and ceiling supports, door swings.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Toilet Compartments:
   1. All American Metal Corp - AAMCO; _____: www.allamericanmetal.com/#sle.
   2. General Partitions Mfg. Corp; ____: www.generalpartitions.com/#sle.
   3. Global Steel Products Corp; ____: www.globalpartitions.com/#sle.
   4. or approved equal.

2.02 MATERIALS

A. Stainless Steel Sheet: ASTM A666, Type 304.

2.03 COMPONENTS

A. Toilet Compartments: Stainless steel, floor-mounted unbraced.

B. Doors, Panels, and Pilasters: Sheet steel faces, pressure bonded to sound deadening core, formed and closed edges; corners made with corner clips or mitered, welded, and ground smooth.

C. Door and Panel Dimensions:
   1. Thickness: 1 inch.
   2. Door Width: 24 inch.
   3. Door Width for Handicapped Use: 36 inch, out-swinging.
   4. Height: 58 inch.

D. Urinal Screens: Wall mounted with two panel brackets, and floor-to-ceiling vertical upright consisting of pilaster anchored to floor and ceiling.

2.04 ACCESSORIES

A. Pilaster Shoes: Formed ASTM A666, Type 304 stainless steel with No. 4 finish, 3 inch high, concealing floor fastenings.

B. Brackets: Polished chrome-plated non-ferrous cast metal.

C. Hardware: Polished chrome plated non-ferrous cast metal:
   1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.
   2. Thumb turn or sliding door latch with exterior emergency access feature.
   3. Door strike and keeper with rubber bumper; mounted on pilaster in alignment with door latch.
   4. Coat hook with rubber bumper; one per compartment, mounted on door.
   5. Provide door pull for outswinging doors.

2.05 FINISHING

A. Stainless Steel Compartments: No. 4 finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that field measurements are as indicated.

C. Verify correct spacing of and between plumbing fixtures.

D. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

3.03 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.

B. Adjust hinges to position doors in partial opening position when unlatched. Return out swinging doors to closed position.

C. Adjust adjacent components for consistency of line or plane.

3.04 SCHEDULES

A. As indicated on plans.

END OF SECTION 10 2113.13

SECTION 10 2800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Commercial toilet accessories.

B. Commercial shower and bath accessories.

C. Electric hand/hair dryers.

D. Diaper changing stations.

1.02 RELATED REQUIREMENTS

A. Section 10 2113.13 - Metal Toilet Compartments.

B. Section 22 4000 - Plumbing Fixtures: Under-lavatory pipe and supply covers.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

D. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2004, with Editorial Revision (2016).

E. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

A. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

B. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Commercial Toilet, Shower, and Bath Accessories:
   1. AJW Architectural Products: www.ajw.com/#sle.
   2. American Specialties, Inc: www.americanspecialties.com/#sle.
   3. Georgia-Pacific Professional: www.blue-connect.com/#sle.
   4. Or approved equal.

B. Electric Hand/Hair Dryers:
   1. American Dryer, Inc: www.americandryer.com/#sle.
   2. Excel Dryer: www.exceldryer.com/#sle.
   3. Dyson; www.dyson.com
   4. World Dryer Corporation: www.worlddryer.com/#sle.
   5. Or approved equal..

C. Diaper Changing Stations:
   1. American Specialties, Inc: www.americanspecialties.com/#sle.
   2. Diaper Deck & Company: www.diaperdeck.com/#sle.
   3. Koala Kare Products: www.koalabear.com/#sle.
   4. Or approved equal.

D. Provide products of each category type by single manufacturer.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.

B. Keys: Provide 4 keys for each accessory to City of Key West; master key lockable accessories.

C. Stainless Steel Sheet: ASTM A666, Type 304.

2.03 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.

2.04 COMMERCIAL TOILET ACCESSORIES

A. Toilet Paper Dispenser: Double roll, surface mounted bracket type, stainless steel, spindleless type for tension spring delivery designed to prevent theft of tissue roll.

B. Waste Receptacle: Stainless steel, freestanding style with swing top.

C. Mirrors: Stainless steel framed, 1/4 inch thick polished stainless steel.

D. Grab Bars: Stainless steel, smooth surface.
   1. Heavy Duty Grab Bars: Floor supports are acceptable if necessary to achieve load rating.
      a. Push/Pull Point Load: Minimum 1000 pound-force, minimum.
      b. Dimensions: 1-1/2 inch outside diameter, minimum 0.125 inch wall thickness, exposed flange mounting, 1-1/2 inch clearance between wall and inside of grab bar.
      c. Length and Configuration: As indicated on drawings.

E. Purse Shelf: Fold-down, with spring-loaded hinge designed to automatically return shelf to vertical position when not in use; 0.03 inch satin-finished stainless steel, with 1/4 inch rolled or 1/2 inch channel edge at shelf front.

2.05 COMMERCIAL SHOWER AND BATH ACCESSORIES

A. Shower Curtain Rod: Stainless steel tube, 1 inch outside diameter, 0.04 inch wall thickness, satin-finished, with 3 inch outside diameter, minimum 0.04 inch thick satin-finished stainless steel flanges, for installation with exposed fasteners.

B. Folding Shower Seat: Wall-mounted surface; welded tubular seat frame, structural support members, swing-down legs, hinges, and mechanical fasteners of Type 304 stainless steel, L-shaped, right hand seat.
   1. Seat: One-piece, pan-type, 0.05 inch stainless steel sheet, Type 304. Weld seams and grind smooth.
   2. Size: ADA Standards compliant.

C. Wall-Mounted Soap Dish: Heavy duty, seamless stainless steel, surface-mounted with drain holes, without grab bar, satin finish; with concealed mechanical fastening suitable for substrate and backplate.

D. Towel Bar: Stainless steel, 3/4 inch square tubular bar; rectangular brackets, concealed attachment, satin finish.

E. Towel Ring: Stainless steel, 2-1/2 inch extension from wall, with 1/4 inch diameter trapezoidal shaped ring, rectangular-shaped bracket and backplate for concealed attachment, satin finish.

F. Robe Hook: Heavy-duty stainless steel, single-prong, rectangular-shaped bracket and backplate for concealed attachment, satin finish.

2.06 ELECTRIC HAND/HAIR DRYERS

A. Electric Hand Dryers: Traditional fan-in-case type, with downward fixed nozzle.
   1. Operation: Automatic, sensor-operated on and off.
   2. Mounting: Surface mounted.
   3. Cover: Stainless steel with brushed finish.
      a. Tamper-resistant screw attachment of cover to mounting plate.
   4. Electric Hand Dryer Products:

a. Basis of Design:
   1) Dryson Airblad V Hand Dryer - https://www.dyson.com/hand-dryers.html

2.07 DIAPER CHANGING STATIONS

A. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
   1. Material: Stainless steel.
   2. Mounting: Surface.
   3. Minimum Rated Load: 250 pounds.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. For electrically-operated accessories, verify that electrical power connections are ready and in the correct locations.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.

B. Install plumb and level, securely and rigidly anchored to substrate.

C. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION 10 2800

SECTION 22 0516

EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flexible pipe connectors.

B. Expansion joints and compensators.

C. Pipe loops, offsets, and swing joints.

1.02 RELATED REQUIREMENTS

A. Section 21 0500 - Common Work Results for Fire Suppression.

B. Section 22 1005 - Plumbing Piping.

1.03 REFERENCE STANDARDS

A. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2015.

B. ASME B16.5 - Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard; 2017.

C. ASME B16.11 - Forged Fittings, Socket-welding and Threaded; 2016 (Errata 2017).

D. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2015a.

E. EJMA (STDS) - EJMA Standards; Tenth Edition.

F. FM (AG) - FM Approval Guide; current edition.

G. ITS (DIR) - Directory of Listed Products; current edition.

H. UL (DIR) - Online Certifications Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data:

1. Flexible Pipe Connectors: Indicate maximum temperature and pressure rating, face-to-face length, live length, hose wall thickness, hose convolutions per foot and per assembly, fundamental frequency of assembly, braid structure, and total number of wires in braid.
2. Expansion Joints: Indicate maximum temperature and pressure rating, and maximum expansion compensation.

PART 2 PRODUCTS

2.01 FLEXIBLE PIPE CONNECTORS - COPPER PIPING

A. Manufacturers:

1. Mercer Rubber Company; _____: www.mercer-rubber.com/#sle.
2. The Metraflex Company; _____: www.metraflex.com/#sle.
3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 EXPANSION JOINTS - STAINLESS STEEL BELLOWS TYPE

A. Manufacturers:

1. Mercer Rubber Company; _____: www.mercer-rubber.com/#sle.
2. The Metraflex Company; _____: www.metraflex.com/#sle.
3. Substitutions: See Section 01 6000 - Product Requirements.

2.03 EXPANSION JOINTS - EXTERNAL RING CONTROLLED STAINLESS STEEL BELLOWS TYPE

A. Manufacturers:

1. Substitutions: See Section 01 6000 - Product Requirements.

2.04 EXPANSION JOINTS - SINGLE SPHERE, ELBOW COMPENSATOR

A. Manufacturers:
   1. Mercer Rubber Company; _____: www.mercer-rubber.com/#sle.
   2. The Metraflex Company; _____: www.metraflex.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.05 EXPANSION JOINTS - TWO-PLY BRONZE BELLOWS TYPE

A. Manufacturers:
   1. Mercer Rubber Company; _____: www.mercer-rubber.com/#sle.
   2. The Metraflex Company; _____: www.metraflex.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.06 EXPANSION JOINTS - LOW PRESSURE COMPENSATOR WITH TWO-PLY BRONZE BELLOWS

A. Manufacturers:
   1. Mercer Rubber Company; _____: www.mercer-rubber.com/#sle.
   2. The Metraflex Company; _____: www.metraflex.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with EJMA (Expansion Joint Manufacturers Association) Standards.

C. Install flexible pipe connectors on pipes connected to vibration isolated equipment. Provide line size flexible connectors.

D. Install flexible connectors at right angles to displacement. Install one end immediately adjacent to isolated equipment and anchor other end. Install in horizontal plane unless indicated otherwise.

END OF SECTION 22 0516

SECTION 22 0517

SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe sleeves.

B. Manufactured sleeve-seal systems.

1.02 RELATED REQUIREMENTS

A. Section 07 8400 - Firestopping.

B. Section 09 9123 - Interior Painting: Preparation and painting of interior piping systems.

C. Section 22 0523 - General-Duty Valves for Plumbing Piping.

D. Section 22 0553 - Identification for Plumbing Piping and Equipment: Piping identification.

E. Section 22 0719 - Plumbing Piping Insulation.

1.03 REFERENCE STANDARDS

A. ASTM C592 - Standard Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type); 2016.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a (Reapproved 2017).

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified this section.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store sleeve and sleeve seals in shipping containers, with labeling in place.

B. Provide temporary protective coating on cast iron and steel sleeves if shipped loose.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 PIPE SLEEVES

A. Manufacturers:
   1. Flexicraft Industries; Pipe Wall Sleeve: www.flexicraft.com/#sle.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Vertical Piping:
   1. Sleeve Length: 1 inch above finished floor.
   2. Provide sealant for watertight joint.
   3. Blocked Out Floor Openings: Provide 1-1/2 inch angle set in silicon adhesive around opening.
   4. Drilled Penetrations: Provide 1-1/2 inch angle ring or square set in silicone adhesive around penetration.

2.02 MANUFACTURED SLEEVE-SEAL SYSTEMS

A. Manufacturers:
   1. Flexicraft Industries; PipeSeal: www.flexicraft.com/#sle.
   2. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and foreign material, from inside and outside, before assembly.

3.02 INSTALLATION

A. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.

B. Install piping to conserve building space, to not interfere with use of space and other work.

C. Install piping and pipe sleeves to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

D. Inserts:
   1. Provide inserts for placement in concrete formwork.

E. Structural Considerations:
   1. Do not penetrate building structural members unless indicated.

F. Provide sleeves when penetrating footings, floors, walls, partitions, and _____. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.

G. Manufactured Sleeve-Seal Systems:
   1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
   2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
   3. Locate piping in center of sleeve or penetration.
   4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
   5. Tighten bolting for a water-tight seal.
   6. Install in accordance with manufacturer's recommendations.

H. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

3.03 CLEANING

A. Upon completion of work, clean all parts of the installation.

B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

C. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

END OF SECTION 22 0517

SECTION 22 0523
GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Applications.

B. General requirements.

C. Ball valves.

D. Check valves.

1.02 RELATED REQUIREMENTS

A. Section 22 0719 - Plumbing Piping Insulation.

B. Section 22 1005 - Plumbing Piping.

1.03 ABBREVIATIONS AND ACRONYMS

A. CWP: Cold working pressure.

1.04 REFERENCE STANDARDS

A. ASME B1.20.1 - Pipe Threads, General Purpose (Inch); 2013.

B. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; 2015.

C. ASME B16.5 - Pipe Flanges and Flanged Fittings NPS 1/2 Through NPS 24 Metric/Inch Standard; 2017.

D. ASME B16.10 - Face-to-Face and End-to-End Dimensions of Valves; 2017.

E. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2012.

F. ASME B16.34 - Valves - Flanged, Threaded and Welding End; 2017.

G. ASME B31.9 - Building Services Piping; 2014.

H. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing and Fusing Operators; 2017.

I. ASTM A126 - Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings; 2004 (Reapproved 2014).

J. ASTM A536 - Standard Specification for Ductile Iron Castings; 1984 (Reapproved 2014).

K. ASTM B61 - Standard Specification for Steam or Valve Bronze Castings; 2015.

L. ASTM B62 - Standard Specification for Composition Bronze or Ounce Metal Castings; 2017.

M. AWWA C606 - Grooved and Shouldered Joints; 2015.

N. MSS SP-71 - Cast Iron Swing Check Valves, Flanged and Threaded Ends; 2011, with Errata (2013).

O. MSS SP-72 - Ball Valves with Flanged or Butt-Welding Ends for General Service; 2010a.

P. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves; 2013.

Q. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

C. Warranty: Submit manufacturer warranty and ensure that forms have been completed in City of Key West's name and registered with manufacturer.

D. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listings.

1.06 QUALITY ASSURANCE

A. Manufacturer:
   1. Obtain valves for each valve type from single manufacturer.

B. Welding Materials and Procedures: Comply with ASME BPVC-IX.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Prepare valves for shipping as follows:
   1. Minimize exposure of operable surfaces by setting plug and ball valves to open position.
   2. Protect valve parts exposed to piped medium against rust and corrosion.
   3. Protect valve piping connections such as grooves, weld ends, threads, and flange faces.

B. Use the following precautions during storage:
   1. Maintain valve end protection and protect flanges and specialties from dirt.
      a. Provide temporary inlet and outlet caps.
      b. Maintain caps in place until installation.
   2. Store valves in shipping containers and maintain in place until installation.
      a. Store valves indoors in dry environment.
      b. Store valves off the ground in watertight enclosures when indoor storage is not an option.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. See drawings for specific valve locations.

B. Provide the following valves for the applications if not indicated on drawings:
   1. Shutoff: Ball, butterfly, gate.

C. Substitutions of valves with higher CWP classes or SWP ratings for same valve types are permitted when specified CWP ratings or SWP classes are not available.

D. Required Valve End Connections for Non-Wafer Types:
   1. Copper Tube:
      a. 2 NPS and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
      b. 2-1/2 NPS to 4 NPS: Grooved or flanged ends except where threaded valve-end option is indicated in valve schedules below.
      c. 5 NPS and Larger: Grooved or flanged ends.

E. Domestic, Hot and Cold Water Valves:
   1. 2 NPS and Smaller:
      a. Bronze and Brass: Provide with solder-joint or _____ ends.
      b. Bronze Angle: Class 125, bronze disc.
      c. Ball: One piece, full port, brass or _____ with brass trim.
   2. 2-1/2 NPS and Larger:
      a. Iron, 2-1/2 NPS to 4 NPS: Provide with threaded ends.
      b. Iron Ball: Class 150.

2.02 GENERAL REQUIREMENTS

A. Valve Pressure and Temperature Ratings: No less than rating indicated; as required for system pressures and temperatures.

B. Valve Sizes: Match upstream piping unless otherwise indicated.

C. Valves in Insulated Piping: With 2 NPS stem extensions and the following features:
   1. Ball Valves: Extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.

D. Valve-End Connections:
   1. Threaded End Valves: ASME B1.20.1.

2. Flanges on Iron Valves: ASME B16.1 for flanges on iron valves.
3. Pipe Flanges and Flanged Fittings 1/2 NPS through 24 NPS: ASME B16.5.
4. Solder Joint Connections: ASME B16.18.
5. Grooved End Connections: AWWA C606.

E. General ASME Compliance:
1. Ferrous Valve Dimensions and Design Criteria: ASME B16.10 and ASME B16.34.
2. Solder-joint Connections: ASME B16.18.
3. Building Services Piping Valves: ASME B31.9.

2.03 BRASS BALL VALVES

A. One-Piece, Reduced-Port with Brass Trim:
1. Comply with MSS SP-110.
2. Body: Forged brass.
3. Ends: Threaded.
4. Seats: PTFE or ____.
5. Stem: Brass.
6. Ball: Chrome-plated brass.

B. Two Piece, Full Port and _____ with Brass Trim:
1. Comply with MSS SP-110.
2. SWP Rating: 150 psig.
3. CWP Rating: 600 psig.
4. Body: Forged brass.
5. Ends: Threaded.
6. Seats: PTFE.

C. Three Piece, Full Port with Stainless Steel Trim:
1. Comply with MSS SP-110.
2. SWP Rating: 150 psig.
3. CWP Rating: 600 psig.
4. Body: Forged brass.
5. Ends: Threaded.
6. Seats: PTFE or ____.

2.04 BRONZE BALL VALVES

A. One Piece, Reduced Port with Bronze Trim:
1. Comply with MSS SP-110.
2. SWP Rating: 400 psig.
3. CWP Rating: 600 psig.
4. Body: Bronze.
5. Ends: Threaded.
6. Seats: PTFE or ____.

B. Two Piece, Regular Port and _____ with Bronze Trim:
1. Comply with MSS SP-110.
2. SWP Rating: 150 psig.
3. CWP Rating: 600 psig.
4. Body: Bronze.
5. Ends: Threaded.
6. Seats: PTFE or ____.

C. Three Piece, Full Port with Stainless Steel Trim:
1. Comply with MSS SP-110.
2. SWP Rating: 150 psig.
3. CWP Rating: 600 psig.
4. Body: Bronze.
5. Ends: Threaded.

6. Seats: PTFE or ____

2.05 IRON BALL VALVES

A. Class 125, Full Port, Stainless Steel Trim:
   1. Comply with MSS SP-72.
   2. CWP Rating: 200 psig.
   3. Body: ASTM A536, Grade 65-45-12, ductile iron.
   4. Ends: Flanged.
   5. Seats: PTFE or _____.
   6. Operator: Lever, with locking handle.

2.06 BRONZE LIFT CHECK VALVES

A. Class 125:
   1. Comply with MSS SP-80, Type 1, Metal Disc to Metal Seat and Type 2, Nonmetallic Disc to Metal Seat.
   2. CWP Rating: 200 psig.
   3. Design: Vertical flow.
   4. Body: Comply with ASTM B61 or ASTM B62, bronze.
   5. Ends: Threaded as indicated.

2.07 BRONZE SWING CHECK VALVES

A. Class 125: CWP Rating: 200 psig (1380 kPa).
   1. Comply with MSS SP-80, Type 3.
   2. Design: Horizontal flow.
   3. Body: Bronze, ASTM B62.
   4. Ends: Threaded as indicated.
   5. Disc: Bronze.

2.08 IRON SWING CHECK VALVES

A. Class 125:
   1. Comply with MSS SP-71, Type I.
   2. CWP Rating: 200 psig.
   3. Design: Clear or full waterway.
   4. Body: ASTM A126, gray iron with bolted bonnet.
   5. Ends: Flanged as indicated.
   6. Trim: Composition.
   7. Seat Ring and Disc Holder: Bronze.
   8. Disc: PTFE or ____.
   9. Gasket: Asbestos free.

2.09 IRON SWING CHECK VALVES WITH CLOSURE CONTROL

A. Class 125 with Lever and Spring-Closure Control.
   1. Comply with MSS SP-71, Type I.
   2. Description:
      a. CWP Rating: 200 psig.
      b. Design: Clear or full waterway.
      c. Body: ASTM A126, gray iron with bolted bonnet.
      d. Ends: Flanged as indicated.
      e. Trim: Bronze.
      f. Gasket: Asbestos free.
      g. Closer Control: Factory installed, exterior lever, and weight.

2.10 IRON GROOVED-END SWING CHECK VALVES

A. 300 CWP:
   1. CWP Rating: 300 psig.
   2. Body: ASTM A536, Grade 65-45-12 ductile iron.

3. Seal: EPDM or ____.
4. Disc: Ductile iron.
5. Coating: Black, non-lead paint.

PART 3 EXECUTION

3.01 EXAMINATION

A. Discard all packing materials and verify that valve interior, including threads and flanges are completely clean without signs of damage or degradation that could result in leakage.

B. Verify valve parts to be fully operational in all positions from closed to fully open.

C. Confirm gasket material to be suitable for the service, to be of correct size, and without defects that could compromise effectiveness.

D. Should valve is determined to be defective, replace with new valve.

3.02 INSTALLATION

A. Provide unions or flanges with valves to facilitate equipment removal and maintenance while maintaining system operation and full accessibility for servicing.

B. Provide separate valve support as required and locate valve with stem at or above center of piping, maintaining unimpeded stem movement.

C. Where valve support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds.

D. Install check valves where necessary to maintain direction of flow as follows:
1. Lift Check: Install with stem plumb and vertical.
2. Swing Check: Install horizontal maintaining hinge pin level.
3. Orient plate-type into horizontal or vertical position, between flanges.

END OF SECTION 22 0523

SECTION 22 0529

HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Support and attachment components for equipment, piping, and other plumbing work.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete equipment pads.

1.03 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2015.

D. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2014.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

F. MFMA-4 - Metal Framing Standards Publication; 2004.

G. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.
   2. Coordinate the work with other trades to provide additional framing and materials required for installation.
   3. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.
   4. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.
   5. Notify K2M Design Inc. of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

B. Sequencing:
   1. Do not install products on or provide attachment to concrete surfaces until concrete has fully cured in accordance with Section 03 3000.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for metal channel (strut) framing systems, non-penetrating rooftop supports, post-installed concrete and masonry anchors, and thermal insulated pipe supports.
   1. Fiberglass Channel (Strut) Framing Systems: Include requirements for strength derating according to ambient temperature.

C. Shop Drawings: Include details for fabricated hangers and supports where materials or methods other than those indicated are proposed for substitution.
   1. Application of protective inserts, saddles, and shields at pipe hangers for each type of insulation and hanger.

1.06 QUALITY ASSURANCE

A. Comply with applicable building code.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store products in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:
   1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of plumbing work.
   2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
   3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported. Include consideration for vibration, equipment operation, and shock loads where applicable.
   4. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
      a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
      b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Metal Channel (Strut) Framing Systems:
   1. Comply with MFMA-4.

C. Fiberglass Channel (Strut) Framing Systems: Factory-fabricated continuous-slot fiberglass channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
   1. Flammability: Fire retardant with NFPA 101, Class A flame spread index (maximum of 25) when tested in accordance with ASTM E84; self-extinguishing in accordance with ASTM D635.

D. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
   1. Minimum Size, Unless Otherwise Indicated or Required:
      a. Equipment Supports: 1/2 inch diameter.
      b. Piping up to 1 inch (27 mm) nominal: 1/4 inch diameter.
      c. Piping larger than 1 inch (27 mm) nominal: 3/8 inch diameter.

E. Anchors and Fasteners:
   1. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.

C. Unless specifically indicated or approved by K2M Design Inc., do not provide support from suspended ceiling support system or ceiling grid.

D. Unless specifically indicated or approved by K2M Design Inc., do not provide support from roof deck.

E. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.

F. Equipment Support and Attachment:

1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.

G. Secure fasteners according to manufacturer's recommended torque settings.

H. Remove temporary supports.

3.02 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect support and attachment components for damage and defects.

C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION 22 0529

SECTION 22 0553

IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nameplates.

B. Tags.

1.02 RELATED REQUIREMENTS

A. Section 09 9123 - Interior Painting: Identification painting.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 IDENTIFICATION APPLICATIONS

A. Piping: Tags.

B. Pumps: Nameplates.

C. Tanks: Nameplates.

2.02 NAMEPLATES

A. Description: Laminated three-layer plastic with engraved letters.
   1. Letter Color: White.
   2. Letter Height: 1/4 inch.
   3. Background Color: Black.

2.03 TAGS

A. Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2 inch diameter.

B. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.

B. Install tags with corrosion resistant chain.

C. Apply stencil painting in accordance with Section 09 9123.

D. Install plastic pipe markers in accordance with manufacturer's instructions.

END OF SECTION 22 0553

SECTION 22 0719
PLUMBING PIPING INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Piping insulation.

1.02 RELATED REQUIREMENTS

A. Section 07 8400 - Firestopping.

B. Section 22 1005 - Plumbing Piping: Placement of hangers and hanger inserts.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years of documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site, labeled with manufacturer's identification, product density, and thickness.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 GLASS FIBER

2.03 FLEXIBLE REMOVABLE AND REUSABLE BLANKET INSULATION

A. Manufacturers:
   1. Auburn Manufacturing Inc; Ever Green Cut 'n Wrap: www.auburnmfg.com/#sle.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Insulation: ASTM C553 Type V; flexible, noncombustible.
   1. K Value: 0.37 at 100 degrees F, when tested in accordance with ASTM C177 or ASTM C518.
   2. Maximum Service Temperature: 150 degrees F.

2.04 EXPANDED POLYSTYRENE

A. Insulation: ASTM C578; rigid closed cell.
   1. K Value: 0.23 at 75 degrees F.
   2. Maximum Service Temperature: 165 degrees F.
   3. Maximum Water Vapor Permeance: 5.0 perms.

2.05 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

A. Manufacturer:
   1. Aeroflex USA, Inc: www.aeroflexusa.com/#sle.
   2. Armacell LLC; AP Armaflex: www.armacell.us/#sle.
   3. K-Flex USA LLC; Insul-Tube: www.kflexusa.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1; use molded tubular material wherever possible.
   1. Minimum Service Temperature: 60 degrees F.
   2. Maximum Service Temperature: 220 degrees F.
   3. Connection: Waterproof vapor barrier adhesive.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with North American Insulation Manufacturers Association (NAIMA) National Insulation Standards.

C. Exposed Piping: Locate insulation and cover seams in least visible locations.

D. Insulated pipes conveying fluids below ambient temperature: Insulate entire system including fittings, valves, unions, flanges, strainers, flexible connections, pump bodies, and expansion joints.

E. Install cellular melamine with factory-applied jackets with a manufacturer-approved adhesive along seams, both straight lap joints and circumferential lap joints.
   1. Install seal over seams with factory-approved room temperature vulcanization (RTV) silicone sealant to ensure a positive vapor barrier seal in outdoor and sanitary washdown environments.

F. Glass fiber insulated pipes conveying fluids below ambient temperature:
   1. Provide vapor barrier jackets, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples and vapor barrier mastic.
   2. Insulate fittings, joints, and valves with molded insulation of like material and thickness as adjacent pipe. Finish with glass cloth and vapor barrier adhesive or PVC fitting covers.

G. For hot piping conveying fluids 140 degrees F or less, do not insulate flanges and unions at equipment, but bevel and seal ends of insulation.

H. Glass fiber insulated pipes conveying fluids above ambient temperature:
   1. Provide standard jackets, with or without vapor barrier, factory-applied or field-applied. Secure with self-sealing longitudinal laps and butt strips with pressure sensitive adhesive. Secure with outward clinch expanding staples.
   2. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe. Finish with glass cloth and adhesive or PVC fitting covers.

I. Inserts and Shields:
   1. Application: Piping 1-1/2 inches diameter or larger.
   2. Shields: Galvanized steel between pipe hangers or pipe hanger rolls and inserts.
   3. Insert Location: Between support shield and piping and under the finish jacket.
   4. Insert Configuration: Minimum 6 inches long, of same thickness and contour as adjoining insulation; may be factory fabricated.
   5. Insert Material: Hydrous calcium silicate insulation or other heavy density insulating material suitable for the planned temperature range.

J. Continue insulation through walls, sleeves, pipe hangers, and other pipe penetrations. Finish at supports, protrusions, and interruptions. At fire separations, refer to Section 07 8400.

K. Pipe Exposed in Mechanical Equipment Rooms or Finished Spaces (less than 10 feet above finished floor): Finish with canvas jacket sized for finish painting.

3.02 SCHEDULES

A. Plumbing Systems:
   1. Domestic Hot Water Supply:
   2. Domestic Hot Water Recirculation:
   3. Domestic Cold Water:

END OF SECTION 22 0719

SECTION 22 1005
PLUMBING PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe, pipe fittings, specialties, and connections for piping systems.
   1. Sanitary sewer.
   2. Domestic water.
   3. Flanges, unions, and couplings.
   4. Pipe hangers and supports.
   5. Valves.
   6. Check.
   7. Water pressure reducing valves.
   8. Relief valves.
   9. Strainers.

1.02 RELATED REQUIREMENTS

A. Section 08 3100 - Access Doors and Panels.

B. Section 09 9113 - Exterior Painting.

C. Section 09 9123 - Interior Painting.

D. Section 22 0516 - Expansion Fittings and Loops for Plumbing Piping.

E. Section 22 0548 - Vibration and Seismic Controls for Plumbing Piping and Equipment.

F. Section 22 0553 - Identification for Plumbing Piping and Equipment.

G. Section 22 0719 - Plumbing Piping Insulation.

H. Section 33 0110.58 - Disinfection of Water Utility Piping Systems.

1.03 REFERENCE STANDARDS

A. ANSI Z21.22 - American National Standard for Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems; 2015.

B. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2012.

C. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2013.

D. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV; 2016.

E. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV; 2012.

F. ASME B31.9 - Building Services Piping; 2014.

G. ASME BPVC-IV - Boiler and Pressure Vessel Code, Section IV - Rules for Construction of Heating Boilers; 2017.

H. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Welding, Brazing, and Fusing Procedures; Welders; Brazers; and Welding, Brazing and Fusing Operators; 2017.

I. ASSE 1003 - Performance Requirements for Water Pressure Reducing Valves for Domestic Water Distribution Systems; 2009.

J. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings; 1999 (Reapproved 2014).

K. ASTM A74 - Standard Specification for Cast Iron Soil Pipe and Fittings; 2017.

L. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

M. ASTM A269/A269M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2015a.

N. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).

O. ASTM B42 - Standard Specification for Seamless Copper Pipe, Standard Sizes; 2015a.

P. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2016.

Q. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2016.

R. ASTM B813 - Standard Specification for Liquid and Paste Fluxes for Soldering of Copper and Copper Alloy Tube; 2016.

S. ASTM B828 - Standard Practice for Making Capillary Joints by Soldering of Copper and Copper Alloy Tube and Fittings; 2016.

T. ASTM C425 - Standard Specification for Compression Joints for Vitrified Clay Pipe and Fittings; 2004 (Reapproved 2013).

U. ASTM C564 - Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings; 2014.

V. ASTM C700 - Standard Specification for Vitrified Clay Pipe, Extra Strength, Standard Strength, and Perforated; 2013.

W. ASTM D2235 - Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings; 2004 (Reapproved 2016).

X. ASTM D2564 - Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems; 2012.

Y. ASTM D2665 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings; 2014.

Z. ASTM D2855 - Standard Practice for the Two-Step (Primer & Solvent Cement) Method of Joining Poly (Vinyl Chloride) (PVC) or Chlorinated Poly (Vinyl Chloride) (CPVC) Pipe and Piping Components with Tapered Sockets; 2015.

AA. ASTM D2996 - Standard Specification for Filament-Wound "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe; 2017.

AB. ASTM D2997 - Standard Specification for Centrifugally Cast "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe; 2015.

AC. ASTM D3034 - Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings; 2016.

AD. ASTM D3517 - Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pressure Pipe; 2014.

AE. ASTM D3754 - Standard Specification for "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Sewer and Industrial Pressure Pipe; 2014.

AF. ASTM F477 - Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe; 2014.

AG. ASTM F628 - Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) Schedule 40 Plastic Drain, Waste, and Vent Pipe With a Cellular Core; 2012, with Editorial Revision (2016).

AH. ASTM F876 - Standard Specification for Crosslinked Polyethylene (PEX) Tubing; 2017.

AI. ASTM F877 - Standard Specification for Crosslinked Polyethylene (PEX) Plastic Hot- and Cold-Water Distribution Systems; 2011a.

AJ. ASTM F1960 - Standard Specification for Cold Expansion Fittings with PEX Reinforcing Rings for Use with Cross-linked Polyethylene (PEX) Tubing; 2015.

AK. AWWA C110/A21.10 - Ductile-Iron and Gray-Iron Fittings; 2012.

AL. AWWA C111/A21.11 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings; 2017.

AM. AWWA C151/A21.51 - Ductile-Iron Pipe, Centrifugally Cast; 2017.

AN. AWWA C550 - Protective Interior Coatings for Valves and Hydrants; 2017.

AO. AWWA C606 - Grooved and Shouldered Joints; 2015.

AP. AWWA C651 - Disinfecting Water Mains; 2014.

AQ. CISPI 301 - Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste and Vent Piping Applications; 2009 (Revised 2012).

AR. CISPI 310 - Specification for Coupling for Use in Connection with Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Applications; 2011 (Revised 2012).

AS. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2009.

AT. MSS SP-67 - Butterfly Valves; 2017.

AU. MSS SP-80 - Bronze Gate, Globe, Angle and Check Valves; 2013.

AV. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends; 2010.

AW. NSF 61 - Drinking Water System Components - Health Effects; 2017.

AX. NSF 372 - Drinking Water System Components - Lead Content; 2016.

AY. PPI TR-4 - PPI Listing of Hydrostatic Design Basis (HDB), Hydrostatic Design Stress (HDS), Strength Design Basis (SDB), Pressure Design Basis (PDB), and Minimum Required Strength (MRS) Ratings For Thermoplastic Piping Materials or Pipe; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with applicable codes.

B. Valves: Manufacturer's name and pressure rating marked on valve body.

C. Welder Qualifications: Certified in accordance with ASME BPVC-IX.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

B. Provide temporary protective coating on cast iron and steel valves.

C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.

D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Potable Water Supply Systems: Provide piping, pipe fittings, and solder and flux (if used), that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

2.02 SANITARY SEWER PIPING, BURIED BEYOND 5 FEET OF BUILDING

A. Cast Iron Pipe: ASTM A74 extra heavy weight.
   1. Fittings: Cast iron.
   2. Joint Seals: ASTM C564 neoprene gaskets, or lead and oakum.

B. Vitrified Clay Pipe: ASTM C700, Standard Strength.
   1. Fittings: Clay.
   2. Joints: Bell-and-spigot, with ASTM C425 compression joint device.

C. ABS Pipe: ASTM F628.
   1. Fittings: ABS.
   2. Joints: Solvent welded with ASTM D2235 cement.

D. PVC Pipe: ASTM D3034 DR 35.3034

1. Fittings: PVC.
2. Joints: Push-on, using ASTM F477 elastomeric gaskets.

E. Copper Tube: ASTM B88 (ASTM B88M), Type K (A) annealed.
1. Fittings: ASME B16.23, cast copper, or ASME B16.29, wrought copper.
2. Joints: ASTM B32, alloy Sn50 solder.

2.03 SANITARY SEWER PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Cast Iron Pipe: ASTM A74 extra heavy weight.
1. Fittings: Cast iron.
2. Joints: Hub-and-spigot, CISPI HSN compression type with ASTM C564 neoprene gaskets or lead and oakum.

B. Cast Iron Pipe: CISPI 301, hubless.
1. Fittings: Cast iron.
2. Joints: CISPI 310, neoprene gasket and stainless steel clamp and shield assemblies.

C. PVC Pipe: ASTM D2665 or ASTM D3034.
1. Fittings: PVC.
2. Joints: Solvent welded, with ASTM D2564 solvent cement.

D. Fiberglass Pipe: ASTM D3754, ASTM D3517, ASTM D2996, or ASTM D2997.
1. Fittings: Custom laminated fiberglass.
2. Joints: Epoxy.

2.04 SANITARY SEWER PIPING, ABOVE GRADE

A. Cast Iron Pipe: ASTM A74, service weight.
1. Fittings: Cast iron.
2. Joint Seals: ASTM C564 neoprene gaskets, or lead and oakum.

B. PVC Pipe: ASTM D2665.
1. Fittings: PVC.
2. Joints: Solvent welded, with ASTM D2564 solvent cement.

C. Fiberglass Pipe: ASTM D3754, ASTM D3517, ASTM D2996, or ASTM D2997.
1. Fittings: Custom laminated fiberglass.
2. Joints: Epoxy.

2.05 DOMESTIC WATER PIPING, BURIED BEYOND 5 FEET OF BUILDING

A. Ductile Iron Pipe: AWWA C151/A21.51.
1. Fittings: AWWA C110/A21.10, ductile or gray iron, standard thickness.
2. Joints: AWWA C111/A21.11, styrene butadiene rubber (SBR) or vulcanized SBR gasket with 3/4 inch diameter rods.

B. Copper Pipe: ASTM B42, hard drawn.
1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22 wrought copper and bronze.
2. Joints: ASTM B32, alloy Sn95 solder.

2.06 DOMESTIC WATER PIPING, BURIED WITHIN 5 FEET OF BUILDING

A. Copper Pipe: ASTM B42, hard drawn.
1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22 wrought copper and bronze.
2. Joints: ASTM B32, alloy Sn95 solder.

B. Cross-Linked Polyethylene (PEX) Pipe: ASTM F876 or ASTM F877.
1. Manufacturers:
a. Uponor, Inc: www.uponorengineering.com/#sle.
b. Viega LLC; PureFlow PEX with Corrugated Sleeve: www.viega.com/#sle.
c. Substitutions: See Section 01 6000 - Product Requirements.
2. Fittings: Brass and engineered polymer (EP) ASTM F1960.
3. Joints: ASTM F1960 cold-expansion fittings.

2.07 DOMESTIC WATER PIPING, ABOVE GRADE

A. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), Drawn (H).
   1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
   2. Joints: ASTM B32, alloy Sn95 solder.

B. Cross-Linked Polyethylene (PEX) Pipe: ASTM F876 or ASTM F877.
   1. Manufacturers:
      a. Uponor, Inc: www.uponorengineering.com/#sle.
      b. Viega LLC: www.viega.com/#sle.
      c. Zurn Industries, LLC: www.zurn.com/#sle.
      d. Substitutions: See Section 01 6000 - Product Requirements.
   2. PPI TR-4 Pressure Design Basis:
   3. Fittings: Brass and engineered polymer (EP) ASTM F1960.
   4. Joints: ASTM F1960 cold-expansion fittings.

C. Stainless Steel Pipe: ASTM A269/A269M, Grade TP304 alloy.
   1. Mechanical Press Sealed Fittings: Double pressed type, NSF 61 and NSF 372 approved or certified, utilizing EPDM, non toxic synthetic rubber sealing elements.
      a. Manufacturers:
         1) Grinnell Products, a Tyco Business: www.grinnell.com/#sle.
         2) Viega LLC: www.viega.com/#sle.
         3) Substitutions: See Section 01 6000 - Product Requirements.

2.08 FLANGES, UNIONS, AND COUPLINGS

A. Unions for Pipe Sizes 3 Inches and Under:
   1. Ferrous pipe: Class 150 malleable iron threaded unions.
   2. Copper tube and pipe: Class 150 bronze unions with soldered joints.

B. Flanges for Pipe Size Over 1 Inch:
   1. Ferrous Pipe: Class 150 malleable iron threaded or forged steel slip-on flanges; preformed neoprene gaskets.
   2. Copper Tube and Pipe: Class 150 slip-on bronze flanges; preformed neoprene gaskets.

C. Mechanical Couplings for Grooved and Shouldered Joints: Two or more curved housing segments with continuous key to engage pipe groove, circular C-profile gasket, and bolts to secure and compress gasket.
   1. Dimensions and Testing: In accordance with AWWA C606.
   2. Housing Material: Provide ASTM A47/A47M malleable iron, ductile iron, or _____, galvanized.
   3. Bolts and Nuts: Hot dipped galvanized or zinc-electroplated steel.
   4. When pipe is field grooved, provide coupling manufacturer's grooving tools.

2.09 PIPE HANGERS AND SUPPORTS

A. Provide hangers and supports that comply with MSS SP-58.
   1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
   2. Overhead Supports: Individual steel rod hangers attached to structure or to trapeze hangers.
   3. Trapeze Hangers: Welded steel channel frames attached to structure.
   4. Vertical Pipe Support: Steel riser clamp.
   5. Rooftop Supports for Low-Slope Roofs: Steel pedestals with bases that rest on top of roofing membrane, not requiring any attachment to the roof structure and not penetrating the roofing assembly, with support fixtures as specified; and as follows:
      a. Bases: High density polypropylene.
      b. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.

c. Steel Components: Stainless steel, or carbon steel hot-dip galvanized after fabrication in accordance with ASTM A123/A123M.
d. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports; corrosion resistant material.
e. Height: Provide minimum clearance of 6 inches under pipe to top of roofing.

B. Plumbing Piping - Drain, Waste, and Vent:
1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
2. Hangers for Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
3. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
4. Wall Support for Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamp.

C. Plumbing Piping - Water:
1. Hangers for Pipe Sizes 1/2 Inch to 1-1/2 Inches: Malleable iron, adjustable swivel, split ring.
2. Hangers for Cold Pipe Sizes 2 Inches and Over: Carbon steel, adjustable, clevis.
3. Hangers for Hot Pipe Sizes 2 Inches to 4 Inches: Carbon steel, adjustable, clevis.

2.10 BALL VALVES

A. Manufacturers:
1. Grinnell Products, a Tyco Business: www.grinnell.com/#sle.
2. Nibco, Inc: www.nibco.com/#sle.
3. Uponor, Inc: www.uponorengineering.com/#sle.
4. Viega LLC: www.viega.com/#sle.
5. Substitutions: See Section 01 6000 - Product Requirements.

2.11 BUTTERFLY VALVES

A. Manufacturers:
1. Crane Company: www.cranecpe.com/#sle.
2. Grinnell Products, a Tyco Business: www.grinnell.com/#sle.

B. Construction 1-1/2 Inches and Larger: MSS SP-67, 200 psi CWP, cast or ductile iron body, nickel-plated ductile iron disc, resilient replaceable EPDM seat, wafer ends, extended neck, 10 position lever handle.

C. Provide gear operators for valves 8 inches and larger, and chain-wheel operators for valves mounted over 8 feet above floor.

2.12 WATER PRESSURE REDUCING VALVES

A. Manufacturers:
1. Amtrol Inc: www.amtrol.com/#sle.
2. Cla-Val Company: www.cla-val.com/#sle.
3. Flomatic Valves: www.flomatic.com/#sle.
4. Watts Regulator Company: www.wattsregulator.com/#sle.
5. Substitutions: See Section 01 6000 - Product Requirements.

B. Up to 2 Inches:
1. ASSE 1003, bronze body, stainless steel, and thermoplastic internal parts, fabric reinforced diaphragm, strainer, threaded single union ends.

C. Over 2 Inches:
1. ASSE 1003, cast iron body with interior lining complying with AWWA C550, bronze fitted, elastomeric diaphragm and seat disc, flanged.

2.13 RELIEF VALVES

A. Pressure:
1. Manufacturers:
a. Cla-Val Co: www.cla-val.com/#sle.

b. Henry Technologies: www.henrytech.com/#sle.
c. Watts Regulator Company: www.wattsregulator.com/#sle.
d. Substitutions: See Section 01 6000 - Product Requirements.

2. ANSI Z21.22, AGA certified, bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated.

B. Temperature and Pressure:

1. Manufacturers:
   a. Cla-Val Co: www.cla-val.com/#sle.
   b. Henry Technologies: www.henrytech.com/#sle.
   c. Watts Regulator Company: www.wattsregulator.com/#sle.
   d. Substitutions: See Section 01 6000 - Product Requirements.
2. ANSI Z21.22, AGA certified, bronze body, teflon seat, stainless steel stem and springs, automatic, direct pressure actuated, temperature relief maximum 210 degrees F, capacity ASME BPVC-IV certified and labelled.

2.14 STRAINERS

A. Manufacturers:

1. Armstrong International, Inc: www.armstronginternational.com/#sle.
2. Green Country Filter Manufacturing: www.greencountryfilter.com/#sle.
3. WEAMCO: www.weamco.com/#sle.
4. Substitutions: See Section 01 6000 - Product Requirements.

B. Size 2 inch and Under:

1. Threaded brass body for 175 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.
2. Class 150, threaded bronze body 300 psi CWP, Y pattern with 1/32 inch stainless steel perforated screen.

C. Size 1-1/2 inch to 4 inch:

1. Class 125, flanged iron body, Y pattern with 1/16 inch stainless steel perforated screen.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that excavations are to required grade, dry, and not over-excavated.

3.02 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.

C. Install piping to maintain headroom, conserve space, and not interfere with use of space.

D. Group piping whenever practical at common elevations.

E. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment. Refer to Section 22 0516.

F. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.

1. Refer to Section 22 0719.

G. Provide access where valves and fittings are not exposed.

1. Coordinate size and location of access doors with Section 08 3100.

H. Install bell and spigot pipe with bell end upstream.

I. Install valves with stems upright or horizontal, not inverted. Refer to Section 22 0523.

J. Install water piping to ASME B31.9.

K. Copper Pipe and Tube: Make soldered joints in accordance with ASTM B828, using specified solder, and flux meeting ASTM B813; in potable water systems use flux also complying with NSF 61 and NSF 372.

L. PVC Pipe: Make solvent-welded joints in accordance with ASTM D2855.

M. Sleeve pipes passing through partitions, walls and floors.

N. Inserts:
   1. Provide inserts for placement in concrete formwork.
   2. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
   3. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
   4. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
   5. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut above slab.

O. Pipe Hangers and Supports:
   1. Install in accordance with ASME B31.9.
   2. Support horizontal piping as indicated.
   3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
   4. Place hangers within 12 inches of each horizontal elbow.
   5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
   6. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
   7. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.
   8. Provide copper plated hangers and supports for copper piping.
   9. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
      a. Painting of interior plumbing systems and components is specified in Section 09 9123.
      b. Painting of exterior plumbing systems and components is specified in Section 09 9113.
   10. Provide hangers adjacent to motor driven equipment with vibration isolation; refer to Section 22 0548.
   11. Support cast iron drainage piping at every joint.

P. Manufactured Sleeve-Seal Systems:
   1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
   2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
   3. Locate piping in center of sleeve or penetration.
   4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.
   5. Tighten bolting for a water-tight seal.
   6. Install in accordance with manufacturer's recommendations.

Q. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

3.04 APPLICATION

A. Use grooved mechanical couplings and fasteners only in accessible locations.

B. Install unions downstream of valves and at equipment or apparatus connections.

C. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

D. Install gate valves for shut-off and to isolate equipment, part of systems, or vertical risers.

E. Install globe valves for throttling, bypass, or manual flow control services.

F. Provide lug end butterfly valves adjacent to equipment when provided to isolate equipment.

G. Provide spring loaded check valves on discharge of water pumps.

H. Provide flow controls in water recirculating systems where indicated.

3.05 TOLERANCES

A. Drainage Piping: Establish invert elevations within 1/2 inch vertically of location indicated and slope to drain at minimum of 1/4 inch per foot slope.

B. Water Piping: Slope at minimum of 1/32 inch per foot and arrange to drain at low points.

3.06 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Disinfect water distribution system in accordance with Section 33 0110.58.

B. Prior to starting work, verify system is complete, flushed and clean.

C. Ensure acidity (pH) of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).

D. Inject disinfectant, free chlorine in liquid, powder, tablet or gas form, throughout system to obtain 50 to 80 mg/L residual.

E. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.

F. Maintain disinfectant in system for 24 hours.

G. If final disinfectant residual tests less than 25 mg/L, repeat treatment.

H. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.

I. Take samples no sooner than 24 hours after flushing, from 10 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

3.07 SERVICE CONNECTIONS

A. Provide new sanitary sewer services. Before commencing work check invert elevations required for sewer connections, confirm inverts and ensure that these can be properly connected with slope for drainage and cover to avoid freezing.

B. Provide new water service complete with approved reduced pressure backflow preventer and water meter with by-pass valves, pressure reducing valve, and sand strainer.
   1. Provide sleeve in wall for service main and support at wall with reinforced concrete bridge. Calk enlarged sleeve and make watertight with pliable material. Anchor service main inside to concrete wall.
   2. Provide 18 gage, 0.0478 inch galvanized sheet metal sleeve around service main to 6 inch above floor and 6 feet minimum below grade. Size for minimum of 2 inches of loose batt insulation stuffing.

3.08 SCHEDULES

A. Pipe Hanger Spacing:
   1. Metal Piping:
      a. Pipe Size: 1/2 inches to 1-1/4 inches:
         1) Maximum Hanger Spacing: 6.5 ft.
         2) Hanger Rod Diameter: 3/8 inches.

b. Pipe Size: 1-1/2 inches to 2 inches:
   1) Maximum Hanger Spacing: 10 ft.
   2) Hanger Rod Diameter: 3/8 inch.
c. Pipe Size: 2-1/2 inches to 3 inches:
   1) Maximum Hanger Spacing: 10 ft.
   2) Hanger Rod Diameter: 1/2 inch.
d. Pipe Size: 4 inches to 6 inches:
   1) Maximum Hanger Spacing: 10 ft.
   2) Hanger Rod Diameter: 5/8 inch.
e. Pipe Size: 8 inches to 12 inches:
   1) Maximum hanger spacing: 14 ft.
   2) Hanger Rod Diameter: 7/8 inch.
f. Pipe Size: 14 inches and Over:
   1) Maximum Hanger Spacing: 20 ft.
   2) Hanger Rod Diameter: 1 inch.

2. Plastic Piping:
   a. All Sizes:
      1) Maximum Hanger Spacing: 6 ft.
      2) Hanger Rod Diameter: 3/8 inch.

END OF SECTION 22 1005

SECTION 22 3000
PLUMBING EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Water Heaters:
   1. Commercial electric.

B. Packaged water heating systems.

C. Diaphragm-type compression tanks.

D. In-line circulator pumps.

1.02 RELATED REQUIREMENTS

A. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

A. ASME BPVC-VIII-1 - Boiler and Pressure Vessel Code, Section VIII, Division 1 - Rules for Construction of Pressure Vessels; 2017.

B. ICC (IPC) - International Plumbing Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. UL 174 - Standard for Household Electric Storage Tank Water Heaters; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

B. Sequencing: Ensure that utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittals procedures.

B. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in City of Key West's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Certifications:
   1. Water Heaters: NSF approved.
   2. Electric Water Heaters: UL listed and labeled to UL 174.
   3. Pressure Vessels for Heat Exchangers: ASME labeled to ASME BPVC-VIII-1.
   4. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

B. Identification: Provide pumps with manufacturer's name, model number, and rating/capacity identified by permanently attached label.

C. Performance: Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, operate within 25 percent of midpoint of published maximum efficiency curve.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide five year manufacturer warranty for domestic water heaters.

PART 2 PRODUCTS

2.01 WATER HEATERS

A. Manufacturers:
   1. A.O. Smith Water Products Co: www.hotwater.com/#sle.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Commercial Electric:
   1. Type: Factory-assembled and wired, electric, vertical storage.
   2. Performance:
      a. Maximum Working Pressure: 150 psig.
   3. Heating Elements: Flange-mounted immersion elements; individual elements sheathed with Incoloy corrosion-resistant metal alloy, rated less than 75 W/sq in.

2.02 DIAPHRAGM-TYPE COMPRESSION TANKS

A. Construction: Welded steel, tested and stamped in accordance with ASME BPVC-VIII-1; supplied with National Board Form U-1, rated for working pressure of 125 psig, with flexible EPDM diaphragm sealed into tank, and steel legs or saddles.

B. Accessories: Pressure gauge and air-charging fitting, tank drain; precharge to 12 psig.

2.03 IN-LINE CIRCULATOR PUMPS

A. Casing: Bronze, rated for 125 psig working pressure, with stainless steel rotor assembly.

B. Impeller: Bronze.

C. Shaft: Alloy steel with integral thrust collar and two oil lubricated bronze sleeve bearings.

D. Seal: Carbon rotating against a stationary ceramic seat.

E. Drive: Flexible coupling.

2.04 ELECTRICAL WORK

A. Provide electrical motor driven equipment specified complete with motors, motor starters, controls, and wiring.

B. Electrical characteristics to be as specified or indicated.

C. Furnish motor starters complete with thermal overload protection and other appurtenances necessary for the motor control specified.

D. Supply manual or automatic control and protective or signal devices required for the operation specified, and any control wiring required for controls and devices not shown.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install plumbing equipment in accordance with manufacturer's instructions, as required by code, and complying with conditions of certification, if any.

B. Coordinate with plumbing piping and related fuel piping work to achieve operating system.

C. Domestic Water Storage Tanks:
   1. Provide steel pipe support, independent of building structural framing members.
   2. Clean and flush prior to delivery to site. Seal until pipe connections are made.

D. Pumps:
   1. Provide line sized isolating valve and strainer on suction and line sized soft seated check valve and balancing valve on discharge.
   2. Decrease from line size with long radius reducing elbows or reducers. Support piping adjacent to pump such that no weight is carried on pump casings. Provide supports under elbows on pump suction and discharge line sizes 4 inches and over.
   3. Ensure pumps operate at specified system fluid temperatures without vapor binding and cavitation, are non-overloading in parallel or individual operation, and operate within 25 percent of midpoint of published maximum efficiency curve.

4. Align and verify alignment of base mounted pumps prior to start-up

END OF SECTION 22 3000

SECTION 22 4000
PLUMBING FIXTURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Water closets.

B. Urinals.

C. Lavatories.

D. Electric water coolers.

E. Drinking fountains.

F. Showers.

1.02 RELATED REQUIREMENTS

A. Section 22 1005 - Plumbing Piping.

B. Section 22 3000 - Plumbing Equipment.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

B. ASHRAE Std 18 - Methods of Testing for Rating Drinking-Water Coolers with Self-Contained Mechanical Refrigeration; 2013.

C. ASME A112.6.1M - Supports for Off-the-Floor Plumbing Fixtures for Public Use; 1997 (Reaffirmed 2017).

D. ASME A112.18.1 - Plumbing Supply Fittings; 2012.

E. ASME A112.19.2 - Ceramic Plumbing Fixtures; 2013.

F. ASSE 1014 - Performance Requirements for Backflow Prevention Devices for Hand-Held Showers; 2005.

G. ASSE 1070 - Performance Requirements for Water Temperature Limiting Devices; 2015.

H. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

I. IAPMO Z124 - Plastic Plumbing Fixtures; 2017.

J. NSF 61 - Drinking Water System Components - Health Effects; 2017.

K. NSF 372 - Drinking Water System Components - Lead Content; 2016.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Potable Water Systems: Provide plumbing fittings and faucets that comply with NSF 61 and NSF 372 for maximum lead content; label pipe and fittings.

B. Water Efficiency: EPA WaterSense label is required for all water closets, urinals, lavatory faucets, and showerheads.

2.02 FLUSH VALVE WATER CLOSETS

A. Water Closets: Vitreous china, ASME A112.19.2, floor mounted, siphon jet flush action, china bolt caps.
   1. Flush Valve: Exposed (top spud).
   2. Flush Operation: Sensor operated.
   3. Handle Height: 44 inches or less.
   4. Supply Size: 1-1/2 inches.

B. Flush Valves: ASME A112.18.1, diaphragm type, complete with vacuum breaker stops and accessories.
   1. Sensor-Operated Type: Solenoid or motor-driven operator, low voltage hard-wired, infrared sensor with mechanical over-ride or over-ride push button.
   2. Exposed Type: Chrome plated, escutcheon, integral screwdriver stop.
   3. Metering Type: Easily accessible adjustment nut.
   4. Manufacturers:
      a. Advanced Modern Technologies Corporation: www.amtcorporation.com/#sle.
      b. American Standard, Inc: www.americanstandard-us.com/#sle.
      c. Delany Products: www.delanyvalve.com/#sle.
      d. Sloan Valve Company: www.sloanvalve.com/#sle.
      e. Zurn Industries, Inc: www.zurn.com/#sle.

C. Seats:
   1. Manufacturers:
      a. American Standard, Inc: www.americanstandard-us.com/#sle.
      b. Bemis Manufacturing Company: www.bemismfg.com/#sle.
      c. Church Seat Company: www.churchseats.com/#sle.
      d. DXV by American Standard, Inc: www.dxv.com/#sle.
      e. Olsonite: www.olsonite.com/#sle.
      f. Zurn Industries, Inc: www.zurn.com/#sle.
      g. Substitutions: See Section 01 6000 - Product Requirements.

D. Water Closet Carriers:
   1. Manufacturers:
      a. JOSAM Company: www.josam.com/#sle.
      b. Zurn Industries, Inc: www.zurn.com/#sle.
      c. Substitutions: See Section 01 6000 - Product Requirements.
   2. ASME A112.6.1M; adjustable cast iron frame, integral drain hub and vent, adjustable spud, lugs for floor and wall attachment, threaded fixture studs with nuts and washers.

2.03 WALL HUNG URINALS

A. Wall Hung Urinal Manufacturers:
   1. Advanced Modern Technologies Corporation: www.amtcorporation.com/#sle.
   2. American Standard, Inc: www.americanstandard-us.com/#sle.
   3. Gerber Plumbing Fixtures LLC: www.gerberonline.com/#sle.
   4. Kohler Company: www.kohler.com/#sle.
   5. Viega LLC: www.viega.com/#sle.
   6. Zurn Industries, Inc: www.zurn.com/#sle.
   7. Substitutions: See Section 01 6000 - Product Requirements.

B. Urinals: Vitreous china, ASME A112.19.2, wall hung with side shields and concealed carrier.
   1. Flush Volume: 1.0 gallons, maximum.
   2. Flush Valve: Exposed (top spud).
   3. Flush Operation: Sensor operated.
   4. Trap: Integral.

C. Flush Valves: ASME A112.18.1, diaphragm type, complete with vacuum breaker stops and accessories.
   1. Sensor-Operated Type: Solenoind or motor-driven operator, low voltage hard-wired, infrared sensor with mechanical over-ride or over-ride push button.
   2. Exposed Type: Chrome plated, escutcheon, integral screwdriver stop.
   3. Manufacturers:
      a. Advanced Modern Technologies Corporation: www.amtcorporation.com/#sle.
      b. American Standard, Inc: www.americanstandard-us.com/#sle.
      c. Delany Products: www.delaneyvalve.com/#sle.
      d. Sloan Valve Company: www.sloanvalve.com/#sle.

e. Zurn Industries, Inc: www.zurn.com/#sle.
f. Substitutions: See Section 01 6000 - Product Requirements.

D. Carriers:
1. Manufacturers:
a. JOSAM Company: www.josam.com/#sle.
b. Viega LLC: www.viega.com/#sle.
c. Zurn Industries, Inc: www.zurn.com/#sle.
d. Substitutions: See Section 01 6000 - Product Requirements.
2. ASME A112.6.1M; cast iron and steel frame with tubular legs, lugs for floor and wall attachment, threaded fixture studs for fixture hanger, bearing studs.

2.04 LAVATORIES

A. Lavatory Manufacturers:
1. American Standard, Inc: www.americanstandard-us.com/#sle.
2. DXV by American Standard, Inc: www.dxv.com/#sle.
3. Gerber Plumbing Fixtures LLC: www.gerberonline.com/#sle.
4. Kohler Company: www.kohler.com/#sle.
5. Zurn Industries, Inc: www.zurn.com/#sle.
6. Substitutions: See Section 01 6000 - Product Requirements.

B. Supply Faucet Manufacturers:
1. Advanced Modern Technologies Corporation: www.amtcorporation.com/#sle.
2. American Standard, Inc: www.americanstandard-us.com/#sle.
3. DXV by American Standard, Inc: www.dxv.com/#sle.
4. Grohe America, Inc: www.grohe.com/us/#sle.
5. Kohler Company: www.kohler.com/#sle.
6. Zurn Industries, Inc: www.zurn.com/#sle.
7. Substitutions: See Section 01 6000 - Product Requirements.

C. Sensor Operated Faucet: Cast brass, chrome plated, wall mounted with sensor located on neck of spout.
1. Spout Style: Standard.
2. Power Supply: Battery, easily replaceable, alkaline or lithium, minimum 200,000 cycles.
a. Low battery indicator warning light at 30 days remaining life and continuous light a 2 weeks.
3. Mixing Valve: None, single line for tempered water.
4. Water Supply: 3/8 inch compression connections.
5. Aerator: Vandal resistant, 0.5 GPM, laminar flow device.
6. Sensor range: Factory set at a minimum of 3 inch adjustable up to 24 inch.
7. Finish: Polished chrome.
8. Sensor Operated Faucet Manufacturers:
a. Advanced Modern Technologies Corporation: www.amtcorporation.com/#sle.
b. American Standard, Inc: www.americanstandard-us.com/#sle.
c. Gerber Plumbing Fixtures LLC: www.gerberonline.com/#sle.
d. Grohe America, Inc: www.grohe.com/us/#sle.
e. The Chicago Faucet Company: www.chicagofaucets.com/#sle.
f. Moen Incorporated: www.moen.com/#sle.
g. Powers Controls: www.powerscontrols.com/#sle.
h. Sloan Valve Company: www.sloanvalve.com/#sle.
i. Toto USA: www.totousa.com/#sle.
j. Watts: www.watts.com/#sle.
k. Zurn Industries, Inc: www.zurn.com/#sle.
l. Substitutions: See Section 01 6000 - Product Requirements.

D. Accessories:

1. Chrome plated 17 gage, 0.0538 inch brass P-trap with clean-out plug and arm with escutcheon.
2. Offset waste with perforated open strainer.
3. Wheel handle stops.
4. Rigid supplies.
5. Carrier:
   a. Manufacturers:
      1) JOSAM Company; _____: www.josam.com/#sle.
      2) Zurn Industries, Inc: www.zurn.com/#sle.
      3) Substitutions: See Section 01 6000 - Product Requirements.

2.05 WALL-HUNG MULTI-STATION LAVATORY UNITS:

A. Description: Rectilinear, level-surface deck, seamless and integral elongated basin, with stainless steel enclosed pedestal cabinet.

B. Deck and Bowl Material: Fabricate from molded engineered stone material consisting of natural quartz, granite, and other minerals in a matrix of thermoset acrylic modified bio-based polyester resin and meeting requirements of IAPMO Z124.

C. Surface Burning Characteristics: Smoke developed index less than 450, and flame spread index less than 25, Class A, when tested in accordance with ASTM E84.

D. Number of Wash Stations: Two.

E. Unit Length: _____ inches.

F. Soap Dispenser:
   1. Deck-mounted, sensor-operated, chrome-plated plastic, with LED battery and soap level indicators, battery box and batteries and 27 ounce (798 ml) bottle of 1000 shot soap.

G. Water Supply: Thermostatic mixing valve assembly.

H. Color: As selected by Architect from manufacturer's full line.

I. Faucet Drilling: 4 inch (100 mm) centerset drilling.

J. Sensor-Operated Faucets:
   1. High profile metering faucet with infrared and external temperature control.
   2. Vandal-resistant meeting requirements of ASME A112.18.1 and ADA Standards compliant.
   3. Body: Polished chrome plated commercial solid cast brass, with 4 inch (102 mm) centerset mounting with anti-rotation trim plate.
   4. Tempered Water Supply: ADA Standards compliant lever on faucet body.
   5. Aerator: Flow rate of 0.5 gal/min at an operating range of 20 to 80 psi.
   6. Sensor Module: Water conserving, vandal-resistant adjustable sensor unit with timing turn-off delay and stationary object automatic timed cutoff, with battery diagnostic light, serviceable from above deck.
   7. Power Supply: Battery-operated single faucet with 6V lithium battery and single 115 VAC plug-in adapter.
   8. Thermostatic Mixing Valve: Thermostatic mixing valve, ASSE 1070 listed, with combination stop, strainer, and check valves, and flexible stainless steel connectors.

K. Access Panel: Stainless steel.

L. Support Frame: Wall mounted, heavy gage, stainless steel.

2.06 SHOWERS

A. Shower Manufacturers:
   1. American Standard, Inc: www.americanstandard-us.com/#sle.
   2. Aqua Glass Corporation: www.aquaglass.com/#sle.
   3. DXV by American Standard, Inc: www.dxv.com/#sle.
   4. Grohe America, Inc: www.grohe.com/us/#sle.
   5. Kohler Company: www.kohler.com/#sle.

6. Substitutions: See Section 01 6000 - Product Requirements.

B. Shower Valve:
1. Comply with ASME A112.18.1.
2. Provide two handle in wall diverter valve body with integral thermostatic mixing valve to supply 1.5 gpm.
3. Shower Valve Manufacturers:
a. American Standard, Inc: www.americanstandard-us.com/#sle.
b. DXV by American Standard, Inc: www.dxv.com/#sle.
c. Grohe America, Inc: www.grohe.com/us/#sle.
d. Substitutions: See Section 01 6000 - Product Requirements.

C. Shower Head:
1. ASME A112.18.1; chrome plated vandal-proof institutional head with integral wall bracket, built-in 2.5 gpm flow control.
2. Shower Head Manufacturers:
a. American Standard, Inc: www.americanstandard-us.com/#sle.
b. DXV by American Standard, Inc: www.dxv.com/#sle.
c. Grohe America, Inc: www.grohe.com/us/#sle.
d. Substitutions: See Section 01 6000 - Product Requirements.

D. Hand-Held Shower Head:
1. ASME A112.18.1, adjustable spray hand-held shower head with swivel fitting, with ASSE 1014 backflow preventer.
2. Provide pushbutton flow control.
3. Include 60 inch minimum flexible polished stainless steel hose and in-line vacuum breaker
4. Provide wall bracket to mount hand spray, allowing use of the unit as either a hand-held spray or a fixed shower head.
5. Hand-Held Shower Head Manufacturers:
a. American Standard, Inc: www.americanstandard-us.com/#sle.
b. DXV by American Standard, Inc: www.dxv.com/#sle.
c. Grohe America, Inc: www.grohe.com/us/#sle.
d. Substitutions: See Section 01 6000 - Product Requirements.

2.07 DRINKING FOUNTAINS

A. Drinking Fountain Manufacturers:
1. Elkay Manufacturing Company: www.elkay.com/#sle.
2. Halsey Taylor: www.halseytaylor.com/#sle.
3. Haws Corporation: www.hawsco.com/#sle.
4. Substitutions: See Section 01 6000 - Product Requirements.

2.08 ELECTRIC WATER COOLERS

A. Electric Water Cooler Manufacturers:
1. Elkay Manufacturing Company: www.elkay.com/#sle.
2. Haws Corporation: www.hawsco.com/#sle.
3. Oasis, a Lynn Tilton Company: www.oasiscoolers.com/#sle.
4. Substitutions: See Section 01 6000 - Product Requirements.

B. Water Cooler: Electric, mechanically refrigerated; surface handicapped mounted; stainless steel top, vinyl on steel body, elevated anti-squirt bubbler with stream guard, automatic stream regulator, push button, mounting bracket; integral air cooled condenser and stainless steel grille.
1. Capacity: 8 gallons per hour of 50 degrees F water with inlet at 80 degrees F and room temperature of 90 degrees F, when tested in accordance with ASHRAE Std 18.
2. Electrical: 115 V, 60 Hertz compressor, 6 foot cord and plug for connection to electric wiring system including grounding connector.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that walls and floor finishes are prepared and ready for installation of fixtures.

3.02 PREPARATION

A. Rough-in fixture piping connections in accordance with minimum sizes indicated in fixture rough-in schedule for particular fixtures.

3.03 INSTALLATION

A. Install each fixture with trap, easily removable for servicing and cleaning.

B. Provide chrome plated rigid or flexible supplies to fixtures with loose key stops, reducers, and escutcheons.

C. Install components level and plumb.

D. Install and secure fixtures in place with wall supports and bolts.

3.04 INTERFACE WITH WORK OF OTHER SECTIONS

A. Review millwork shop drawings. Confirm location and size of fixtures and openings before rough-in and installation.

3.05 ADJUSTING

A. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

3.06 CLEANING

A. Clean plumbing fixtures and equipment.

B. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

3.07 PROTECTION

A. Protect installed products from damage due to subsequent construction operations.

B. Repair or replace damaged products before Date of Substantial Completion.

END OF SECTION 22 4000

SECTION 23 0529

HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Support and attachment components for equipment, piping, and other HVAC/hydronic work.

1.02 REFERENCE STANDARDS

A. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

C. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2015.

D. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2014.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

F. MFMA-4 - Metal Framing Standards Publication; 2004.

G. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets for channel (strut) framing systems, non-penetrating rooftop supports, post-installed concrete and masonry anchors, and thermal insulated pipe supports.
   1. Fiberglass Channel (Strut) Framing Systems: Include requirements for strength derating according to ambient temperature.

PART 2 PRODUCTS

2.01 SUPPORT AND ATTACHMENT COMPONENTS

A. General Requirements:
   1. Provide all required hangers, supports, anchors, fasteners, fittings, accessories, and hardware as necessary for the complete installation of plumbing work.
   2. Provide products listed, classified, and labeled as suitable for the purpose intended, where applicable.
   3. Where support and attachment component types and sizes are not indicated, select in accordance with manufacturer's application criteria as required for the load to be supported with a minimum safety factor of _____. Include consideration for vibration, equipment operation, and shock loads where applicable.
   4. Steel Components: Use corrosion resistant materials suitable for the environment where installed.
      a. Zinc-Plated Steel: Electroplated in accordance with ASTM B633.
      b. Galvanized Steel: Hot-dip galvanized after fabrication in accordance with ASTM A123/A123M or ASTM A153/A153M.

B. Metal Channel (Strut) Framing Systems: Factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
   1. Manufacturers:
      a. Cooper B-Line, a division of Eaton Corporation: www.cooperindustries.com/#sle.
      b. Thomas & Betts Corporation: www.tnb.com/#sle.
      c. Unistrut, a brand of Atkore International Inc: www.unistrut.com/#sle.

d. Substitutions: See Section 01 6000 - Product Requirements.
e. Source Limitations: Furnish channels (struts) and associated fittings, accessories, and hardware produced by a single manufacturer.

2. Provide factory-fabricated continuous-slot metal channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
3. Comply with MFMA-4.
4. Channel Material:
   a. Indoor Dry Locations: Use painted steel, zinc-plated steel, or galvanized steel.
   b. Outdoor and Damp or Wet Indoor Locations: Use galvanized steel.
5. Minimum Channel Thickness: Steel sheet, 12 gage, 0.1046 inch.
6. Minimum Channel Dimensions: 1-5/8 inch width by 13/16 inch height.

C. Fiberglass Channel (Strut) Framing Systems: Factory-fabricated continuous-slot fiberglass channel (strut) and associated fittings, accessories, and hardware required for field-assembly of supports.
1. Manufacturers:
   a. Enduro Composites: www.endurocomposites.com/#sle.
   b. Substitutions: See Section 01 6000 - Product Requirements.
   c. Source Limitations: Furnish channels (struts) and associated fittings, accessories, and hardware produced by a single manufacturer.
2. Channel Material: Use polyester resin or vinyl ester resin.
3. Minimum Channel Dimensions: 1-5/8 inch width by 1 inch height.
4. Flammability: Fire retardant with NFPA 101, Class A flame spread index (maximum of 25) when tested in accordance with ASTM E84; self-extinguishing in accordance with ASTM D635.

D. Hanger Rods: Threaded zinc-plated steel unless otherwise indicated.
1. Minimum Size, Unless Otherwise Indicated or Required:
   a. Equipment Supports: 1/2 inch diameter.
   b. Piping up to 1 inch (27 mm) nominal: 1/4 inch diameter.
   c. Piping larger than 1 inch (27 mm) nominal: 3/8 inch diameter.
   d. Trapeze Support for Multiple Pipes: 3/8 inch diameter.

E. Non-Penetrating Rooftop Supports for Low-Slope Roofs:
1. Manufacturers:
   a. Cooper B-Line, a division of Eaton Corporation: www.cooperindustries.com/#sle.
   b. Erico International Corporation, a brand of Pentair: www.erico.com/#sle.
   c. PHP Systems/Design: www.phpsd.com/#sle.
   d. Unistrut, a brand of Atkore International Inc: www.unistrut.com/#sle.
   e. Substitutions: See Section 01 6000 - Product Requirements.
2. Base Sizes: As required to distribute load sufficiently to prevent indentation of roofing assembly.
3. Attachment/Support Fixtures: As recommended by manufacturer, same type as indicated for equivalent indoor hangers and supports.
4. Mounting Height: Provide minimum clearance of 6 inches under supported component to top of roofing.

F. Anchors and Fasteners:
1. Manufacturers - Mechanical Anchors:
   a. Hilti, Inc: www.us.hilti.com/#sle.
   b. ITW Red Head, a division of Illinois Tool Works, Inc: www.itwredhead.com/#sle.
   c. Powers Fasteners, Inc: www.powers.com/#sle.
   d. Simpson Strong-Tie Company Inc: www.strongtie.com/#sle.
   e. Substitutions: See Section 01 6000 - Product Requirements.
2. Unless otherwise indicated and where not otherwise restricted, use the anchor and fastener types indicated for the specified applications.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Provide independent support from building structure. Do not provide support from piping, ductwork, conduit, or other systems.

C. Unless specifically indicated or approved by K2M Design Inc., do not provide support from suspended ceiling support system or ceiling grid.

D. Unless specifically indicated or approved by K2M Design Inc., do not provide support from roof deck.

E. Do not penetrate or otherwise notch or cut structural members without approval of Structural Engineer.

F. Equipment Support and Attachment:
   1. Use metal fabricated supports or supports assembled from metal channel (strut) to support equipment as required.
   2. Use metal channel (strut) secured to studs to support equipment surface-mounted on hollow stud walls when wall strength is not sufficient to resist pull-out.
   3. Use metal channel (strut) to support surface-mounted equipment in wet or damp locations to provide space between equipment and mounting surface.
   4. Securely fasten floor-mounted equipment. Do not install equipment such that it relies on its own weight for support.

G. Secure fasteners according to manufacturer's recommended torque settings.

H. Remove temporary supports.

3.02 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect support and attachment components for damage and defects.

C. Repair cuts and abrasions in galvanized finishes using zinc-rich paint recommended by manufacturer. Replace components that exhibit signs of corrosion.

D. Correct deficiencies and replace damaged or defective support and attachment components.

END OF SECTION 23 0529

SECTION 23 0593

TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.01 SECTION INCLUDES

1.02 REFERENCE STANDARDS

A. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems; 2008.

B. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing; 2002.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
   1. Submit to K2M Design Inc..
   2. Include at least the following in the plan:
      a. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
      b. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
      c. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
      d. Final test report forms to be used.
      e. Procedures for formal deficiency reports, including scope, frequency and distribution.

C. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
   1. Revise TAB plan to reflect actual procedures and submit as part of final report.
   2. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for K2M Design Inc. and for inclusion in operating and maintenance manuals.
   3. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
   4. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
   5. Units of Measure: Report data in both I-P (inch-pound) and SI (metric) units.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Perform total system balance in accordance with one of the following:
   1. SMACNA (TAB).

B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.

C. TAB Agency Qualifications:
   1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
   2. Having minimum of three years documented experience.
   3. Certified by one of the following:
      a. AABC, Associated Air Balance Council: www.aabc.com/#sle; upon completion submit AABC National Performance Guaranty.
      b. NEBB, National Environmental Balancing Bureau: www.nebb.org/#sle.
      c. TABB, The Testing, Adjusting, and Balancing Bureau of National Energy Management Institute: www.tabbcertified.org/#sle.

D. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

3.02 EXAMINATION

A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
   1. Systems are started and operating in a safe and normal condition.
   2. Temperature control systems are installed complete and operable.
   3. Proper thermal overload protection is in place for electrical equipment.
   4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
   5. Duct systems are clean of debris.

3.03 PREPARATION

A. Hold a pre-balancing meeting at least one week prior to starting TAB work.

3.04 RECORDING AND ADJUSTING

A. Field Logs: Maintain written logs including:
   1. Running log of events and issues.
   2. Discrepancies, deficient or uncompleted work by others.
   3. Contract interpretation requests.
   4. Lists of completed tests.

B. Ensure recorded data represents actual measured or observed conditions.

C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.

D. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.

E. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

END OF SECTION 23 0593

SECTION 23 0713
DUCT INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Duct insulation.

B. Duct liner.

1.02 RELATED REQUIREMENTS

A. Section 22 0553 - Identification for Plumbing Piping and Equipment.

B. Section 23 0553 - Identification for HVAC Piping and Equipment.

C. Section 23 3100 - HVAC Ducts and Casings: Glass fiber ducts.

1.03 REFERENCE STANDARDS

A. ASTM C177 - Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus; 2013.

B. ASTM C534/C534M - Standard Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form; 2016.

C. ASTM C1410 - Standard Specification for Cellular Melamine Thermal and Sound-Absorbing Insulation; 2017.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

E. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015.

F. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005 (Revised 2009).

G. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide product description, thermal characteristics, list of materials and thickness for each service, and locations.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Accept materials on site in original factory packaging, labelled with manufacturer's identification, including product density and thickness.

B. Protect insulation from weather and construction traffic, dirt, water, chemical, and mechanical damage, by storing in original wrapping.

1.07 FIELD CONDITIONS

A. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics, and insulation cements.

B. Maintain temperature during and after installation for minimum period of 24 hours.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Surface Burning Characteristics: Flame spread index/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84 or UL 723.

2.02 CELLULAR MELAMINE

A. Manufacturers:
   1. Substitutions: See Section 01 6000 - Product Requirements.

B. Insulation: Flexible preformed open-cell polymeric foam tubing, slit lengthwise for installation, complying with applicable requirements of ASTM C1410.
   1. 'K' Value: ASTM C177; 0.25 at 75 degrees F.
   2. Minimum Service Temperature: 55 degrees F.
   3. Maximum Service Temperature: 100 degrees F.
   4. Density: 0.56 lb/cu ft.
   5. Factory-Applied Jacketing Material: Paper/Foil/Scrim.
   6. Jacketing material to be field-applied.

2.03 GLASS FIBER, FLEXIBLE

A. Manufacturer:
   1. Johns Manville: www.jm.com/#sle.
   2. Knauf Insulation: www.knaufinsulation.com/#sle.
   3. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
   4. CertainTeed Corporation: www.certainteed.com/#sle.
   5. Substitutions: See Section 01 6000 - Product Requirements.

B. Vapor Barrier Jacket:

2.04 FLEXIBLE ELASTOMERIC CELLULAR INSULATION

A. Manufacturer:
   1. Armacell LLC: www.armacell.us/#sle.
   2. K-Flex USA LLC: www.kflexusa.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1, in sheet form.
   1. Minimum Service Temperature: Minus 40 degrees F.
   2. Maximum Service Temperature: 180 degrees F.
   3. Connection: Waterproof vapor barrier adhesive.

2.05 DUCT LINER

A. Manufacturers:
   1. Armacell LLC: www.armacell.us/#sle.
   2. Johns Manville: www.jm.com/#sle.
   3. Knauf Insulation: www.knaufinsulation.com/#sle.
   4. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
   5. CertainTeed Corporation: www.certainteed.com/#sle.
   6. Substitutions: See Section 01 6000 - Product Requirements.

B. Elastomeric Foam Insulation: Preformed flexible elastomeric cellular rubber insulation complying with ASTM C534/C534M Grade 1, in sheet form.
   1. Minimum Service Temperature: 55 degrees F.
   2. Maximum Service Temperature: 100 degrees F.
   3. Fungal Resistance: No growth when tested according to ASTM G21.
   4. Apparent Thermal Conductivity: Maximum of 0.28 at 75 degrees F.
   5. Connection: Waterproof vapor barrier adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that ducts have been tested before applying insulation materials.

B. Verify that surfaces are clean, foreign material removed, and dry.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install in accordance with NAIMA National Insulation Standards.

C. Insulated ducts conveying air below ambient temperature:
   1. Provide insulation with vapor barrier jackets.
   2. Finish with tape and vapor barrier jacket.
   3. Continue insulation through walls, sleeves, hangers, and other duct penetrations.
   4. Insulate entire system including fittings, joints, flanges, fire dampers, flexible connections, and expansion joints.

D. Insulated ducts conveying air above ambient temperature:
   1. Provide with or without standard vapor barrier jacket.
   2. Insulate fittings and joints. Where service access is required, bevel and seal ends of insulation.

E. Ducts Exposed in Mechanical Equipment Rooms or Finished Spaces: Finish with canvas jacket sized for finish painting.

F. Exterior Applications: Provide insulation with vapor barrier jacket. Cover with with calked aluminum jacket with seams located on bottom side of horizontal duct section.

G. External Duct Insulation Application:
   1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.
   2. Secure insulation without vapor barrier with staples, tape, or wires.
   3. Install without sag on underside of duct. Use adhesive or mechanical fasteners where necessary to prevent sagging. Lift duct off trapeze hangers and insert spacers.
   4. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.
   5. Stop and point insulation around access doors and damper operators to allow operation without disturbing wrapping.

H. Duct and Plenum Liner Application:
   1. Adhere insulation with adhesive for 90 percent coverage.
   2. Secure insulation with mechanical liner fasteners. Refer to SMACNA (DCS) for spacing.
   3. Seal and smooth joints. Seal and coat transverse joints.
   4. Seal liner surface penetrations with adhesive.
   5. Duct dimensions indicated are net inside dimensions required for air flow. Increase duct size to allow for insulation thickness.

END OF SECTION 23 0713

SECTION 23 2300
REFRIGERANT PIPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Piping.

B. Refrigerant.

C. Moisture and liquid indicators.

D. Valves.

E. Strainers.

F. Filter-driers.

1.02 REFERENCE STANDARDS

A. AHRI 710 - Performance Rating of Liquid-Line Driers; 2009.

B. AHRI 730 (I-P) - Flow Capacity Rating of Suction-Line Filters and Suction-Line Filter-Driers; 2013.

C. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2013.

D. ASME B31.5 - Refrigeration Piping and Heat Transfer Components; 2016.

E. ASTM B280 - Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service; 2016.

F. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2011 (Amended 2012).

1.03 SYSTEM DESCRIPTION

A. Where more than one piping system material is specified ensure system components are compatible and joined to ensure the integrity of the system is not jeopardized. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

B. Provide pipe hangers and supports in accordance with ASME B31.5 unless indicated otherwise.

C. Liquid Indicators:
   1. Use line size liquid indicators in main liquid line leaving condenser.
   2. If receiver is provided, install in liquid line leaving receiver.
   3. Use line size on leaving side of liquid solenoid valves.

D. Refrigerant Charging (Packed Angle) Valve: Use in liquid line between receiver shut-off valve and expansion valve.

E. Strainers:
   1. Use line size strainer upstream of each automatic valve.
   2. Where multiple expansion valves with integral strainers are used, use single main liquid line strainer.
   3. On steel piping systems, use strainer in suction line.
   4. Use shut-off valve on each side of strainer.

F. Filter-Driers:
   1. Use a filter-drier immediately ahead of liquid-line controls, such as thermostatic expansion valves, solenoid valves, and moisture indicators.
   2. Use a filter-drier on suction line just ahead of compressor.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide general assembly of specialties, including manufacturers catalogue information. Provide manufacturers catalog data including load capacity.

C. Sustainable Design Documentation: Submit manufacturer's product data on refrigerant used, showing compliance with specified requirements.

PART 2 PRODUCTS

2.01 PIPING

A. Copper Tube: ASTM B280, H58 hard drawn or O60 soft annealed.
   1. Fittings: ASME B16.22 wrought copper.
   2. Joints: Braze, AWS A5.8M/A5.8 BCuP silver/phosphorus/copper alloy.

2.02 REFRIGERANT

2.03 MOISTURE AND LIQUID INDICATORS

A. Indicators: Single port type, UL listed, with copper or brass body, flared or solder ends, sight glass, color coded paper moisture indicator with removable element cartridge and plastic cap; for maximum temperature of 200 degrees F and maximum working pressure of 500 psi.

2.04 VALVES

2.05 STRAINERS

2.06 FILTER-DRIERS

A. Performance:
   1. Flow Capacity - Liquid Line: ____ ton, minimum, rated in accordance with AHRI 710.
   2. Flow Capacity - Suction Line: ____ ton, minimum, rated in accordance with AHRI 730 (I-P).
   3. Pressure Drop: 2 psi, maximum, when operating at full connected evaporator capacity.
   4. Design Working Pressure: 350 psi, minimum.

B. Cores: Molded or loose-fill molecular sieve desiccant compatible with refrigerant, activated alumina, activated charcoal, and filtration to 40 microns, with secondary filtration to 20 microns; of construction that will not pass into refrigerant lines.

C. Construction: UL listed.
   1. Connections: As specified for applicable pipe type.

PART 3 EXECUTION

3.01 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt on inside and outside before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.02 INSTALLATION

A. Install refrigeration specialties in accordance with manufacturer's instructions.

B. Route piping in orderly manner, with plumbing parallel to building structure, and maintain gradient.

C. Install piping to conserve building space and avoid interference with use of space.

D. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

E. Pipe Hangers and Supports:
   1. Install in accordance with ASME B31.5.
   2. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
   3. Place hangers within 12 inches of each horizontal elbow.
   4. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

3.03 SCHEDULES

A. Hanger Spacing for Copper Tubing.
   1. 1/2 inch, 5/8 inch, and 7/8 inch OD: Maximum span, 5 feet; minimum rod size, 1/4 inch.

END OF SECTION 23 2300

SECTION 23 3100
HVAC DUCTS AND CASINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal ductwork.

B. Duct cleaning.

1.02 RELATED REQUIREMENTS

A. Section 23 0593 - Testing, Adjusting, and Balancing for HVAC.

B. Section 23 0713 - Duct Insulation: External insulation and duct liner.

C. Section 23 3700 - Air Outlets and Inlets.

1.03 REFERENCE STANDARDS

A. ASHRAE (FUND) - ASHRAE Handbook - Fundamentals; Most Recent Edition Cited by Referring Code or Reference Standard.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

C. NFPA 90A - Standard for the Installation of Air-Conditioning and Ventilating Systems; 2018.

D. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005 (Revised 2009).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.05 FIELD CONDITIONS

A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.

B. Maintain temperatures within acceptable range during and after installation of duct sealants.

PART 2 PRODUCTS

2.01 DUCT ASSEMBLIES

A. Regulatory Requirements: Construct ductwork to comply with NFPA 90A standards.

B. Ducts: Galvanized steel, unless otherwise indicated.

2.02 MATERIALS

A. Galvanized Steel for Ducts: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.

2.03 DUCTWORK FABRICATION

A. Fabricate and support in accordance with SMACNA (DCS) and as indicated.

B. No variation of duct configuration or size permitted except by written permission. Size round duct installed in place of rectangular ducts in accordance with ASHRAE (FUND) Handbook - Fundamentals.

C. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.

E. Fabricate continuously welded round and oval duct fittings in accordance with SMACNA (DCS).

2.04 MANUFACTURED DUCTWORK AND FITTINGS

PART 3 EXECUTION

3.01 INSTALLATION

A. Install, support, and seal ducts in accordance with SMACNA (DCS).

B. Install in accordance with manufacturer's instructions.

C. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.

D. Duct sizes indicated are inside clear dimensions. For lined ducts, maintain sizes inside lining.

E. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.

3.02 CLEANING

A. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

B. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment that could be harmed by excessive dirt with temporary filters, or bypass during cleaning.

END OF SECTION 23 3100

SECTION 23 3700
AIR OUTLETS AND INLETS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Diffusers.

B. Registers/grilles.

C. Louvers.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Titus, a brand of Air Distribution Technologies: www.titus-hvac.com/#sle.

2.02 LOUVERS

A. Manufacturers:
   1. GREENHECK.
   2. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.

C. Install diffusers to ductwork with air tight connection.

D. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.

END OF SECTION 23 3700

SECTION 23 8126.13

SMALL-CAPACITY SPLIT-SYSTEM AIR CONDITIONERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Air-source heat pumps.

B. Air cooled condensing units.

C. Indoor air handler (fan & coil) units for duct connection.

D. Controls.

1.02 REFERENCE STANDARDS

A. AHRI 210/240 - Standard for Performance Rating of Unitary Air-Conditioning and Air-Source Heat Pump Equipment; 2008, Including All Addenda.

B. AHRI 520 - Performance Rating of Positive Displacement Condensing Units; 2004.

C. ASHRAE Std 23.1 - Methods of Testing for Rating the Performance of Positive Displacement Refrigerant Compressors and Condensing Units that Operate at Subcritical Temperatures of the Refrigerant; 2010.

D. NEMA MG 1 - Motors and Generators; 2017.

E. UL 207 - Standard for Refrigerant-Containing Components and Accessories, Nonelectrical; Current Edition, Including All Revisions.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Mitsubishi.

2.02 SYSTEM DESIGN

A. Split-System Heating and Cooling Units: Self-contained, packaged, matched factory-engineered and assembled, pre-wired indoor and outdoor units; UL listed.
   1. Heating and Cooling: Air-source electric heat pump located in outdoor unit with evaporator.
   2. Provide refrigerant lines internal to units and between indoor and outdoor units, factory cleaned, dried, pressurized and sealed, with insulated suction line.

B. Performance Requirements: See Drawings for additional requirements.
   1. Efficiency:
      a. Seasonal Energy Efficiency Ratio: 14, minimum.

2.03 INDOOR UNITS FOR DUCTED SYSTEMS

A. Indoor Units: Self-contained, packaged, factory assembled, pre-wired unit consisting of cabinet, supply fan, heating and cooling element(s), controls, and accessories; wired for single power connection with control transformer.
   1. Air Flow Configuration: Upflow.
   2. Cabinet: Steel with baked enamel finish, easily removed and secured access doors with safety interlock switches, glass fiber insulation with reflective liner.

B. Supply Fan: Centrifugal type rubber mounted with direct or belt drive with adjustable variable pitch motor pulley.
   1. Motor: NEMA MG 1; 1750 rpm single speed, permanently lubricated, hinge mounted.
   2. Motor Electrical Characteristics:

C. Air Filters: 1 inch thick urethane, washable type arranged for easy replacement.

D. Evaporator Coils: Copper tube aluminum fin assembly, galvanized or polymer drain pan sloped in all directions to drain, drain connection, refrigerant piping connections, restricted distributor or thermostatic expansion valve.
   1. Construction and Ratings: In accordance with AHRI 210/240 and UL 207.
   2. Manufacturers: System manufacturer.

2.04 OUTDOOR UNITS

A. Outdoor Units: Self-contained, packaged, pre-wired unit consisting of cabinet, with compressor and condenser.
   1. Construction and Ratings: In accordance with AHRI 210/240 with testing in accordance with ASHRAE Std 23.1 and UL 207.

B. Air Cooled Condenser: Aluminum fin and copper tube coil, AHRI 520 with direct drive axial propeller fan resiliently mounted, galvanized fan guard.

C. Accessories: Filter drier, high pressure switch (manual reset), low pressure switch (automatic reset), service valves and gauge ports, thermometer well (in liquid line).
   1. Provide thermostatic expansion valves.

D. Operating Controls:
   1. Control by room thermostat to maintain room temperature setting.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrates are ready for installation of units and openings are as indicated on shop drawings.

B. Verify that proper power supply is available and in correct location.

C. Verify that proper fuel supply is available for connection.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions and requirements of local authorities having jurisdiction.

END OF SECTION 23 8126.13

SECTION 26 0519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Single conductor building wire.

B. Service entrance cable.

C. Metal-clad cable.

D. Wiring connectors.

E. Electrical tape.

F. Oxide inhibiting compound.

G. Wire pulling lubricant.

H. Cable ties.

1.02 RELATED REQUIREMENTS

A. Section 07 8400 - Firestopping.

B. Section 26 0526 - Grounding and Bonding for Electrical Systems: Additional requirements for grounding conductors and grounding connectors.

C. Section 26 2100 - Low-Voltage Electrical Service Entrance: Additional requirements for electrical service conductors.

D. Section 31 2316.13 - Trenching: Excavating, bedding, and backfilling.

1.03 REFERENCE STANDARDS

A. ASTM B3 - Standard Specification for Soft or Annealed Copper Wire; 2013.

B. ASTM B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft; 2011 (Reapproved 2017).

C. ASTM B33 - Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes; 2010 (Reapproved 2014).

D. ASTM B787/B787M - Standard Specification for 19 Wire Combination Unilay-Stranded Copper Conductors for Subsequent Insulation; 2004 (Reapproved 2014).

E. ASTM B800 - Standard Specification for 8000 Series Aluminum Alloy Wire for Electrical Purposes - Annealed and Intermediate Tempers; 2005 (Reapproved 2015).

F. ASTM B801 - Standard Specification for Concentric-Lay-Stranded Conductors of 8000 Series Aluminum Alloy Wire for Subsequent Covering of Insulation; 2016.

G. ASTM D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape; 2017.

H. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

I. NECA 104 - Recommended Practice for Installing Aluminum Building Wire and Cable; 2012.

J. NECA 120 - Standard for Installing Armored Cable (AC) and Metal-Clad Cable (MC); 2012.

K. NEMA WC 70 - Power Cables Rated 2000 Volts or Less for the Distribution of Electrical Energy; 2009.

L. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2017.

M. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

N. UL 44 - Thermoset-Insulated Wires and Cables; Current Edition, Including All Revisions.

O. UL 83 - Thermoplastic-Insulated Wires and Cables; Current Edition, Including All Revisions.

P. UL 486A-486B - Wire Connectors; Current Edition, Including All Revisions.

Q. UL 486C - Splicing Wire Connectors; Current Edition, Including All Revisions.

R. UL 510 - Polyvinyl Chloride, Polyethylene, and Rubber Insulating Tape; Current Edition, Including All Revisions.

S. UL 854 - Service-Entrance Cables; Current Edition, Including All Revisions.

T. UL 1569 - Metal-Clad Cables; Current Edition, Including All Revisions.

PART 2 PRODUCTS

2.01 CONDUCTOR AND CABLE APPLICATIONS

A. Do not use conductors and cables for applications other than as permitted by NFPA 70 and product listing.

B. Provide single conductor building wire installed in suitable raceway unless otherwise indicated, permitted, or required.

C. Nonmetallic-sheathed cable is not permitted.

2.02 CONDUCTOR AND CABLE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, etc. as required for a complete operating system.

D. Comply with NEMA WC 70.

E. Thermoplastic-Insulated Conductors and Cables: Listed and labeled as complying with UL 83.

F. Thermoset-Insulated Conductors and Cables: Listed and labeled as complying with UL 44.

G. Conductor Material:
   1. Provide copper conductors except where aluminum conductors are specifically indicated. Substitution of aluminum conductors for copper is not permitted. Conductor sizes indicated are based on copper unless specifically indicated as aluminum. Conductors designated with the abbreviation "AL" indicate aluminum.
   2. Copper Conductors: Soft drawn annealed, 98 percent conductivity, uncoated copper conductors complying with ASTM B3, ASTM B8, or ASTM B787/B787M unless otherwise indicated.
   3. Tinned Copper Conductors: Comply with ASTM B33.
   4. Aluminum Conductors (only where specifically indicated or permitted for substitution): AA-8000 series aluminum alloy conductors recognized by ASTM B800 and compact stranded in accordance with ASTM B801 unless otherwise indicated.

H. Conductor Color Coding:
   1. Color code conductors as indicated unless otherwise required by the authority having jurisdiction. Maintain consistent color coding throughout project.
   2. Color Coding Method: Integrally colored insulation.
   3. Color Code:
      a. 240/120 V, 1 Phase, 3 Wire System:
         1) Phase A: Black.
         2) Phase B: Red.
         3) Neutral/Grounded: White.
      b. Equipment Ground, All Systems: Green.
      c. Isolated Ground, All Systems: Green with yellow stripe.
      d. Travelers for 3-Way and 4-Way Switching: Pink.
      e. For control circuits, comply with manufacturer's recommended color code.

2.03 SINGLE CONDUCTOR BUILDING WIRE

A. Description: Single conductor insulated wire.

B. Conductor Stranding:

1. Feeders and Branch Circuits:
    a. Size 10 AWG and Smaller: Solid.
    b. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation:
1. Copper Building Wire: Type THHN/THWN or THHN/THWN-2, except as indicated below.

2.04 SERVICE ENTRANCE CABLE

A. Service Entrance Cable for Above-Ground Use: NFPA 70, Type SE multiple-conductor cable listed and labeled as complying with UL 854, Style R.

B. Service Entrance Cable for Underground Use: NFPA 70, Type USE single-conductor cable listed and labeled as complying with UL 854, Type USE-2, and with UL 44, Type RHH/RHW-2.

C. Conductor Stranding: Stranded.

D. Insulation Voltage Rating: 600 V.

2.05 METAL-CLAD CABLE

A. Description: NFPA 70, Type MC cable listed and labeled as complying with UL 1569, and listed for use in classified firestop systems to be used.

B. Conductor Stranding:
1. Size 10 AWG and Smaller: Solid.
2. Size 8 AWG and Larger: Stranded.

C. Insulation Voltage Rating: 600 V.

D. Insulation: Type THHN, THHN/THWN, or THHN/THWN-2.

E. Grounding: Full-size integral equipment grounding conductor.

F. Armor: Steel, interlocked tape.

2.06 WIRING CONNECTORS

A. Description: Wiring connectors appropriate for the application, suitable for use with the conductors to be connected, and listed as complying with UL 486A-486B or UL 486C as applicable.

2.07 WIRING ACCESSORIES

A. Electrical Tape:
1. Vinyl Insulating Electrical Tape: Complying with ASTM D3005 and listed as complying with UL 510; minimum thickness of 7 mil; resistant to abrasion, corrosion, and sunlight; conformable for application down to 0 degrees F and suitable for continuous temperature environment up to 221 degrees F.

B. Oxide Inhibiting Compound: Listed; suitable for use with the conductors or cables to be installed.

C. Wire Pulling Lubricant: Listed; suitable for use with the conductors or cables to be installed and suitable for use at the installation temperature.

D. Cable Ties: Material and tensile strength rating suitable for application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that interior of building has been protected from weather.

B. Verify that work likely to damage wire and cable has been completed.

C. Verify that raceways, boxes, and equipment enclosures are installed and are properly sized to accommodate conductors and cables in accordance with NFPA 70.

D. Verify that field measurements are as indicated.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 PREPARATION

A. Clean raceways thoroughly to remove foreign materials before installing conductors and cables.

3.03 INSTALLATION

A. Circuiting Requirements:
   1. Unless dimensioned, circuit routing indicated is diagrammatic.
   2. When circuit destination is indicated without specific routing, determine exact routing required.

B. Install products in accordance with manufacturer's instructions.

C. Perform work in accordance with NECA 1 (general workmanship).

D. Install aluminum conductors in accordance with NECA 104.

E. Install metal-clad cable (Type MC) in accordance with NECA 120.

F. Installation in Raceway:
   1. Tape ends of conductors and cables to prevent infiltration of moisture and other contaminants.
   2. Pull all conductors and cables together into raceway at same time.
   3. Do not damage conductors and cables or exceed manufacturer's recommended maximum pulling tension and sidewall pressure.
   4. Use suitable wire pulling lubricant where necessary, except when lubricant is not recommended by the manufacturer.

G. Paralleled Conductors: Install conductors of the same length and terminate in the same manner.

H. Secure and support conductors and cables in accordance with NFPA 70 using suitable supports and methods approved by the authority having jurisdiction. Provide independent support from building structure. Do not provide support from raceways, piping, ductwork, or other systems.

I. Terminate cables using suitable fittings.
   1. Metal-Clad Cable (Type MC):
      a. Use listed fittings.
      b. Cut cable armor only using specialized tools to prevent damaging conductors or insulation. Do not use hacksaw or wire cutters to cut armor.

J. Install conductors with a minimum of 12 inches of slack at each outlet.

K. Neatly train and bundle conductors inside boxes, wireways, panelboards and other equipment enclosures.

L. Group or otherwise identify neutral/grounded conductors with associated ungrounded conductors inside enclosures in accordance with NFPA 70.

M. Make wiring connections using specified wiring connectors.
   1. Make splices and taps only in accessible boxes. Do not pull splices into raceways or make splices in conduit bodies or wiring gutters.
   2. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors.
   3. Do not remove conductor strands to facilitate insertion into connector.
   4. Clean contact surfaces on conductors and connectors to suitable remove corrosion, oxides, and other contaminates. Do not use wire brush on plated connector surfaces.
   5. Connections for Aluminum Conductors: Fill connectors with oxide inhibiting compound where not pre-filled by manufacturer.

N. Insulate splices and taps that are made with uninsulated connectors using methods suitable for the application, with insulation and mechanical strength at least equivalent to unspliced conductors.

O. Insulate ends of spare conductors using vinyl insulating electrical tape.

P. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.

Q. Unless specifically indicated to be excluded, provide final connections to all equipment and devices, including those furnished by others, as required for a complete operating system.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS, except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.3.2. The insulation resistance test is required for all conductors. The resistance test for parallel conductors listed as optional is not required.

D. Correct deficiencies and replace damaged or defective conductors and cables.

END OF SECTION 26 0519

SECTION 26 0526

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Grounding and bonding requirements.

B. Conductors for grounding and bonding.

C. Connectors for grounding and bonding.

D. Ground bars.

E. Ground rod electrodes.

1.02 RELATED REQUIREMENTS

A. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Additional requirements for conductors for grounding and bonding, including conductor color coding.

B. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

C. Section 26 5600 - Exterior Lighting: Additional grounding and bonding requirements for pole-mounted luminaires.

1.03 REFERENCE STANDARDS

A. IEEE 81 - IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System; 2012.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

C. NEMA GR 1 - Grounding Rod Electrodes and Grounding Rod Electrode Couplings; 2007.

D. NETA ATS - Acceptance Testing Specifications for Electrical Power Equipment and Systems; 2017.

E. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

F. UL 467 - Grounding and Bonding Equipment; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittals procedures.

PART 2 PRODUCTS

2.01 GROUNDING AND BONDING REQUIREMENTS

A. Do not use products for applications other than as permitted by NFPA 70 and product listing.

B. Unless specifically indicated to be excluded, provide all required components, conductors, connectors, conduit, boxes, fittings, supports, accessories, etc. as necessary for a complete grounding and bonding system.

C. Where conductor size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

D. Grounding System Resistance:
   1. Achieve specified grounding system resistance under normally dry conditions unless otherwise approved by K2M Design Inc.. Precipitation within the previous 48 hours does not constitute normally dry conditions.
   2. Grounding Electrode System: Not greater than 5 ohms to ground, when tested according to IEEE 81 using "fall-of-potential" method.
   3. Between Grounding Electrode System and Major Electrical Equipment Frames, System Neutral, and Derived Neutral Points: Not greater than 0.5 ohms, when tested using "point-to-point" methods.

E. Grounding Electrode System:

1. Provide connection to required and supplemental grounding electrodes indicated to form grounding electrode system.
    a. Provide continuous grounding electrode conductors without splice or joint.
    b. Install grounding electrode conductors in raceway where exposed to physical damage. Bond grounding electrode conductor to metallic raceways at each end with bonding jumper.
2. Metal Underground Water Pipe(s):
    a. Provide connection to underground metal domestic and fire protection (where present) water service pipe(s) that are in direct contact with earth for at least 10 feet at an accessible location not more than 5 feet from the point of entrance to the building.
    b. Provide bonding jumper(s) around insulating joints/pipes as required to make pipe electrically continuous.
    c. Provide bonding jumper around water meter of sufficient length to permit removal of meter without disconnecting jumper.
3. Metal In-Ground Support Structure:
    a. Provide connection to metal in-ground support structure that is in direct contact with earth in accordance with NFPA 70.
4. Concrete-Encased Electrode:
    a. Provide connection to concrete-encased electrode consisting of not less than 20 feet of either steel reinforcing bars or bare copper conductor not smaller than 4 AWG embedded within concrete foundation or footing that is in direct contact with earth in accordance with NFPA 70.
5. Ground Rod Electrode(s):
    a. Provide three electrodes in an equilateral triangle configuration unless otherwise indicated or required.
    b. Space electrodes not less than 10 feet from each other and any other ground electrode.
6. Provide additional ground electrode(s) as required to achieve specified grounding electrode system resistance.
7. Ground Bar: Provide ground bar, separate from service equipment enclosure, for common connection point of grounding electrode system bonding jumpers as permitted in NFPA 70. Connect grounding electrode conductor provided for service-supplied system grounding to this ground bar.
    a. Ground Bar Size: 1/4 by 2 by 12 inches unless otherwise indicated or required.

F. Service-Supplied System Grounding:
1. For each service disconnect, provide grounding electrode conductor to connect neutral (grounded) service conductor to grounding electrode system. Unless otherwise indicated, make connection at neutral (grounded) bus in service disconnect enclosure.
2. For each service disconnect, provide main bonding jumper to connect neutral (grounded) bus to equipment ground bus where not factory-installed. Do not make any other connections between neutral (grounded) conductors and ground on load side of service disconnect.

G. Bonding and Equipment Grounding:
1. Provide bonding for equipment grounding conductors, equipment ground busses, metallic equipment enclosures, metallic raceways and boxes, device grounding terminals, and other normally non-current-carrying conductive materials enclosing electrical conductors/equipment or likely to become energized as indicated and in accordance with NFPA 70.
2. Provide insulated equipment grounding conductor in each feeder and branch circuit raceway. Do not use raceways as sole equipment grounding conductor.
3. Where circuit conductor sizes are increased for voltage drop, increase size of equipment grounding conductor proportionally in accordance with NFPA 70.
4. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

5. Terminate branch circuit equipment grounding conductors on solidly bonded equipment ground bus only. Do not terminate on neutral (grounded) or isolated/insulated ground bus.
6. Provide bonding jumper across expansion or expansion/deflection fittings provided to accommodate conduit movement.
7. Provide bonding for interior metal piping systems in accordance with NFPA 70. This includes, but is not limited to:

H. Communications Systems Grounding and Bonding:
1. Provide intersystem bonding termination at service equipment or metering equipment enclosure and at disconnecting means for any additional buildings or structures in accordance with NFPA 70.
2. Provide bonding jumper in raceway from intersystem bonding termination to each communications room or backboard and provide ground bar for termination.
a. Bonding Jumper Size: 6 AWG, unless otherwise indicated or required.
b. Raceway Size: 3/4 inch trade size unless otherwise indicated or required.
c. Ground Bar Size: 1/4 by 2 by 12 inches unless otherwise indicated or required.

I. Pole-Mounted Luminaires: Also comply with Section 26 5600.

2.02 GROUNDING AND BONDING COMPONENTS

A. General Requirements:
1. Provide products listed, classified, and labeled as suitable for the purpose intended.
2. Provide products listed and labeled as complying with UL 467 where applicable.

B. Conductors for Grounding and Bonding, in Addition to Requirements of Section 26 0526:
1. Use insulated copper conductors unless otherwise indicated.
a. Exceptions:
1) Use bare copper conductors where installed underground in direct contact with earth.
2) Use bare copper conductors where directly encased in concrete (not in raceway).

C. Connectors for Grounding and Bonding:
1. Description: Connectors appropriate for the application and suitable for the conductors and items to be connected; listed and labeled as complying with UL 467.
2. Unless otherwise indicated, use exothermic welded connections for underground, concealed and other inaccessible connections.
3. Unless otherwise indicated, use mechanical connectors, compression connectors, or exothermic welded connections for accessible connections.

D. Ground Bars:
1. Description: Copper rectangular ground bars with mounting brackets and insulators.
2. Size: As indicated.
3. Holes for Connections: As indicated or as required for connections to be made.

E. Ground Rod Electrodes:
1. Comply with NEMA GR 1.
2. Material: Copper-bonded (copper-clad) steel.
3. Size: 3/4 inch diameter by 10 feet length, unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that work likely to damage grounding and bonding system components has been completed.

B. Verify that field measurements are as indicated.

C. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Ground Rod Electrodes: Unless otherwise indicated, install ground rod electrodes vertically. Where encountered rock prohibits vertical installation, install at 45 degree angle or bury horizontally in trench at least 30 inches (750 mm) deep in accordance with NFPA 70 or provide ground plates.

D. Make grounding and bonding connections using specified connectors.
   1. Remove appropriate amount of conductor insulation for making connections without cutting, nicking or damaging conductors. Do not remove conductor strands to facilitate insertion into connector.
   2. Remove nonconductive paint, enamel, or similar coating at threads, contact points, and contact surfaces.
   3. Exothermic Welds: Make connections using molds and weld material suitable for the items to be connected in accordance with manufacturer's recommendations.
   4. Mechanical Connectors: Secure connections according to manufacturer's recommended torque settings.
   5. Compression Connectors: Secure connections using manufacturer's recommended tools and dies.

E. Identify grounding and bonding system components in accordance with Section 26 0553.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect and test in accordance with NETA ATS except Section 4.

C. Perform inspections and tests listed in NETA ATS, Section 7.13.

D. Perform ground electrode resistance tests under normally dry conditions. Precipitation within the previous 48 hours does not constitute normally dry conditions.

E. Investigate and correct deficiencies where measured ground resistances do not comply with specified requirements.

END OF SECTION 26 0526

SECTION 26 0533.13
CONDUIT FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Galvanized steel rigid metal conduit (RMC).

B. Aluminum rigid metal conduit (RMC).

C. Intermediate metal conduit (IMC).

D. PVC-coated galvanized steel rigid metal conduit (RMC).

E. Electrical metallic tubing (EMT).

F. Rigid polyvinyl chloride (PVC) conduit.

G. Reinforced thermosetting resin conduit (RTRC).

H. Conduit fittings.

1.02 RELATED REQUIREMENTS

A. Section 07 8400 - Firestopping.

B. Section 26 0526 - Grounding and Bonding for Electrical Systems.

C. Section 26 0529 - Hangers and Supports for Electrical Systems.

1.03 REFERENCE STANDARDS

A. ANSI C80.1 - American National Standard for Electrical Rigid Steel Conduit (ERSC); 2015.

B. ANSI C80.3 - American National Standard for Electrical Metallic Tubing -- Steel (EMT-S); 2015.

C. ANSI C80.5 - American National Standard for Electrical Rigid Metal Conduit -- Aluminum (ERMC-A); 2015.

D. ANSI C80.6 - American National Standard for Electrical Intermediate Metal Conduit (EIMC); 2005.

E. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

F. NECA 101 - Standard for Installing Steel Conduits (Rigid, IMC, EMT); 2013.

G. NECA 102 - Standard for Installing Aluminum Rigid Metal Conduit; 2004.

H. NECA 111 - Standard for Installing Nonmetallic Raceways (RNC, ENT, LFNC); 2003.

I. NEMA FB 1 - Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit, Electrical Metallic Tubing, and Cable; 2014.

J. NEMA RN 1 - Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit; 2005 (Reaffirmed 2013).

K. NEMA TC 2 - Electrical Polyvinyl Chloride (PVC) Conduit; 2013.

L. NEMA TC 3 - Polyvinyl Chloride (PVC) Fittings for Use with Rigid PVC Conduit and Tubing; 2016.

M. NEMA TC 14 (SERIES) - Reinforced Thermosetting Resin Conduit and Fittings Series; 2015.

N. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

O. UL 6 - Electrical Rigid Metal Conduit-Steel; Current Edition, Including All Revisions.

P. UL 6A - Electrical Rigid Metal Conduit-Aluminum, Red Brass, and Stainless Steel; Current Edition, Including All Revisions.

Q. UL 514B - Conduit, Tubing, and Cable Fittings; Current Edition, Including All Revisions.

R. UL 651 - Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings; Current Edition, Including All Revisions.

S. UL 797 - Electrical Metallic Tubing-Steel; Current Edition, Including All Revisions.

T. UL 1242 - Electrical Intermediate Metal Conduit-Steel; Current Edition, Including All Revisions.

PART 2 PRODUCTS

2.01 CONDUIT APPLICATIONS

A. Do not use conduit and associated fittings for applications other than as permitted by NFPA 70 and product listing.

B. Unless otherwise indicated and where not otherwise restricted, use the conduit types indicated for the specified applications. Where more than one listed application applies, comply with the most restrictive requirements. Where conduit type for a particular application is not specified, use galvanized steel rigid metal conduit.

C. Underground:
   1. Under Slab on Grade: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), PVC-coated galvanized steel rigid metal conduit, rigid PVC conduit, or reinforced thermosetting resin conduit (RTRC).
   2. Exterior, Direct-Buried: Use galvanized steel rigid metal conduit, intermediate metallic conduit (IMC), PVC-coated galvanized steel rigid metal conduit, rigid PVC conduit, or reinforced thermosetting resin conduit (RTRC).
   3. Where rigid polyvinyl (PVC) conduit is provided, transition to galvanized steel rigid metal conduit where emerging from underground.
   4. Where steel conduit is installed in direct contact with earth where soil has a resistivity of less than 2000 ohm-centimeters or is characterized as severely corrosive based on soils report or local experience, use corrosion protection tape to provide supplementary corrosion protection or use PVC-coated galvanized steel rigid metal conduit.

D. Concealed Within Hollow Stud Walls: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).

E. Concealed Above Accessible Ceilings: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).

F. Exposed, Interior, Not Subject to Physical Damage: Use galvanized steel rigid metal conduit, intermediate metal conduit (IMC), or electrical metallic tubing (EMT).

G. Exposed, Interior, Subject to Physical Damage: Use galvanized steel rigid metal conduit or intermediate metal conduit (IMC).
   1. Locations subject to physical damage include, but are not limited to:
      a. Where exposed below 20 feet in warehouse areas.

2.02 CONDUIT REQUIREMENTS

A. Provide all conduit, fittings, supports, and accessories required for a complete raceway system.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. Where conduit size is not indicated, size to comply with NFPA 70 but not less than applicable minimum size requirements specified.

2.03 GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit complying with ANSI C80.1 and listed and labeled as complying with UL 6.

B. Fittings:
   1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
   3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.04 ALUMINUM RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC aluminum rigid metal conduit complying with ANSI C80.5 and listed and labeled as complying with UL 6A.

B. Fittings:
   1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use aluminum.
   3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.05 INTERMEDIATE METAL CONDUIT (IMC)

A. Description: NFPA 70, Type IMC galvanized steel intermediate metal conduit complying with ANSI C80.6 and listed and labeled as complying with UL 1242.

B. Fittings:
   1. Non-Hazardous Locations: Use fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
   3. Connectors and Couplings: Use threaded type fittings only. Threadless set screw and compression (gland) type fittings are not permitted.

2.06 PVC-COATED GALVANIZED STEEL RIGID METAL CONDUIT (RMC)

A. Description: NFPA 70, Type RMC galvanized steel rigid metal conduit with external polyvinyl chloride (PVC) coating complying with NEMA RN 1 and listed and labeled as complying with UL 6.

B. Exterior Coating: Polyvinyl chloride (PVC), nominal thickness of 40 mil.

C. PVC-Coated Fittings:
   1. Manufacturer: Same as manufacturer of PVC-coated conduit to be installed.
   2. Non-Hazardous Locations: Use fittings listed and labeled as complying with UL 514B.
   3. Material: Use steel or malleable iron.
   4. Exterior Coating: Polyvinyl chloride (PVC), minimum thickness of 40 mil.

D. PVC-Coated Supports: Furnish with exterior coating of polyvinyl chloride (PVC), minimum thickness of 15 mil.

2.07 ELECTRICAL METALLIC TUBING (EMT)

A. Description: NFPA 70, Type EMT steel electrical metallic tubing complying with ANSI C80.3 and listed and labeled as complying with UL 797.

B. Fittings:
   1. Description: Fittings complying with NEMA FB 1 and listed and labeled as complying with UL 514B.
   2. Material: Use steel or malleable iron.
   3. Connectors and Couplings: Use compression (gland) or set-screw type.
      a. Do not use indenter type connectors and couplings.

2.08 RIGID POLYVINYL CHLORIDE (PVC) CONDUIT

A. Description: NFPA 70, Type PVC rigid polyvinyl chloride conduit complying with NEMA TC 2 and listed and labeled as complying with UL 651; Schedule 40 unless otherwise indicated, Schedule 80 where subject to physical damage; rated for use with conductors rated 90 degrees C.

B. Fittings:
   1. Manufacturer: Same as manufacturer of conduit to be connected.
   2. Description: Fittings complying with NEMA TC 3 and listed and labeled as complying with UL 651; material to match conduit.

2.09 REINFORCED THERMOSETTING RESIN CONDUIT (RTRC)

A. Description: NFPA 70, Type RTRC reinforced thermosetting resin conduit complying with NEMA TC 14 (SERIES).

B. Supports: Per manufacturer's recommendations.

C. Fittings: Same type and manufacturer as conduit to be connected.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Install galvanized steel rigid metal conduit (RMC) in accordance with NECA 101.

D. Install aluminum rigid metal conduit (RMC) in accordance with NECA 102.

E. Install intermediate metal conduit (IMC) in accordance with NECA 101.

F. Install PVC-coated galvanized steel rigid metal conduit (RMC) using only tools approved by the manufacturer.

G. Install rigid polyvinyl chloride (PVC) conduit in accordance with NECA 111.

H. Conduit Support:
   1. Secure and support conduits in accordance with NFPA 70 and Section 26 0529 using suitable supports and methods approved by the authority having jurisdiction.
   2. Provide independent support from building structure. Do not provide support from piping, ductwork, or other systems.

I. Connections and Terminations:
   1. Use approved zinc-rich paint or conduit joint compound on field-cut threads of galvanized steel conduits prior to making connections.
   2. Where two threaded conduits must be joined and neither can be rotated, use three-piece couplings or split couplings. Do not use running threads.
   3. Use suitable adapters where required to transition from one type of conduit to another.
   4. Terminate threaded conduits in boxes and enclosures using threaded hubs or double lock nuts for dry locations and raintight hubs for wet locations.
   5. Provide insulating bushings or insulated throats at all conduit terminations to protect conductors.
   6. Secure joints and connections to provide maximum mechanical strength and electrical continuity.

J. Penetrations:
   1. Do not penetrate or otherwise notch or cut structural members, including footings and grade beams, without approval of Structural Engineer.
   2. Make penetrations perpendicular to surfaces unless otherwise indicated.
   3. Provide sleeves for penetrations as indicated or as required to facilitate installation. Set sleeves flush with exposed surfaces unless otherwise indicated or required.
   4. Conceal bends for conduit risers emerging above ground.
   5. Seal interior of conduits entering the building from underground at first accessible point to prevent entry of moisture and gases.
   6. Where conduits penetrate waterproof membrane, seal as required to maintain integrity of membrane.
   7. Make penetrations for roof-mounted equipment within associated equipment openings and curbs where possible to minimize roofing system penetrations. Where penetrations are necessary, seal as indicated or as required to preserve integrity of roofing system and maintain roof warranty. Include proposed locations of penetrations and methods for sealing with submittals.
   8. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 07 8400.

K. Conduit Movement Provisions: Where conduits are subject to movement, provide expansion and expansion/deflection fittings to prevent damage to enclosed conductors or connected equipment. This includes, but is not limited to:
   1. Where conduits cross structural joints intended for expansion, contraction, or deflection.

2. Where calculated in accordance with NFPA 70 for rigid polyvinyl chloride (PVC) conduit installed above ground to compensate for thermal expansion and contraction.
3. Where calculated in accordance with NFPA 70 for reinforced thermosetting resin conduit (RTRC) conduit installed above ground to compensate for thermal expansion and contraction.
4. Where conduits are subject to earth movement by settlement or frost.

L. Condensation Prevention: Where conduits cross barriers between areas of potential substantial temperature differential, provide sealing fitting or approved sealing compound at an accessible point near the penetration to prevent condensation. This includes, but is not limited to:
1. Where conduits pass from outdoors into conditioned interior spaces.
2. Where conduits pass from unconditioned interior spaces into conditioned interior spaces.

M. Provide grounding and bonding in accordance with Section 26 0526.

3.02 PROTECTION

A. Immediately after installation of conduit, use suitable manufactured plugs to provide protection from entry of moisture and foreign material and do not remove until ready for installation of conductors.

END OF SECTION 26 0533.13

SECTION 26 0553

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical identification requirements.

B. Identification nameplates and labels.

C. Warning signs and labels.

1.02 RELATED REQUIREMENTS

A. Section 26 0519 - Low-Voltage Electrical Power Conductors and Cables: Color coding for power conductors and cables 600 V and less; vinyl color coding electrical tape.

1.03 REFERENCE STANDARDS

A. ANSI Z535.2 - American National Standard for Environmental and Facility Safety Signs; 2011.

B. ANSI Z535.4 - American National Standard for Product Safety Signs and Labels; 2011.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. UL 969 - Marking and Labeling Systems; Current Edition, Including All Revisions.

PART 2 PRODUCTS

2.01 IDENTIFICATION REQUIREMENTS

A. Identification for Equipment:
   1. Use identification nameplate to identify each piece of electrical distribution and control equipment and associated sections, compartments, and components.
      a. Panelboards:
         1) Identify ampere rating.
         2) Identify voltage and phase.
         3) Identify power source and circuit number. Include location when not within sight of equipment.
         4) Use typewritten circuit directory to identify load(s) served for panelboards with a door. Identify spares and spaces using pencil.
         5) For power panelboards without a door, use identification nameplate to identify load(s) served for each branch device. Do not identify spares and spaces.
      b. Enclosed switches, circuit breakers, and motor controllers:
         1) Identify voltage and phase.
         2) Identify power source and circuit number. Include location when not within sight of equipment.
   2. Available Fault Current Documentation: Use identification label to identify the available fault current and date calculations were performed at locations requiring documentation by NFPA 70, including but not limited to the following.
      a. Service equipment.
      b. Industrial control panels.
      c. Motor control centers.
      d. Elevator control panels.
      e. Industrial machinery.

B. Identification for Conductors and Cables:
   1. Color Coding for Power Conductors 600 V and Less: Comply with Section 26 0519.
   2. Use identification nameplate or identification label to identify color code for ungrounded and grounded power conductors inside door or enclosure at each piece of feeder or branch-circuit distribution equipment when premises has feeders or branch circuits served by more than one nominal voltage system.

2.02 IDENTIFICATION NAMEPLATES AND LABELS

A. Identification Nameplates:
   1. Materials:
   2. Mounting Holes for Mechanical Fasteners: Two, centered on sides for sizes up to 1 inch high; Four, located at corners for larger sizes.

B. Identification Labels:
   1. Materials: Use self-adhesive laminated plastic labels; UV, chemical, water, heat, and abrasion resistant.
   2. Text: Use factory pre-printed or machine-printed text. Do not use handwritten text unless otherwise indicated.

2.03 WARNING SIGNS AND LABELS

A. Comply with ANSI Z535.2 or ANSI Z535.4 as applicable.

B. Warning Signs:
   1. Materials:
   2. Minimum Size: 7 by 10 inches unless otherwise indicated.

C. Warning Labels:
   1. Materials: Use factory pre-printed or machine-printed self-adhesive polyester or self-adhesive vinyl labels; UV, chemical, water, heat, and abrasion resistant; produced using materials recognized to UL 969.
   2. Machine-Printed Labels: Use thermal transfer process printing machines and accessories recommended by label manufacturer.
   3. Minimum Size: 2 by 4 inches unless otherwise indicated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions.

B. Install identification products to be plainly visible for examination, adjustment, servicing, and maintenance. Unless otherwise indicated, locate products as follows:
   1. Surface-Mounted Equipment: Enclosure front.
   2. Flush-Mounted Equipment: Inside of equipment door.
   3. Free-Standing Equipment: Enclosure front; also enclosure rear for equipment with rear access.
   4. Elevated Equipment: Legible from the floor or working platform.
   5. Branch Devices: Adjacent to device.
   6. Interior Components: Legible from the point of access.
   7. Conductors and Cables: Legible from the point of access.

C. Install identification products centered, level, and parallel with lines of item being identified.

D. Secure nameplates to exterior surfaces of enclosures using stainless steel screws and to interior surfaces using self-adhesive backing or epoxy cement.

E. Install self-adhesive labels and markers to achieve maximum adhesion, with no bubbles or wrinkles and edges properly sealed.

F. Mark all handwritten text, where permitted, to be neat and legible.

END OF SECTION 26 0553

SECTION 26 0923
LIGHTING CONTROL DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Occupancy sensors.

B. Outdoor photo controls.

C. Lighting contactors.

1.02 RELATED REQUIREMENTS

A. Section 26 0529 - Hangers and Supports for Electrical Systems.

B. Section 26 0533.16 - Boxes for Electrical Systems.

C. Section 26 2726 - Wiring Devices: Devices for manual control of lighting, including wall switches, wall dimmers, and fan speed controllers.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.04 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.01 LIGHTING CONTROL DEVICES - GENERAL REQUIREMENTS

A. Provide products listed, classified, and labeled as suitable for the purpose intended.

B. Unless specifically indicated to be excluded, provide all required conduit, wiring, connectors, hardware, components, accessories, etc. as required for a complete operating system.

2.02 OCCUPANCY SENSORS

A. Manufacturers:
   1. Hubbell Incorporated; _____: www.hubbell.com/#sle.
   2. Lutron Electronics Company, Inc; _____: www.lutron.com/#sle.
   3. WattStopper; _____: www.wattstopper.com/#sle.

B. All Occupancy Sensors:
   1. Description: Factory-assembled commercial specification grade devices for indoor use capable of sensing both major motion, such as walking, and minor motion, such as small desktop level movements, according to published coverage areas, for automatic control of load indicated.
   2. Sensor Technology:
   3. Provide LED to visually indicate motion detection with separate color LEDs for each sensor type in dual technology units.
   4. Operation: Unless otherwise indicated, occupancy sensor to turn load on when occupant presence is detected and to turn load off when no occupant presence is detected during an adjustable turn-off delay time interval.
   5. Turn-Off Delay: Field adjustable, with time delay settings up to 30 minutes.
   6. Compatibility (Non-Dimming Sensors): Suitable for controlling incandescent lighting, low-voltage lighting with electronic and magnetic transformers, fluorescent lighting with electronic and magnetic ballasts, and fractional motor loads, with no minimum load requirements.

C. Wall Switch Occupancy Sensors:
   1. All Wall Switch Occupancy Sensors:
      a. Description: Occupancy sensors designed for installation in standard wall box at standard wall switch mounting height with a field of view of 180 degrees, integrated manual control capability, and no leakage current to load in off mode.

b. Manual-Off Override Control: When used to turn off load while in automatic-on mode, unit to revert back to automatic mode after no occupant presence is detected during the delayed-off time interval.

D. Ceiling Mounted Occupancy Sensors:
1. All Ceiling Mounted Occupancy Sensors:
a. Description: Low profile occupancy sensors designed for ceiling installation.

2.03 OUTDOOR PHOTO CONTROLS

2.04 LIGHTING CONTACTORS

A. Description: Magnetic lighting contactors complying with NEMA ICS 2, and listed and labeled as complying with UL 60947-1 and UL 60947-4-1; noncombination type unless otherwise indicated; ratings, configurations and features as indicated on the drawings.

B. Short Circuit Current Rating:

C. Enclosures:
1. Comply with NEMA ICS 6.
2. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
3. Finish: Manufacturer's standard unless otherwise indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate devices and conductors in accordance with NFPA 70.

C. Verify that openings for outlet boxes are neatly cut and will be completely covered by devices or wall plates.

D. Verify that final surface finishes are complete, including painting.

E. Verify that branch circuit wiring installation is completed, tested, and ready for connection to lighting control devices.

F. Verify that the service voltage and ratings of lighting control devices are appropriate for the service voltage and load requirements at the location to be installed.

G. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Install lighting control devices in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.

B. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of lighting control devices provided under this section.

C. Install lighting control devices in accordance with manufacturer's instructions.

D. Unless otherwise indicated, connect lighting control device grounding terminal or conductor to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

E. Install lighting control devices plumb and level, and held securely in place.

F. Where required and not furnished with lighting control device, provide wall plate in accordance with Section 26 2726.

G. Provide required supports in accordance with Section 26 0529.

H. Where applicable, install lighting control devices and associated wall plates to fit completely flush to mounting surface with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.

I. Outdoor Photo Control Locations:
   1. Where possible, locate outdoor photo controls with photo sensor facing north. If north facing photo sensor is not possible, install with photo sensor facing east, west, or down.
   2. Locate outdoor photo controls so that photo sensors do not face artificial light sources, including light sources controlled by the photo control itself.

J. Install outdoor photo controls so that connections are weatherproof. Do not install photo controls with conduit stem facing up in order to prevent infiltration of water into the photo control.

3.03 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

B. Adjust occupancy sensor settings to minimize undesired activations while optimizing energy savings, and to achieve desired function as indicated or as directed by K2M Design Inc..

END OF SECTION 26 0923

SECTION 26 2100

LOW-VOLTAGE ELECTRICAL SERVICE ENTRANCE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electrical service requirements.

1.02 RELATED REQUIREMENTS

A. Section 26 0526 - Grounding and Bonding for Electrical Systems.

B. Section 26 0529 - Hangers and Supports for Electrical Systems.

C. Section 26 0553 - Identification for Electrical Systems: Identification products and requirements.

1.03 REFERENCE STANDARDS

A. IEEE C2 - National Electrical Safety Code; 2017.

B. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

C. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 QUALITY ASSURANCE

A. Comply with the following:
   1. IEEE C2 (National Electrical Safety Code).
   2. NFPA 70 (National Electrical Code).
   3. The requirements of the Utility Company.

PART 2 PRODUCTS

2.01 ELECTRICAL SERVICE REQUIREMENTS

A. Provide new electrical service consisting of all required conduits, conductors, equipment, metering provisions, supports, accessories, etc. as necessary for connection between Utility Company point of supply and service entrance equipment.

B. Products Furnished by Contractor: Comply with Utility Company requirements.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install products in accordance with manufacturer's instructions and Utility Company requirements.

B. Perform work in accordance with NECA 1 (general workmanship).

C. Arrange equipment to provide minimum clearances and required maintenance access.

D. Provide required support and attachment components in accordance with Section 26 0529.

E. Provide grounding and bonding for service entrance equipment in accordance with Section 26 0526.

F. Identify service entrance equipment, including main service disconnect(s) in accordance with Section 26 0553.

END OF SECTION 26 2100

SECTION 26 2726
WIRING DEVICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall switches.

B. Wall dimmers.

C. Receptacles.

D. Wall plates.

1.02 RELATED REQUIREMENTS

A. Section 26 0533.16 - Boxes for Electrical Systems.

1.03 REFERENCE STANDARDS

A. FS W-C-596 - Connector, Electrical, Power, General Specification for; 2017h.

B. FS W-S-896 - Switches, Toggle (Toggle and Lock), Flush-mounted (General Specification); 2017g.

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

D. NECA 130 - Standard for Installing and Maintaining Wiring Devices; 2010.

E. NEMA WD 1 - General Color Requirements for Wiring Devices; 1999 (Reaffirmed 2015).

F. NEMA WD 6 - Wiring Devices - Dimensional Specifications; 2016.

G. UL 20 - General-Use Snap Switches; Current Edition, Including All Revisions.

H. UL 498 - Attachment Plugs and Receptacles; Current Edition, Including All Revisions.

I. UL 514D - Cover Plates for Flush-Mounted Wiring Devices; Current Edition, Including All Revisions.

J. UL 943 - Ground-Fault Circuit-Interrupters; Current Edition, Including All Revisions.

K. UL 1472 - Solid-State Dimming Controls; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

PART 2 PRODUCTS

2.01 WIRING DEVICE APPLICATIONS

A. Provide weather resistant GFCI receptacles with specified weatherproof covers for receptacles installed outdoors or in damp or wet locations.

B. Provide GFCI protection for receptacles installed within 6 feet of sinks.

C. Provide GFCI protection for receptacles installed in kitchens.

D. Provide GFCI protection for receptacles serving electric drinking fountains.

2.02 WIRING DEVICE FINISHES

A. Provide wiring device finishes as described below unless otherwise indicated.

B. Wiring Devices, Unless Otherwise Indicated: White with white nylon wall plate.

C. Wiring Devices Installed in Finished Spaces: White with white nylon wall plate.

2.03 WALL SWITCHES

A. Wall Switches - General Requirements: AC only, quiet operating, general-use snap switches with silver alloy contacts, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 20 and where applicable, FS W-S-896; types as indicated on the drawings.

1. Wiring Provisions: Terminal screws for side wiring and screw actuated binding clamp for back wiring with separate ground terminal screw.

2.04 WALL DIMMERS

A. Wall Dimmers - General Requirements: Solid-state with continuous full-range even control following square law dimming curve, integral radio frequency interference filtering, power failure preset memory, air gap switch accessible without removing wall plate, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 1472; types and ratings suitable for load controlled as indicated on the drawings.

2.05 RECEPTACLES

A. Receptacles - General Requirements: Self-grounding, complying with NEMA WD 1 and NEMA WD 6, and listed as complying with UL 498, and where applicable, FS W-C-596; types as indicated on the drawings.
   1. Wiring Provisions: Terminal screws for side wiring or screw actuated binding clamp for back wiring with separate ground terminal screw.
   2. NEMA configurations specified are according to NEMA WD 6.

B. GFCI Receptacles:
   1. GFCI Receptacles - General Requirements: Self-testing, with feed-through protection and light to indicate ground fault tripped condition and loss of protection; listed as complying with UL 943, class A.

2.06 WALL PLATES

A. Wall Plates: Comply with UL 514D.
   1. Configuration: One piece cover as required for quantity and types of corresponding wiring devices.
   2. Size: Standard; _____.
   3. Screws: Metal with slotted heads finished to match wall plate finish.

PART 3 EXECUTION

3.01 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.02 INSTALLATION

A. Perform work in accordance with NECA 1 (general workmanship) and, where applicable, NECA 130, including mounting heights specified in those standards unless otherwise indicated.

B. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of wiring devices provided under this section.

C. Install wiring devices in accordance with manufacturer's instructions.

D. Install permanent barrier between ganged wiring devices when voltage between adjacent devices exceeds 300 V.

E. Where required, connect wiring devices using pigtails not less than 6 inches long. Do not connect more than one conductor to wiring device terminals.

F. Connect wiring devices by wrapping conductor clockwise 3/4 turn around screw terminal and tightening to proper torque specified by the manufacturer. Where present, do not use push-in pressure terminals that do not rely on screw-actuated binding.

G. Unless otherwise indicated, connect wiring device grounding terminal to branch circuit equipment grounding conductor and to outlet box with bonding jumper.

H. Install wiring devices plumb and level with mounting yoke held rigidly in place.

I. Install wall switches with OFF position down.

J. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer.

K. Do not share neutral conductor on branch circuits utilizing wall dimmers.

L. Install vertically mounted receptacles with grounding pole on top and horizontally mounted receptacles with grounding pole on left.

M. Install wall plates to fit completely flush to wall with no gaps and rough opening completely covered without strain on wall plate. Repair or reinstall improperly installed outlet boxes or improperly sized rough openings. Do not use oversized wall plates in lieu of meeting this requirement.

N. Install blank wall plates on junction boxes and on outlet boxes with no wiring devices installed or designated for future use.

3.03 ADJUSTING

A. Adjust devices and wall plates to be flush and level.

3.04 CLEANING

A. Clean exposed surfaces to remove dirt, paint, or other foreign material and restore to match original factory finish.

SECTION 26 5133

LUMINAIRES, BALLASTS, AND DRIVERS - LUTRON

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Luminaires.

B. LED drivers.

C. Lamps.

1.02 RELATED REQUIREMENTS

A. Section 26 0533.16 - Boxes for Electrical Systems.

B. Section 26 5100 - Interior Lighting: Additional general and execution requirements applicable to this section; additional lighting products.

1.03 REFERENCE STANDARDS

A. ANSI/ESD S20.20 - Standard for the Development of an Electrostatic Discharge Control Program for Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices); 2014.

B. IEC 60081 - Double-Capped Fluorescent Lamps - Performance Specifications; 2002 (Amended 2017).

C. IEC 60901 - Single-Capped Fluorescent Lamps - Performance Specifications; 2001 (Amended 2014).

D. IEC 61000-4-2 - Electromagnetic Compatibility (EMC) - Part 4-2: Testing and Measurement Techniques - Electrostatic Discharge Immunity Test; 2008.

E. IEEE C62.41.2 - IEEE Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits; 2002 (Corrigendum 2012).

F. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

G. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems; 2006.

H. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts; 2016.

I. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; 2012.

J. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

K. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

L. UL 924 - Emergency Lighting and Power Equipment; Current Edition, Including All Revisions.

M. UL 1598 - Luminaires; Current Edition, Including All Revisions.

N. UL 1598C - Light-Emitting Diode (LED) Retrofit Luminaire Conversion Kits; Current Edition, Including All Revisions.

O. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:

C. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, and installed accessories; include model number nomenclature clearly marked with all proposed features.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Dimming Ballasts and Drivers:
   1. Lutron Electronics Company, Inc; www.lutron.com/#sle.
   2. Manufacturer Limitations: Where possible, provide ballasts/drivers produced by a single manufacturer.

2.02 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

2.03 LUMINAIRE GENERAL REQUIREMENTS

A. Provide products that comply with requirements of NFPA 70.

B. Provide products that are listed and labeled as complying with UL 1598, where applicable.

C. Provide products listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. Recessed Luminaires:
   1. Ceiling Compatibility: Comply with NEMA LE 4.
   2. Luminaires Recessed in Insulated Ceilings: Listed and labeled as IC-rated, suitable for direct contact with insulation and combustible materials.

H. Fluorescent Luminaires:
   1. Provide ballast disconnecting means complying with NFPA 70 where required.

I. LED Luminaire Components: UL 8750 recognized or listed as applicable.

J. Emergency Power Supply Units: Suitable for use with indicated luminaires, complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.

2.04 LED DRIVERS

A. General Requirements:
   1. Operate for at least 50,000 hours at maximum case temperature and 90 percent non-condensing relative humidity.
   2. Provide thermal protection by automatically reducing power output to protect LED driver and LED light engine/fixture from damage due to over-temperature conditions that exceed the LED driver's maximum operating temperature at the calibration point (tc).
   3. Provide integral recording of operating hours and maximum operating temperature to aid in troubleshooting and warranty claims.
   4. Designed and tested to withstand electrostatic discharges incurred during manufacturing, installation, or field troubleshooting without impairment of performance when tested according to IEC 61000-4-2.
   5. Manufactured in a facility that employs ESD reduction practices in compliance with ANSI/ESD S20.20.
   6. UL 8750 recognized or listed as applicable.
   7. UL Type TL rated or UL Class P listed where possible to allow for easier fixture evaluation and listing of different driver series.

8. Suitable for field replacement as applicable; listed in accordance with UL 1598C or UL 8750, Class P as indicated.
9. Designed and tested to withstand Category A surges of 4,000 V according to IEEE C62.41.2 without impairment of performance.
10. Class A sound rating; inaudible in a 27 dBA ambient.
11. Demonstrate no visible change in light output with a variation of plus or minus 10 percent change in line-voltage input.
12. LED drivers of the same family/series to track evenly across multiple fixtures at all light levels.
13. Offer programmable output currents in 10 mA or smaller increments within designed driver operating ranges for custom fixture length and lumen output configurations, while meeting a low-end dimming range of 100 to 0.1 percent, 100 to 1 percent or 100 to 5 percent as applicable.
14. Meet NEMA 410 inrush requirements for mitigating inrush currents with solid state lighting sources.
15. Employ integral fault protection up to 277 V to prevent LED driver damage or failure in the event of incorrect application of line-voltage to communication link inputs.
16. LED driver may be remote located up to 100 feet from LED light engine depending on power outputs required and wire gauge utilized by installer.

2.05 LAMPS

A. All Lamps:
   1. Unless explicitly excluded, provide new, compatible, operable lamps in each luminaire.
   2. Verify compatibility of specified lamps with luminaires to be installed. Where lamps are not specified, provide lamps per luminaire manufacturer's recommendations.
   3. Minimum Efficiency: Provide lamps complying with all current applicable federal and state lamp efficiency standards.
   4. Fluorescent Lamps: Comply with IEC 60081 and IEC 60901 as applicable.

B. Compact Fluorescent Lamps: Wattage and bulb type as indicated, with base type as required for luminaire.

C. Linear Fluorescent Lamps: Wattage and bulb type as indicated, with base type as required for luminaire.

PART 3 EXECUTION

3.01 SEE SECTION 26 5100 - INTERIOR LIGHTING FOR ADDITIONAL REQUIREMENTS.

3.02 EXAMINATION

A. Verify that field measurements are as shown on the drawings.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.

C. Verify that suitable support frames are installed where required.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.03 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of luminaires provided under this section.

B. Install products according to manufacturer's instructions.

C. Perform work in a neat and workmanlike manner in accordance with NECA 1.

D. Install luminaires in accordance with NECA/IESNA 500 (commercial lighting).

E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

F. Suspended Ceiling Mounted Luminaires:

1. Do not use ceiling tiles to bear weight of luminaires.
2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.
3. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.

G. Recessed Luminaires:
1. Install trims tight to mounting surface with no visible light leakage.
2. Non-IC Rated Luminaires: Maintain required separation from insulation and combustible materials according to listing.
3. Luminaires Recessed in Fire-Rated Ceilings: Install using accessories and firestopping materials to meet regulatory requirements for fire rating.

H. Suspended Luminaires:
1. Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.
2. Install canopies tight to mounting surface.

I. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.

J. Install accessories furnished with each luminaire.

K. Bond products and metal accessories to branch circuit equipment grounding conductor.

L. Install lamps in each luminaire.

M. Lamp Burn-In: Operate lamps at full output for prescribed period per manufacturer's recommendations prior to use with any dimming controls. Replace lamps that fail prematurely due to improper lamp burn-in.

END OF SECTION 26 5133

SECTION 26 5600
EXTERIOR LIGHTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior luminaires.

B. Poles and accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Materials and installation requirements for concrete bases for poles.

B. Section 26 0529 - Hangers and Supports for Electrical Systems.

C. Section 26 0533.16 - Boxes for Electrical Systems.

1.03 REFERENCE STANDARDS

A. IES LM-79 - Approved Method: Electrical and Photometric Measurements of Solid-State Lighting Products; 2008.

B. IES LM-80 - Approved Method: Measuring Luminous Flux and Color Maintenance of LED Packages, Arrays, and Modules; 2015, with Errata (2017).

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; 2015.

D. NECA/IESNA 501 - Standard for Installing Exterior Lighting Systems; 2006.

E. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; 2012.

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. UL 1598 - Luminaires; Current Edition, Including All Revisions.

H. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, weight, effective projected area (EPA), and installed accessories; include model number nomenclature clearly marked with all proposed features.

1. LED Luminaires:

a. Include estimated useful life, calculated based on IES LM-80 test data.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

PART 2 PRODUCTS

2.01 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

2.02 LUMINAIRES

A. Provide products that comply with requirements of NFPA 70.

B. Provide products that are listed and labeled as complying with UL 1598, where applicable.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, poles, foundations, supports, trims, accessories, etc. as necessary for a complete operating system.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. Provide luminaires listed and labeled as suitable for wet locations unless otherwise indicated.

H. Recessed Luminaires:
   1. Ceiling Compatibility: Comply with NEMA LE 4.

I. LED Luminaires:
   1. Components: UL 8750 recognized or listed as applicable.
   2. Tested in accordance with IES LM-79 and IES LM-80.
   3. LED Estimated Useful Life: Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

2.03 POLES

A. All Poles:
   1. Provide poles and associated support components suitable for the luminaire(s) and associated supports and accessories to be installed.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.

C. Verify that suitable support frames are installed where required.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 26 0533.16 as required for installation of luminaires provided under this section.

B. Install products in accordance with manufacturer's instructions.

C. Install luminaires in accordance with NECA/IESNA 501.

D. Provide required support and attachment in accordance with Section 26 0529.

E. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

F. Recessed Luminaires:
   1. Install trims tight to mounting surface with no visible light leakage.

G. Suspended Luminaires:
   1. Install using the suspension method indicated, with support lengths and accessories as required for specified mounting height.

H. Wall-Mounted Luminaires: Unless otherwise indicated, specified mounting heights are to center of luminaire.

I. Install accessories furnished with each luminaire.

J. Bond products and metal accessories to branch circuit equipment grounding conductor.

K. Install lamps in each luminaire.

3.03 ADJUSTING

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by K2M Design Inc.. Secure locking fittings in place.

3.04 CLEANING

A. Clean surfaces according to NECA/IESNA 501 and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.05 PROTECTION

A. Protect installed luminaires from subsequent construction operations.

END OF SECTION 26 5600

SECTION 31 1000

SITE CLEARING AND GRUBBING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for clearing and grubbing.

B. Related Requirements:
   1. Section 312500 - Erosion and Sedimentation Controls: Temporary erosion and sediment control features and requirements.

B. PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE “SOIL AND GROUND WATER MANAGEMENT PLAN”, DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

1.03 DEFINITIONS

A. Clearing: Cutting, removal, and proper disposal of trees, stumps, brush, shrubs, rubbish, and other material as required to construct improvements shown and specified.

B. Grubbing: Removal and disposal of stumps larger than 1-1/2-inch in diameter and other similar items to a depth of not less than 12 inches below finish grade.

1.04 SYSTEM DESCRIPTION

A. Clear and grub project site as shown on the Drawings and specified in this Section.

B. Clear and grub project site as required to complete project.

1.05 SUBMITTALS

A. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated:
   1. Classification according to ASTM D 2487 of each on-site or borrow soil material proposed for fill and backfill.
   2. Laboratory compaction curve according to ASTM D 1557 for each on-site or borrow soil material proposed for fill and backfill.

1.06 PROJECT CONDITIONS

A. Site Information: Data in the subsurface investigation report was used for the basis of the design. The report is available for review. Conditions are not intended as representations or warranties of accuracy or continuity between soil. The Owner will not be responsible for interpretations or conclusions drawn from this data by Contractor.

B. Additional test borings and other exploratory operations may be performed by Contractor, at the Contractor’s option; however, no change in the Contract Sum will be authorized for such additional exploration.

C. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Owner’s Representative and then only after arranging to provide temporary utility services according to requirements indicated:
   1. Notify Owner’s Representative not less than two days in advance of proposed utility interruptions.
   2. Do not proceed with utility interruptions without Owner’s Representative's written permission.
   3. Contact utility-locator service for area where Project is located before excavating.

D. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shut off services if lines are active.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CLEARING AND GRUBBING

A. Site preparation shall be in accordance with the recommendations of the Report of Geotechnical Exploration prepared by Nutting Engineers, dated, April 2018.

B. Clear and grub areas to be occupied by facilities to be constructed, including areas to be excavated, filled, paved, or planted as shown on the Drawings.

C. Clear and grub as required to complete project. Clear and grub easements as required to complete project. Do not clear or grub more than required to complete project.

D. Existing palm trees on project site shall be removed and relocated to a site within the Owner's property as designated by the Owner.

3.02 PROTECTION OF ADJACENT AREA

A. Protect areas shown on the Drawings or designated by the Engineer to remain protected from damage by construction operations by erecting suitable barriers or other acceptable means.

B. Areas outside limits of construction as shown on the Drawings shall be protected and no equipment or materials shall be stored on these areas or allowed to damage these areas.

3.03 DISPOSAL

A. Remove roots, vegetation, and other debris from the site daily. Dispose of roots, vegetation, and other debris removed from the site at no cost to the owner.

B. Do not burn any material on the site or other areas where burning is not permitted.

3.04 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: ASTM D 2487 soil classification groups GW, GP, SW, and SP, or a combination of these group symbols; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: ASTM D 2487 soil classification groups GC, GM, SC, SM, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.
   1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Backfill and Fill: Satisfactory soil materials.

E. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 97 percent passing a 3-inch sieve and not more than 5 percent passing a No. 200 sieve.

F. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

G. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

H. Clear and strip all surface vegetation, topsoil, roots, grass, organics, structures, appurtenances, pavements, and other deleterious material. Depth of removal is anticipated to be on the order of 6 inches or less.

I. Proof-roll soils at the stripped surface areas with a minimum of 10 passes (30% overlap with preceding pass) of a heavyweight vibratory drum roller (minimum impact force of 20,000 pounds per drum to the soil). Any areas that yield during the proof-rolling operation or areas of deleterious material that are exposed during proof-rolling operation shall be over excavated, compacted, and replaced with compacted satisfactory material. Satisfactory material shall be placed in lifts not exceeding 12 inches in loose thickness. Thoroughly compact each lift with the vibratory roller. Prior to compaction, document condition of adjacent structures. Compaction shall cease if deemed harmful to adjacent structures. Compaction with a non-vibratory drum roller may be required to protect adjacent structures.

END OF SECTION 31 1000

SECTION 31 2300

TRENCH EXCAVATION AND FILL

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for excavation, and backfilling of trenches.
   1. Trenching and Backfilling
      a. Trenching and backfilling for Work included in this project is included in the lump sum cost for work installed, unless otherwise stated herein, and the lump sum price for work includes trenching and backfilling in whatever nature of material may be encountered. No additional allowance to the lump sum price proposal by the Contractor for the project or any part thereof will be allowed on any claim for extra compensation because of trenching, backfilling, or trenching and backfilling being of a nature different from that contemplated by Contractor.
      b. The Contractor is charged with the responsibility of actually investigating and examining the site of the project before preparing his proposal and satisfying himself in this respect.

B. PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE “SOIL AND GROUND WATER MANAGEMENT PLAN”, DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

1.02 REFERENCES

A. General: References to standards, specifications, manuals, or codes of any technical society, organization or association, or to the Laws or Regulations of any government authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of proposals (or, on the Effective Date of the Agreement if there were no proposals), except as may be otherwise specifically stated in the Contract Documents.

B. ANSI/ASTM Standards
   1. ANSI/ASTM C33 Concrete Aggregates
   2. ANSI/ASTM D1557 Test Method for Laboratory Compaction Characteristics of Soil
   3. (AASHTO T-180) Using Modified Effort (56,000 ft.-lbf/ft3)(2,700 kN-m/m3)

C. ASTM Standards
   1. ASTM D1556 Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
   2. ASTM D2487 Classification of Soils for Engineering Purposes
   3. ASTM D2922 Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Method (Shallow Depth)
   4. ASTM D2937 Test Method for Density of Soil in Place by the Drive-Cylinder Method

D. Florida Department of Transportation (FDOT) Standards
   1. Standard Specifications for Road and Bridge Construction

E. State of Florida
   1. Florida Trench Safety Act (90-96, Laws of Florida)

F. Occupational Safety and Health Administration
   1. Excavation Safety Standards, 29 C.F.R.s.1926.650 Subpart P.

1.03 DEFINITIONS

A. General: Soil classifications presented in this Article are applicable to natural soils and processed materials.

B. ASTM D2487 Unified Soil Classification System (USCS)
   1. Class I: Angular, one-quarter inch (1/4") to one and one-half inch (1-1/2") graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed shells and crushed stone.
   2. Class II: Coarse sands and gravels with maximum particle size of one and one-half inches (1-1/2"), including variously graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. The following soil types are included in this class:
      a. GW (well-graded gravel)
      b. GP (pea gravel or crushed stone mixed with sand)
      c. SW (well-graded sand)
      d. SP (poorly graded sands and gravelly sands with little or no fines)
   3. Class III: Fine sand and clayey (clay filled) gravels, including fine sands, sand-clay mixture and gravel-clay mixtures. The following soil types are included in this class:
      a. GM (silty gravels)
      b. GC (clayey gravels)
      c. SM (silty sands)
      d. SC (clayey sands)
   4. Class IV: Silt, silty clays and clays, including inorganic clays and silts of medium to high plasticity and liquid limits. The following soil types are included in this class:
      a. CH (Inorganic clays of high plasticity)
      b. CL (Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays)
      c. MH (inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts)
      d. ML (Inorganic silts, very fine sands, rock flour, silty or clayey fine sands)
   5. Class V: This class includes the following organic soils as well as soils containing frozen earth, debris, rocks larger than one and one-half inches (1-1/2") in diameter and other foreign materials:
      a. OL (Organic silts and organic silty clays of low plasticity)
      b. OH (Organic clays of medium to high plasticity)
      c. PT (Peat, muck, and other highly organic soils)

C. Maximum Density: Maximum weight in pounds per cubic foot of a specific material.

D. Optimum Moisture: Percentage of water in a specific material at maximum density.

E. Rock: A natural aggregate of mineral particles connected by strong and permanent cohesive forces. Rock includes:
   1. Limestone, lime rock, sandstone, dolomite, granite marble, lava, and coral.
   2. Boulders 1/3 cubic yard or more in volume.
   3. Material which by actual demonstration cannot, in the Engineer's opinion, be reasonably excavated with a backhoe or 3/4 cubic yard capacity power shovel equipped with two rippers, or similarly approved equipment and which is, in fact, systematically drilled and blasted or broken by power operated hand tools. Engineer may waive demonstration requirement if material encountered is well-defined rock.

F. Deleterious Materials: Household and construction debris, organic debris, peat and organic soils,

1.04 SYSTEM DESCRIPTION

A. Perform excavation required to construct underground piping systems to lines and grades shown on the Drawings.

B. Provide, place, and compact pipe bedding and haunching as shown on the Drawings and specified in this Section.

C. Provide, place, and compact initial fill as shown on the Drawings and specified in this Section.

D. Provide, place, and compact final fill as shown on the Drawings and specified in this Section.

E. Place, compact, and test fill as specified in this Section.

F. Dispose of unsuitable and excess excavated material as specified in this Section.

G. Grade final fill to elevations, lines, slopes, depths and cross-sections shown on the Drawings. Where no change in finish grade is indicated, grade final fill to elevations, lines, slopes, depths and cross-sections that existed prior to start of construction.

1.05 QUALITY ASSURANCE

A. General: Trenching and backfilling shall be performed by company with not less than five years of documented experience in underground utility construction.

B. Soils Testing
   1. Contractor will employ and pay for services of an independent testing agency to perform specified testing and inspection.
   2. Schedule trenching and backfilling to permit a reasonable time for testing before placing succeeding lifts of installing pipe.
   3. Keep testing laboratory informed of structural earthwork progress.

C. General Monitoring: Trenching and backfilling shall be monitored on a periodic basis by the independent testing laboratory for general compliance with the intent of these specifications.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Contractor shall be responsible for delivery, storage, and handling of fill material from off-site sources.

B. Comply with requirements of Federal, State, and County authorities regulating shipment of products.

C. Contractor shall be responsible for storage and handling of on-site excavated suitable fill material.

D. Do not allow fill material from off-site sources or on-site excavated suitable fill material to be mixed with unsuitable material.

E. Do not allow stored fill material from off-site sources to be mixed with stored on-site excavated suitable fill material.

F. Protect stored fill materials so that the composition of materials is not altered and materials are not otherwise degraded or contaminated.

G. Prevent erosion of soil and fill materials and sedimentation of waterways, open drainage ways and storm and sanitary sewers due to construction activities, by complying with Section 015713 Temporary Erosion and Sedimentation Control.

1.07 PROJECT/SITE CONDITIONS

A. Regulatory Requirements
   1. Conform to Federal and State regulatory requirements for excavations.
   2. Obtain excavation permit prior to starting trenching and backfilling. Conform to requirements of excavation permit.
   3. Provide barricades, warning signs, and lights as required by law, regulation, or law and regulation.

B. Excavation Protection
   1. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in or loose soil from falling into excavation.
   2. Grade top perimeter of trench to prevent surface water run off into trench.

C. Protection of Adjacent Improvements
   1. Underpin adjacent structures and utilities, including utility services, which may be damaged by excavation work.
   2. Repair damaged structures, utilities, or structures and utilities at no additional cost to the Owner.

D. Protection of Benchmarks, Monuments, and Other Reference Points

1. Maintain benchmarks, monuments, and other reference points.
2. Retain a Registered Land Surveyor who shall establish, for any benchmarks, monuments, and other reference points that might be disturbed by structural earthwork, references that will not be disturbed.
3. Registered Land Surveyor shall replace benchmarks, monuments, and other reference points removed or otherwise disturbed.

E. Geotechnical Data
1. Geotechnical data prepared for this project are available for review by the Contractor.
2. Date and recommendations in the subsurface investigation report have been used by the Engineer in the preparation of the Drawings and Specifications.
3. Geotechnical Data made available to the Contractor by the Owner, the Engineer, or the Geotechnical Consultant are not guaranteed as to accuracy or completeness. Geotechnical Data made available to the Contractor by the Owner, the Engineer, or the Geotechnical Consultant are not part of the Contact Documents. If Geotechnical Data made available to the Contractor by the Owner, the Engineer, or the Geotechnical Consultant are used by the Contractor, the Contractor shall assume all risks resulting from actual conditions differing from conditions set out in the Geotechnical Data.

F. Unanticipated Conditions
1. Notify Engineer of unexpected subsurface conditions and discontinue work in affected area until notified by Engineer to resume work.
2. Take emergency measures as required to protect persons and improvements.

PART 2 - PRODUCTS

2.01 SOURCE FOR BEDDING AND FILL MATERIALS

A. Use excavated materials that meet the requirements specified in this Section.

B. Furnish and install imported material if excavated material does meet the requirements of this Section.

C. Excess excavated material that meets the requirements of this Section shall be stored at the project site until backfilling is completed. Do remove excess excavated material that meets the requirements of this Section from the project site until backfilling is completed.

2.02 BEDDING

A. Crushed Stone Bedding: Imported, graded stone meeting the requirements of Class I soil with maximum particle size equal to one-half inch (1/2").
1. Size range and resulting high void ration of crushed stone bedding material makes it suitable for use to dewater trenches during pipe installation.
2. The permeable characteristic of crushed stone dictates that use of crushed stone bedding material be limited to locations where pipe support will not be lost by migration of fine grained natural material from trench walls and bottom or migration of other embedment materials into crushed stone bedding material.
3. When migration of fine grained natural material into crushed stone bedding is possible, minimum size range of crushed stone bedding shall be reduced to finer than one-quarter inch (1/4"), and gradation shall be selected to limit the size of the voids.
4. An alternative to modifying the gradation is to use a geotextile fabric as a barrier to migration to fines.)

B. Coarse Sand and Gravel Bedding: Coarse sands and gravels meeting the requirements of Class II soil with maximum particle size equal to three-quarter inch (3/4") and with less than five percent fines.
1. Coarse-grained soils with less than 12 percent but more than five percent fines may be used for coarse sand and gravel bedding if approved by the Engineer.
2. Gradation of coarse sand and gravel bedding material influences density and pipe support strength of coarse sand and gravel when bedding material is loosely placed. Gradation of coarse sand and gravel bedding material may be critical to the pipe support and stability of the foundation and embedment, if the material is imported and is not native to the trench

excavation. Gradation other than well graded, such as uniformly graded or gap graded, may permit loss of support by migration into void spaces of a finer grained natural material from the trench wall and bottom.

3. When migration of fine grained natural material into coarse sand and gravel bedding is possible, adjust gradation of bedding material to limit size of voids so there is no migration of fines from trench walls or trench bottom into bedding material.
4. An alternative to modifying the gradation is to use a geotextile fabric as a barrier to migration of fines.

2.03 HAUNCHING

A. Haunching material shall be on-site or imported non-cohesive, non-plastic material free of debris and gravel larger than one-half inch in diameter.

B. Haunching materials shall be Class I or Class II soils as defined in this Section.

2.04 SELECT FILL

A. Select fill shall be on-site or imported non-cohesive, non-plastic material free of debris and gravel larger than one-half inch in diameter.

B. Select initial and final fill materials shall be Class I or Class II soils as defined in this Section.

2.05 COMMON FILL

A. Common fill shall be on-site or imported non-cohesive, non-plastic material, free of debris and rocks larger than six inches in diameter.

B. Common initial fill materials shall be Class I, Class II, or Class III soils as defined in this Section.

C. Common final fill materials shall be Class I, Class II, Class III or acceptable dry, native Class IV soils as defined in this Section.

PART 3 - EXECUTION

3.01 INSPECTION OF SOURCE FOR BEDDING AND FILL MATERIALS

A. Verify approval of full or limited use of stockpiled fill.

3.02 PREPARATION

A. Identify required lines, levels, contours, and datum.

B. Prior to trenching, cut or score pavement to straight edges, six inches outside each edge of the proposed trench. Do not damage pavement not removed.

3.03 EXCAVATION

A. Dewater trenches as specified in Section 312319 Dewatering.

B. Excavate trench so that piping can be installed to alignment and depth shown on the Drawings and as specified.

C. Trench width shall be ample to permit piping to be laid and jointed properly. Minimum trench width shall be at least three feet, six inches or eight inches greater than the largest outside diameter of the pipe or bell, whichever is greater.

D. If sheeting is used, sheeting may be removed provided removal can be accomplished without disturbing bedding, pipe or alignment. Should Engineer determine that removal of sheeting will damage pipe, sheeting shall be left in place at no additional cost to the Owner. If left in place, cut sheeting off two feet above top of pipe and leave sheeting in place below cut. Any damage to pipe bedding, pipe, or alignment caused by removal of sheeting shall be cause for rejection of the affected portion of the Work.

E. Open no more than 100 feet of trench ahead of pipe laying operations at one time unless a greater length of trench is approved by the Engineer.

3.04 TRENCH BOTTOM

A. Excavate trench to elevation required for pipe material.

1. For piping that does not require bedding below bottom of pipe, excavate trench to bottom of pipe.
2. For piping that requires bedding below bottom of pipe, excavate trench to bottom of bedding below pipe.

B. Soil surface at trench bottom shall provide a firm, stable and uniform support for pipe. Soil surface at trench bottom shall be free of any protrusions which may cause point loading on any portion of pipe or bell.

C. Do not over-excavate trench bottom if trench bottom material is stable undisturbed soil of the follow types:
1. Class II soil including types GW, GP, SW and SP.
2. Class III soil including types GM, GC, SM and SC.
3. Class IV soil including types CL and ML.

D. Do not bed pipe on solid rock, boulders, hardpan, unsuitable soils, organic material, or other materials that are not suitable for trench bottom. Remove soils and other materials that are not suitable materials for trench bottom. Remove soils and other materials that are not suitable materials for trench bottom to six inches under pipe, minimum.
1. Remove wet, yielding, or mucky soils. Remove the following soils:
   a. Type CH and Type MH Class IV soils.
   b. All Class V soils.
2. Remove organic material including roots, mulch, or other vegetable matter, which in the opinion of the Engineer, will result in unsatisfactory foundation conditions.
3. Remove soils containing cobbles, boulders or stones larger than one and one-half inches (1-1/2") in diameter.
4. Remove ledge rock and hardpan. Remove rock and hardpan to provide bedding width 24 inches wider than pipe.
5. Remove soils containing rubbish, trash, or other foreign materials.

E. Replace ledge rock, hard pan, boulders, unsuitable soils, and soil containing material that is not suitable for trench bottom.
1. Over-excavation Replacement for Piping that Does Not Require Bedding below Bottom of Pipe
   a. If trench is over-excavated more than six inches below the bottom of the pipe, but less than twelve inches below the bottom of the pipe, fill and compact over-excavation with acceptable Class I, II or III soil as defined in this Section.
   b. If trench is over-excavated more than twelve inches below bottom of pipe, fill and compact over-excavation with crushed stone bedding.
2. Over-excavation Replacement for Piping that Requires Bedding below Bottom of Pipe: Fill and compact over-excavation to bottom of bedding with Class I soil as defined in this Section.

3.05 BEDDING

A. General: Properly bed pipelines, conduits and appurtenances as shown on Drawings and as specified in this Section.

B. Bedding for PVC Pipe: Place and compact crushed stone bedding from a minimum of 1/4 diameter of pipe below invert of pipe to bottom of pipe.

C. Bedding for Ductile Iron Pipe
1. If trench bottom at bottom of pipe is Class I, Class II, Class III or acceptable dry, native Class IV soils as defined in this Section, bed pipe on trench bottom.
2. If trench bottom is not acceptable for bedding, place crushed stone bedding or coarse sand and gravel bedding from a minimum of l/4 diameter of pipe below invert of pipe up to bottom of pipe.

D. Preparation of Trench Bottom for Piping and Conditions that Do Not Require Bedding below Bottom of Pipe

1. Compact trench bottom as required to achieve density specified for bedding, haunching, and backfill. Minimum compaction for trench bottom shall be 90% of Modified Proctor Maximum Dry density (ASTM D1557).
2. Bring trench bottom to grade prior to installation of pipe, fittings, and valves. Bring trench bottom to grade along entire length of pipe.

E. Preparation of Trench Bottom for Piping or Conditions that Require Bedding below Bottom of Pipe
1. Excavate trench bottom and place bedding material, so that bedding grade is correct following compaction of bedding.
2. Uniformly compact bedding. Use hand or mechanical tamping to compact bedding material.
3. Compact bedding material as required to achieve density specified for haunching and backfill. Minimum compaction of bedding material shall be 95% of Modified Proctor Maximum Dry density (ASTM D1557).
4. Bring bedding material to grade prior to installation of pipe, fittings, and valves. Bring bedding material to grade along entire length of pipe.

3.06 HAUNCHING

A. Haunching for PVC Pipe: Place crushed stone bedding material from top of bedding to spring line (centerline) of pipe.

B. Haunching for Ductile Iron Pipe
1. If trench bottom at bottom of pipe is Class I, Class II, Class III or acceptable dry, native Class IV soils as defined in this Section, place haunching material from trench bottom to spring line (centerline) of pipe.
2. If trench bottom is not acceptable for bedding, place crushed stone bedding or coarse sand and gravel bedding material from top of bedding up to 1/8 diameter of pipe. Place haunching material from top of crushed stone bedding or coarse sand bedding material to spring line (centerline) of pipe.

C. Piping Support: Support piping during placement and compaction of haunching.

D. Placing Haunching Material
1. Do not place haunching over porous, wet, or spongy trench bottom or bedding material.
2. Hand place haunching material.
3. Place haunching evenly along both sides of pipe, fittings, and valves so that equal load is maintained along both sides of pipe, fittings, and valves.
4. Work haunching under pipe, fittings, and valves so that there are no voids in fill and so that pipe, fittings, and valves are properly supported.
5. Place haunching so that piping materials, coatings, and encasement are not damaged.

E. Haunching Material Compaction
1. Compact haunching material
2. Compact haunching so that pipe, fittings, and valves are properly supported.
3. Compact haunching as required to achieve density specified for backfill material.
4. Minimum compaction of haunching shall be 95% of Modified Proctor Maximum Dry density (ASTM D1557).

3.07 INITIAL BACKFILL

A. Initial backfill shall extend from the top of haunching to one foot above top of pipe. Placement of initial backfill may be either by hand or mechanical means.

B. Initial fill in trenches wholly or partially beneath paved areas as follows shall be select initial fill:
1. Public streets, roads, and parking areas.
2. Institutional roads, drives, and parking areas.
3. Commercial roads, drives, and parking areas.

C. Initial fill in trenches beneath unimproved areas, lawns, landscaping, private drives, and private parking areas shall be common initial fill unless otherwise shown on the Drawings.

D. Keep initial backfill free from debris, rocks, clods, and other items larger than one-half inch (1/2").

E. Do not compact initial fill directly over pipe, fittings, or valves until adequate cover has been provided to prevent damage to pipe, fitting, or valve. Adequate cover will depend on piping materials and type of compaction equipment used. Adequate cover shall be as accepted by the Engineer.

F. Minimum compaction of initial fill shall be 95% of Modified Proctor Maximum Dry density (ASTM D1557).

3.08 FINAL BACKFILL

A. Backfill trenches to contours and elevations shown on drawings, or to match existing grade if finish grade is not changed.

B. Final backfill in trenches wholly or partially beneath paved areas as follows shall be select initial fill:
   1. Public streets, roads, and parking areas.
   2. Institutional roads, drives, and parking areas.
   3. Commercial roads, drives, and parking areas.

C. Final backfill in trenches beneath unimproved areas, lawns, landscaping, private drives, and private parking areas shall be common initial fill unless otherwise shown on the Drawings.

D. Backfill trench systematically, as early as possible, to allow maximum time for natural settlement.

E. Place and compact select fill material in continuous layers not exceeding 6 inches in depth. Minimum compaction of select fill shall be 98% of Modified Proctor Maximum Dry density (ASTM D1557). Compaction of select fill shall be by small portable plate compactor or other approved method.

F. Place and compact common fill material in continuous layers not exceeding 12 inches in depth. Minimum compaction of common fill shall be 95% of Modified Proctor Maximum Dry density (ASTM D1557). Compaction of common fill shall be by mechanical means or other approved methods.

3.09 COMPACTION

A. Compaction Equipment
   1. Compaction shall be accomplished by use of appropriate compaction equipment.
   2. Compact each lift by repeated passes of appropriate compaction equipment.
   3. Select and operate compaction equipment so that pipe and structures are not damaged by compaction operation.

B. Moisture Control
   1. Control moisture content of soil during compaction as required to achieve specified compaction.
   2. Moisture content of fill and backfill material shall be within plus or minus 2% of optimum moisture content during compaction of fill and backfill material.
   3. If necessary, add water or allow material to dry until the proper moisture content for the specified compaction is obtained.

C. Compaction Testing
   1. Test compaction of bedding, haunching, initial backfill, and final backfill as specified in this Section.
   2. Test each compacted soil layer, in place, prior to placement of succeeding layers.

3.10 TESTING

A. Retain a laboratory approved by Owner to make field density tests and Proctor Tests as specified below.
   1. Contractor shall pay the cost of initial density test(s).

2. Contractor shall pay cost for any additional testing required as a result of failure of any initial test.

B. Perform one Proctor Test, according to ASTM D1557, for each source of fill used on the Project. If material from excavation is used as backfill material, take a test proctor from the best available location as determined by the testing lab.

C. Determine Optimum moisture content of fill, subgrade, and backfill material by Modified Proctor Method (ASTM D1557).

D. Test the density of compacted bedding, haunching, and initial fill. Test the density of each compacted final fill layer in place. Field density tests shall meet the requirements of ASTM D1556, ASTM D2922, or ASTM D2937.

E. Perform density tests for initial backfill and final backfill as follows:

1.	Initial Backfill	1 test per layer for each 300 foot length of trench (minimum 1 test per day)
2.	Select Final Backfill	1 test per layer for each 300 foot length of trench (minimum 1 test per day)
3.	Common Final Backfill:	1 test for each 300 feet of trench.

F. Perform additional field density tests as follows:
   1. If test density of compacted backfill or fill is less than specified density, make additional tests at locations directed by Engineer.
   2. Make additional field density tests at no additional cost to the Owner.

G. Allow for inspection of import fill by Engineer at the source before delivery to site.

3.11 DISPOSAL OF UNSUITABLE AND EXCESS EXCAVATED MATERIAL

A. Remove unsuitable material and excess excavated suitable material from the Project.

B. Remove, temporarily stockpile, and dispose petroleum impacted soil off site.

END OF SECTION 31 2300

SECTION 31 2319

DEWATERING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for dewatering excavations and trenches.

1. Unless specifically authorized by the Owner, all pipe, and structures shall be installed "in the dry". The contractor shall dewater trench excavation as required for the proper execution of the work, using one or more of the following approved methods: well point system, and or pumps with silt box and filtering system.
   a. Contractor shall design and provide a ground water treatment system plan comprised of the following:
      1) A large settling tank (silt box) with baffles for the removal of large solids and free product
      2) Sock Bag filters shall be attached to the discharge hose into the settling tank and sewer manholes for the removal of suspended solids. Contractor responsible for determining number of discharge hose's required from the settling tank to the manhole to maintain adequate flow.
   b. Well point systems must be efficient enough to lower the water level in advance of the excavation and maintain it continuously in order that the trench bottom and sides shall remain firm and reasonably dry. The well points shall be designed especially for this type of service, and the pumping unit used shall be capable of maintaining a high vacuum, and at the same time, of handling large volumes of air as well as of water.
   c. Pumps shall be capable of handling the water the contractor need removed to perform the work. Sock filters shall be provided on the pump discharge at the silt box and manhole discharge. Filter cloth draped in manhole shall not be used except for temporary basis of less than 4 hours. Silt boxes shall be capable of handling the water the contractor needs removed to perform the work. Silt box discharged into the sewer systems shall have filter socks on the discharge hose. The contractor shall provide multiple discharge hose with filtering sock if required to remove the water from the silt box. Silt boxes shall be cleaned daily. Socks shall be replaced as needed. Sock(s) with holes or cuts shall be replaced immediately.
   d. The Contractor shall be responsible for disposing into the city sewer system of all water resulting from trench dewatering operations, and shall dispose of the water without damage or undue inconvenience to the work, the surrounding area, or the general public. He shall not dam, divert, or cause water to flow in excess in existing gutters, pavements or other structures: and to do this he may be required to conduct the water to a suitable place of discharge may be determined by the Owner.
   e. The contractor shall not dewater into the permitted stormwater gravity injection well at the project site.
   f. The contractor shall be responsible for payment to the city for the cleanup of the sewers system and any repairs that are determined to have been caused by the project dewatering.

B. PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE "SOIL AND GROUND WATER MANAGEMENT PLAN", DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

1.02 SUBMITTALS

A. General: As specified in:

1. General Conditions;
2. Division 1;

B. Submit copy of dewatering permit prior to installing dewatering system, or systems.

C. Submit dewatering plan, or plans, prior to installing dewatering system, or systems.
   1. Contractor is responsible for the de-watering plan; should the contractor require additional de-watering requirement this shall be done at no additional cost to the owner.
   2. Dewatering shall be done to the City's sewer system.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements
   1. Obtain Dewatering Permit from South Florida Water Management District prior to dewatering of any areas. Make application and arrangements and pay fees and charges for dewatering and disposal of discharge from dewatering
   2. Submit copy of dewatering permit.
   3. Comply with requirements of dewatering permit. Meet regulatory requirements relative to dewatering and disposal of discharge water from dewatering.

1.04 PROJECT/SITE CONDITIONS

A. Noise Limitations.
   1. Dewatering systems and equipment shall comply with ordinances regulating noise.
   2. Provide "residential" mufflers on engines.
   3. Provide sound attenuating enclosures over dewatering system equipment if necessary to meet noise limit requirements of ordinances and regulations.
   4. Do not shut off dewatering systems to meet noise limitations during non-work hours. Provide sound attenuating measures to meet noise limit requirements.
   5. Provide sound attenuating equipment, devices, and measures at no additional cost to the Owner.
   6. Modify dewatering system, or systems, as required to comply with ordinances regulating noise.

B. Damage Prevention
   1. Dewatering shall not cause settlement of existing or new structures. Repair or replace structures damaged by settlement caused by dewatering. Repair or replace structures at no additional cost to the Owner.
   2. Discharge from dewatering systems shall not cause erosion of turf or soil. Replace turf damaged by dewatering discharge. Replace soil displaced by dewatering discharge. Replace turf and soil at no additional cost to the Owner.
   3. Discharge from dewatering systems shall not damage landscaping. Replace landscaping damaged by dewatering discharge. Replace landscaping at no additional cost the Owner.
   4. Modify dewatering system, or systems, as required to eliminate conditions that cause damage.

C. Access
   1. Dewatering systems and dewatering system operations shall not prevent emergency access or prevent persons living in the vicinity of construction from completing their normal daily pursuits.
   2. Provide temporary access over dewatering system piping for vehicular and pedestrian traffic.

PART 2 - PRODUCTS

2.01 DEWATERING SYSTEMS

A. Contractor shall be responsible for the sizing and selection of dewatering systems, dewatering equipment, dewatering system piping, and appurtenances.

PART 3 - EXECUTION

3.01 GROUNDWATER

A. Contractor shall be responsible for evaluating and determining groundwater conditions.

3.02 DEWATERING PLAN

A. Contractor shall prepare and submit dewatering plan for each dewatering system

B. Ground water plan shall include the following:
   1. Groundwater data and assumptions relating to groundwater conditions.
   2. Description of proposed dewatering system with drawings, diagrams, and system component data as applicable.
   3. Proposed measures to insure dewatering system reliability.
   4. Description of discharge water disposal methods.
   5. Identification and location of private water supply wells, public water supply wells, lakes, and ponds that may be affected by dewatering.
   6. Anticipated affect upon private water supply wells, public water supply wells, lakes, and ponds that may be impacted by dewatering. Proposed measures to ameliorate effects of dewatering upon private water supply wells, public water supply wells, lakes, and ponds.
   7. Other data pertinent to the dewatering system.

3.03 DEWATERING SYSTEMS

A. Provide, operate, and maintain dewatering systems including well points, wells, chemical grouting, water tight sheeting, ground freezing, tremie wall, or any other technology as may be necessary to accomplish dewatering in a safe and proper manner.

B. Provide dewatering systems that control groundwater level in conformance with the requirements of this Section. Provide dewatering systems that lower groundwater to level shown, specified, or shown and specified in advance of excavation. Provide dewatering systems that continuously maintain groundwater level at, or below, level shown, specified, or shown and specified until backfilling and compaction have been completed to level shown, specified, or shown and specified.

C. Provide automatic starting devices, standby pumps, and other equipment and controls required to provide continuous dewatering in the event of an outage of dewatering pump or other dewatering system component.

D. Provide headers, suction piping, and discharge piping as required to convey water from well points, dewatering wells, and caissons to dewatering system discharge point designated in permit and accepted dewatering plan.

E. Modify dewatering system during the course of construction as conditions that affect dewatering change.

3.04 DEWATERING OPEN EXCAVATIONS

A. Lower groundwater to level shown, specified, or shown and specified in advance of excavation. Provide monitoring wells or other means to measure groundwater level prior to starting excavation.

B. Dewater excavation from outside the limits of excavation. Dewater excavation from below the bottom of excavation. Do not dewater excavation from sumps within excavation.

C. Dewatering measures shall provide the following:
   1. Prevent instability of excavation due to groundwater.
   2. Prevent the disturbance of subgrade bearing materials due to groundwater.
   3. Keep excavation free from standing water and running water.
   4. Prevent tanks, pipes, and other structures from being displaced by hydrostatic pressures.

D. Do not install or operate dewatering systems that allow movement of soil through excavation or excavation subgrade.

E. Do not install or operate dewatering systems that allow movement of soil from beneath existing or previously installed structures or pipes.

3.05 DEWATERING TRENCHES

A. Lower groundwater to level shown, specified, or shown and specified in advance of excavation. Provide monitoring wells or other means to measure groundwater level prior to starting excavation.

B. Dewater trench from outside the limits of trench. Dewater trench from below the excavated trench bottom. Do not dewater trench from sumps within trench.

C. Dewater trench to a minimum level of 24 inches below excavated trench bottom. Maintain water level a minimum of 24 inches below excavated trench bottom until backfill meets the following requirements:
   1. Backfilling and compaction have progressed as to a depth that installed piping will not be displaced by hydrostatic pressure.
   2. Backfilling and compaction have been completed above natural water table to a level that remaining backfill can be placed and compacted as specified in Section 31 23 00 Excavation and Fill.

D. Dewatering measures shall provide the following:
   1. Prevent instability of trench due to groundwater.
   2. Prevent the disturbance of subgrade bearing materials due to groundwater.
   3. Keep trench free from standing water and running water.
   4. Prevent tanks, pipes, and other structures from being displaced by hydrostatic pressures.

E. Do not install or operate dewatering systems that allow movement of soil through trench or trench subgrade.

F. Do not install or operate dewatering systems that allow movement of soil from beneath existing or previously installed structures or pipes.

3.06 SURFACE WATER CONTROL

A. Do not allow surface runoff to flow into excavations and trenches.
   1. Grade top perimeter of excavation to prevent surface water run-off to flow into excavation.
   2. Grade sides and ends of trench to prevent surface water run-off to flow into trench.

B. Do not allow storm water to puddle or pond on construction site except in designated storm water retention areas. Grade construction areas so that storm water drains to storm water system.

C. Do not allow storm water to flow off construction site except through permitted discharge structures and through permitted storm water pipes, conduits, and channels.

D. Do not allow storm water to flow into or through stored fill and backfill materials.

3.07 DEWATERING DISCHARGE CONTROL

A. Discharge water from dewatering system to storm drain systems in accordance with dewatering permit and as specified in this Section. Provide silting basins and other discharge treatment systems in accordance with dewatering permit and to meet discharge permit requirements.

B. Do not allow discharge from dewatering system to puddle or pond on construction site except in areas designated and approved to receive discharge from dewatering system.

C. Do not allow to discharge from dewatering system to flow off construction site except through permitted discharge structures and through pipes, conduits, and channels that have been designated and approved for discharge flow from dewatering systems.

D. Do not use sanitary sewers for disposal of water from water control systems. Do not use sanitary sewer system under construction as conduit to remove ground water from trench.

E. Do not use storm sewer under construction as conduit to remove ground water from trench. Do not use new storm water system for dewatering system discharge unless new storm water system has been approved for dewatering system discharge.

F. Do not discharge water containing settleable solids into storm sewers.

G. Do not contaminate or disturb the environment of properties adjacent to the Work.

H. Do not contaminate streams or other surface waters.

I. Provide temporary facilities and controls for dewatering system discharge. Temporary facilities and controls shall be appropriate to the project, including, but not limited to:
   1. Silting basin, or basins, of adequate size.
   2. Filters.
   3. Coagulants.
   4. Screens.

J. Discharge onto pavement shall not damage pavement.

3.08 DEWATERING SYSTEM REMOVAL AND CLEANUP

A. Completely remove dewatering systems installed for construction.

B. Plug and seal dewatering wells after dewatering operations are concluded. Plug and seal dewatering wells in accordance with permit requirements.

C. Remove and dispose of solids, including sand, mud, and other material, discharged from dewatering systems.

3.09 GENERAL ADDITIONAL REQUIREMENTS

A. Contractor shall design and provide a ground water treatment system plan comprised of the following:

B. A large settling tank (silt box) with baffles for the removal of large solids and free product

C. Sock Bag filters shall be attached to the discharge hose into the sewer manholes for the removal of suspended solids. Contractor responsible for determining number of discharge hose's required from the settling tank to the manhole to maintain adequate flow.

D. Well point systems must be efficient enough to lower the water level in advance of the excavation and maintain it continuously in order that the trench bottom and sides shall remain firm and reasonably dry. The well points shall be designed especially for this type of service, and the pumping unit used shall be capable of maintaining a high vacuum, and at the same time, of handling large volumes of air as well as of water. Pumps shall be capable of handling the water the contractor need removed to perform the work. Sock filters shall be provided on the pump discharge at the silt box and manhole discharge. Filter cloth draped in manhole shall not be used except for temporary basis of less than 4 hours.

E. Silt boxes shall be capable of handling the water the contractor needs removed to perform the work. Silt box discharged into the sewer systems shall have filter socks on the discharge hose. The contractor shall provide multiple discharge hose with filtering sock if required to remove the water from the silt box. Silt boxes shall be cleaned daily. Socks shall be replaced as needed. Sock(s) with holes or cuts shall be replaced immediately. He shall not dam, divert, or cause water to flow in excess in existing gutters, pavements or other structures: and to do this he may be required to conduct the water to a suitable place of discharge may be determined by the Owner.

F. The contractor shall not dewater into the permitted stormwater gravity injection well at the project site.

END OF SECTION 31 2319

SECTION 31 2500

EROSION AND SEDIMENTATION CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for erosion and sedimentation control.

1.02 DEFINITIONS

A. The phrase "DOT Specifications" shall refer to the most current Florida Department of Transportation Standard Specifications for Road and Bridge Construction.

1.03 SYSTEM DESCRIPTION

A. Obtain permits required by regulatory authorities having jurisdiction and required by the Owner for installation, maintenance, and removal of erosion and sedimentation control measures.

B. Furnish and install erosion and sedimentation control measures.

C. Provide labor, equipment, and services required to maintain erosion and sedimentation control measures.

D. Remove erosion and sedimentation control measures that are not a permanent part of Work.

1.04 SUBMITTALS

A. General: As specified in:
   1. Division 1;
   2. This Section

B. Submit copy of Stormwater Pollution Prevention Plan (SWPPP)/Erosion Control Plan prior to installing erosion and sedimentation control measures.

C. Submit the Stormwater Pollution Prevention Plan (SWPPP) approved by State, local, or State and local authorities.

1.05 PROJECT/SITE CONDITIONS

A. Regulatory Requirements
   1. Dewatering
      a. Comply with requirements of permits for erosion and sedimentation control.
   2. Stormwater Pollution Prevention Plan
      a. Prepare "Notice of Intent to Use Generic Permit for Stormwater Discharge from Construction Activities". Submit application and pay fee for review and approval of Notice.
      b. Obtain response to Notice prior to starting construction.
      c. Comply with requirements of Stormwater Pollution Prevention Plan and Generic Permit for Stormwater Discharge from Construction Activities, including modifications, addenda, and additions by Federal, State, and County regulatory authorities having jurisdiction.

PART 2 - PRODUCTS

2.01 MATERIALS FOR EROSION AND SEDIMENT CONTROL

A. Filter Fabric
   1. Filter Fabric Material: Nylon, polyester, propylene or ethylene yarn with ultraviolet ray inhibitors and stabilizers conforming to Section 985 of the DOT Specifications.
   2. Filter Fabric Flow: 0.3 gallons per foot per minute, minimum.

B. Sediment Fence Posts
   1. Post Material: Pine
   2. Post Diameter: four inches
   3. Post Length: Four feet, minimum.

PART 3 - EXECUTION

3.01 EROSION CONTROL PLAN

A. Excavation method shall be selected by the Contractor, unless otherwise shown on the Drawings or required by local regulations

B. Contractor shall be responsible for erosion and sedimentation control.

C. Prepare and submit an Erosion Control Plan based upon the proposed excavation method.

D. Erosion Control Plan shall be reviewed and accepted by the Engineer prior to commencement of any land disrupting activities. Erosion Control Plan shall be reviewed and accepted by State, local, or State and local authorities having jurisdiction over erosion and sedimentation control prior commencement of any land disrupting activities.

E. Submit erosion and sedimentation control plan approved by State, local, or State and local authorities.

3.02 LOCATION

A. The type of sedimentation and erosion control (SEC) devices to be employed on the project will depend on location and adjoining features of the land at that location.

B. Construct SEC devices in accordance with approved Erosion Control Plan.

3.03 SEDIMENT FENCE CONSTRUCTION

A. Locate sediment fence down-slope from source of sediment. Extend sediment fence around source of sediment so that all run-off from source of sediment flows through sediment fence.

B. Set posts down-slope of fabric.

C. Bury toe of fence approximately eight inches deep.

D. When joints are necessary, securely fasten fabric at support post with overlap to next post.

3.04 SILTATION AND BANK EROSION

A. Take adequate precautions to minimize siltation and bank erosion in ditches, in discharging well point systems, or during other construction activities.

END OF SECTION 31 2500

SECTION 31 6329
DRILLED CONCRETE PIERS AND SHAFTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete and reinforcement.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Concrete Reinforcing: Requirements for concrete reinforcement.

B. Section 03 3000 - Cast-in-Place Concrete: Requirements for concrete.

1.03 REFERENCE STANDARDS

A. ACI 336.1 - Standard Specification for the Construction of Drilled Piers; 2001.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2014.

C. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.

D. ASTM A929/A929M - Standard Specification for Steel Sheet, Metallic-Coated by the Hot-Dip Process for Corrugated Steel Pipe; 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Conduct a preinstallation meeting one week prior to the start of the work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Designer's Qualification Statement.

C. Installer's Qualification Statement.

D. Project Record Documents: Record actual locations of piers, pier diameter, and pier length. Accurately record the following:
   1. Sizes, lengths, and locations of piers.
   2. Sequence of placement.
   3. Final base and top elevations.
   4. Deviation from indicated locations.
   5. Placement and configuration of reinforcement deviations.

1.06 QUALITY ASSURANCE

A. Design piers under direct supervision of a Professional Engineer experienced in design of this Work and licensed in Florida.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum 3 years of documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

A. Casing: Temporary casings of steel conforming to ASTM A283/A283M, Grade C; ASTM A36/A36M; or ASTM A929/A929M; of sufficient strength to withstand handling and drilling stresses, concrete pressures, and surrounding earth and water pressures.

B. Concrete Materials and Mix: Specified in Section 03 3000.

C. Reinforcement: Specified in Section 03 2000; spiral wound.

D. Equipment: Appropriate for dewatering excavated shaft.

PART 3 EXECUTION

3.01 PREPARATION

A. Use placement method which will not cause damage to nearby structures.

B. Protect structures near the work from damage.

C. Prepare to place piers from existing site elevations.

D. Grade perimeter of pier and shaft area to prevent surface water from draining into soil borings. Provide temporary means and methods, as required, to maintain surface diversion until no longer needed, or as directed by the K2M Design Inc..

3.02 INSTALLATION

A. Construct piers in accordance with ACI 336.1.

B. Drill vertical pier shafts, belled bases, shear rings, and rock sockets to diameters and depths indicated.

C. Clean shaft and bottom of loose material. Provide temporary means and methods, as required, to remove all water from soil borings as needed, or until directed by the Geotechnical Engineer.

D. Allow inspection of shaft and liner prior to placement of reinforcement and concrete.

E. Place reinforcing steel in accordance with Section 03 2000.

F. Place concrete in single pour, in accordance with Section 03 3000 with equipment designed for vertical placement of concrete.

G. Extend reinforcement for connection of grade beams.

H. Set tops of piers to elevations indicated.

3.03 TOLERANCES

A. Install piers with maximum variation from location, plumbness, bottom area, diameter, and anchorage locations as specified in ACI 336.1.

B. Maximum Out-of-Position: 2 inches.

3.04 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed under provisions of Section 01 4000 - Quality Requirements.

B. Test Piers: Same diameter and type as specified for other piers, placed in same manner.

C. Accepted test piers may not be used in the Work.

3.05 UNACCEPTABLE PIERS

A. Unacceptable Piers: Piers that fail, are placed out of position, are below elevations, or are damaged.

B. Provide additional piers or replace piers failing to conform to specified requirements.

END OF SECTION 31 6329

SECTION 32 1216

ASPHALT PAVING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: This section covers the work necessary for the construction of the Asphalt / Pavement.
   1. Type SP- 9.5 9.5 mm
   2. Type SP- 12.5 12.5 mm

1.02 REFERENCES; FDOT LOCAL AGENCY SPECIFICATIONS (LAP) AND STANDARD SPECIFICATIONS / LOCAL AGENCY SPECIFICATIONS

A. The term "Standard Specifications" is used; such reference shall mean the most current edition of Florida Department of Transportation Standard Specification for Road and Bridge Construction and LAP Specifications. The Standard Specifications shall be considered as part of this section of the Specifications; below are Listed references for the contractor's convenience; the contractor shall be responsible for obtaining and incorporation in the contract all of the Standard Specification's and the most current revisions that apply to this contract scope of work. The contractor shall document in his daily reports the required Standard Specifications that are used.

B. Reference(s):
   1. SECTION 334 HOT MIX ASPHALT FOR LOCAL AGENCIES
   2. SECTION 120 EARTHWORH AND RELATED OPERATIONS FOR LOCAL AGENCIES
   3. SECTION 710 PAINTED PAVEMENT MARKINGS
   4. SECTION 711 THERMOPLASTIC TRAFFIC STRIPES AND MARKINGS
   5. 911 LIMEROCK MATERIAL FOR BASE AND STABILIZED BASE
   6. SECTION 971 TRAFFIC MARKING MATERIALS

C. Any reference of the "FDOT", "Agency" "Engineer" 'Local Agency" in the LAP SPECS, and "Standard Specifications" shall be considered to be the Owner (City of Key West) for this contract. LAP SPECS are available at:
   1. http://www.dot.state.fl.us/specificationsoffice/Implemented/LAP/LapSpecs/Default.shtm

1.03 DEFINITIONS

A. The phrase "FDOT Specifications" shall refer to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction.

1.04 SYSTEM DESCRIPTION

A. Furnish and install asphaltic concrete pavement as shown on the Drawings and specified in this Section. Furnish and install asphaltic concrete pavement in accordance with the lines, grades and typical section as indicated on the Drawings.

B. Furnish and install new asphaltic concrete pavement required to complete the paving work.

C. Furnish and install asphaltic concrete topping as indicated on the Drawings.

D. Repair asphaltic concrete pavement damaged as a result of completing Work and damaged by construction operations.

1.05 SUBMITTALS

A. General: As specified in:
   1. Division 1;
   2. This Section

B. Submit proposed formula for asphaltic concrete paving prior to starting pavement work.

1.06 QUALITY ASSURANCE

A. FDOT Specifications referred to in this Section are made a part of this Contract to the extent of such references and shall be as binding upon the Contract as through reproduced herein in their entirety.

1.07 DELIVERY, STORAGE, AND HANDLING

A. General
   1. Product Delivery: As specified in Section 01650 Product Delivery Requirements.
   2. Product Storage and Handling: As specified in Section 01660 Product Storage and Handling.

B. Asphaltic Concrete Pavement Materials: Delivery, storage, and handling of asphaltic concrete pavement materials shall meet the requirements of FDOT LAP / Specifications.

1.08 PROJECT/SITE CONDITIONS

A. Environmental Requirements
   1. Do not place base, prime coat, tack coat, or asphaltic concrete when rain is falling or when there is water on the surface to be covered.
   2. Monitor climatic conditions and anticipate conditions producing rainfall.
   3. Remove and replace materials damaged by rainfall or standing water.

1.09 RELATED DOCUMENTS

A. PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE “SOIL AND GROUND WATER MANAGEMENT PLAN”, DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Lime Rock Base: Lime Rock base shall be in accordance with Section 911 of the FDOT Specifications.

B. Soil-Cement Base: Soil Cement base shall be in accordance with Section 270 of the FDOT Specifications.

C. Prime Coat: Material used for prime coat shall be cut-back Asphalt Grade RC-70 conforming to Sections 300 and 916 of the FDOT Specifications for prime to be used on Miami Oolite formation lime rock.

D. Tack Coat: Material used for tack coat shall be Emulsified Asphalt Grade RS-2 conforming to Sections 300 and 916 of the FDOT Specifications. All areas to be paved shall receive a final tack coat that provides a uniform finish for new and existing paving.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Subgrade
   1. Stabilize roadway subgrades to the minimum depth shown on the Drawings to a Limerock Bearing Ratio of not less than 40. Stabilizing shall be Type B as defined in Section 160 of the FDOT Specifications. Stabilization may require addition and thorough mixing in of crushed limerock, course limerock screenings, or any other stabilizing material acceptable to the Engineer. Apply stabilizing material in such quantity that, after mixing and blending, the subgrade will have a LBR of not less than 40. Mix, blend, or mix and blend stabilizing material into subgrade material by plowing, scarifying, disking, harrowing, blading and mixing with rotary tillers until mixed materials are of uniform bearing value throughout width and depth of layer being processed.

2. Make not less than three density determinations on each day's final compaction operations on each course. Make density determinations at more frequent intervals if deemed necessary by the Engineer.

B. Base
1. Construct Base in accordance with Section 230 of the FDOT Specifications, to the thickness and width indicated on the Drawings.
2. After spreading of the base material is completed, scarify entire surface and shape surface to produce the exact grade and cross section after compaction. For double course base, extend scarifying to a depth sufficient to penetrate slightly the surface of the first course. The maximum depth of each lift shall be 8 inches.
3. When the material does not have the proper moisture content to insure the required density, wetting or drying shall be required.
   a. If the material is deficient in moisture, add and uniformly mix in water by disking the base course to the full depth of the base course.
   b. If the material contains an excess of moisture, allow the material to dry to proper moisture content before compacting material.
4. As soon as proper conditions of moisture are attained, compact material to an average density not less than 95 percent maximum density (ASTM D-1557) as determined in more than one course, the density shall be obtained in each lift of the base.
5. During final compacting operations, if blading of any areas is necessary to obtain true grade and cross section, complete compacting operations for such areas prior to making density determination on finished base.
6. Unless otherwise directed by the Engineer, “hard-plane” the surface with a blade grader immediately prior to the application of the prime coat to remove the thin glaze or cemented surface and to allow free penetration of the prime material. Materials planed from the base shall be removed from base area.
7. If cracks or checks appear in the base, either before or after priming, which in the opinion of the Engineer, would impair the structural efficiency of the base course, remove such cracks or checks by rescarifying, reshaping, adding base material where necessary and recompacting, at no additional cost to the Owner.
8. If at any time the subgrade material shall become mixed with the base course material, dig out and remove the mixture, reshape and compact the subgrade and replace the materials removed with clean base material. Shape and compact clean base material as specified in this Article. Remove, replace, shape, and compact material at no additional cost to the Owner.

C. Prime Coat: Apply prime coat and perform the Work in accordance with Section 300 of the FDOT Specifications.

D. Tack Coat: Apply tack coat and perform the Work in accordance with Section 300 of the FDOT Specifications.

E. Asphaltic Concrete: Spreading, compact, and joint the wearing surface in accordance with Sections 330, 332, 333 of the FDOT Specifications to the thickness indicated on the Drawings.

3.02 PAVEMENT REPAIR

A. Repair damage to pavement as a result of Work under this Contract. Repair damage to pavement in a manner satisfactory to the Engineer and at no additional cost to the Owner. Pavement repair shall include preparation of the subgrade, placing and compacting of the limerock base, priming of the base, and placing and maintaining of surface treatment, as specified in this Section.

B. Width of repairs shall extend at least 12 inches beyond the limit of damage. Edge of pavement to be left in place shall be cut to a true edge with a saw or other acceptable method that provides a clean edge to abut repair. Line of the repair shall be reasonably uniform with no unnecessary irregularities.

END OF SECTION 32 1216

SECTION 32 1600

SIDEWALKS, CURBS & GUTTERS

PART 1- GENERAL

1.01 WORK INCLUDED: THIS SECTION COVERS ALL FORMED CONCRETE WORK REINFORCED AND NON-REINFORCED AS REQUIRED BY THE PROJECT INDICATED ON THE PLANS OR SPECIFIED BY THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR ALL SITE WORK AND CONSTRUCTION SUPERVISION REQUIRED TO MEET ADAAG/ADA SPECIFICATIONS.

1.02 SUBMITTALS DURING CONSTRUCTION:

A. Submittal during construction shall be made as required in
   1. General Requirements.

1.03 SUBMITTALS REQUIRED FOR:

A. Concrete - Submit data sheets

B. Granular fill - Submit data sheets

C. Expansion joint fillers - Submit data sheets

D. Traffic paint - Submit data sheets

E. Asphalt concrete cold patch - submit data sheets

F. Asphalt Hot Mix - submit data sheets

G. Sod - submit data sheets

H. Stamped and Colored concrete-submit data sheets

I. Detectable Warnings System:- submit data sheets

J. Concrete Sealer - submit data sheets

1.04 RELATED DOCUMENTS

A. PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE “SOIL AND GROUND WATER MANAGEMENT PLAN”, DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

PART 2- PRODUCTS

2.01 FORMS:

A. Materials for curb forms shall be 2-inch dressed dimension lumber, fiberglass, or metal of equal strength, free from defects which would impair the appearance or structural quality of the complete curb. Where short-radius forms are required, 1-inch dressed lumber or plywood may be used. Form material for the face of the curb shall not have any horizontal joints closer than 7-inches from the top of the curb. Provide stakes and bracing materials as required to hold forms securely in place. Metal forms shall be subject to approval by the Engineer. Forms are incidental to the Contract Price.

B. Materials for sidewalk forms shall be 2-inch dressed lumber straight and free from defects or fiberglass or standard metal forms may be used. Where short radius forms are required, 1-inch dressed lumber is required to hold forms securely in place.

2.02 GRANULAR FILL:

A. Natural sand not having any piece of material larger than 1-inch, free from dirt, clay balls, or organic material, well graded from coarse to fine, containing sufficient finer material for proper compaction and less than ten (10) percent by weight passing the No. 200 sieve. Payment shall incidental to the concrete unit Price bid.

2.03 EARTH FILL:

A. Earth must be free from rocks 2-inches or larger and other foreign materials. Earth fill is incidental to contract Prices. Payment shall incidental to the concrete unit Price bid.

2.04 EXPANSION JOINT FILLERS:

A. Expansion joint fillers shall conform to F.D.O.T. Standard Specifications for Road and Bridge Construction 2004. Submit complete information regarding joint fillers for approval by the Engineer. Payment shall incidental to the concrete unit Price bid.

2.05 CONCRETE:

A. Concrete shall be ready-mixed conforming to ASTM C 94 and shall have a compressive strength of 3,000 psi at 28 days. All exposed aggregate concrete applications shall be comprised of 3 MM - 5 MM maximum size brown river rock aggregate. Limerock aggregate is acceptable for all other concrete applications. Submit complete information regarding mix to the Engineer for review in accordance with the requirements of the referenced ASTM Specification.

2.06 DETECTABLE WARNING SYSTEM:

A. Detectable Warning Systems on walking surfaces shall be “Endicott Handicap Detectable Warning Paver” or equal with raised truncated domes and specified color and must meet federal ADAAG guidelines.

2.07 TRAFFIC MARKING PAINT:

A. Traffic marking paint shall conform to F.D.O.T. Specifications Section 971. Paint for curbs shall be Pride Baker Paint brand traffic marking paint or approved equal. Paint and labor shall be incidental to contract price for replacement markings and the unit price bid for new markings.

2.08 ASPHALT:

A. Asphalt and labor shall be incidental to the contract price for patches surrounding curbs and sidewalks.

2.09 ACCEPTANCE OF MATERIALS:

A. All materials shall be subject to inspection for suitability, as the Engineer may elect, Prior to or during incorporation into the work.

PART 3- EXECUTION

3.01 EXCAVATION AND BACKFILL:

A. Cut the existing sidewalk regardless of the thickness, with an approved pavement saw or approved pavement cutter wherever sidewalk edges do not follow straight lines. Saw cutting of concrete shall be wet down to reduce air borne contamination. Remove and dispose of sidewalk at the Contractor's expense.

B. Prior to excavation of the sidewalk the Contractor's superintendent and the Owner's Engineer or designee shall, together, walk the length of the site marking the limits of the excavation and marking any other pertinent information. Paint shall be supplied by the Contractor, incidental to the cost of the Contract.

C. At the time of each walk through described in Section 3.1.2, each water meter box and sewer cleanout shall be inspected for structural integrity. Those which are deemed in need of replacement at that time will be supplied by the contractor at the unit price bid or the Florida Keys Aqueduct Authority. Those which meet normal structural and functional standards, and are broken by the Contractor during the construction Process shall be replaced by the Contractor at his cost.

   1. Sewer cleanout boxes shall be made from 100% homogenous polyethylene material having a minimum wall thickness of .550 inch, a compartment size of 12-inches by 20-inches with a clear opening of 10-inches by 17-inches. Provide knockouts or notches in each end sized to allow placement of a 6-inch PVC pipe inside the box. Vertical crush to exceed 20,000 pounds and sidewall loading to exceed 180 pounds per square inch. A flange shall encircle the top area for installation in concrete. Cleanout covers shall be cast

of ductile conforming to ASTM A-536-84, grade 60-40-18.The meter box covers shall meet or exceed Federal specifications RR-F-621D for a minimum Proof load of 25,000 pounds on 9”x 9” area. All boxes and covers shall be manufactured by Mid- States Plastics, Mount Sterling, KY. Florida Master Distributor: Ferguson Water Works (561-844-3222) or approved equal.

2. Water meter boxes shall be in accordance with the latest FKAA standards and specifications.

D. As directed by the Engineer remove any unsuitable material to such a depth that the addition of the sub grade and granular fill can be placed and compacted. Unsuitable material shall consist of and not be limited to top soil, wood, root matter, stumps, trunks, roots or root systems. Excavation that cannot be accomplished without endangering present structures shall be performed with hand tools.

3.02 PREPARATION OF SUBGRADE:

A. Bring the areas on which curbs and sidewalks are to be constructed to required grade and compact to 95 percent ASTM D 1557 by sprinkling and rolling or mechanical tamping. As depressions occur, refill with approved material and recompact until the surface is at the proper grade.

3.03 PLACING GRANULAR FILL:

A. After the sub grade for sidewalks and curbs is compacted and at the Proper grade, spread 4-inches or more of granular fill. Sprinkle with water and compact to 95 percent ASTM D 1557 by rolling or other method. Top of the compacted fill shall be at the proper level to receive the concrete. Granular fill shall be used, when needed, to raise the level of grade to allow for proper thickness of concrete. After spreading fill, compact to 95 per cent.

3.04 SETTING FORMS:

A. Construct forms to the shape, lines, grades, and dimensions as required for proper installation or as called for on the drawings or as directed by the Engineer. Stake wood or steel forms securely in place, true to line and grade.

B. Forms on the face of the curb shall not have any horizontal joints within seven (7) inches of the top of the curb. Brace forms to prevent change of shape or movement in any direction resulting from the weight of the concrete during placement. Construct short-radius forms to exact radius. Tops of forms shall not depart from grade line more than 1/8-inch when checked with a ten-foot straightedge. Alignment of straight sections shall not vary more than 1/8-inch in ten (10) feet.

3.05 CURB/GUTTER CONSTRUCTION:

A. Construct curbs to line and grade of curbs and gutters removed, as shown on plans or as established or directed by the Engineer. Curbs shall conform to F.D.O.T. type "D" or "F" or as directed by the Engineer.

B. Handicap ramps shall be constructed at locations shown on the drawings or as directed by the Engineer and in conformance with legal requirements.

C. Place preformed asphalt-impregnated expansion joints at intervals not exceeding 100 feet, at the beginning and ends of the curved portions of the curbs and at inlets.

D. Place contraction joints in the curb at intervals not exceeding fifteen (15) feet. Contraction joints shall be of the open joint type and shall be Provided by inserting a thin, oiled steel sheet vertically into the fresh concrete to force coarse aggregate away from the joint. The steel sheet shall be inserted the full depth of the curb. Place, process, finish and cure concrete in conformance with the applicable requirements of ACI 614, and this Specification. Whenever the requirements differ, the higher shall govern. After initial set has occurred in the concrete and prior to removing the front curb form, the steel sheet shall be removed with a sawing motion. Finish top of curb with a steel trowel and finish edges with a steel edging tool.

E. As soon as the concrete has set sufficiently to support its own weight, remove the front form and finish all exposed surfaces. Finish formed face by rubbing with a burlap sack or similar

device that will produce a uniformly textured surface, free of form marks, honeycombs and other defects. All defective concrete shall be removed and replaced at the Contractor's sole expense.

F. Upon completion of the curing period, backfill the curb with earth, free from rocks 2-inches and larger and other foreign materials. Tamp backfill firmly in place.

G. Finished curb shall present a uniform appearance for both grade and alignment. Remove any section of curb showing abrupt changes in alignment or grade, or which is more than 1/4-inch away from its location as staked, and construct new curb in its place at the Contractor's sole expense.

H. Upon completion of the curing period fill with asphalt any street side holes or ruts in the asphalt paving that was created by the installation of the sidewalk or the curb. When required by Engineer, saw cut, remove and replace sections as directed.

I. Where curbs that were painted for legal traffic markings (i.e., loading zones, driveways, no parking zones) prior to construction are removed, replaced, repaired or installed. These and any newly constructed curbs and sidewalks shall be repainted by the Contractor. Painting shall be performed upon completion of the curing period, but not less than seven (7) days have elapsed since pouring the concrete. Curbs are to be painted from the inside edge of the curb to the edge of the pavement.

3.06 SIDEWALK CONSTRUCTION:

A. Sidewalks shall be four-inches and driveways shall be 6 inches thick as directed by the City.

B. Place preformed expansion joints as in the adjacent curb, where the sidewalk ends at a curb, around posts, poles, concrete buildings or walls or other objects protruding through the sidewalk, and at locations shown on the Drawings.

C. Provide dummy joints transversely to the walks at locations opposite the contraction joints in the curb and at intervals not exceeding five (5) feet. These joints shall be 1/4-inch by 1-inch weakened plane joints. They shall be straight and at right angles to the surface of the walk.

D. Place, process, finish, and cure concrete in conformance with the applicable requirements of ACI 614 and this Specification. Where the requirements differ, the higher shall govern.

E. Surface finish shall be as depicted on the Landscape Drawings.

F. Sidewalks shall be placed to slope towards the street at a maximum slope of 2% or as otherwise directed by the Engineer.

G. Where sidewalks or curbs which were painted for legal traffic markings (i.e., loading zone, driveways, no parking zones) are removed and replaced with new curb or sidewalk or repaired, the Contractor shall be responsible to paint the new portions of the curbs or sidewalks.

H. Upon completion of the curing period fill with asphalt, any street side holes or ruts in the asphalt paving that were created by the installation of the curbs or sidewalks.

END OF SECTION 32 1600

SECTION 32 1726
TACTILE WARNING SURFACING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Plastic tactile and detectable warning tiles for pedestrian walking surfaces.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete for sidewalks and platforms.

B. Section 32 1313 - Concrete Paving: Concrete sidewalks.

C. Section 32 1723.13 - Painted Pavement Markings: Crosswalk and curb markings.

1.03 REFERENCE STANDARDS

A. 49 CFR 37 - Transportation Services for Individuals with Disabilities (ADA); current edition.

B. AASHTO LRFD - Bridge Design Specifications; 2017.

C. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.

D. ASTM A48/A48M - Standard Specification for Gray Iron Castings; 2003 (Reapproved 2016).

E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.

F. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2016.

G. ASTM C501 - Standard Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abraser; 1984 (Reapproved 2015).

H. ASTM C903 - Standard Practice for Preparing Refractory Specimens by Cold Gunning; 2015, with Editorial Revision (2016).

I. ASTM D2047 - Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine; 2011.

J. ASTM D543 - Standard Practices for Evaluating the Resistance of Plastics to Chemical Reagents; 2014.

K. ASTM D570 - Standard Test Method for Water Absorption of Plastics; 1998 (Reapproved 2010).

L. ASTM D638 - Standard Test Method for Tensile Properties of Plastics; 2014.

M. ASTM D695 - Standard Test Method for Compressive Properties of Rigid Plastics; 2015.

N. ASTM D790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials; 2016.

O. ASTM D1308 - Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes; 2002 (Reapproved 2013).

P. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.

Q. ASTM G155 - Standard Practice for Operating Xenon Arc Light Apparatus for Exposure of Nonmetallic Materials; 2013.

R. ATBCB PROWAG - Proposed Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way; 2011.

S. SAE AMS-STD-595 - Colors Used in Government Procurement; 2017a.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit manufacturer's product data, standard details, details specific to this project; written installation and maintenance instructions.

C. Samples: For each product specified provide two samples, 8 inches square, minimum; show actual product, color, and patterns.

D. Shop Drawings: Submit plan and detail drawings. Indicate:
   1. Locations on project site. Demonstrate compliance with referenced accessibility standards.
   2. Sizes and layout.
   3. Pattern spacing and orientation.
   4. Attachment and fastener details, if applicable

E. Warranty: Submit manufacturer warranty; complete forms in City of Key West's name and register with manufacturer.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years documented experience.

B. Installer Qualifications: Company certified in writing by product manufacturer as having successfully completed work substantially similar to the work of this section.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver to project site in manufacturer's protective wrapping and in manufacturer's unopened packaging.

B. Store covered and elevated above grade and in manufacturer's unopened packaging until ready for installation. Maintain at ambient temperature between 40 and 90 degrees F.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Plastic Tiles: Provide manufacturer's standard five year warranty against manufacturing defects, breakage or deformation.

PART 2 PRODUCTS

2.01 TACTILE AND DETECTABLE WARNING DEVICES

A. Plastic Tactile and Detectable Warning Tiles: ADA Standards compliant, glass fiber and carbon fiber reinforced, exterior grade, matte finish polyester sheet with truncated dome pattern, solid color throughout, internal reinforcing of sheet and of truncated domes, integral radius cut lines on back face of tile; with factory applied removable protective sheeting.
   1. Material Properties:
      a. Water Absorption: 0.20 percent, maximum, when tested in accordance with ASTM D570.
      b. Slip Resistance: 0.50 minimum dry static coefficient of friction, when tested in accordance with ASTM D2047.
      c. Compressive Strength: 25,000 pounds per square inch, minimum, when tested in accordance with ASTM D695.
      d. Tensile Strength: 10,000 pounds per square inch, minimum, when tested in accordance with ASTM D638.
      e. Flexural Strength: 25,000 pounds per square inch minimum, when tested in accordance with ASTM D790.
      f. Chemical Stain Resistance: No reaction to 1 percent hydrochloric acid, motor oil, calcium chloride, gum, soap solution, bleach, or antifreeze, when tested in accordance with ASTM D543.
      g. Chemical Stain Resistance: No reaction to 1 percent hydrochloric acid, motor oil, calcium chloride, gum, soap solution, bleach, or antifreeze, when tested in accordance with ASTM D1308.
      h. Abrasion Resistance: 300, minimum, when tested in accordance with ASTM C501.
      i. Flame Spread Index: 25, maximum, when tested in accordance with ASTM E84.

j. Accelerated Weathering: Delta-E of less than 5.0 at 2,000 hours exposure, when tested in accordance with ASTM G155.
k. Adhesion: No delamination of tile prior to board failure in a temperature range of 20 to 180 degrees F, when tested in accordance with ASTM C903.
l. Loading: No damage when tested according to AASHTO LRFD test method HS20.
m. Salt and Spray Performance: No deterioration or other defect after 200 hours of exposure, when tested in accordance with ASTM B117.

2. Installation Method: Cast in place.
3. Shape: Rectangular.
4. Dimensions: 24 inches by 48 inches.
5. Dimensions: 24 inches by 33-1/4 inches with a radius of 11 feet, 6 inches.
6. Pattern: In-line pattern of truncated domes complying with ADA Standards.
7. Edge: Square.
8. Joint: Butt.
9. Color: As selected by K2M Design Inc. from manufacturer's standard range.
10. Color: SAE AMS-STD-595, Table IV, Federal Yellow No. 33538.
11. Color: Pantone #7529C Houston Beige.

B. Cast Iron Detectable Warning Plates:
1. Material: Cast gray iron; ASTM A48/A48M, Class 30 A (minimum).
2. Installation Method: Cast in place.
3. Shape: Rectangular and Radius.
4. Square Dimensions: 24 inches square.
5. Radius Dimensions: 24 inches wide, 9 feet, 5 inch radius.
6. Pattern: Truncated cones in compliance with ADA Standards.
7. Joint: Manufacturer standard, bolted connection.
8. Finish: Manufacturer's factory applied powder coat.
9. Color: As selected by K2M Design Inc. from manufacturer's standard range.
10. Color: SAE AMS-STD-595, Table IV, Federal Yellow No. 33538.

2.02 ACCESSORIES

A. Fasteners: ASTM A666, Type 304 stainless steel
1. Type: Countersunk, color matched composite sleeve anchors
2. Size: 1/4 inch diameter and 1-1/2 inches long.

B. Adhesive: Type recommended and approved by surfacing tile manufacturer.

C. Sealant: Elastomeric sealant of color to match adjacent surfaces; approved by surfacing tile manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. When installation location is near site boundary or property line, verify required location using property survey.

B. Verify that work area is ready to receive work:
1. Examine work area with installer present.
2. If existing conditions are not as required to properly complete the work of this section, notify K2M Design Inc..
3. Do not proceed with installation until deficiencies in existing conditions have been corrected.

C. Verify that dimensions, tolerances, and attachment methods for work in this section are properly coordinated with other work on site.

3.02 INSTALLATION, GENERAL

A. Install in accordance with manufacturer's written instructions.
1. Do not install damaged, warped, bowed, dented, abraded, or otherwise defective units.

2. Do not install when ambient or substrate temperature has been below 40 degrees F during the preceding 8 daylight hours.

B. Field Adjustment:
1. Cut units to size and configuration shown on drawings.
2. Do not cut plastic tiles to less than 9 inches wide in any direction.
3. Locate relative to curb line in compliance with ATBCB PROWAG, Sections 304 and 305.
4. Orient so dome pattern is aligned with the direction of ramp.
5. Align truncated dome pattern between adjacent units.

C. Install units fully seated to substrate, square to straight edges and flat to required slope.

D. Align units so that tops of adjacent units are flush and joints between units are uniform in width.

3.03 INSTALLATION, CAST IN PLACE PLASTIC TILES

A. Concrete:
1. See Section 03 3000.
2. Slump: 4 to 7 percent.

B. When installing multiple adjacent units, leave a 3/16 inch gap between units to allow for expansion.

C. Tamp and vibrate units as recommended by manufacturer.

D. Place and position weights on units while concrete cures as recommended by manufacturer. Ensure no voids or air pockets exist between top surface of concrete and underside of units.

3.04 INSTALLATION, SURFACE APPLIED PLASTIC TILES

A. Cure concrete surfaces for a minimum of 4 days before installing units.

B. Verify substrate is clean and dry; free of voids, projections and loose material. Remove dust, oil, grease, curing compounds, sealers and other substances that may interfere with adhesive bond or sealant adhesion.

C. Mechanically roughen surface as required to remove contaminants and prepare surface for adhesive and sealant application.

D. When installing multiple adjacent units, leave a 1/8 inch gap between tiles to allow for expansion.

E. Drill fastener holes straight, true and to depth recommended by manufacturer.

F. Apply adhesive to back of unit as recommended by manufacturer.

G. Mechanically fasten to substrate. Avoid striking or damaging the unit itself during installation.

H. Apply sealant to edges in cove profile.

3.05 INSTALLATION - CAST IN PLACE, CAST IRON PLATES

A. Concrete: See Section 03 3000.

B. When installing multiple adjacent units, connect plates before placing.

C. Install by method described in manufacturer's written instructions.

D. Place units into wet concrete.

E. Press assembly into concrete to achieve final elevation.

F. Finish concrete adjacent to plate. Remove wet concrete spilled onto plate surface.

3.06 CLEANING PLASTIC UNITS

A. Remove protective plastic sheeting within 24 hours of installation.

B. Remove excess sealant or adhesive from joints and edges.

C. Clean four days prior to date of scheduled inspection.

3.07 PROTECTION

A. Protect installed units from traffic, subsequent construction operations or other imposed loads until concrete is fully cured.

B. Touch-up, repair or replace damaged products prior to Date of Substantial Completion.

END OF SECTION 32 1726

SECTION 32 18 13 - SYNTHETIC TURF

PART 1 -GENERAL

1.1 SUMMARY

A. Provisions of the General Conditions and Division 01 apply to this section.

B. Section Includes:

1. Synthetic turf over a shock pad over a drainage layer over stone base.

C. Related Sections:

1. Section 01 78 23 Operation and Maintenance Data
2. Section 01 78 36 Warranty Procedures
3. Section 11 68 16 Athletic and Playground Equipment
4. Section 32 18 12 Porous Stone Base and Drainage

D. Description of Work:

1. Contractor to supply design-build drawings showing the extent of synthetic turf over drainage layer installed over stone base work; refer to the drawings for layout, extents of turf system and ancillary items, which together make up the complete synthetic turf system.

2. Synthetic turf work includes, but is not limited to, the following:

a) A complete synthetic turf system, consisting of a tufted blend of polyethylene monofilament and fibrillated yarns on a reinforced multi-layer backing, which is installed over a suitable substrate having a vertical drainage and horizontal drainage pattern in addition to a water retention storage capacity in accordance with these specifications.

b) The work associated with the stone base is not part of this specification. Refer to Specification Section 32 18 12 Porous Stone Base and Drainage.

c) A resilient infill system, consisting of an organic and silica sand mixture, which is applied to the synthetic turf system in accordance with the manufacturers recommendations.

d) Tufted-in game lines and perimeter lines are per the drawings. Remaining required game marking shall be permanently inlaid as per the drawings or at the direction of t h e Owner or Owner's Representative.

e) A complete edging system that provides an enclosed total perimeter edge thereby enclosing the synthetic turf system. The edge system is 2" x 3" minimum recycled plastic secured to thickened edge sidewalks and curbing with Tap-con screws 3' on center as indicated on the drawings or per the direction of the Owner or Owner's

Representative.

f) Maintenance and operating manuals for the synthetic turf system must be provided.

g) Warranty: Eight Year Warranty. The turf is guaranteed against defects in workmanship for a period of eight (8) years from the date of substantial completion.

h) Striping and seaming plan: Striping plan and layouts for the sports are as shown on the drawings including logos, markings, game lines, numbering and boundaries.

i) Glue system: Fast setting, moisture setting, two-component polyurethane adhesive specifically designed for seaming and direct bonding of synthetic turf in high-performance sports installations.

j) Training for the Owners field maintenance personnel in proper care and maintenance procedures is required; provide (4) hours training for a group of personnel at one sitting. Schedule the training with the Owner or Owner's Representative. Provide a sign-in sheet and present the document to the Owner upon completion of the training session.

k) Comprehensive Maintenance Specification: The maintenance of the synthetic turf field shall be performed on a consistent basis to maintain the safety and playability of the playing surface. Routine maintenance shall be performed on the field by owner or owner representative per the manufacturers maintenance manual/recommendations. An additional maintenance shall be performed by Contractor on an annual basis throughout the warranty period to total seven (7) scheduled cleanings. Said maintenance must be performed by the Contractor that is awarded the contract for construction of the synthetic turf system. Contractor shall maintain a staff of maintenance technicians and demonstrate that all personnel involved in performing maintenance on the synthetic turf system are fully certified by the Manufacturer(s) of the component products that make up the synthetic turf system. Certification must be in accordance with the Manufacturer(s) recommendations'.

l) A field analysis must be completed before maintenance is performed. Repairs to the synthetic field must be completed in their entirety. To ensure proper maintenance and to adhere to Manufacturers specifications, a static brush shall only be used for general infill leveling and to "stand up" the fibers. A magnetic sweep shall be performed to remove all metal objects from the field. Machinery that can perform a deep hydro pressurized fiber cleaning to a depth of 1.5" that lifts and separates infill must be used once a year throughout the contractual period of eight (8) years (seven total cleanings/inspections). All infill will be maintained by installer/maintenance crews as required to maintain G- MAX levels. Drainage slots or gaps in the edging system, that occur at four-foot on center intervals, shall be cleared and free-flowing on an annual basis.

E. Provide all materials, labor, equipment and services required to accomplish related work in accordance with the drawings and specifications.

F. The synthetic turf shall be specifically designed, manufactured and installed for the intended sports and events as shown on the drawings. At the time of substantial completion, the system's shock attenuation shall have an average G-max value less than 120 for a padded system and less than 135 for a non-padded system, based on ASTM-F355A. At no time shall the G-max value exceed 145 for a padded system and 170 for a non-padded system throughout the life of the warranty.

G. Copies of independent laboratory test reports on system or components:

1. ASTM D5848-10 Total Product Coefficients
2. ASTM D5823-05a Average Pile Height
3. ASTM D 1335-11 Tuft Bind Strength
4. ASTM D5034-09 Grab Tear Strength
5. ASTM D1907-07 Fiber Denier
6. ASTM D789-07 Fiber Melt Point
7. ASTM F355A-10 G-MAX
8. ASTM D2859-06 (2011) Pill Flammability
9. ASTM F1015-03 (2009) Relative Abrasive Index

1.2 SUBMITTALS

A. Submit the following in accordance with the contract documents and prior to the commencement of work:

1. Pre-installation Meetings: Submit a Preinstallation Meeting schedule for all components of the synthetic turf system.
2. Baseline Schedule: Submit a baseline construction schedule that is fully delineated and showing all components of the work for a complete and fully operational synthetic turf system.
3. Staging Plan: Submit a staging Plan for housing the construction materials and move-in of construction.
4. Striping Plan: Provide a colored striping plan showing lines, numbers, letters and any logos that are to be included in the final product. Refer to the drawings for assistance and coordinate with the Owner or Owner's Representative in order to get final approval of all designated colors, dimensions and logo/lettering designs.
5. Material Samples and Submittals: Material Certificates, Cut Sheets and Product Samples: Provide three (3) copies of submittals for each component of the synthetic turf system. Obtain samples of each component from the material producer that will be used for this project. Each material submittal must be stamped and checked as approved as meeting

the requirements of the construction documents by the Contractor before being submitted to the Owner or Owner's Representative.

6. Seaming Plan: Submit a seam layout plan fully showing all seams on the synthetic turf system. Seams may be glued or sewn.

7. Submit shop drawings on all component products required for a complete and total installation of the synthetic turf system; turf, substrate panels, underlayment, border, matting, infill, and any additional components so stated on the drawings and specifications.

1.3 JOB CONDITIONS

A. All work shall be done in a workmanlike fashion within the parameters of the Manufacturer(s) recommendations of the products specified.

1.4 QUALITY ASSURANCE

A. Installation to be provided by certified in-house labor, including a qualified installation foreman to coordinate and review the component parts of the synthetic turf system. Submit a resume showing the foreman's experience for the Owner's approval prior to starting work. Contractor shall maintain on-site supervision at all times during work progression including while any subcontractors, Contractor retained vendors, suppliers or contracted "third party" providers are on the job site. This encompasses time while deliveries are being made of goods and materials in order to maintain total quality control of all supplies that will be incorporated into the project provided by Contractor for the Owner.

B. Contractor shall maintain as permanent staff, a representative acting on behalf of the Manufacturer for coordination of all materials, parts, or "synthetic turf system" inquiries, Requests for Interpretation, submittal review and general product support for all components or parts of the synthetic turf system.

C. Contractor shall demonstrate that personnel involved in the installation process are in-house employees and fully certified by the Manufacturer of said products. Certification shall be demonstrated via written means and shall be provided to the Owner upon being deemed the lowest bidder. Certification submittal to Owner is a requisite for installation and being deemed responsive.

D. Contractor shall demonstrate proficiency in the successful installation of the synthetic turf system as applied over a stone base. Contractor shall have successfully installed and closed-out a minimum of five (5) synthetic turf systems in Florida within the past three (3) years. Successful demonstration of a synthetic turf system is indicative of a standard American football or soccer size field. Experience with synthetic turf systems in Key West and/or Florida Keys is preferred.

E. Contractor shall provide, for the cause of quality control, site engineering surveying and verification of grades, drainage and overall slope of the new stone base that is within the boundary and adjacent to the synthetic turf system. Provide topographic delineation and demonstrate that slope of the stone base provides site drainage into a properly sized perimeter collector drain, which discharges into a designated storm water outlet. Submit data as part of the submittal process prior to construction and installation.

F. Contractor shall also be certified by the manufacturer and be current and have been in good standing as a Certified Field Builder as accredited by the American Sports Builders Association for a minimum of three years.

G. Manufacturer to have ISO 9001 accreditation for quality and must be Synthetic Turf Council (STC) Certified as a manufacturer as well as a member of the Synthetic Turf Managers Association (STMA). Manufacturer must have minimum 10 NFL fields and must be a Rugby, FIH and a FIFA Licensee and have a minimum of 100 FIFA certified installations. Manufacturer must have no (zero) failed fields within the last seven (7) years and must not have any litigation or claims pending or awarded during past seven (7) years for failed fields. All litigation within the past seven (7) years between manufacturer and clients must be listed at time of bid.

H. Organic Filled Synthetic Turf Personnel:

1. Factory-trained technicians skilled in the installation of athletic-caliber infilled synthetic turf systems will undertake the placement of the turf. Utilize approved brushing equipment and techniques for the installation and in accordance with the Manufacturer's recommendations. The designated Supervisory personnel on the project must be certified, in writing, by the Contractor, as being competent in the installation of all materials including installation of the substrate CMS panels, gluing and/or sewing of the seams, proper installation of the infill mixture at 75% of the pile height, installation of the recycled plastic border, and any other installation process necessary for the complete and proper installation of the total synthetic turf system.

2. A notarized letter from the Contractor that the Installation Crew and Foreman are factory certified must be submitted prior to the start of synthetic turf system installation.

I. Warranty:

1. The warranty must have the following characteristics:

a. Provide full coverage for a minimum of eight (8) years from the date of Substantial Completion.

b. Warrant materials and workmanship.

c. Warrant that the materials installed meet or exceed the system specifications.

d. Repair or replace such portions of the installed materials that are no longer serviceable in order to maintain a serviceable and playable surface.

e. Be from a single source and complete, covering workmanship and all materials.

f. Assure the availability of exact or substantially the same replacement materials for the synthetic turf system installed for the full warranty period.

g. Include general wear and damage caused from UV degradation. The warranty shall specifically exclude vandalism and acts of God that are beyond the control of the turf Manufacturer or Contractor.

h. Shall be limited to repair or replacement of the affected areas at the option of

i. the Contractor, and shall include all necessary materials, labor, transportation costs, etc. to complete said repairs.

j. The materials hereinafter specified, shall withstand full climatic exposure in the location of the field, be resistant to insect infestation, wet rot, fungus and mildew; it shall also withstand ultra-violet exposure and extreme heat, it shall allow the free flow of water horizontally to perimeter areas and vertically to the substrate resilient underlayment panel drainage mat system below the synthetic turf.

k. The adhesive bonded or sewn seams of all system components shall provide a permanent, tight, secure and hazard-free athletic playing surface. All inlaid markings (game lines, logos, etc.) shall remain in place throughout the duration of the warranty period.

l. The installed synthetic turf system's drainage capability shall allow water to flow through the system (turf & infill) at a rate of 25 inches per hour.

PART 2- PRODUCTS

2.1 SYNTHETIC TURF SYSTEM

A. Turf Materials:

1. Synthetic Grass: Monofilament and fibrillated blend
2. Reinforced multilayer backing
3. Pile Weight is 46 oz/sy
4. Denier: 11,500 denier 300/360 micron monofilament blended with 10,000 denier 117 micron fibrillated fiber. Both fibers must be capable of exceeding 130k Lisport cycles.
5. Stitches: 120 stitches per linear meter
6. Primary backing weight: 7 oz/sy
7. Secondary backing weight: 20 oz/sy
8. Total weight: 73 oz/sy
9. Pile height: 2” or 51 mm
10. Tufting gauge: 1/2”
11. Tuft bind: >10 lbs
12. Primary backing: Multi-layer
13. Secondary backing: PU Coating
14. Width: 15’
15. Perforation: Yes
16. Infill: Sand and Organic Infill at 75% of the pile height
17. G-MAX: Accepted Synthetic Turf Council (STC) standards

B. The synthetic turf shall be delivered in 15-foot wide rolls with the four (4") inch white yard lines tufted into each roll, when applicable. The perimeter white lines shall also be tufted into the individual sideline rolls, when applicable. The rolls shall be of sufficient length to go from sideline to sideline. Head seams, between the sidelines, will not be acceptable.

C. Provide game markings as shown on the drawings: Hash marks, numbers, individual yard marks, school logo and related markings shall be cut in and glued in accordance with Manufacturer’s recommendations.

D. The synthetic turf shall meet all specs and be provided from the following approved manufacturers: (or approved equal)

1. Act Global
2. Shaw
3. A-Turf

E. Seaming Materials:

1. Adhesives for bonding tufted synthetic turf shall be one-component fast-setting polyurethane adhesive obtained from a single manufacturer and be equivalent to Ultra Bond Turf PU 1K as manufactured by Mapei Corporation, Deerfield Beach, FL (800) 992-6273, or one-part moisture-cured polyurethane obtained from a single manufacturer and be equivalent. No substitutions.

2. If seams are to be sewn, they must be sewn with high quality cord/thread as recommended by the Manufacturer.

F. Resilient infill:

1. A resilient infill system, consisting of a specially formulated mixture of silica sand and an organic infill at 75% of the pile height engineered to provide the look, feel, footing and shock absorption of a natural grass field in ideal conditions. Must be Brock Fill, Greenplay USA, or approved equal.

   a. Organic Infill:

      i. Must be equivalent to one of the following:
         - Coconut based with minimum of 90% coconut
         - Engineered wood particle comprised of virgin natural pine wood grown in the USA

      ii. Infill ratios:
         - Coconut based infill shall be applied at a minimum of 1 ½ pounds per sq/ft
         - Engineered wood particle infill shall be applied at a minimum of 1 pound per sq/ft

      iii. Additional Material for continued maintenance
         - Contractor shall include a guaranteed price for 3 years to provide and install an additional 1 pound per sq/ft of coconut based infill.
         - Contractor shall include a guaranteed price for 3 years to provide and install an additional ¼ pound per sq/ft of wood particle infill.

   b. Sand Particulate: Silica sand. The sand provided, as a component of the infill mixture, shall be rounded or sub-angular so as to minimize abrasion to the athlete and synthetic grass fibers.

i. Infill ratios:
    - Coconut based infill requires approximately 3.5 pounds per sq/ft of silica sand.
    - Wood particle infill requires approximately 4.5 pounds per sq/ft of silica sand.

G. Resilient Underlayment (Pre-manufactured resilient shock pad)

1. Resilient Underlayment shall have drainage channels and must be Brock Powerbase YSR, Schmitz Proplay 20D, or approved equal.

a. If Contractor wishes to provide an equivalent, he shall provide information prior to the bid to the Owner/Owner Representative showing equivalent performance characteristics of the underlayment.

b. The following performance criteria shall be met for the resilient underlayment:

i. Underlayment shall be a minimum 14 mm thick and material must be made from expanded polypropylene (EPP).

ii. G-max shall be 75-135 throughout the warranty period.

iii. HIC (EN-1177) not to exceed 1000 from 1.3m drop for full turf system.

iv. System must meet minimum critical fall height of 1.3m at installation with specified turf system.

v. Product shall drain at greater than 300 inches per hour.

vi. Warranty shall be 16 years or more cover the cost to replace or repair the turf in affected area in the event of product failure.

2.2 GEOTEXTILE FABRIC

A. The geotextile fabric (Amoco 4545, Bedim, Teramo 1000 or equal) shall be installed over the entire surface before the installation of the stone depending on geographic location. Seams shall be overlapped a minimum of 12". The geotextile shall extend into and completely wrap the perimeter drainage ditch.

2.3 EDGING NAILER

A. Wood-Plastic Recycled Composite Lumber:

1. Products supplied by; Trex Company, Inc., 160 Exeter Dr., Winchester, VA 22603, or approved equal.

PART 3- EXECUTION

3.1 SYNTHETIC TURF SYSTEM

A. The synthetic turf Contractor shall strictly adhere to the installation procedures outlined under

B. this section and must comply with the Manufacturer's requirements for handling, moving, laying-out, exposing, attaching, cutting and all other installation procedures for all products associated with this project. Any variance from these requirements must be accepted in writing by the Manufacturer's representative or engineer, and any resultant change must be submitted to the Owner's Representative via the standard Request for Interpretation (RFI) process. All changes (if any) shall be verified that they do not in any way affect the performance of the synthetic turf system or warranty.

C. Stone Base Acceptance: The Owner's Representative must approve the stone base and slope before turf installation can begin. See Specification Section 32 18 12Pourous Stone Base and Drainage for additional information.

D. Synthetic Turf and infill Materials:

1. After a final inspection of the stone base by the Contractor and the Owner's Representative, the synthetic turf installation shall begin. The first installation of roll turf is to begin with the longest perpendicular cross-field distance. No head seams shall be permitted in the inbound playing surface.

2. The rolls of turf shall be unrolled and laid out at a minimum of four hours prior to starting seaming procedures. The rolls of turf shall be allowed to relax/expand during this time period for c o n d i t i o n i n g .

   a. All visible wrinkles shall be stretched out before seaming.

   b. Seams shall be flat, tight and permanent with no separation or f r a y i n g .

   c. Synthetic turf yarn fabric that is trapped or glued between seams shall be freed from the seams by hand or other approved method to an upright position prior to the commencement of brushing and top dressing p r o c e d u r e s .

   d. All synthetic turf seams shall be assembled as follows: The full width rolls shall be laid out across the field. Utilizing standard state of the art adhering or sewing procedures, each roll shall be attached to the next. Carefully follow the drawings for correct placement of turf in order to allow for field diagrammatic alignment of lines and sports field playing o u t l i n e .

3. After all seaming operations are completed and inlaid lines, logos and lettering have been installed, the infill materials shall be spread evenly, using a drop spreader or top dresser.

   a. Organic Infill and sand shall be applied in a uniform rate of multiple applications until the specified infill depth is achieved.

   b. Infill material shall be brushed between infill applications with a motorized rotary broom and pull-type groomer brush s i m u l t a n e o u s l y .

   c. A minimum infill of organic and sand at 75% of the pile height is required.

E. Tufted and Inlaid Lines:

1. Layout and descriptions of tufted, inlaid and/or painted lines shall be as indicated on the final shop drawings (submittals).

2. Inlaid lines and field markings shall be cut-in using seaming methods recommended by the Manufacturer.

F. Synthetic Turf Perimeter Attachment and Border Edging Material Attachment:

1. After final trimming of the synthetic turf, the turf shall be screwed, nailed or stapled to the edging nailer system, or other system, as per the drawings and/or Manufacturer's recommendations.
2. Installation of the rubber border edging materials shall be completed using attachment methods that are in accordance with the Manufacturer's recommendations. Follow the Manufacturer's recommendations and the drawings.

3.2 FIELDLAYOUT

A. Field layout shall be as shown on the record drawings. Any Owner-approved changes that took place during the installation must be marked in red and resubmitted on the record drawings as an "as-built" condition.

3.3 CLOSEOUT

A. The Contractor must verify that a qualified manufacturers' representative has inspected the installation and that the finished field surface conforms to the Owner's requirements.

B. The Contractor shall provide the warranty to the Owner that covers defects in materials and workmanship of the turf for a period of 8 years from the date of Substantial Completion as described in Section 1.4, H. Submit three (3) copies of the warranty.

C. The Contractor must submit three (3) copies of its standard maintenance manual to the Owner.

D. Contractor must train Owner's designated field personnel in proper grooming and care procedures. This includes training field personnel on how to properly use grooming equipment as well as how to make minor repairs.

E. Extra materials: Contractor must leave required organic infill and the equivalent of a 15' x 10' (all pieces combined) of turf with Owner before demobilizing the job site. All salvageable pieces of colored turf used during the installation shall be left with the Owner as well.

3.4 CLEAN UP

A. Contractor shall provide the labor, supplies and equipment as necessary for final cleaning of surface and installed items.

B. All usable remnants of new material shall be neatly rolled up and turned over to the Owner at a place and area designated by the Owner.

C. Throughout the term of the contract and at intervals directed by the Owner and as synthetic turf installation is completed, clear the site of all extraneous materials, rubbish, trash or debris and leave the site in a clean, safe and neat condition.

D. Upon demobilization, Contractor is to remove all construction equipment and with final cleaning as described above, the job site is to be left in a clean, immaculate condition ready for immediate occupancy and use by the Owner.

3.5 G-MAX TESTING

A. Upon substantial completion, the Contractor shall hire an independent testing laboratory to perform a G-MAX test (ASTM 355, 1936 method) to verify that the shock attenuation properties of the field meet the requirements set forth in this specification. Submit three (3) copies of the G-MAX test to the Owner when applicable.

This page intentionally left blank.

SECTION 32 3119
DECORATIVE METAL FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Decorative aluminum fences.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete.

B. Section 31 2316 - Excavation.

1.03 REFERENCE STANDARDS

A. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2017.

B. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.

C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2014.

D. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments; 2008, with Editorial Revision (2017).

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

B. Shop Drawings:
   1. Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, gates, and schedule of components.
   2. Foundation details, concrete design mix and reinforcing schedule for anti-ram barrier system.

C. Manufacturer's Warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 FENCES

A. Fences: Complete factory-fabricated system of posts and panels, accessories, fittings, and fasteners; finished with electrodeposition coating, and having the following performance characteristics:

B. Electro-Deposition Coating: Multi-stage pretreatment/wash with zinc phosphate, followed by epoxy primer and acrylic topcoat.
   1. Total Coating Thickness: 2 mils, minimum.
   2. Color: As scheduled.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify K2M Design Inc. of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Set fence posts in accordance with the manufacturer recommended spacing.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch.

B. Maximum Offset From Indicated Position: 1 inch.

C. Minimum Distance from Property Line: 6 inches.

3.05 CLEANING

A. Clean jobsite of excess materials; scatter excess material from post hole excavations uniformly away from posts. Remove excess material if required.

B. Clean fence with mild household detergent and clean water rinse well.

3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair, or replace damaged products before Date of Substantial Completion.

END OF SECTION 32 3119

SECTION 33 1100

WATER UTILITY DISTRIBUTION PIPING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. The work to be performed under this Section shall include the furnishing and installing of water mains and appurtenances as herein described and as shown on the Drawings. The Contractor shall perform all excavation, backfilling, and related work required for the construction of these mains, in accordance with the provisions set forth under the applicable items of this Specification and of the General Conditions of the Contract. Where not otherwise set forth, all work shall be in accordance with AWWA (ANSI) C600 and the Florida Keys Aqueduct Standards and Specifications.

1.02 REFERENCES

A. Standards applicable in this Specification include:
   1. American Water Works Association (AWWA) and American National Standards Institute (ANSI).
   2. AWWA C104 (ANSI A21.4) Cement-Mortar Lining for Ductile-Iron and Gray Iron Pipe and Fittings for Water.
   3. AWWA C110 Gray-Iron and Ductile-Iron Fittings, 3-inch through 48-inch for Water and Other Liquids.
   4. AWWA C111 (ANSI A21.11) Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe and Fittings.
   5. AWWA C150 (ANSI A21.50) Thickness Design of Ductile-Iron Pipe.
   6. AWWA C151 (ANSI A21.51) Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand Lined Molds for Water or Other Liquids.
   7. AWWA C605 Installation of PVC Pressure Pipe & Fittings.
   8. AWWA C601 Standard for Disinfecting Water Mains.
   9. AWWA C900 Polyvinyl Chloride Pressure Pipe 4" through 12"
   10. AWWA C901 Polyethylene Pressure Pipe and Tubing for Water Service.

B. American Association of State Highway and Transportation Official (AASHTO).

C. AASHTO T-180-82 The Moisture-Density Relation of Soils Using a 10-lb. (4.54 kg) Rammer and an 18-inch (457 mm) Drop.

1.03 RELATED DOCUMENTS

A. PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE “SOIL AND GROUND WATER MANAGEMENT PLAN”, DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

PART 2 - PRODUCTS

2.01 PIPE

A. Ductile Iron Pipe: Ductile iron pipe shall conform to AWWA C151 (ANSI A21.51) and shall be pressure class 350.
   1. Lining: Ductile iron pipe for water mains shall have an internal lining of cement mortar in accordance with AWWA C104/A21.4.
   2. Coating: Buried ductile iron pipe shall be bituminous coated per AWWA C151/A21.10 and wrapped in a 12 mil polyethylene encasement.
   3. Polyvinyl Chloride Pipe (PVC): PVC pipe shall meet requirements of AWWA C900 DR-18 for pipe 4" to 12" in diameter, and shall be furnished in cast-iron pipe equivalent outside diameters with rubber gasketed joints. Pressure class shall be 150 psi (DR-18).

4. Polyethylene pressure pipe and tubing, ½“ through 3" having standard PE code designations PE2406, PE3406 and PE3408, shall be in accordance with AWWA Standard C-901, have a standard dimension ratio (SDR) of 9 with a 200 psi working pressure and have cooper equivalent (CTS) outside diameters. Polyethylene pipe shall be used for all service connections.

2.02 FITTINGS

A. Fittings shall be ductile iron mechanical joint type conforming to AWWA/ANSI C153/A21.53 with MEGALUGS, or approved equivalent restraint. All fittings shall have a working pressure of 350 psi in size 4" through 12", and shall be coated and lined as specified for ductile iron pipe. Ductile iron fittings on PVC pipe shall be wrapped in a 12 mil polyethylene encasement extending 1 foot from each end of the fitting.

2.03 JOINTS

A. Pipe shall be furnished with integral bell joints with locked in EPDM gaskets.

B. Restrained joint pipe shall be used for changes in elevation or alignment as shown on the Drawings or as required in the field by the Engineer. Ductile iron pipe restrained joints shall be “TR-Flex” by U.S. Pipe, “Lok-Ring” by American or approved equal. PVC pipe restrained joints shall be Certainteed Certa-Lok, EBAA Iron Series 1500 Retainers, or approved equivalent restraint. All restrained joints shall have a working pressure of 350 psi.

PART 3 - EXECUTION

3.01 THE INSTALLATION AND TESTING OF THE WATER MAIN SHALL BE DONE IN ACCORDANCE WITH ANSI/AWWA C600 PLUS THE ADDITIONAL REQUIREMENTS DESCRIBED HEREIN OR SHOWN ON THE PLANS.

3.02 PREPARATION

A. The layout of some of the piping systems shown on the Drawings may be diagrammatic but shall be followed as closely as the work will permit.

B. In shipping, delivery, and installing pipe and accessories, they shall be handled in such manner as to insure a sound, undamaged condition. Particular care shall be taken not to injure pipe coating and no other pipe or material of any kind shall be placed inside a pipe or fitting after the coating has been applied.

3.03 INSTALLATION

A. General

1. All pipe, fittings and valves shall be installed according to AWWA Specification C600 or C605. Prior to installation, all pipe and appurtenances shall be examined for damage and defects. Under no circumstances shall defective pipe be installed. All lumps, blisters and excess coating materials shall be removed from the bell and spigot ends of each pipe. While being placed in the trench, care shall be taken to prevent foreign material from entering the pipe. As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade.
2. At times when pipe laying is not in progress, the open end of the pipe shall be closed by a watertight plug. When practical, the plug shall remain in place until the trench is pumped completely dry. When it is necessary to deflect the pipe from a straight line in either the vertical or horizontal plane, or where long radius curves are permitted, the amount of deflection shall not exceed that of Table 5 in AWWA Specification C600 or C605.

B. Ductile Iron Fittings

1. Ductile iron fittings for use with ductile iron or PVC pipe shall be bell fittings with machined grooves for use with rubber rings. Grooves shall be clean and free of all sand or other foreign material before the ring is inserted. The pipe shall be properly lubricated prior to pushing the joints together. On installation of all bolting materials the Contractor shall utilize a graphite base non-binding lubricant (non-corrosive).

C. Mechanical Joints

1. Mechanical Joints are to be made in accordance with manufacturer's recommendations and requirements of pipe joint specifications. Case shall be taken to tighten bolts evenly around circumference of pipe and in no case shall bolts be overstressed.

D. Flanged Joints
1. Before making up flanged joints in ductile iron pipe and fittings, the back of each flange under the bolt heads and the face of each flange shall have all lumps, blisters and excess bituminous coating removed and shall be wire brushed and wiped clean and dry. Flange faces shall be kept clean and dry when making up the joint, and the workmen shall exercise caution to prevent damage to the gasket or the adherence of grease or particles of sand or dirt. Bolts and nuts shall be tightened by opposites in order to keep flange faces square with each other, and to insure that bolt stresses are evenly distributed.

E. Valve Settings
1. All valves placed on branch lines or bends shall be restrained via anchor couplings or anchor tees as specified hereinabove. Valves and valve boxes shall be set plumb at the locations indicated, and in accordance with the details shown on the Drawings. After being positioned, backfill shall be carefully placed and hand tamped. Before installation, care shall be taken to see that all foreign matter has been removed from the interior of the barrel. Stuffing boxes shall be tightened and the valves opened and closed to see that all parts are in working condition.

F. Connection to Existing Mains
1. Connection to existing water mains shall be made by the Contractor. The Contractor shall be responsible for making all necessary arrangements with the FKAA for these connections and shall bear any costs incurred at no additional cost to the FKAA. Prior to commencing the work of connecting to existing facilities, the Contractor shall uncover or expose the point of connection and insure himself that he has all materials, equipment and all other facilities required to complete the installation, and that such connections can be made in accordance with the details shown on the Drawings.
2. The Contractor shall take every precaution to insure that the alignment or gradient of the existing facilities are not disturbed, or otherwise damaged, as a result of his construction procedures. In the event the existing facilities are damaged or otherwise disturbed, the Contractor will be required to do such necessary repair, re-alignment, or replacement, so as to restore these facilities to a water tight, workable, acceptable condition.
3. No existing valves shall be operated by the Contractor. These valves shall only be operated by personnel of the FKAA. The Contractor shall advise the FKAA Engineering Department, 24 hours in advance of making these connections. This work shall be done under direct supervision of personnel of the FKAA. The valves and fittings to be employed in these connections, shall be thoroughly swabbed with a 300 ppm solution of chlorine and water. The connections shall be made as rapidly as possible, and any water in the excavation shall be kept below the level of pipe and fittings. The Contractor may have to make connections at off-peak hours. Shut-downs shall be kept to a maximum of 2 hours, unless previously approved by the FKAA, pending extenuating circumstances. Once valves are installed, they shall only be operated by FKAA personnel.

G. Customer Service Connections
1. Service connections shall be installed of the type and size and at the locations shown on the Drawings. All materials shall be as shown on the Drawings and as stated in these specifications. All taps to the distribution main may be made with the main under pressure, or dry tapped. Customer Service connections shall be direct tapped on mains 6" in diameter or greater and shall have corporation stop Ford F-1000 or approved equal. For connections to 4" diameter mains, use brass tapping saddle Rockwell Style 323 or approved equal and corporation stop Ford F-1000 or approved equal. For connections to 2" diameter mains, use Pack Joint Tee Ford T441-774 or approved equal and corporation stop Ford F-1100 or approved equal.

H. Miscellaneous

1. All excavated material shall be stockpiled in a manner that will not hinder the work or obstruct sidewalks, roadways, and driveways. All utility control structures shall be kept accessible. This shall be designed to mean those areas as designed by the Permitting Agency unless otherwise specified. Material stockpiles on private property must have written consent with a copy to FKAA.
2. Trench bottom shall be constructed to provide a firm, stable and uniform support for the full length of the pipe and/or fittings. Bellholes shall be provided at each joint to permit proper assembly and pipe support. When an unstable subgrade condition is encountered that could provide inadequate pipe support, additional trench bottom shall be excavated, refilled with suitable foundation material, and compacted as required to provide firm support.
3. All pipe shall be installed in dry trenches. Where conditions are such that running or standing water occurs in the trench bottom or the soil in the trench bottom displays a "quick" tendency, the water shall be removed by pumps until the pipe has been installed and the backfill has been placed over the top of pipe to a depth equal to 1 and ½ pipe diameters.

3.04 CUTTING AND CAPPING RETIRED WATER MAINS

A. As shown on the Drawings, some of the existing water mains are to be retired. The Contractor shall be responsible for cutting and capping or plugging, leak free, the existing water mains at the locations shown on the Drawings. Thrust blocks shall be installed at the capped end if required, dependent upon the type of existing pipe and method of capping to ensure that there is no movement in the pipe remaining in service. The Contractor shall obtain the approval of the FKAA prior to cutting any existing water mains.

3.05 CUSTOMER SERVICE LINES

A. Location of Meters
   1. All meters and meter boxes shall be located in the right-of-way as shown on the Drawings. Where meter relocations are required, the Contractor shall also install new service piping between the relocated meter and the point of connection on the customer's property.
   2. If the meters are in "back" easements or at the back of lots it may be better to install the new meter boxes and run the on-site customer service piping up to the point of connection prior to relocating any meter. The exact sequence of operations will be decided by the FKAA in the field.

B. On-Site Customer Service Piping
   1. Portions of the work to be constructed under the terms and conditions of these Contract Documents are the installation and construction of on-site customer service piping. In all instances where existing water meters are located in easements along the rear property lines, or where the existing water meters are located outside of the rights-of-way, the Contractor shall install such piping as may be required to connect the new meter locations with the customer's existing house potable water system. The point of connection will generally be at the old meter location, but, may be at some other point closer to, or at, the customers house. Each new on-site customer service line shall be installed with a valve near the point of connection to the existing house potable water system. On-site customer service lines will be buried a minimum of 6-inches below existing grade and will be thoroughly flushed before connecting to the existing house potable water system. The inspector will determine the exact point of connection in the field so as to minimize future maintenance problems of the customer and the FKAA. All such work within private property shall be performed by or under the direct supervision of a licensed master plumber. Service lines from the meter to the customer's existing potable water system shall be schedule 40 PVC and shall be in accordance with requirements of the Standard Plumbing Code applicable in Monroe County, Florida.

C. Removal of Existing Meter Boxes and Service Lines
   1. After water service has been restored through the existing meters and new service lines, the old meter boxes and service lines shall be removed from the site. Meter boxes which are no longer in use shall be carefully removed and delivered to a storage area designated

by the Florida Keys Aqueduct Authority. Old service pipes above ground, or not more than two inches underground, except in paved areas, shall be removed and disposed of as directed. Service lines more than three inches below ground and those lines under paved areas shall be capped, abandoned and left undisturbed. All old service pipe and fittings located within 3 feet of the new meter box shall be removed.

D. Installation

1. New service line pipes installed by the Contractor shall be of the same size and type as the service lines being replaced, except that no new service lines shall be less than 3/4-inch size, and any galvanized steel service lines shall be replaced with Schedule 80 PVC pipe, ASTM SPEC. D1785, PVC 1120. Connections to existing house potable water systems shall be at the most practicable and suitable locations for satisfactory water service as determined by the FKAA. The FKAA will only furnish the new meters. The Contractor shall install the meters and make all connections thereto. All meter installations that are not T-10 meters will require a new dual check valve as shown on detail drawing no. 12. T-10 meter installations will require a second meter stop on the customer's side of the meter instead of a dual check valve.

E. Types of Service Connections:

1. Type "D". Furnish and install 1" polyethylene tubing including all fittings, adaptors and/or specials to connect the proposed service pipe to the existing meter (or new meter provided by FKAA) at the location shown. Any adjustment of the meter or meter box within a five (5) foot radius shall be considered incidental and will not be paid under a separate item.
2. Type "E". Furnish and install 1" polyethylene tubing including all fittings, adapters and/or specials to connect the proposed dual service pipes to the existing meter (or new meter provided by FKAA) at the location shown. Any adjustment of the meter or meter box within a five (5) foot radius shall be considered incidental and will not be paid under a separate item.
3. Type "F". Furnish and install new meter box, 1" polyethylene tubing including all fittings, adapters and/or specials to connect the proposed new service connections to the new on-site service connection at the new location shown. The new meter box should be located as close to property line as possible within the public right-of-way. New on-site customer piping required to connect the new meter installation to the customer's potable water shall be considered a part of this item.
4. Type "G". Furnish and install two single meter boxes, 1" polyethylene tubing from the proposed main to the new meter boxes located within the right-of-way, meter valve or valves, meter idler or idlers, check valve or valves, all in accordance with the details shown on the drawings. New on-site customer piping required to connect the new meter installation to the customer's potable water shall be considered a part of this item.
5. Type "H". Relocate one (1) meter box, furnish and install 1" polyethylene tubing including all fittings, adapters and/or specials to connect the proposed dual service pipe to one (1) existing and one (1) relocated meter at the location shown. The relocated meter box shall be located as close to the property line as possible, within the public right-of-way and adjacent to the existing meter box. The new on-site customer piping required to connect the relocated meter installation to the customers potable water system shall be considered a part of this item. Any adjustment of the existing meter box within a five foot (5') radius shall be considered incidental and shall not be paid under a separate item.

3.06 FIELD QUALITY CONTROL

A. Hydrostatic Tests

1. The Contractor shall provide all necessary material and shall perform all work required in connection with the test, including temporary plugs where required. All pipe on low pressure side of pressure reducing valves on distribution systems shall be tested to a hydrostatic pressure of 150 P.S.I. The required pressure as measured at the point of highest elevation shall be applied for not less than two hours, and all pipe, fittings, valves, and joints shall be made water tight if leakage is evident.
2. No pipe installation will be accepted unless and until the leakage is less than that as specified under Section 4.2 of the AWWA (ANSI) C600.

B. Pigging
   1. All water main installations shall be cleaned with a polypropylene pigging device to clean all dirt, sand, and debris from the newly installed water main where determined by the FKAA field representative. The FKAA field representative shall determine the extent and type of pigging required. At a minimum, a “bare” type, B3 style pig shall be used as manufactured by Pipeline Pigging Products Inc., or approved equal.

C. Sterilization of Complete Line
   1. Before being placed in service, each line shall be sterilized in accordance with the directions of the Florida State Board of Health and in accordance with AWWA C601.

D. Connections to the Existing System
   1. Connections to be made by the Contractor are shown on the Drawings. Connections shall not be made until the new main is cleared by DEP.

3.07 ADJUSTING AND CLEANING

A. Restoring Surfaces
   1. The top surfaces of the backfill shall be restored to present standards or better conditions. Trenches shall be carefully examined upon the completion of backfilling and surface irregularities, which are dangerous or obstructive to traffic, are to be removed.
   2. Paved sections shall conform in grade with adjacent areas and shall be of at least equal quality. Design mixes for flexible pavement shall be subject to approval by the City of Key West. All damaged or undermined areas of existing pavement, not previously removed, shall be removed and restored to original conditions or in the specified manner.
   3. Equipment shall not travel over loose rock fragments, or other hard material, lying on sections or pavements which are not to be removed. Removal, replacement and restoration of areas of pavement shall be as indicated on drawings.

END OF SECTION 33 1100

SECTION 33 1200

WATER UTILITY DISTRIBUTION EQUIPMENT

PART 1 - GENERAL

1.01 1.01 WORK INCLUDED

A. Gate valves

B. Ball Valve Curb Stops

C. Residential Meter Dual Check Valves

D. Ball Valve Meter Stops

E. Saddles

F. Pack Joint Tees

G. Corporation Stops

H. Pump Suction Control Valves

I. Fire Hydrants

J. Tapping Sleeves and Valves

K. Valve Boxes Polyethylene Tubing

L. Valve Identification Systems

M. Pressure Reducing Valves

N. Detectable Warning Tape

1.02 1.02 RELATED WORK

A. Section 33 11 00: Water Utility Distribution Piping

1.03 1.03 REFERENCES

A. AWWA - American Waterworks Association.

B. ASTM - American Society for Testing Materials

C. FS - Federal Specification.

1.04 1.04 SHOP DRAWINGS

A. Submit detailed Shop Drawings in accordance with Section 014000 - Quality Requirements. Clearly indicate make, model, location, type, size, and pressure rating.

1.05 RELATED DOCUMENTS

A. PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE “SOIL AND GROUND WATER MANAGEMENT PLAN”, DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

PART 2 - PRODUCTS

2.01 VALVES - GENERAL

A. All valves shall be furnished with affidavits from the manufacturers that the valves furnished under this Contract comply with all the applicable provisions of the respective AWWA Specifications, cited below. All valves shall be factory tested in accordance with AWWA Standard Leakage and Hydrostatic Tests and a certified test report shall be furnished stating that the valves have met the requirements of the test.

B. Valves shall be furnished with mechanical joint or flanged ends. Valve ends with mechanical joints or flanged joints shall conform to AWWA Standard C110, “Gray-Iron and Ductile Iron Fittings, 3" through 48" for Water and other Liquids”. In addition, mechanical joints shall

conform to ANSI/AWWA Standard C111/A21.11. Bolt holes in the flanges of the mechanical joint shall straddle the vertical and horizontal centerline. Flanges shall be ANSI Standard Class 125, plain faced and drilled.

C. All valves 4-inch through 16 inch in diameter, shall be resilient seated or resilient wedge gate valves and all valves 18 inch in diameter and larger, shall be as specified and shown on the Drawings. All valves shall be polyethylene encased, from one foot on each side of the valve.

2.02 GATE VALVES

A. Gate valves shall be resilient seated or resilient wedge gate valves for 150 psi working pressure, on low pressure side of pressure reducing valves conforming to AWWA Standard C-509 and C-500. The gate valves shall have a high strength bronze non-rising stem. Valves shall have neoprene or equal, but not natural rubber, EPDM O-ring stem seals (compatible with chloramines) and be of a design that permits the replacement of the O-ring seals while the valve is in service under pressure. The valves shall open by turning the operating nut counterclockwise. Operating nuts shall be AWWA two inch square nuts with skirts.

B. Valve body, bonnet, and gate shall be Ductile Iron conforming to ASTM A-536. Shell thickness of body and bonnet components shall conform to Table 2 Section 4.4 AWWA C-509 and C-500. So-called “thinwall” valves, not included in this Standard, are not allowed. Valve body and bonnet shall be coated on all exterior and interior surfaces with a fusion bonded epoxy conforming to the requirements of AWWA Standard for Protective Epoxy Interior Coatings for Valves and Hydrants; C-550. Manufacturer shall certify that the coating will conform to following sections of the Standard:
   1. Section 2 - Materials (relating to the suitability of the coating for use in a potable water system).
   2. Section 4 - Testing and Inspection (relating to qualification and production testing).

C. Gate shall be covered with rubber over all interior and exterior ferrous surfaces. The rubber shall be securely bonded to the gate body, including the part which houses the stem nut. The stem hole through the gate shall be full opening top to bottom and shall also be covered with rubber.

D. Body and bonnet shall be coated inside and out with a fusion bonded epoxy that meets or exceeds requirements of AWWA C550.

E. Direct buried gate valves shall be polyethylene encased and shall have Type 304 stainless steel bonnet bolts.

F. Gate valves shall be as manufactured by American Flow Control Series 2500, U.S. Pipe Metroseal 250, or an approved equal.

2.03 BALL VALVE CURB STOPS

A. Curb stops shall be Ford Series B-11, Mueller H10283 or approved equal. Ball valves shall have locking lugs and 2" square operating nut which opens to the left on 1½ “ and 2" valves.

2.04 RESIDENTIAL METER DUAL CHECK VALVES

A. Meter check valves shall be dual check valve assemblies suitable for installation on 5/8-inch, 3/4-inch, 1-inch, and 1-1/2-inch lines, and shall be Ford HHS31, Mueller H-14242, or an approved equal.

2.05 BALL VALVE METER STOPS

A. Meter stops shall be Ford Series B43 or BF13, or an approved equal. Valves shall have lockable padlock wings, and open to the left.

2.06 SADDLES

A. Saddles shall be Rockwell International, Type 323, style double strap bronze saddles, for PVC and ductile iron pipe, or approved equal. Tapping saddles shall be used for all taps on 4" PVC pipe.

2.07 PACK JOINT TEES

A. Pack joint tees shall be used to connect services to 2" water mains. They shall be Ford T441-774 or approved equal.

2.08 CORPORATION STOPS

A. Corporation stops shall be Ford F-1000, FB-1000, or approved equal. The largest corporation stop which can be tapped directly into the pipe is 1-inch.

2.09 PUMP SUCTION CONTROL VALVES (NOT USED)

2.10 FIRE HYDRANTS

A. Fire hydrants shall be 6-inch, mechanical joint pipe connection with a minimum 5.25 inch valve opening. Hydrants shall be of AWWA approved type, designed for a 150 psi working pressure. Provisions shall be made for two 2.5 inch hose nozzles and one 4.5 inch pumper nozzle, open left (counter clockwise). All base threads shall conform to the national standard hose coupling thread specifications. Fire hydrants shall have a safety stem coupling to prevent bending of the operating stem, and a safety flange to prevent breaking of the hydrant barrel if hit by a vehicle. The hydrant base (shoe) shall be coated with a two-part thermo-setting epoxy, not less than 4 mils thick. Weather cap shall be metal. The maximum pressure loss allowable for the 5-1/4" valve opening shall be 2.2 psi at 1000 gpm flow based on 5 foot bury with 6" diameter inlet. The hydrant shall be a Mueller Super Centurion or American Darling B-84-B. The drain hole in the foot of the fire hydrant shall be plugged and all buried bolts shall be AISI Type 304 stainless steel.

B. Fire hydrants shall be painted with one coat of rust proof primer and two finish coats of an approved red.

2.11 TAPPING SLEEVES AND VALVES

A. Tapping Sleeves shall be ASTM 285 Grade C Steel or ASTM A-36 Carbon Steel with Fusion applied epoxy coating (AWWA C213-70). Tapping Sleeves shall utilize AISI Type 304 (ASTM A320 Grade B8) stainless steel bolts and nuts. Tapping Sleeves shall be as manufactured by JCM Industries Model 412, Romac Industries Model FTS420, or approved equal.

B. Tapping valves shall be as specified for gate valves, hereinabove, and as further specified herein. Valve body, bonnet, and gate shall be Ductile Iron conforming to ASTM A-536. Tapping valves for use in tapping distribution mains shall be resilient seat gate valves. Inlet shall be Class 125, ANSI B16.1, ductile iron flange with centering ring to match tapping sleeve. Outlet shall be a mechanical joint. Tapping valves shall be compatible for use with a drilling machine. Tapping valves shall be attached to tapping sleeves with stainless steel nuts and bolts which shall be heavy hex-head AISI Type 316 (ASTM A320 Grade B8) stainless steel. Approved tapping valves include American Flow Control Series 2500, or approved equal.

2.12 2.12 VALVE BOXES

A. Furnish, assemble, and place a valve box over the operating nut for each buried valve. The valve box shall be installed so as to prevent the transmission of surface loads directly to the valve or piping. Valve boxes shall be U.S. Foundry No. 7615, No. 7630 or approved equal.

B. Valve extension stems shall be provided for all buried valves when operating nut is deeper than 3 feet below final grade.

2.13 POLYETHYLENE TUBING

A. Service lines shall be polyethylene tubing conforming to ASTM D2737 and AWWA standard C-901; SDR 9 with a minimum working pressure of 200 psi.

2.14 VALVE IDENTIFICATION SYSTEMS

A. Buried Valves:

1. In paved areas, tops of valve box covers shall be set flush with pavement. Following paving operations, a 30-inch square shall be neatly cut in the pavement around the box and the paving removed. The top of the box shall then be adjusted to the proper elevation and a 30-inch square by 6-inch thick concrete pad poured around the box cover. Concrete

pads in traffic areas shall be reinforced with No. 4 reinforcement bars as shown on the drawings. Concrete for the pad shall be 3,000 psi compressive strength.

2. In unpaved areas, tops of valve box covers shall be set 0.20 foot above finished grade. After the top of the box is set to the proper elevation, a 30-inch square by 6-inch thick concrete pad shall be poured around the box cover. Concrete for the pad shall be 3,000 psi compressive strength.
3. Shall have valve boxes protected by a concrete pad. The concrete pad for the valve box cover shall have a 2 ½ -inch diameter, bronze disc embedded in the surface as shown on the drawings. The bronze disc shall have the following information neatly stamped on it:
   a. Size of valve, inches
   b. Type of valve:
      1) GV - Gate Valve
      2) BFV - Butterfly Valve
      3) Ball Valve
   c. Number of turns to fully open
   d. Direction to open
   e. Year of installation

B. The pressure reducing valve shall be hydraulically operated, diaphragm actuated in globe pattern. The valve shall maintain a constant downstream pressure regardless of inlet pressure variations. It shall contain a resilient synthetic rubber disc having a rectangular cross section, contained on three and one-half sides by a disc retainer.

C. The seat ring shall be firmly held in place and not pressed into the body. The diaphgram assembly shall be fully guided to assure positive contact with the seat. The diaphragm assembly shall be the only moving part.

D. The diaphragm shall consist of a nylon fabric reinforced BUNA-N rubber and shall not be used as a seating surface. All necessary repairs shall be possible without removing the valve from the line.

E. All main valve interior components shall be manufactured from non-corrosive materials.

F. The pilot valve shall be adjustable, direct acting, spring loaded and normally open. The reducing pilot shall be supplied with a stainless steel seat ring.

G. The valve shall be CLA-VAL 90-01D, and shall be Pressure Class 300. The valve shall have 304L stainless steel body, stainless steel trim, and Class 250 flanged ends. The valve shall be piloted in reverse flow for fail-safe operation.

2.15 DETECTABLE WARNING TAPE

A. Detectable warning tapes shall be provided for all water mains. Such tape shall be magnetic type, 5 mils thick, 2mil thick aluminum center core, encased in mylar. Tape shall be blue imprinted with the words “Caution: Potable Water Line Below”. Printing shall appear on both sides of the tape. The tape shall be placed between 6 and 12 inches below finish grade.

PART 3 - EXECUTION

3.01 INSTALLATION OF VALVES

A. Valves of the size and type shown on the Drawings shall be set plumb and installed at the locations indicated on the Drawings. Valves shall be installed in accordance with manufacturer's installation instructions and with the details shown on the Drawings.

B. Valves shall be installed such that they are supported properly in their respective positions, free from distortion and strain. Valves shall be installed such that their weight is not borne by pumps and equipment that are not designed to support the weight of the valve.

C. Valves shall be carefully inspected during installation; they shall be opened wide and then tightly closed and the various nuts and bolts shall be tested for tightness. Special care shall be taken to prevent any foreign matter form becoming lodged in the valve seat. Check and adjust all valves for smooth operation.

D. Install valves with the operating stem in either horizontal or vertical position as shown on the drawings.

E. Allow sufficient clearance around the valve operator for proper operation.

F. Clean iron flanges before installing flanged valves. Clean carbon steel flange bolts and nuts by wire brushing, lubricate threads with oil or graphite, and tighten nuts uniformly and progressively.

G. For buried valves, a valve box shall be centered accurately over the operating nut and the entire assembly shall be plumb. The tops of valve boxes shall be adjusted to the proper elevation as specified below and as shown on the Drawings.

H. Valves shall be tested hydrostatically, concurrently with the pipeline in which they are installed. Protect or isolate any parts of valves, operators, or control and instrumentation systems whose pressure rating is less than the pressure test(s). If valve joints leak during pressure testing, loosen or remove the nuts and bolts, reseat or replace the gasket, reinstall or retighten the bolts and nuts and hydrostatically retest the joints.

I. All buried valves shall be wrapped with polyethylene (8mils).

END OF SECTION 33 1200

SECTION 33 1300

DISINFECTING OF WATER UTILITY DISTRIBUTION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for disinfection and bacteriological testing of potable water piping.

B. Payment Procedures
   1. Water
      a. Contractor shall pay Owner for water used for disinfection and flushing of new potable water piping.
      b. Initial water to fill new potable water piping following disinfection will be provided by the Owner. Contractor shall pay Owner for addition water used to repeat disinfection, flushing, and filling.
      c. Payment for water shall be at Owner's bulk rate.

1.02 REFERENCES

A. General: References to standards, specifications, manuals, or codes of any technical society, organization or association, or to the Laws or Regulations of any government authority, whether such reference be specific or by implication, shall mean the latest standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

B. AWWA Standards
   1. AWWA C651 Disinfecting Water Mains

1.03 SYSTEM DESCRIPTION

A. Furnish and install equipment and connections required to complete disinfection of potable water piping as specified in this Section.

B. Provide labor, services, and equipment required to complete disinfection of potable water piping specified in this Section.

C. Disconnect and remove equipment, piping, and appurtenances after water mains have been successfully disinfected, bacteriological testing has been completed, and water mains have been approved for connection to existing water distribution system.

1.04 SUBMITTALS

A. General: As specified in:
   1. General Conditions; and
   2. Division 1.

B. Submit copy of permit for flushing water disposal prior to starting to install pressure piping system.

1.05 PROJECT/SITE CONDITIONS

A. Bacteriological Clearance: New potable water piping shall not be placed in service prior to receipt of bacteriological clearance from regulatory authority having jurisdiction.

B. Flushing Water Disposal
   1. Obtain permit from South Florida Water Management District prior to starting installation or pressure piping system. Make application and arrangements and pay fees and charges for disposal of discharge from flushing.
   2. Submit copy of permit for flushing water disposal.
   3. Comply with requirements of permit for flushing water disposal. Meet regulatory requirements relative to disposal of discharge water from flushing.

PART 2 - PRODUCTS

2.01 DISINFECTION SYSTEM

A. Contractor shall be responsible for the sizing and selection of disinfection system, disinfection equipment, disinfection system piping, and appurtenances.

PART 3 - EXECUTION

3.01 DISINFECTION SEQUENCE

A. The following shall be done prior to disinfection:
   1. Potable water pipe, fitting, valves, and appurtenances shall be installed.
   2. Cleaning and flushing of potable water piping shall be completed.
   3. Pressure testing of potable water piping shall be completed.
   4. Any repairs required on potable water piping shall be completed.

B. Disinfect and flush potable water piping as specified in this Section.

C. Following flushing of chlorine solution, samples shall be collected and bacteriological testing shall be performed as specified in this Section.

D. Do not place potable water piping in service without approval of the Engineer. Piping for dry connections shall be disinfected and installed as specified in Section 02501 Installation of Buried Pressure Piping Systems and placed in service when approved by the Engineer. No other new potable water piping shall be placed in service prior to receipt of bacteriological clearance and approval of the Engineer.

3.02 PREPARATION

A. Obtain approval of Engineer prior to starting disinfection of potable water piping system.

B. Furnish and install taps and connections required to inject chlorine solution into potable water piping system.

3.03 BACTERIAL SAMPLE POINTS

A. Install bacteriological sample points. Bacteriological sample points shall be as shown on the Drawings.

B. Provide bacteriological sample points at following locations:
   1. Test Sections 1,000 Feet and Smaller: One sample for each section of piping tested placed at farthest point from chlorine injection.
   2. Test Section Greater Than 1,000 Feet: One sample for every 1,000 feet of line, places at regular intervals along water pipe section.
   3. Dead Ends: One sample at each dead end in section.
   4. Other Locations: As shown on the Drawings.

C. Appropriately located fire hydrants may be utilized for sampling points. Under this circumstance, the Contractor will be solely responsible for maintaining the hydrants in a satisfactory environment for conducting the bacterial testing.

D. Bacteriological sample points will be utilized by Utilities personnel for water main bacterial clearance procedures.

3.04 DISINFECTANT

A. Disinfect potable water piping with chlorine.

B. Chlorinating agent shall be as selected by the Contractor and accepted by the Engineer.

C. Acceptable chlorinating agents include the following:
   1. Chlorine gas.
   2. Calcium hypochlorite
   3. Sodium hypochlorite

D. Select the chlorinating agent appropriate to the size and length of piping to be disinfected and to the location of piping system. Do not use chlorine gas in residential, commercial, or institutional areas.

E. Placing chlorine tablets or powder in the piping is not an acceptable method of disinfection.

F. Provide equipment and feed system for chlorinating agent that is appropriate to the chlorinating agent and the piping to be disinfected.

G. If disinfection cannot be achieved with system furnished and installed, modify or replace disinfection system, until disinfection of potable water piping can meet the requirements of this Section.

3.05 DISINFECTION OF POTABLE WATER PIPING

A. Fill potable water piping with water containing 50 to 100 parts per million available chlorine. Quantity of disinfectant required for 100 feet of pipe is presented in tables at end of this Section. Tables are to be used only as a guide and are not guaranteed.

B. Perform disinfection using the following schedule unless otherwise approved by the Engineer:
   1. Friday: Inject chlorine solution;
   2. Saturday and Sunday: Allow chlorine to remain in piping system.
   3. Monday: Flush lines.
   4. Tuesday and Wednesday: Collect bacteriological samples.

C. Feed chlorinating agent at or near the point from which potable water piping is to be filled. Control flow and proportioning of water and chlorinating agent so that specified chlorine concentration is achieved throughout piping to be disinfected. Eliminate air pockets as piping is filled.

D. Allow chlorine solution to stand in piping for not less than 48 hours.

E. Operate valves and other appurtenances during disinfection to assure sterilizing mixture is dispersed into all parts of system being disinfected.

F. Check chlorine residual at sample points after chlorine solution has remained in piping for 48 hours or longer.
   1. If chlorine solution contains at least 25 parts per million of chlorine, flush the piping and take bacteriological samples at sample points.
   2. If chlorine solution contains less than 25 parts per million of chlorine, flush the piping and repeat disinfection of piping.

G. Prior to taking samples for bacteriological testing, flush chlorine solution from piping until replacement water has a chlorine content not more than 0.1 parts per million in excess of the residual in water from supplying main.

3.06 DISPOSAL OF CHLORINE SOLUTION

A. After chlorine solution has been retained for the required time, pipes shall be flushed and filled with potable water from distribution system in service.

B. Discharge water from flushing to storm drain systems in accordance with permit for disposal of flushing water and as specified in this Section.

C. Reduce chlorine concentration to level that will not harm plants or animals in ditches, streams, canals, ponds, lakes, waterways, bays, estuaries, or any other location that could be impacted by disinfectant discharge. Provide temporary dechlorination tanks, equipment, and chemicals as required to reduce chlorine concentration to level that will not harm plants or animals. Chlorine concentration in discharge to storm drain system shall not exceed 0.1 parts per million.

3.07 BACTERIOLOGICAL SAMPLING AND TESTING

A. Sampling
   1. Collect and submit samples for bacteriological analysis.
   2. Sampling: Water samples for bacteriological examination shall be taken by the Owner after receiving adequate notice, 48 hours minimum, from the Contractor.
   3. Numbers of samples collected shall meet the requirements of the regulatory authority having jurisdiction.

B. Testing

1. Bacteriological test shall meet the requirements of AWWA C651.
2. Bacteriological test shall be performed by independent testing laboratory certified by State of Florida for bacteriological testing.
3. Bacteriological tests shall be performed by the Owner.
4. Bacteriological tests shall be performed by regulatory authority having jurisdiction.
5. Repeat disinfection and bacteriological testing until piping is approved for service by regulatory authority having jurisdication.
6. Repeat disinfection and bacteriological testing until piping is approved for service by the Owner.

3.08 PLACING POTABLE WATER PIPING IN SERVICE

A. Do not place potable water piping in service until Engineer has approved placing potable water piping in service.

B. Do not place potable water piping in service until disinfection of potable water piping has been completed and bacteriological clearance for potable water piping has been received.
   1. Quantity of Chlorine Gas
   2. Required to Produce 50 mg/l of Available Chlorine per 100 feet of Pipe

PIPE SIZE	POUNDS PER 100 FEET
¾"	0.001
1"	0.002
1¼"	0.003
1½"	0.004
2"	0.007
2½"	0.011
3"	0.015
4"	0.027
6"	0.061
8"	0.11
10"	0.17
12"	0.24
14"	0.33
16"	0.44
18"	0.55
20"	0.68
24"	0.98
30"	1.5
36"	2.2
42"	3.0
48"	3.9
54"	5.0
60"	6.1
64"	7.0

A. Quantity of Calcium Hypochlorite Solution (70% Available Chlorine)

B. Required to Produce 50 mg/l of Available Chlorine per 100 feet of Pipe

PIPE SIZE	POUNDS PER 100 FEET	OUNCES PER 100 FEET
½"	0.001	0.01
¾"	0.002	0.02
1"	0.003	0.04
1¼"	0.004	0.06
1½"	0.006	0.09

2"	**0.010**	**0.16**
2½"	**0.015**	**0.25**
3"	**0.022**	**0.35**
4"	**0.039**	**0.62**
6"	**0.087**	**1.4**
8"	**0.16**	**2.5**
10"	**0.24**	**3.9**
12"	**0.35**	**5.6**
14"	**0.48**	**7.6**
16"	**0.62**	**10**
18"	**0.79**	**13**
20"	**0.97**	**16**
24"	**1.4**	**22**
30"	**2.2**	**34**
36"	**3.1**	**50**
42"	**4.3**	**69**
48"	**5.6**	**90**
54"	**7.2**	**110**
60"	**8.8**	**140**
64"	**10**	**160**

A. Quantity of Sodium Hypochlorite Solution (5.25% to 14.7% Available Chlorine)

B. Required to Produce 50 mg/l of Available Chlorine per 100 feet of Pipe

PIPE SIZE	**OUNCES PER 100 FEET**		**QUARTS PER 100 FEET**	
	14.% AVAILABLE CHLORINE	**5.25% AVAILABLE CHLORINE**	**14.7% AVAILABLE CHLORINE**	**5.25% AVAILABLE CHLORINE**
½"	**0.05**	**0.1**	**0.001**	**0.004**
¾"	**0.10**	**0.3**	**0.003**	**0.010**
1"	**0.20**	**0.5**	**0.006**	**0.020**
1¼"	**0.30**	**0.8**	**0.009**	**0.030**
1½"	**0.40**	**1.2**	**0.013**	**0.040**
2"	**0.80**	**2.1**	**0.023**	**0.070**
2½"	**1.2**	**3.3**	**0.036**	**0.10**
3"	**1.7**	**4.7**	**0.052**	**0.15**
4"	**3.0**	**8.3**	**0.093**	**0.26**
6"	**6.7**	**19**	**0.21**	**0.58**
8"	**12**	**33**	**0.37**	**1.0**
10"	**19**	**52**	**0.58**	**1.6**
12"	**27**	**75**	**0.83**	**2.3**
14"	**36**	**100**	**1.1**	**3.2**
16"	**47**	**130**	**1.5**	**4.1**
18"	**60**	**170**	**1.9**	**5.2**
20"	**74**	**210**	**2.3**	**6.5**
24"	**110**	**300**	**3.3**	**9.3**
30"	**170**	**470**	**5.0**	**14**
36"	**240**	**680**	**7.2**	**21**
42"			**9.8**	**28**
48"			**13**	**36**
54"			**16**	**46**
60"			**20**	**56**

64"	**23**	**64**

END OF SECTION 33 1300

SECTION 33 3923

SANITARY SERVICE CONNECTIONS

PART 1 GENERAL

1.01 WORK INCLUDED

A. This section covers the work necessary for the repairs and installation of the service connections for all pipe materials specified, complete.

B. It shall be the CONTRACTOR's responsibility to properly locate and install all sewer service laterals.

C. New service connections for existing wyes shall be extended to the street or alley right-of-way line, in which case a cleanout shall be furnished and installed. Sewer service connection details are as shown on the Drawings. Where a new service exists and where approved by the ENGINEER, the service connection may be made at the wall of the trench excavation for the main and connected directly with the existing service.

1.02 RELATED DOCUMENTS

A. PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE "SOIL AND GROUND WATER MANAGEMENT PLAN", DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

PART 2 PRODUCTS

2.01 EXCAVATION AND BACKFILL

A. Conform to Section 312300, TRENCH EXCAVATION AND FILL.

2.02 PIPE AND FITTINGS FOR SERVICE CONNECTIONS

A. General:
   1. Manufactured with nominal inside diameter of 6 inches. Except by permission of the ENGINEER, long-radius bends shall be used at all changes in direction. Pipe and fittings for individual service connections shall be of one type of material throughout, and no interchanging of pipe and fittings will be allowed. Pipe and fittings shall be one of those specified below.
   2. Minimum service size shall be 6 inches. The ENGINEER will determine the size of the service in every case, unless specifically shown.

B. PVC service connection lateral pipe and fittings shall conform to ASTM 3034, standard dimension ratio (SDR) of 26 and 35, respectively. (All repairs shall be made with PVC couplings)

2.03 DETECTION TAPE

A. Detection tape shall be 3 inches wide with a metallic backing. The tape shall be imprinted with the words CAUTION SEWERLINE BELOW. Tape shall be green "Terra Tape/D" as manufactured by Griffolyn Company, Inc., Houston, Texas; "Line Guard" by Calpico, South San Francisco, California; or equal.

2.04 PIPE BEDDING AND PIPE ZONE MATERIAL

A. Pipe bedding and pipe zone material shall be as specified in Section 312300, EXCAVATION AND FILL.

2.05 SERVICE CONNECTION TO SEWER MAIN

A. Sewer service connection to 15-inch diameter or smaller PVC main shall be made with an inline PVC wye. PVC wye shall be sized for the pipe diameter by 6 inches for service lateral.

2.06 CLEANOUT BOXES AND COVERS

A. The cleanout boxes shall be a modified polyethylene meter box having a minimum wall thickness of 0.550 inch with wall core interior area of rigid foam construction offering insulation and tensile strength. Vertical crush to exceed 2,000 pounds, sidewall loading to exceed 180 pounds per square inch, and a compartment size of 11 by 18 by 26 inches deep. Cleanout boxes shall be protected from UV degradation with black exterior and white interior. A flange shall encircle the top area for installation in concrete. Provide knockouts or notches in each end sized to allow placement of a 6-inch PVC pipe inside the box.

B. Cleanout boxes shall be capable of being stacked vertically to provide adequate access to deeply buried sewer service lines.

C. Cleanout covers shall be cast ductile iron conforming to ASTM A-536, Grade 60-40-18. Meter box covers shall meet or exceed Federal Specification RR-F-621D for a minimum proof load of 25,000 pounds on a 9-inch by 9-inch area. Mark cover shall have raised lettering "Sewer Cleanout." All meter box covers shall have a 10-year warranty. Cleanout box and cover shall be as manufactured by Mid-States Plastics, Mount Sterling, KY; or equal.

D. All new clean out boxes not in existing concrete, shall be installed with a concrete pad as per the details.

PART 3 EXECUTION

3.01 MAINTAIN EXISTING SERVICE

A. The CONTRACTOR is responsible for maintaining sewage flows from the upstream lines leading to the pipe undergoing replacement by whatever means possible including, but not limited to, bypass pumping. At no time shall the CONTRACTOR be allowed to back up sewage flow to a potentially harmful level or to discharge sewage into the trench.

B. The CONTRACTOR shall make whatever provisions are necessary to maintain house or building sewer service including, but not limited to, bypass pumping. During the time of disconnection and reconnection of service connections, the property owners or residents shall be notified prior to the work.

3.02 PIPE BEDDING MATERIAL

A. Provide a minimum 6-inch thick base of pipe bedding material under all service connection pipe. Hand-grade bedding to proper grade ahead of pipe laying. The bedding shall provide a firm, unyielding support along the entire pipe length.

3.03 BACKFILL AT THE PIPE ZONE

A. The pipe zone shall be considered to extend from the top of the pipe base to 12 inches above the top of the pipe and for the full width of the trench. Backfill the pipe zone with pipe zone material, hand-placed simultaneously on both sides of the pipe for the full trench width and hand-tamped with approved tamping sticks supplemented by "walking in" and slicing with a shovel.

3.04 BACKFILL ABOVE THE PIPE ZONE

A. Conform to applicable portions of Section 312300, EXCAVATION AND FILL.

B. Do not backfill around service connections until inspected and approved by the ENGINEER.

3.05 LAYING AND JOINTING PIPE AND FITTINGS

A. Lay pipe upgrade from connection to the sanitary sewer with bell or coupling ends upgrade. Pipe shall be laid in a straight line at uniform grade between fittings, or on a uniform horizontal or vertical curvature achieved by deflecting the pipe joints within manufacturer's recommended limits.

B. Maximum deflection permissible with any one fitting shall not exceed 45 degrees and shall be accomplished with long-radius curves or bends. Short-radius elbows or curves will not be permitted, except by permission of the ENGINEER.

C. Make service connections to the sewer system at manholes only when directed by the ENGINEER. Where service connection pipe is connected to manholes or concrete structures, make the connection so the standard pipe joint is located not more than 1.5 feet from the structure.

D. Provide ends of all inactive service connection lines with standard watertight plugs, caps, and stopper, suitably braced to prevent blowoff during internal hydrostatic or air testing.

E. The first length of pipe, out from the tee on the lateral or main, shall not be greater than 3 feet in length.

3.06 LINE AND GRADE

A. The CONTRACTOR shall establish line and grade to the tract of land to be serviced by the sewer system and shall perform all stakeout. At the pre-selected location of the service connections, a stake will be driven into the ground showing the depth of excavation required at the upstream end of the service connection.

B. Install the sewer tee so as to locate the connection pipe within a horizontal distance of 1 foot either side of the pre-selected location.

C. Batter boards will not be required, but lay the pipe uniformly between the tee or the top of the riser section and the stake. Where minimum slopes are used, lay the pipe by means of a good-quality builder's level, not less than 24 inches in length. Minimum slope shall be 1/4 inch per foot unless otherwise permitted by the ENGINEER, but in no case less than 1/8 inch per foot.

3.07 WATER SERVICES

A. It is possible that water services will be located in the same trenches as existing sewer laterals. The CONTRACTOR shall notify the Florida Keys Aqueduct Authority when encountering water services.

B. The CONTRACTOR shall either disconnect water services and reconnect after installing the sewer laterals or remove and replace the water services with new materials when water services are encountered. All materials and workmanship shall be in conformance with Florida Keys Aqueduct Authority standards. Work must be inspected by Authority personnel prior to backfilling and compaction. Removal and replacement of waterline services and fittings is incidental to sewer service connections. No claim will be allowed for delays or additional compensation due to the existence of water services in the same trench as sewer laterals.

3.08 DETECTION TAPE

A. Detection tape shall be installed over all service connection pipe. It shall be placed in accordance with the manufacturer's recommendations directly over the pipe at a depth of 12 inches below final grade.

3.09 SERVICE CONNECTION CLEANOUTS

A. All pipe and fittings for cleanouts shall conform to applicable requirements herein, and gravel backfill around the cleanouts shall conform to imported pipe base and pipe zone material, herein.

B. Construct in accordance with the Service Connection Cleanout as shown on the Sewer Service Connection Details on the Drawings.

3.10 DISCONNECTING AND RECONNECTING EXISTING SERVICE CONNECTIONS

A. On all existing services, disconnect existing service connections from existing sewers to be abandoned and reconnect them to the new sewers. It shall be the CONTRACTOR's responsibility to locate the existing service connections prior to installing the tee in the new sewer line.

END OF SECTION 33 3923

SECTION 33 4101

STORM PIPING

PART 1.0 GENERAL

1.01 WORK INCLUDED

A. This section covers the work necessary for the storm sewers and appurtenances, complete.

1.02 RELATED DOCUMENTS

A. PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE “SOIL AND GROUND WATER MANAGEMENT PLAN”, DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

PART 2.0 PRODUCTS

2.01 GENERAL

A. All storm drainpipes in the project shall be ADS polyethylene or Polyvinyl Chloride (PVC)

B. Provide ADS Pipe Adapter flexible watertight Waterstop connection with pipe adapter for ADS Corrugated HDPE Pipe to storm structures, or approved equal ADS Pipe Adapters meeting the requirements of ASTM F 2510 and ASTM C 1478 for watertight flexible connections. Rapid set mortar shall be used with potable water; ground water shall not be used.

2.02 ADS POLYETHYLENE PIPE N-12 OR EQUAL

A. This Specification covers the requirement of high-density polyethylene corrugated pipe with smooth interior for storm sewer. Nominal sizes 12, 15, 18, and 24 -inch are included.

B. Material: Pipe and fittings shall be manufactured from high density polyethylene resin which shall meet or exceed the requirements of Type III, Category 4 of 5, Grade P33 or P34, Class C per ASTM D1248.

C. Pipe Dimensions: the nominal size of the pipe is based on the nominal inside diameter of the pipe. The tolerance on the specified inside diameter shall be +3 percent, -1 percent, or 1/2 inch whichever is less. Lengths shall be not less than 99 percent of the stated quantity.

D. Pipe Stiffness: The pipe shall have minimum pipe stiffness at 5 percent deflection as follows:

1. Diameter Pipe Stiffness

Diameter (Inches)	Pipe Stiffness (PSI)
12	45
15	42
18	40
24	34

E. Tests shall be in accordance with ASTM D2412 with a minimum one-diameter sample length, a loading rate of 0.5 inch/min., and readings at 5 percent deflection.

F. Hydraulics: The pipe shall have a minimum tested Manning’s "n" value of 0.012.

2.03 POLYVINYL CHLORIDE (PVC) GRAVITY PIPE AND FITTING:

A. 15 inch diameter PVC sewer pipe and under for general service shall conform to ASTM D3034, standard dimension ratio not to exceed 26.

B. PVC fittings for 15 inch diameter pipe and under for general service shall conform to ASTM D3034, standard dimension ratio not to exceed 35.

C. PVC pipe for watermains 12 inches and smaller shall be AWWA C900, standard dimension. Dimension ratio not to exceed 18.

D. PVC pipe for storm and sanitary sewer pipe larger than 15 inches shall be AWWA C905, standard dimension ratio, not to exceed 26.

E. PVC additives and fillers including but not limited to stabilizers, antioxidants, lubricants, colorants, etc. shall not exceed 10 parts by weight per 100 of PVC resin in the compound.

F. Plastic pipe and fittings shall meet all the requirements of AWWA C900 and shall be PVC-1120 pipe, having a cell classification of 1245A or 1245B, in accordance with ASTM D1784. Pipe 4 inches and larger shall be pressure rated Class 150 (DR 18) with cast iron pipe equivalent OD in accordance with AWWA C900. Pipe shall be equipped with a push-on type joint with elastomeric gasket that meets the requirements of ASTM D3139. Pipe smaller than 4 inches shall be PVC Schedule 80, in accordance with ASTM D1785. Schedule 80 pipe and fittings shall be threaded joint.

2.04 PIPE JOINTS

A. ADS POLYETHYLENE PIPE JOINTS: The pipe shall be joined by split corrugated couplings at least seven corrugations wide and exceeding the soil tightness requirements of the AASHTO Standard Specification for Highway Bridges, Section 23 (2.23.3).

B. POLYVINYL CHLORIDE (PVC) GRAVITY PIPE JOINTS: Joints shall be rubber gasketed type complying in all respects to the physical requirements of ASTM D3212 for gravity pipes. Gaskets shall conform to ASTM F477. Furnish complete information on basic gasket polymer and results of test of physical properties. Lubricant for jointing as approved by the pipe manufacturer.

2.05 PIPE BEDDING AND PIPE ZONE MATERIAL

A. Pipe bedding and pipe zone material shall be in accordance with Section 31 23 00 Trench Excavation and Fill.

PART 3.0 EXECUTION

3.01 LINE AND GRADE

A. Installation of the pipe shall be in accordance with the manufacturer and either AASHTO Section 30 or ASTM Recommended Practice D2321.

B. Do not deviate from line or grade, as established by the ENGINEER, more than 1/2 inch for line and 1/4 inch for grade, provided that such variation does not result in a level or reverse sloping invert. Measure for grade at the pipe invert not at the top of the pipe because of permissible variation in pipe wall thickness.

C. All storm sewers shall be laid using a laser accepted by the ENGINEER. The beam shall be directed through the pipe. Batter boards or instrument laying will not be permitted. The laser shall be constantly shielded from the direct sun.

D. The CONTRACTOR shall set offset stakes or other accepted method of controlling alignment and grade for excavation of trenches and for pipe laying. The CONTRACTOR shall submit in writing his proposed method of establishing line and grade to the ENGINEER for acceptance.

3.02 LAYING AND JOINTING PIPE AND FITTINGS

A. Do not permit mud and foreign material to get into the pipe. During laying operations, do not permit debris, tools, clothing, or similar items to be placed in pipes.

B. Pipe laying shall proceed upgrade with ends pointing in the direction of flow. After a section of pipe has been lowered into the trench, clean the ends of the pipe. Be careful in handling pipe to prevent breakage. Remove any pipe damaged and replace at the CONTRACTOR's sole expense.

C. Make assembly of the joint in accordance with the recommendations of the manufacturer of the type of joint used. Provide all special tools and appliances required for the jointing assembly.

D. After the joint has been made, check pipe for alignment and grade. The trench bottom shall form a continuous and uniform bearing and support for the pipe at every point between joints. Apply sufficient pressure in making the joint to assure that the joint is "home," as defined in the

standard installation instructions provided by the pipe manufacturer. To assure proper pipe alignment and joint makeup, place sufficient pipe zone material to secure the pipe from movement before the next joint is installed. Pipe 21 inches and smaller shall be laid so the inside joint space does not exceed 3/8 inch in width.

E. Take the necessary precautions required to prevent excavated or other foreign material from entering the pipe during the laying operation. At all times, when laying operations are not in progress, at the close of the day's work, or whenever the workmen are absent from the job, close and block the open end of the last laid section of pipe to prevent entry of foreign material or creep of the gasketed joints.

F. Take all precautions necessary to prevent the "uplift" or floating of the line prior to the completion of the backfilling operation.

3.03 BACKFILL AT THE PIPE ZONE

A. Backfill at the pipe zone shall be in accordance with Section 31 23 00 Trench Excavation and Fill.

B. DETECTION TAPE shall be used above every underground pipe.

3.04 MATERIALS TESTS AND INSPECTIONS

A. Deflection Test: All PVC and ADS gravity stormwater pipes shall be tested for deflection after installation and backfill by pulling a round plug equal to 95.0 percent of pipe base inside diameter, as defined in the Appendices of ASTM D3034, through the completed pipeline. The mandrel shall be of a design that provides an accurate measure of excess deflection regardless of orientation. Mandrel testing shall be performed not less than 30 days after complete pipe installation.

B. Lamping Test: City to perform Lamping test of all the installed stormwater pipes, prior to establishing flow to the associated gravity injection well, to verify the alignment and condition of the pipe. The lamp test shall be performed only after the contractor has completely cleaned the line to the satisfaction of the City. Should the lamp test indicate an alignment problem, the City shall be the sole judge of the need for replacement. The contractor shall supply all the equipment and labor necessary for the lamping (i.e. lamps, ladders).

3.05 CONNECTING TO EXISTING PIPING AND EQUIPMENT

A. The CONTRACTOR shall verify exact location, material, alignment, joint, etc. of existing piping and prior to making the connections called out in the Drawings. The verifications shall be performed with adequate time to correct any potential alignment or other problems prior to the actual time of connection.

B. At the time that a new connection is made to an existing pipeline, additional new piping, extending to and including the most convenient ne valve, shall be installed.

C. Where necessary or required for the purpose of making connections, the CONTRACTOR shall cut existing pipe lines in a manner to provide an approved joint. Where required, he shall weld beads, flanges or provide couplings or special pieces as needed.

D. Where connections are to be made to existing piping, or when existing piping and fittings are to be reused in the work, the pipe and fittings shall be sand blasted, cleaned and mating surfaces shall be properly prepared. CONTRACTOR may not reuse bolts, nuts, washers or gaskets, and shall instead replace with new.

3.06 FINAL STORM SEWERS CLEANING

A. Prior to final acceptance and final structure to structure inspection by the ENGINEER of the storm sewers system, completely flush or clean all parts of the system. Remove all accumulated construction debris, rocks, gravel, and other foreign material from the storm sewers system at or near the closest downstream manhole. If necessary, use mechanical rodding equipment to remove accumulated mud, silt, and all other deposits from the storm sewer system at no additional cost to the OWNER.

B. Upon the ENGINEER's final structure to structure inspection of the storm sewers system, if foreign matter and other construction debris are still prevalent in the system, reflush and clean the sections and portions of the lines as required.

END OF SECTION 33 4101

SECTION 33 4413
STORM STRUCTURES

PART 1 GENERAL

1.01 WORK INCLUDED

A. This section covers the work necessary for the catch basins and inlets complete.

PART 2 PRODUCTS

2.01 CONCRETE

A. Concrete structures shall meet the requirements of FDOT 400; Concrete structures. All structures shall be H-20 rated.

2.02 FORMS

A. Forms shall be conformance with Section 425 of FDOT Standard Specifications for Road and Bridge Construction.

2.03 REINFORCING BARS

A. Concrete structures shall meet the requirements of FDOT 400; Concrete structures.

B. Repair damaged epoxy coating per Article 3.5 of this Section.

2.04 UNITS

A. Inlet dimensions and details of construction shall conform to FDOT Roadway and Traffic Specifications and Design Standards.

2.05 PRECAST UNITS

A. At the opinion of the Contractor, approved pre-cast units may be substituted for cast-in-place units. Pre-cast units shall conform to ASTM C478. All pre-cast units shall have epoxy-coated reinforcing bars. Submit details of proposed units to the ENGINEER for review. Concrete risers for extensions shall be a maximum of 6 inches high and of the same quality as the sections. ENGINEER shall review risers before installation.

B. Provide ADS Pipe Adapter flexible watertight Waterstop connection with pipe adapter for ADS Corrugated HDPE Pipe to storm structures, or approved equal ADS Pipe Adapters meeting the requirements of ASTM F 2510 and ASTM C 1478 for watertight flexible connections. Rapid set mortar shall be used with potable water; ground water shall not be used.

2.06 MORTAR

A. Standard premixed mortar conforming to ASTM C387, Type S, or proportion 1 part Portland cement to 2 parts clean, well-graded sand that will pass a 1/8-inch screen. Admixtures may be used not exceeding the following percentages of weight of cement: Hydrated lime, 10 percent diatomaceous earth or other inert materials, 5 percent. Consistency of mortar shall be such that it will readily adhere to the concrete.

B. DO NOT USE GROUND WATER TO MIX MORTAR, arrange for and provide potable water.

2.07 FRAMES AND GRATINGS

A. Cast iron frames and gratings for catch basins and storm drain inlets shall be as indicated. Bearing surfaces shall be clean and shall provide uniform contact. Castings shall be tough, close-grained gray iron, sound, smooth, clean, free from blisters, blowholes, shrinkage, cold shuts, and all defects, and shall conform to ASTM A48, Class 30.

B. All grates shall be H20 Traffic Rated and Galvanized coated.

2.08 BASE ROCK

A. Base rock shall be crushed gravel or crushed rock, free from dirt, clay balls, and organic material, and conforming to size No. 57 graduation as specified in the Standard Specifications or similar accepted material and shall be imported, if necessary, at the Contractor's own expense. Lime rock screenings or material resulting from trench excavation, except for lime rock that has been crushed and graded to size as specified, will not be accepted for base rock.

2.09 PRECAST MANHOLE SECTIONS

A. Precast manhole sections shall be minimum 48 inches in diameter, conforming to ASTM C478. Precast sections shall meet the permeability test requirements of ASTM C14. Minimum wall thickness shall be 4 inches. All manholes shall have epoxy-coated reinforcing bars. All manholes of less than 5 feet of depth shall have either flat top covers or concentric cones. Cones shall have same wall thickness and reinforcement as manhole section. Top and bottom of all sections shall be parallel. The Contractor's attention is directed to Paragraph MORTAR herein before.

2.10 PRECAST BASE SECTIONS AND BASES

A. At the option of the Contractor, precast base sections or manhole bases may be used provided the Engineer approves all details of construction. Base sections shall have the base slab integral with sidewalls. Base slab shall be 6 inches thick with No. 4 epoxy-coated reinforcing bars, 8-inch centers, both directions in center of slab. Tie reinforcing steel to wall steel.

2.11 PRECAST BAFFLE BOX SECTIONS (NOT USED)

A. Precast manhole sections shall size shall be as specified on the drawings, conforming to ASTM C478. Precast sections shall meet the permeability test requirements of ASTM C14. Minimum wall thickness top, bottom, and sides shall be 8 inches. All manholes shall have epoxy-coated reinforcing bars. Reinforcing bars shall be 3” minimum from the edge. Top and bottom of all sections shall be parallel. The Contractor's attention is directed to Paragraph MORTAR herein before. Baffle Boxes shall support H20 loading.

2.12 MANHOLE AND BAFFLE BOX EXTENSIONS

A. Concrete grade rings shall be H-20 rated and for extensions shall be a maximum of 6 inches high and shall be approved by Engineer before installation.

B. HDPE adjustment rings shall be H-20 Rated and shall be approved by Engineer before installation

C. Clay Brick and Shale Brick. This brick shall meet the requirements of AASHTO M 114, for Grade MW. and shall be approved by Engineer before installation

D. Concrete Brick. Concrete brick shall meet the requirements of ASTM C 55 for Grade S-I, and shall be approved by Engineer before installation

E. In general, manhole and baffle box extensions will be used on all manholes in roads or streets or in other locations where a subsequent change in existing grade may be likely. Extensions will be limited to a maximum height of 12 inches. Finish grade for manhole covers shall conform to finished ground or street surface unless otherwise directed by the Engineer. The Contractor will be responsible for coordinating with the Engineer and Owner to determine the finish grade for manhole and baffle box covers and will make all adjustments necessary to bring manhole covers to that grade. Extensions shall lined with polypropylene and be watertight. Extensions shall meet the H-20 load rating; brick is used contractor is required to submit a shop drawing with an 18 inch concrete collar 4000 PSI 1-6 inches thick. Brick shall be installed using Rapid Set Mortar Mix or equal. This cost shall be incidental to the cost of installing the structure. Masonry unit’s manufacturer shall submit six test certificates furnished to the Engineer. Such certificates shall be signed by an authorized agent of the manufacturer, and identified by project number.

2.13 MANHOLE FRAMES AND COVERS:

A. Cast iron of size and shape detailed on the Drawings. Covers shall have the word STORM SEWER, as appropriate, in 2-inch raised letters. Castings shall be tough, close-grained gray iron, sound, smooth, clean, free from blisters, blowholes, shrinkage, cold shuts, and all defects, and shall conform to ASTM A-48, Class 30B. Plane or grind bearing surfaces to ensure flat, true surfaces. Covers shall be true and seat within ring at all points.

2.14 WATERTIGHT

A. Provide water tight manhole ring and covers, and extensions.

B. Provide ADS Pipe Adapter flexible watertight Waterstop connection with pipe adapter for ADS Corrugated HDPE Pipe to storm structures, or approved equal ADS Pipe Adapters meeting the requirements of ASTM F 2510 and ASTM C 1478 for watertight flexible connections. Rapid set mortar shall be used with potable water; ground water shall not be used.

PART 3 EXECUTION

3.01 EXCAVATION AND BACKFILL

A. Excavation as required to accomplish the construction. Backfill shall be as specified for the adjoining pipe trench.

3.02 CONSTRUCTION OF CATCH BASINS AND INLETS

A. Construct inlets and catch basins at the locations shown and in accordance with the Drawings. Construct forms to the dimensions and elevations required. Forms shall be tight and well braced Chamfer corners of forms.

B. Prior to placing the concrete, remove all water and debris from the forms. Moisten forms just prior to placing the concrete. Handle concrete from the transporting vehicle to the forms in a continuous manner as rapidly as practical without segregation or loss of ingredients. Immediately after placing, compact concrete with a mechanical vibrator. Limit the duration of vibration to the time necessary to produce satisfactory consolidation without causing segregation.

C. Screed the top surface of exposed slabs and walls. When the initial water has been absorbed, float the surfaces with a wood float and lightly trowel with a steel trowel to a smooth finish free from marks or irregularities. Finish exposed edges with a steel-edging tool. Remove forms and patch any defects in the concrete with mortar mixed in the same proportions as the original concrete mix.

D. Cure concrete by preventing the loss of moisture for a period of 7 days. Accomplish with a membrane-forming curing compound. Apply the curing compound immediately after removal of forms or finishing of the slabs. Protect concrete from damage during the 7-day curing period.

3.03 PLACING PRECAST UNITS

A. Remove water from the excavation. Place a minimum of 6 inches of rock base and thoroughly compact with a mechanical vibrating or power tamper.

3.04 EXTENSIONS

A. Install extensions to height determined by ENGINEER. Lay risers in mortar with sides plumb and tops to grade. Joints shall be sealed with mortar, with interior and exterior troweled smooth. Prevent mortar from drying out and cure by applying a curing compound. Extensions shall be watertight.

3.05 REPAIR OF DAMAGED STRUCTURES EPOXY COATING ON REINFORCING BARS

A. Damaged STRUCTURES shall be repaired with Rapid Set Mortar Mix and REINFORCING BARS shall be repaired with epoxy coating material conforming to ASTM A775. Repair shall be done in accordance with the patching material manufacturer's recommendations.

3.06 INSTALLATION OF FRAMES AND GRATES

A. Set frames and grates at elevations indicated or as determined in the field and in conformance with the Drawings.

B. Frames may be cast in, or shall be set in mortar, they shall be H-20 rated.

C. Frames set with brick; contractor is required to submit a shop drawing with an 18 inch concrete collar 4000 PSI 1-6 inches thick. Brick shall be installed using Rapid Set Mortar Mix or equal. This cost shall be incidental to the cost of installing the structure. Masonry unit’s manufacturer shall submit six test certificates furnished to the Engineer. Such certificates shall be signed by an authorized agent of the manufacturer, and identified by project number.

3.07 PLACING PRECAST MANHOLE SECTIONS

A. Section Installation:

1. Thoroughly clean ends of sections to be joined.
2. Thoroughly wet joint with water prior to placing mortar.
3. Place mortar on groove of lower section.
4. Set next section in-place.
5. Fill joint completely with mortar of proper consistency.
6. Trowel interior and exterior surfaces smooth on standard tongue-and-groove joints.
7. Prevent mortar from drying out and cure by applying an approved curing compound or comparable approved method.
8. Do not use mortar mixed for longer than 30 minutes.
9. Chip out and replace cracked or defective mortar.
10. Completed Manholes: Rigid and watertight.

B. Preformed Plastic Gaskets: Install in accordance with manufacturer's instructions and the following:
   1. Carefully inspect precast manhole sections to be joined.
   2. Do not use sections with chips or cracks in the tongue.
   3. Use only pipe primer furnished by gasket manufacturer.
   4. Install gasket material in accordance with manufacturer instructions.
   5. Fusion weld top and bottom 2-inch minimum wide strip over each section joint, where required.
   6. Completed Manholes: Rigid and watertight.

3.08 CLEANING

A. Upon completion, clean each structure of all silt, debris, and foreign matter.

END OF SECTION 33 4413

PART 5

DRAWINGS

Reference Construction Drawing Set

TRUMAN WATERFRONT 1B
CITY OF KEY WEST,
TRUMAN WATERFRONT
PHASE 1B – BUILDING 1287 & FIELD

By K2M Design dated 2019.02.25 – ISSUED BID SET

TRUMAN WATERFRONT 1B

KEY WEST, FL 33040

CITY OF KEY WEST ,
TRUMAN WATERFRONT

PHASE 1B - BUILDING 1287 & SITE

BUILDING 1287 REMODEL & SITE WORK

2019.03.22 - ISSUED BID SET

K2M DESIGN

1150 Virginia Street
Key West, Florida 33040
Tel: 305-292-7722
Fax:305-292-2162
Email: info@k2mdesign.com
URL: www.k2mdesign.com

ARCHITECT:

K2M DESIGN

Architecture, Engineering,
Interior Design,
Asset Management,
Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL. 33040

PLOTTED: 3/21/2019 10:47 PM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
EP	SCM

Title:

COVER SHEET

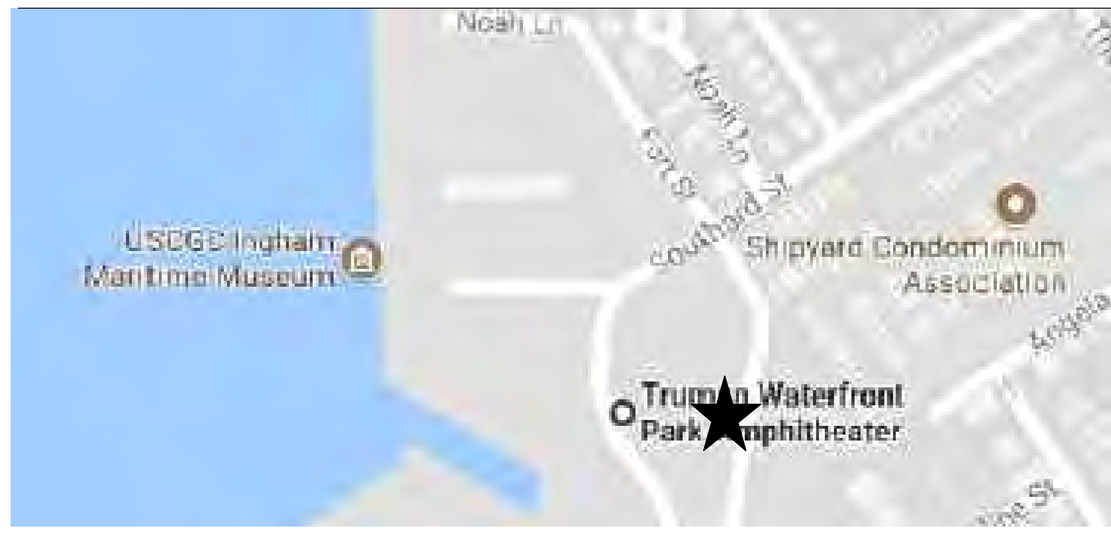
Sheet Number:

G0.0.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

LOCATION MAP



PROJECT LOCATION ★

CODE INFORMATION

BUILDING CODE:	2017 FLORIDA BUILDING CODE, 6TH EDITION
MECHANICAL CODE:	2017 FLORIDA MECHANICAL CODE
PLUMBING CODE:	2017 FLORIDA PLUMBING CODE
ELECTRICAL CODE:	2017 NATIONAL ELECTRIC CODE (NEC) NFPA
FUEL GAS CODE:	2017 FLORIDA FUEL GAS CODE
ENERGY CODE:	2017 FLORIDA ENERGY CONSERVATION CODE
ADA ACCESSIBILITY CODE:	2017 FLORIDA ACCESSIBILITY CODE
STANDARD LOAD DESIGN CRITERIA:	ASCE 7-10
LOCAL BUILDING REQUIREMENTS:	CITY OF KEY WEST CODES AND ORDINANCES
FEMA REQUIREMENTS:	FLOOD ZONE: AE: 7' NGVD 1929
CURRENT ZONING	SUBURBAN COMMERCIAL
MAX BUILDING HEIGHT	35' FROM COR/LAG
FLORIDA GREEN BUILDING	MIN REQUIREMENTS TO BE MET
USE GROUP	STORAGE/BUSINESS

SCOPE OF WORK

DEMO OF THE FOLLOWING AREAS:
- HORSE RUN 3,900 SF
- HORSE STABLES 1,467 SF
- PARTIAL BUILDING 4,903 SF
- ORIGINAL FT. ZACHARY TAYLOR ENTRY GUARD SHACK
- PARKING AREA/PEDESTRIAN WALKS WITHIN SITE

SITE PLANNING AND DESIGN OF THE FOLLOWING AREAS:
- HORSE RUN 12,541 SF – 10,877 SF
- PROPOSED MUTI-USE FACILITY 8,109 SF
- HORSE STABLES 1,266 SF
- SOCCER FIELD 180'X330'
- DOG PARK 9,800 SF
- FRUIT TREE GROVE (BY OTHERS)
- OPEN GRASS AREA FOR ADDITIONAL PARKING
- PARKING 8 SPACES W/ 3 ADA SPACES
- COMPOST STORAGE SITE
- PEDESTRIAN SIDEWALKS

BUILDING DESIGN
- MECHANICAL, ELECTRICAL, PLUMBING AND STRUCTURAL
- CIVIL (BY OTHERS)
- IRRIGATION (BY OTHERS)
- LANDSCAPING (BY CITY)

FIXTURE COUNT
- LAVATORY (BATHROOM) – 10
- SERVICE SINK – 1
- SHOWER HEAD (SHOWER ONLY) – 1
- TOILET (WALL-MOUNT) – 10
- URINAL (WALL FLUSH VALVE) – 4
- HOSE CONNECTION – 6
- DRINKING FOUNTAIN (PUBLIC) – 2
- DRINKING FOUNTAIN (COOLER) – 1

DRAWING INDEX

ISSUED FOR:

	2019.02.28 – BID SET	2018.11.28 – DRAFT SET	2018.10.23 – 90% REVIEW SET	2018.09.18 – CITY REVIEW SET	2018.05.17 – HARC SUBMITTAL	2018.05.14 – SD SUBMITTAL
GENERAL						
G0.0.1 COVER SHEET	●	●	●	●	●	●
G0.0.2 DRAWING INDEX, CODE INFO., SYMBOL LEG., ABBREV.	●	●	●			
G0.0.3 NTP SITE MAP	●	●				
G0.1.1 ACCESSIBILITY GUIDELINES (ADAAG)	●	●	●	●	●	
G0.1.2 FLORIDA ACCESSIBILITY CODE	●					
G0.2.1 LIFE SAFETY PLAN	●	●	●			
ARCHITECTURAL						
AE1.1.1 EXISTING ARCHITECTURAL SITE PLAN	●	●	●	●	●	●
AE1.1.2 PROPOSED/EXISTING SITE PLAN	●					
AE2.1.0 EXISTING FIRST FLOOR PLAN	●	●	●	●	●	●
AE3.1.1 EXISTING EXTERIOR ELEVATIONS	●	●	●	●	●	●
AD1.1.1 DEMOLITION SITE PLAN	●	●	●	●	●	●
AD2.1.0 DEMOLITION FIRST FLOOR PLAN	●	●	●	●	●	●
AD2.2.0 DEMOLITION FIRST FLOOR SLAB PLAN	●	●	●	●	●	●
AD2.3.0 DEMOLITION FIRST FLOOR ROOF PLAN	●	●	●	●	●	●
A1.1.1 PROPOSED ARCHITECTURAL SITE PLAN	●	●	●	●	●	●
A2.1.0 FIRST FLOOR PLAN	●	●	●	●	●	●
A2.1.2 ROOF PLAN	●	●	●	●	●	●
A2.2.1 REFLECTED CEILING PLAN & FINISH FLOOR PLAN	●	●	●	●	●	
A3.1.1 EXTERIOR ELEVATIONS	●	●	●	●	●	●
A4.1.1 WOMEN'S RESTROOM ENLARGED PLAN	●	●	●	●		●
A4.1.2 MEN'S RESTROOM ENLARGED PLAN	●	●	●	●		●
A4.1.3 BATHROOM ENLARGED PLAN	●	●	●	●		●
A4.1.4 HORSE BARN CORRIDOR ENLARGED ELEVATIONS	●	●	●	●		
A6.1.1 FINISH, EQUIPMENT & DOOR HARDWARE SCHEDULE	●	●	●	●	●	●
A6.2.1 DOOR AND WINDOW SCHEDULE	●	●	●	●	●	
A8.1.1 EXTERIOR DETAILS	●	●	●	●	●	
A9.1.1 WALL TYPES AND INTERIOR DETAILS	●	●	●	●	●	●
STRUCTURAL						
SD-1.0 DEMOLITION PLAN	●	●	●	●		
S-1.0 FOUNDATION PLAN	●	●	●	●		
S-2.0 STRUCTURAL PLAN	●	●	●	●		
S-3.0 ROOF FRAMING PLAN	●	●	●	●		
S-4.0 STRUCTURAL SECTIONS & DETAILS	●	●	●	●		
S-4.1 STRUCTURAL SECTIONS & DETAILS	●	●	●			
S-4.2 STRUCTURAL SECTIONS & DETAILS	●	●	●			
PLUMBING						
P1.1.1 PLUMBING PLANS	●	●	●	●		
P1.1.2 OVERALL PLUMBING VIEW	●	●	●	●		
P2.1.1 WATER PLUMBING PLAN	●	●	●	●		
P3.1.1 PLUMBING DETAILS & SCHEDULES	●	●	●			
MECHANICAL						
M1.1.1 MECHANICAL PLAN	●	●	●	●		
M2.1.1 MECHANICAL ROOF PLAN	●	●	●	●		
M3.1.1 MECHANICAL DETAILS	●	●	●	●		
M3.1.2 MECHANICAL SCHEDULES	●	●	●			
ELECTRICAL						
E0.1.1 ELECTRICAL NOTES AND SPECIFICATIONS	●	●	●	●		
E1.1.1 ELECTRICAL POWER PLAN	●	●	●	●		
E2.1.1 ELECTRICAL LIGHTING PLAN	●	●	●	●		
E3.1.1 SITE LIGHTING PLAN	●	●	●	●		
E4.1.1 ELECTRICAL DETAILS	●	●	●	●		
CIVIL						
C100 EROSION CONTROL/DEMO	●		●			
C200 SITE DEMO PLAN	●		●			
C300 CIVIL SITE PLAN	●		●			
C400 GRADING AND DRAINAGE PLAN	●		●			
C500 WATER AND SEWER PLAN	●		●			
C600 ALTERNATE SIDEWALK WORK	●		●			
C700 CIVIL DETAILS	●		●			
C800 CIVIL DETAILS	●		●			
IRRIGATION						
IR1.1.1 IRRIGATION SITE PLAN	●	●				
IR1.1.2 IRRIGATION SITE PLAN	●	●				
IR1.1.3 IRRIGATION SITE PLAN	●	●				
IR1.1.4 IRRIGATION NOTES & DETAILS	●	●				
LANDSCAPE						
L1.1.1 EXISTING LANDSCAPE PLAN	●	●	●	●		
L1.1.2 PROPOSED LANDSCAPE PLAN	●	●	●	●		
L1.1.3 PROPOSED LANDSCAPE PLAN	●	●	●			
L2.1.1 LANDSCAPE CHARTS	●	●	●	●		
L5.1.1 LANDSCAPE/SITE DETAILS	●	●	●			
L5.1.2 LANDSCAPE/SITE DETAILS	●	●	●			
L3.1.1 PRIOR LANDSCAPE DOCUMENTATION	●	●	●	●		
L3.1.2 PRIOR LANDSCAPE DOCUMENTATION	●	●	●	●		

GENERAL NOTES

1. The contract documents consist of this set of drawings, addenda, construction change directives, change orders, the contract between the owner and contractor, conditions of the contract and any other information written and mutually agreed upon between the owner and contractor.
2. These drawings are complementary and interrelated; work of any individual trade is not necessarily confined to specific documents, chapters, or locations.
3. It is the intent of the contract documents to be designed in accordance with all codes and ordinances in effect at the time the permit is issued. Notify architect immediately upon discovery of suspected deviation.
4. If discrepancies or inconsistencies in the documents are discovered, notify the architect immediately using a consistent "request for information" procedure.
5. Construction techniques, procedures, sequencing, and scheduling are solely the responsibility of the contractor.
6. DO NOT SCALE DRAWINGS; use dimensions only. All dimensions must be verified on the job and the architect must be notified of any discrepancies before proceeding with the work.
7. Coordinate locations and/or elevations of floor drains, registers, grilles, louvers, ducts, unit heaters, panels, etc. with the Mechanical, Plumbing, and Electrical Contractors and the architectural drawings.
8. Where a detail is shown for one condition, it shall apply to all like or similar conditions, even though not specifically marked on the drawings.
9. All abbreviations, materials and symbols in legends may or may not be used.
10. Follow the manufacturer's instruction specifications for preparation, implementation, and construction of all materials and systems.
11. Refer to soils report for geotechnical information.
12. Refer to survey for flood zone and benchmark information.

SITE INFORMATION:

STREET ADDRESS: 21 QUAY ROAD, KEY WEST
RE #: 00001630-001000
ZONING: HNC-2 (HISTORIC NEIGHBORHOOD COMMERCIAL - 2) & HPS-1 (HISTORIC PUBLIC & SEMI-PUBLIC SERVICES - 1)
LAND COVER - HABITAT 2009: DEVELOPED LAND
LAND USE: COMMERCIAL EXEMPT

LEGAL DESCRIPTION:
KW PARCEL OF LAND LYING W'LY OF TRUMAN ANNEX (24.95 AC) U-161-329
OR1839-410/479Q/C

DEVELOPMENT: TRUMAN WATERFRONT PHASE 1B

HARC DATA:

YEAR BUILT: 1964
NO SANBORN MAP DATA FOR THIS PROPERTY
NO HISTORIC IMAGE FILE FOR THIS PROPERTY

NTP1: BUILDING 1287 SCOPE, STUB UP WATER AND SEWER CONNECTION, INCLUDE KEYS ENERGY AND COMCAST CONNECTIONS.
NTP2: ALL SITE WORK, FIELD, LANDSCAPING, FENCING, AND BUILDING 1287 WATER/SEWER CONNECTIONS.

CODE DATA:

OCCUPANCY	PUBLIC WORKS STORAGE (6,040.5 SF): S-1 HORSE STABLES (1,266 SF): U TREATED AS S-1 OFFICES/RESTROOMS (2,068.5 SF): B	
CONSTRUCTION TYPE	IIB	
ALLOWABLE BUILDING HEIGHT	TYPE IIB	(S/U/B): 55 FEET
ALLOWABLE # OF STORIES	TYPE IIB (NS)	S-1: 2 U: 2 B: 3
ALLOWABLE AREA (SF)	TYPE IIB (NS)	S-1: 17,500 U: 8,500 B: 23,000
REQUIRED SEPARATION	S-1 TO U S-1 TO B	N/A N/A

OCCUPANT LOAD CALCULATION

PUBLIC WORKS STORAGE (S-1) = 6,040.5 SF
500 SF PER OCCUPANT
6,040.5 SF/500 = 12.08 = 13 OCCUPANTS

HORSE STABLES (U TREATED AS S-1) = 1,266 SF
500 SF PER OCCUPANT
1,266 SF/500 = 2.5 = 3 OCCUPANTS

OFFICES/RESTROOMS (B) = 2,068.5 SF
100 SF PER OCCUPANT
2,068.5 SF/100 = 20.7 = 21 OCCUPANTS

EXIT REQUIREMENT - 2

EGRESS WIDTH (OTHER THAN STAIRWAYS)

PUBLIC WORKS STORAGE = 13 OCCUPANTS
13 X .02 = .26
PROVIDED = 36" MINIMUM

HORSE STABLES = 3 OCCUPANTS
3 X .02 = .06
PROVIDED = 36" MINIMUM

OFFICES/RESTROOMS = 21 OCCUPANTS
21 X .02 = .42
PROVIDED = 36" MINIMUM

MAXIMUM TRAVEL DISTANCE
S 100 FEET (LOAD LESS THAN 30)
U 100 FEET (LOAD LESS THAN 30)
B 100 FEET (LOAD LESS THAN 30)

SYMBOLS

Symbol	Meaning
101 (diamond)	WINDOW NUMBER
? (circle)	WALL TYPES
101 (oval)	DOOR NUMBER
1 (triangle)	REVISION NUMBER
ROOM NAME / # / S.F.	ROOM/SPACE NUMBER
±	PLUS OR MINUS LAST INDICATED UNIT
℄	CENTER LINE
∅	DIAMETER OR ROUND
L	ANGLE
[	CHANNEL
AA	COLUMN LINE
XXX / XXX	EXTERIOR ELEVATION NO. / DWG. REF. NO.
X / AX.XX	WALL SECTION NO. / DWG. REF. NO.
??? / ????	DETAIL NO. / DWG. REF. NO.
??? / ???? (1, 2, 3, 4)	INTERIOR ELEVATION NO. / DWG. REF. NO.

DESIGN TEAM INFORMATION

PRIMARY POINT OF CONTACT:
K2M Design, Inc.
Erica Poole, Project Contact
1150 Virginia Street
Key West, Florida 33040
tel: 305.307.5840

ENGINEER:
K2M Design, Inc.
Steven S. Grasley
1150 Virginia Street
Key West, Florida 33040
tel: 305.307.5840

IRRIGATION DESIGNER:
Blue Island Lighting & Irrigation Inc.
Rick DeKeyser
3255 Flagler Avenue #307
Key West, Florida 33040
tel: 305.293.8444

CIVIL ENGINEER:
Perez Engineering & Development
Allen Perez
1010 Kennedy Drive #201
Key West, Florida 33040
tel: 305.293.9440

STRUCTURAL ENGINEER:
Meridian Engineering LLC
Rick Milelli
201 Front Street
Key West, Florida 33040
tel: 305.293.3263

SHEET NUMBERING SYSTEM

A2.1.1
DISCIPLINE:
SERIES NUMBER
SUB-SERIES NUMBER
NUMBER OF DRAWING WITH IN SUB-SERIES

ARCHITECT:
K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting
Key Largo, FL
Key West, FL
Marathon, FL
URL: www.k2mdesign.com
PROF. REG. AA26001059
Building Relationships Based on Trust and Results
Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:
STRUCTURAL ENGINEER: Meridian Engineering LLC
CIVIL ENGINEER: Perez Engineering & Development
IRRIGATION: Blue Island Lighting & Irrigation Inc.

Submissions:
DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/27/2019 11:31 AM

Drawing Size	Project #:
24x36	18070
Drawn By: EP	Checked By: SSG

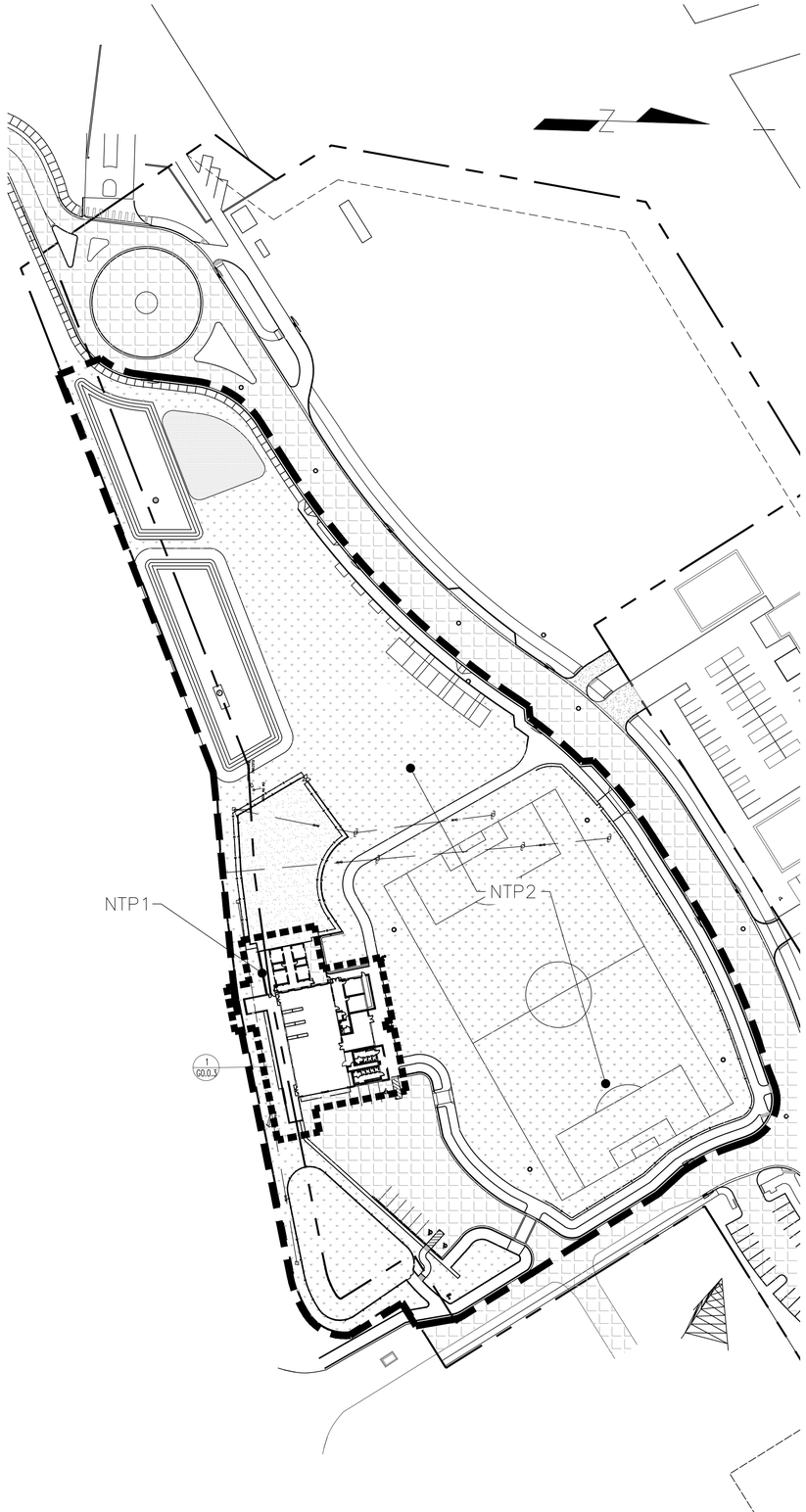
Title:
DRAWING INDEX CODE INFO., SYMBOL LEGEND, & ABBREVIATIONS

Sheet Number:
G0.0.2

Date: March 22, 2019

©2018 by K2M Design, Inc.

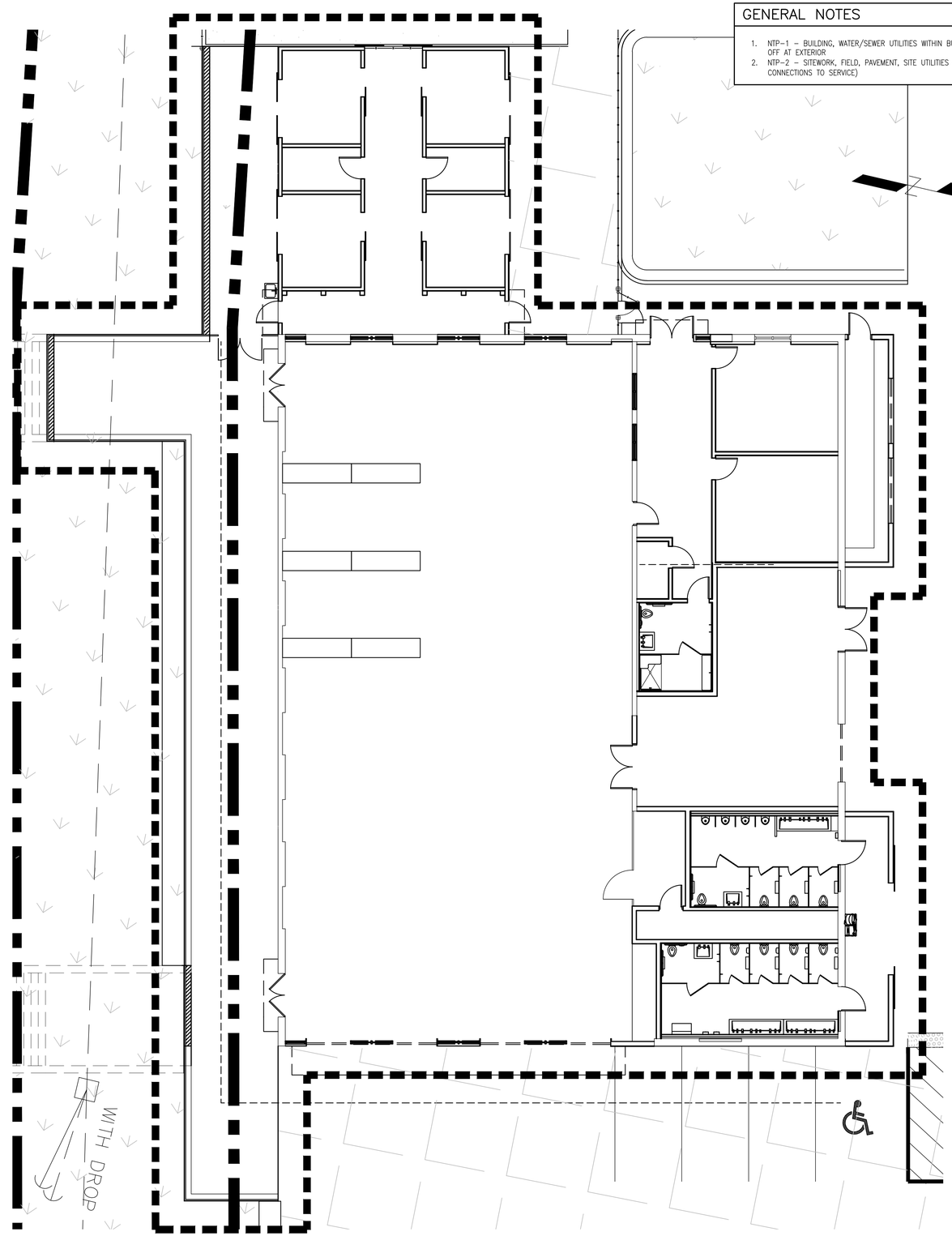
J:\2018\18070 – City of Key West – Truman Waterfront 1B\4-CDs\Drawings_General\G002.dwg, 3/27/2019 11:31 AM, scale: 1'-0" = 1'-0", erica poole



N

NTP - SITE MAP

SCALE: 1/64" = 1'-0"



1

ENLARGED NTP-1

SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. NTP-1 – BUILDING, WATER/SEWER UTILITIES WITHIN BUILDING & STUB UP/CAP OFF AT EXTERIOR
2. NTP-2 – SITEWORK, FIELD, PAVEMENT, SITE UTILITIES (WATER/SEWER CONNECTIONS TO SERVICE)

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST

1300 White Street, Key West, FL, 33040

PLOTTED: 3/27/2019 7:51 AM

Drawing Size	Project #:
24x36	18070
Drawn By: BK	Checked By: AA

Title:

NTP SITE MAP

Sheet Number:

G0.0.3

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings_General\G0.0.3.dwg, 3/27/2019 7:51 AM, scale: 1'-0" = 1'-0", erica poole

NOT USED — SCALE: --- | 5

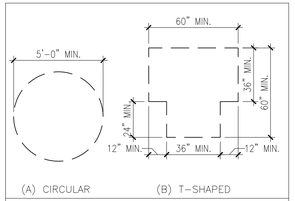
NOT USED — SCALE: --- | 4

NOT USED — SCALE: --- | 3

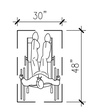
GENERAL NOTES — SCALE: N.T.S. | 2

GENERAL NOTES:

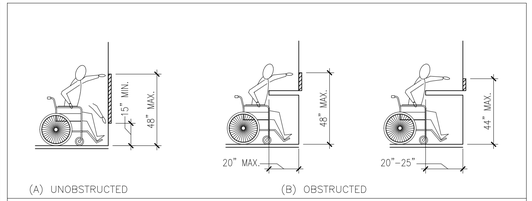
1. THESE DETAILS GOVERN IN THE EVENT OF ANY DISCREPANCIES ELSEWHERE IN THE DRAWINGS.
2. INCLUDED DETAILS MAY OR MAY NOT BE USED ON THIS PROJECT.
3. DIMENSIONS THAT ARE NOT MARKED MAXIMUM (MAX.) OR MINIMUM (MIN.) ARE ABSOLUTE, UNLESS OTHEWISE NOTED IN FOOT NOTES.
4. DRAWINGS ARE NOT TO BE SCALED.



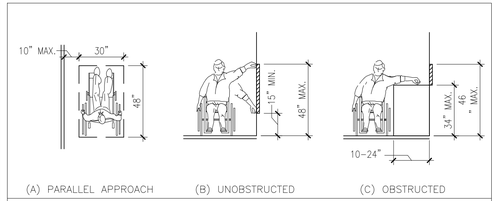
SECTION 304 TURNING SPACE
TURNING SPACE



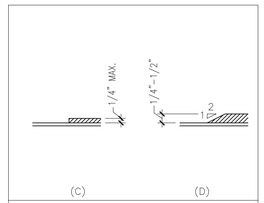
SECTION 305
CLEAR FLOOR AREA



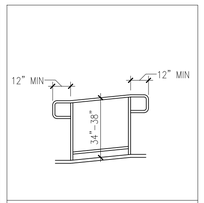
SECTION 308 REACH RANGES
FORWARD REACH RANGES



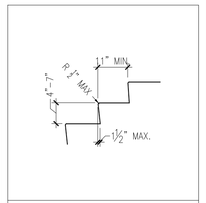
SECTION 308 REACH RANGES
SIDE REACH RANGES



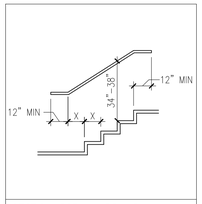
SECTION 303 CHANGES IN LEVEL
CHANGES IN LEVEL



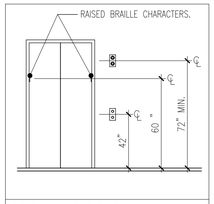
SECTION 505 HANDRAILS
HANDRAILS AT RAMPS



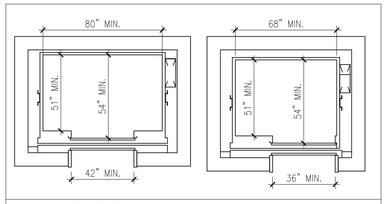
SECTION 504 STAIRWAYS
TREADS, RISERS AND NOSINGS



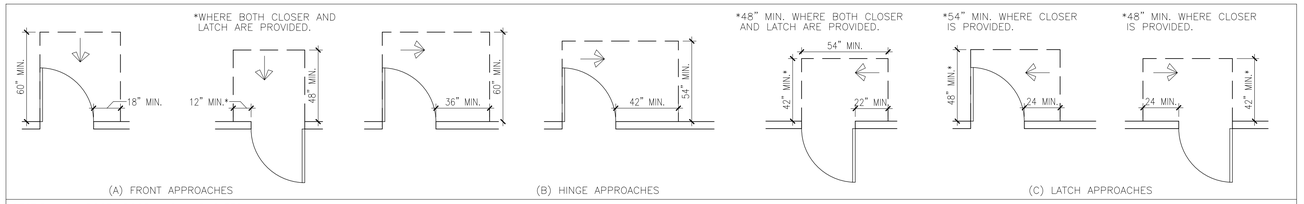
SECTION 505 HANDRAILS
HANDRAILS AT STAIRS



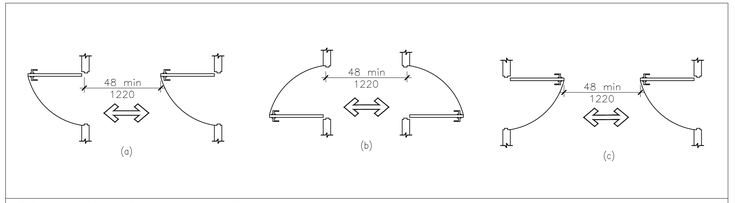
SECTION 407 ELEVATORS
ELEVATOR ENTRANCE HEIGHTS



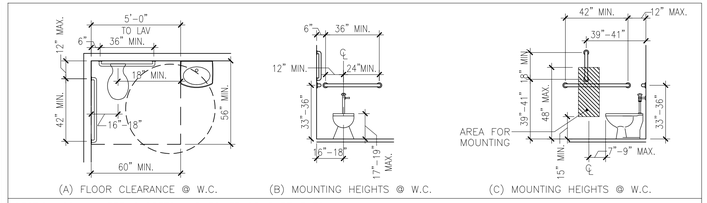
SECTION 407 ELEVATORS
ELEVATOR FLOOR PLAN



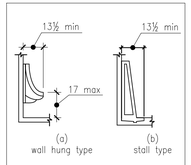
SECTION 404 DOOR, DOORWAYS, AND GATES
MANEUVERING CLEARANCE AT DOORS



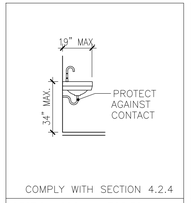
SECTION 404 DOORS, DOORWAYS, AND GATES
TWO DOORS IN SERIES



SECTION 604 WATER CLOSETS AND TOILET COMPARTMENTS
WATER CLOSET AND GRAB BAR MOUNTING HEIGHTS

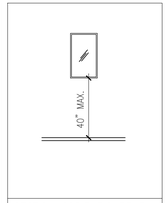


SECTION 605 URINALS
URINAL MOUNTING HEIGHT

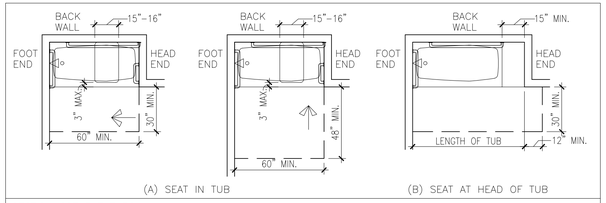


COMPLY WITH SECTION 4.2.4

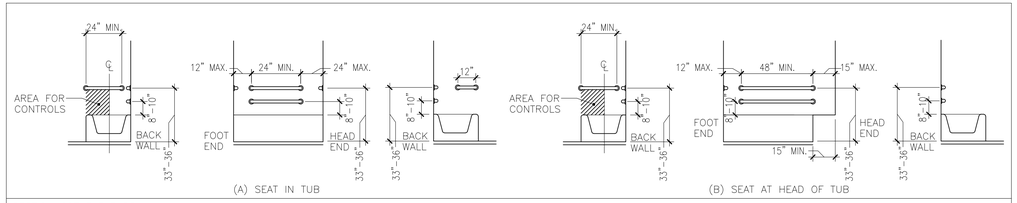
SECTION 606 LAVATORIES
LAVATORY MOUNTING HEIGHT



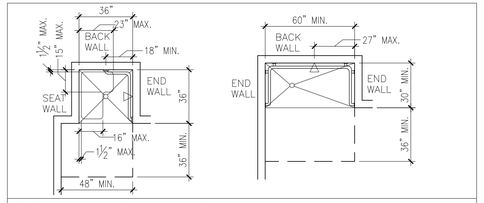
SECTION 603.3 FIGURE 31
MIRROR MOUNTING HEIGHT



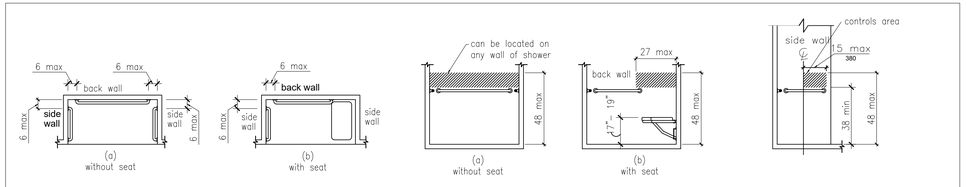
SECTION 607 BATHTUBS
CLEAR FLOOR AREA FOR TUB



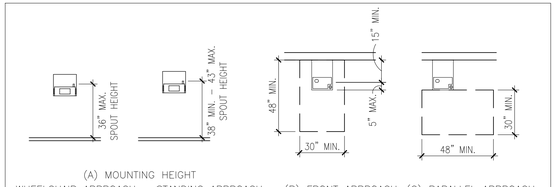
SECTION 607 BATHTUBS
GRAB BARS FOR TUB



SECTION 608 SHOWER COMPARTMENTS
FLOOR CLEARANCE AND DIMENSIONS OF SHOWER STALLS



SECTION 608 SHOWER COMPARTMENTS
GRAB BARS FOR SHOWER STALL



SECTION 602 DRINKING FOUNTAINS
ACCESSIBLE DRINKING FOUNTAINS

ADA ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES (ADAAG) — SCALE: N.T.S. | 1

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST

1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 5:40 PM

Drawing Size	Project #:
24x36	18070
Drawn By: XXX	Checked By: XXX

Title:
ACCESSIBLITY GUIDELINES ADAAG

Sheet Number:

G0.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\K-CDs\Drawings_General\G011_ADAAG.dwg, 3/21/2019 5:40 PM, scale: 1"=0" = 1"=0", bryan bailey

EXISTING BUILDING DESCRIPTION:

GENERAL NOTES:

1. THESE DETAILS GOVERN IN THE EVENT OF ANY DISCREPANCIES ELSEWHERE IN THE DRAWINGS. NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO INSTALLATION. OF ANY ITEMS.
2. INCLUDED DETAILS MAY OR MAY NOT BE USED ON THIS PROJECT.
3. DO NOT SCALE DRAWINGS.

ADDITIONAL ICC 117.1–2009 CODE REFERENCES:

1. 301.2 OVERLAP. UNLESS OTHERWISE SPECIFIED, CLEAR FLOOR SPACES, CLEARANCES AT FIXTURES, MANEUVERING CLEARANCES AT DOORS, AND TURNING SPACES SHALL BE PERMITTED TO OVERLAP.
2. 302.3 OPENINGS. OPENINGS IN FLOOR SURFACES SHALL BE OF A SIZE THAT DOES NOT PERMIT THE PASSAGE OF A ½" DIAMETER SPHERE, EXCEPT AS ALLOWED ELSEWHERE IN THIS CODE. ELONGATED OPENINGS SHALL BE PLACED SO THAT THE LONG DIMENSION IS PERPENDICULAR TO THE PREDOMINANT DIRECTION OF TRAVEL.
3. 304.4 DOOR SWING. UNLESS OTHERWISE SPECIFIED, DOORS SHALL BE PERMITTED TO SWING INTO TURNING SPACES.
4. 306.1 GENERAL. WHERE SPACE BENEATH AN ELEMENT IS INCLUDED AS PART OF CLEAR FLOOR SPACE AT AN ELEMENT, CLEARANCE AT AN ELEMENT, OR A TURNING SPACE, THE SPACE SHALL COMPLY WITH SECTION 306.
5. 307.4 VERTICAL CLEARANCE. VERTICAL CLEARANCE SHALL BE 80 INCHES MINIMUM. RAILS OR OTHER BARRIERS SHALL BE PROVIDED WHERE THE VERTICAL CLEARANCE IS LESS THAN 80 INCHES. THE LEADING EDGE OF SUCH RAILS OR BARRIER SHALL BE LOCATED 27 INCHES MAXIMUM ABOVE THE FLOOR.
6. 309.4 OPERATION. OPERABLE PARTS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE OPERABLE PARTS SHALL BE 5.0 POUNDS MAXIMUM.
7. 403.5 CLEAR WIDTH. THE CLEAR WIDTH OF AN ACCESSIBLE ROUTE SHALL BE 36 INCHES MINIMUM.

7.1. EXCEPTION: THE CLEAR WIDTH SHALL BE PERMITTED TO BE REDUCED TO 32 INCHES MINIMUM FOR A LENGTH OF 24 INCHES MAXIMUM PROVIDED THE REDUCED WIDTH SEGMENTS ARE SEPARATED BY SEGMENTS THAT ARE 48 INCHES MINIMUM IN LENGTH AND 36 INCHES MINIMUM IN WIDTH.

8. 404.2.4 THRESHOLDS. IF PROVIDED, THRESHOLDS AT DOORWAYS SHALL BE 1/2 INCH MAXIMUM IN HEIGHT. RAISED THRESHOLDS AND CHANGES IN LEVEL AT DOORWAYS SHALL COMPLY WITH SECTIONS 302 AND 303.

8.1. EXCEPTION: AN EXISTING OR ALTERED THRESHOLD SHALL BE PERMITTED TO BE 3/4 INCH MAXIMUM IN HEIGHT PROVIDED THAT THE THRESHOLD HAS A BEVELED EDGE ON EACH SIDE WITH A MAXIMUM SLOPE OF 1:2 FOR THE HEIGHT EXCEEDING 1/4 INCH.

9. 404.2.6 DOOR HARDWARE. HANDLES, PULLS, LATCHES, LOCKS, AND OTHER OPERABLE PARTS ON ACCESSIBLE DOORS SHALL HAVE A SHAPE THAT IS EASY TO GRASP WITH ONE HAND AND DOES NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST TO OPERATE. OPERABLE PARTS OF SUCH HARDWARE SHALL BE 34 INCHES MINIMUM AND 48 INCHES MM) MAXIMUM ABOVE THE FLOOR. WHERE SLIDING DOORS ARE IN THE FULLY OPEN POSITION, OPERATING HARDWARE SHALL BE EXPOSED AND USABLE FROM BOTH SIDES.
10. 404.2.7.1 DOOR CLOSERS. DOOR CLOSERS SHALL BE ADJUSTED SO THAT FROM AN OPEN POSITION OF 90 DEGREES, THE TIME REQUIRED TO MOVE THE DOOR TO AN OPEN POSITION OF 12 DEGREES SHALL BE 5 SECONDS MINIMUM.
11. 404.2.8 DOOR–OPENING FORCE. FIRE DOORS SHALL HAVE THE MINIMUM OPENING FORCE ALLOWABLE BY THE APPROPRIATE ADMINISTRATIVE AUTHORITY. THE FORCE FOR PUSHING OR PULLING OPEN DOORS OTHER THAN FIRE DOORS SHALL BE AS FOLLOWS:
1. INTERIOR HINGED DOOR: 5.0 POUNDS MAXIMUM
2. SLIDING OR FOLDING DOOR: 5.0 POUNDS MAXIMUM

THESE FORCES DO NOT APPLY TO THE FORCE REQUIRED TO RETRACT LATCH BOLTS OR DISENGAGE OTHER DEVICES THAT HOLD THE DOOR IN A CLOSED POSITION.

12. 405.2 SLOPE. RAMP RUNS SHALL HAVE A RUNNING SLOPE GREATER THAN 1 :20 AND NOT STEEPER THAN 1 :12.
13. 405.3 CROSS SLOPE. CROSS SLOPE OF RAMP RUNS SHALL NOT BE STEEPER THAN 1 :48.
14. 504.5 NOSINGS. THE RADIUS OF CURVATURE AT THE LEADING EDGE OF THE TREAD SHALL BE 1/2 INCH MAXIMUM. NOSINGS THAT PROJECT BEYOND RISERS SHALL HAVE THE UNDERSIDE OF THE LEADING EDGE CURVED OR BEVELED. RISERS SHALL BE PERMITTED TO SLOPE UNDER THE TREAD AT AN ANGLE OF 30 DEGREES MAXIMUM FROM VERTICAL. THE PERMITTED PROJECTION OF THE NOSING SHALL BE 11/2 INCHES MAXIMUM OVER THE TREAD OR FLOOR BELOW.
15. 504.5.1 VISUAL CONTRAST. THE LEADING 2 INCHES (51 MM) OF THE TREAD SHALL HAVE VISUAL CONTRAST OF DARKON–LIGHT OR LIGHT–ON–DARK FROM THE REMAINDER OF THE TREAD.
16. 604.6 FLUSH CONTROLS. FLUSH CONTROLS SHALL BE HAND OPERATED OR AUTOMATIC. HAND OPERATED FLUSH CONTROLS SHALL COMPLY WITH SECTION 309. FLUSH CONTROLS SHALL BE LOCATED ON THE OPEN SIDE OF THE WATER CLOSET.
17. 604.9.3 DOORS. TOILET COMPARTMENT DOORS, INCLUDING DOOR HARDWARE, SHALL COMPLY WITH SECTION 404, EXCEPT IF THE APPROACH IS TO THE LATCH SIDE OF THE COMPARTMENT DOOR CLEARANCE BETWEEN THE DOOR SIDE OF THE STALL AND ANY OBSTRUCTION SHALL BE 42 INCHES MINIMUM. THE DOOR SHALL BE SELF–CLOSING. A DOOR I PULL COMPLYING WITH SECTION 404.2.6 SHALL BE PLACED ON BOTH SIDES OF THE DOOR NEAR THE LATCH. TOILET COMPARTMENT DOORS SHALL NOT SWING INTO THE REQUIRED MINIMUM AREA OF THE COMPARTMENT.
18. 604.9.5.1 TOE CLEARANCE AT COMPARTMENTS. THE FRONT PARTITION AND AT LEAST ONE SIDE PARTITION SHALL PROVIDE A TOE CLEARANCE OF 9 INCHES MINIMUM ABOVE THE FLOOR AND EXTENDING 6 INCHES BEYOND THE COMPARTMENT SIDE FACE OF THE PARTITION, EXCLUSIVE OF PARTITION SUPPORT MEMBERS.
19. 604.9.6 GRAB BARS. GRAB BARS SHALL COMPLY WITH SECTION 609. SIDE WALL GRAB BARS COMPLYING WITH SECTION 604.5.1 LOCATED ON THE WALL CLOSEST TO THE WATER CLOSET, AND A REAR WALL GRAB BAR COMPLYING WITH SECTION 604.5.2, SHALL BE PROVIDED.
20. 604.10.3 DOORS. TOILET COMPARTMENT DOORS, INCLUDING DOOR HARDWARE, SHALL COMPLY WITH SECTION 404, EXCEPT IF THE APPROACH IS TO THE LATCH SIDE OF THE COMPARTMENT DOOR THE CLEARANCE BETWEEN THE DOOR SIDE OF THE COMPARTMENT AND ANY OBSTRUCTION SHALL BE 42 INCHES MINIMUM. THE DOOR SHALL BE SELF–CLOSING. A DOOR PULL COMPLYING WITH SECTION 404.2.6 SHALL BE PLACED ON BOTH SIDES OF THE DOOR NEAR THE LATCH. COMPARTMENT DOORS SHALL NOT SWING INTO THE REQUIRED MINIMUM AREA OF THE COMPARTMENT.
21. 604.10.4 GRAB BARS. GRAB BARS SHALL COMPLY WITH SECTION 609. SIDE WALL GRAB BARS COMPLYING WITH SECTION 604.5.1 SHALL BE PROVIDED ON BOTH SIDES OF THE COMPARTMENT.
22. 607.5 CONTROLS. CONTROLS, OTHER THAN DRAIN STOPPERS, SHALL BE PROVIDED ON AN END WALL, LOCATED BETWEEN THE BATHTUB RIM AND GRAB BAR, AND BETWEEN THE OPEN SIDE OF THE BATHTUB AND THE CENTERLINE OF THE WIDTH OF THE BATHTUB. CONTROLS SHALL COMPLY WITH SECTION 309.4.
23. 607.6 HAND SHOWER. A HAND SHOWER WITH A HOSE 59 INCHES MINIMUM IN LENGTH, THAT CAN BE USED AS BOTH A FIXED SHOWER HEAD AND AS A HAND SHOWER, SHALL BE PROVIDED. THE HAND SHOWER SHALL HAVE A CONTROL WITH A NONPOSITIVE SHUT–OFF FEATURE. WHERE PROVIDED, AN ADJUSTABLE HEIGHT HAND SHOWER MOUNTED ON A VERTICAL BAR SHALL BE INSTALLED SO AS TO NOT OBSTRUCT THE USE OF GRAB BARS.
24. 607.7 BATHTUB ENCLOSURES. ENCLOSURES FOR BATHTUBS SHALL NOT OBSTRUCT CONTROLS, FAUCETS, SHOWER AND SPRAY UNITS OR OBSTRUCT TRANSFER FROM WHEELCHAIRS ONTO BATHTUB SEATS OR INTO BATHTUBS. ENCLOSURES ON BATHTUBS SHALL OT HAVE TRACKS INSTALLED ON THE RIM OF THE BATHTUB.

ARCHITECT:

K2M DESIGN

Architecture, Engineering,
Interior Design,
Asset Management,
Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 5:40 PM

Drawing Size	Project #:
24x36	18070
Drawn By: LBB	Checked By: EHP

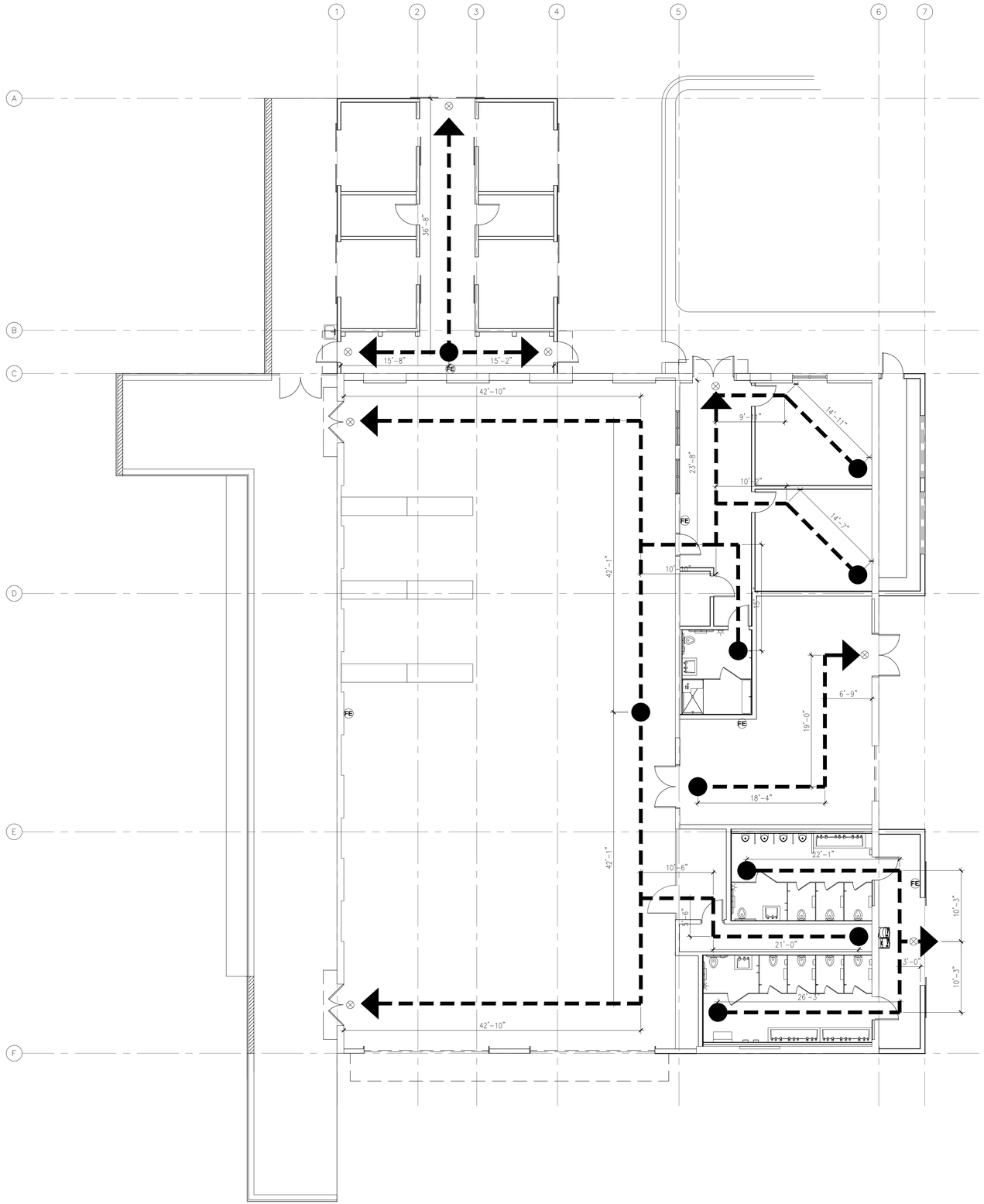
Title:
FLORIDA ACCESSIBLITY CODE

Sheet Number:
G0.1.2

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 – City of Key West – Truman Waterfront 1B\4-CDs\Drawings_General\2012_ADAAG.dwg, 3/21/2019 5:40 PM, scale: 1"=0" = 1'-0", bryan bubby



GENERAL NOTES

1. FIRE EXTINGUISHER LOCATIONS TO BE COORDINATION W/ FIRE MARSHAL OR AHJ
2. FIRE SUPPRESSION SYSTEM BY OTHERS (NOT REQUIRED)
3. SEE SHEET G0.0.2 FOR CODE INFORMATION

LEGEND

- CEILING MOUNTED INTERIOR LIT LED EXIT SIGN
- FE – INTERIOR FIRE EXTINGUISHER WALL MOUNTED 4'-8" ABOVE FINISHED FLOORING
- EMERGENCY STROBE LIGHT MOUNTED 80" ABOVE FINISHED FLOORING
- MOST REMOTE POINT IN ROOM
- TRAVEL DISTANCE

1 LIFE SAFETY PLAN

SCALE: 1/8"=1'-0"

0 8 16 24

GRAPHIC SCALE: 1/8" = 1'-0"

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:19 PM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
NC	AA

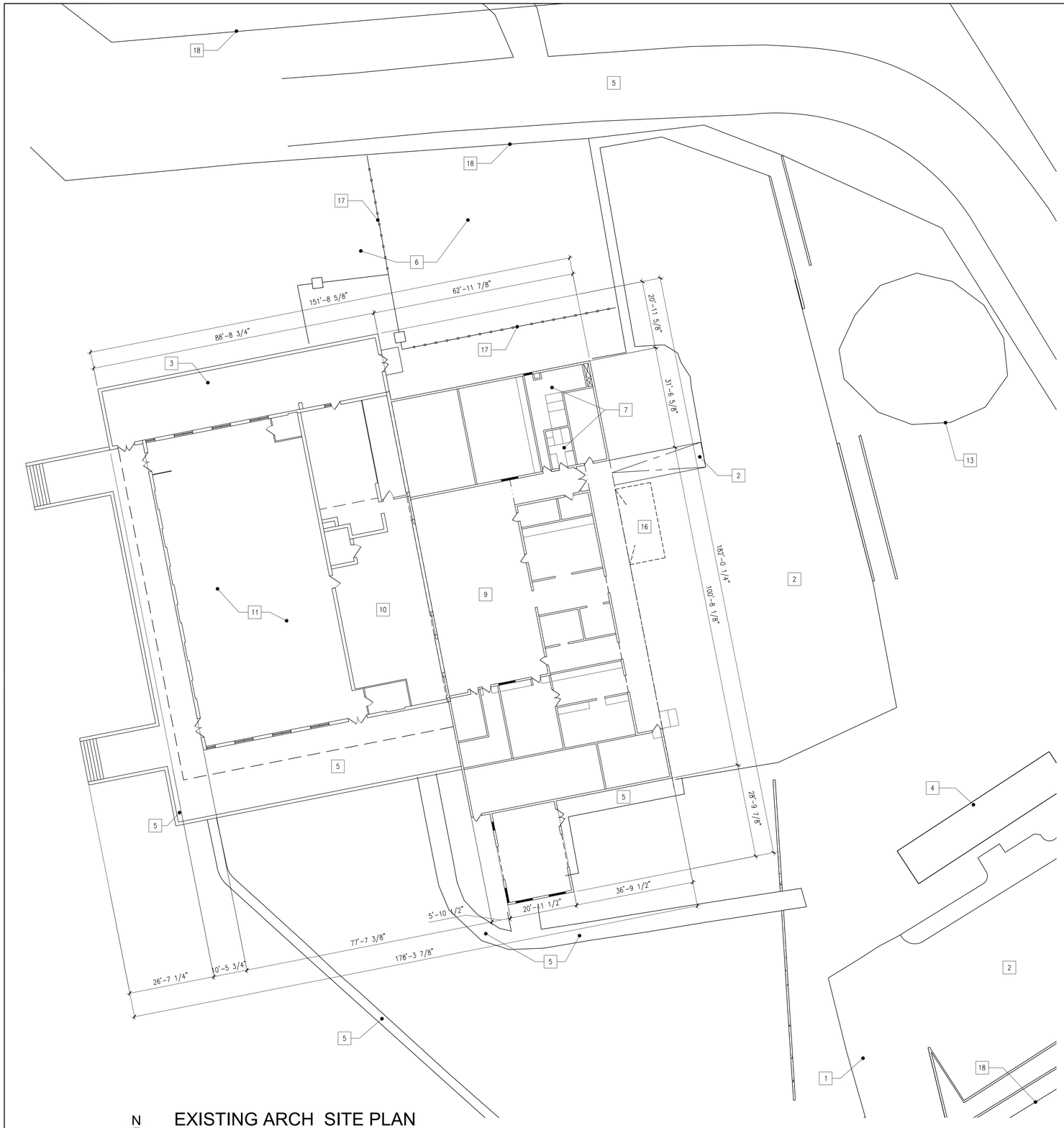
Title:
LIFE SAFETY PLAN

Sheet Number:
G0.2.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings_General\G0201.dwg, 3/21/2019 10:19 PM, scale: 1'-0" = 1'-0", erica poole



1 N

EXISTING ARCH SITE PLAN
FOR HARC REFERENCE ONLY - NOT FOR BIDDING

SCALE: 1/16" = 1'-0"

EXISTING BUILDING DESCRIPTION:

SQUARE FOOTAGES:
PUBLIC WORKS/PAL GYM – 13,012 SF
HORSE STABLES–1,467 SF
HORSE RUN–3,900 SF
BUILDING INFORMATION:
CMU WALLS–EXTERIOR
WOOD FRAME WALLS–INTERIOR
PRECAST DOUBLE TEE ROOF,LOW SLOPE (MEMBRANE)
STUCCO FINISH EXTERIOR
PAINTED FINISH INTERIOR
PRECAST DOUBLE TEE ROOF
CONCRETE SLAB FLOOR–EPOXIED

CODED NOTES

X

1 EXISTING DRIVEWAY
2 EXISTING PARKING LOT AREA
3 EXISTING HORSE STABLES
4 EXISTING CONSTRUCTION TRAILER
5 EXISTING WALKWAYS
6 EXISTING HORSE RUN
7 EXISTING BATHROOM
8 EXISTING RAMP
9 EXISTING PUBLIC WORKS STORAGE
10 EXISTING PAL WEIGHT GYM
11 EXISTING PAL BOXING GYM/MAT ROOM
12 EXISTING PERIMETER WALKWAY
13 EXISTING CORRAL
14 EXISTING OFFICE
15 EXISTING MESS HALL KITCHEN (DECOMISSIONED, STORAGE)
16 COMPOST BIN
17 EXISTING 2X WOOD HORSE RUN FENCING
18 EXISTING CHAIN LINK FENCING

NOTE: EXISTING DIMENSIONS OF BUILDING TO BE DEMOLISHED TO BE VERIFIED IN FIELD WHERE REQUIRED.

0 16 32 48
GRAPHIC SCALE: 1/16" = 1'-0"

ARCHITECT:
K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting
Key Largo, FL
Key West, FL
Marathon, FL
URL: www.k2mdesign.com
PROF. REG. AA26001059
Building Relationships Based on Trust and Results
Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:
STRUCTURAL ENGINEER:
Meridian Engineering LLC
CIVIL ENGINEER:
Perez Engineering & Development
IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:24 PM

Drawing Size	Project #:
24x36	18070
Drawn By: RV	Checked By: AA

Title:
EXISTING ARCHITECTURAL SITE PLAN

Sheet Number:
AE1.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

A:\2018\18070 – City of Key West – Truman Waterfront 1B\K-CD\Drawings\Arch\AE111.dwg, 3/21/2019 10:24 PM, scale: 1'-0" = 1'-0", eliza poole

1

N

PROPOSED/EXISTING SITE PLAN
FOR HARC REFENCE ONLY - NOT FOR BIDDING

SCALE: 1" = 20'-0"

GENERAL NOTES

1. FOR GENERAL REFERENCE ONLY – NOT FOR DEMO REFERENCE. SEE AD-SHEETS FOR DEMO INFORMATION. SEE SD-1.0 FOR STRUCTURAL DEMO.

PLAN LEGEND:

- TO BE DEMOLISHED
- EXISTING TO REMAIN

N

0 20 40 60

GRAPHIC SCALE: 1" = 20'-0"

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST

1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:24 PM

Drawing Size	Project #:
24x36	18070
Drawn By: RV	Checked By: AA

Title:
PROPOSED/ EXISTING SITE PLAN

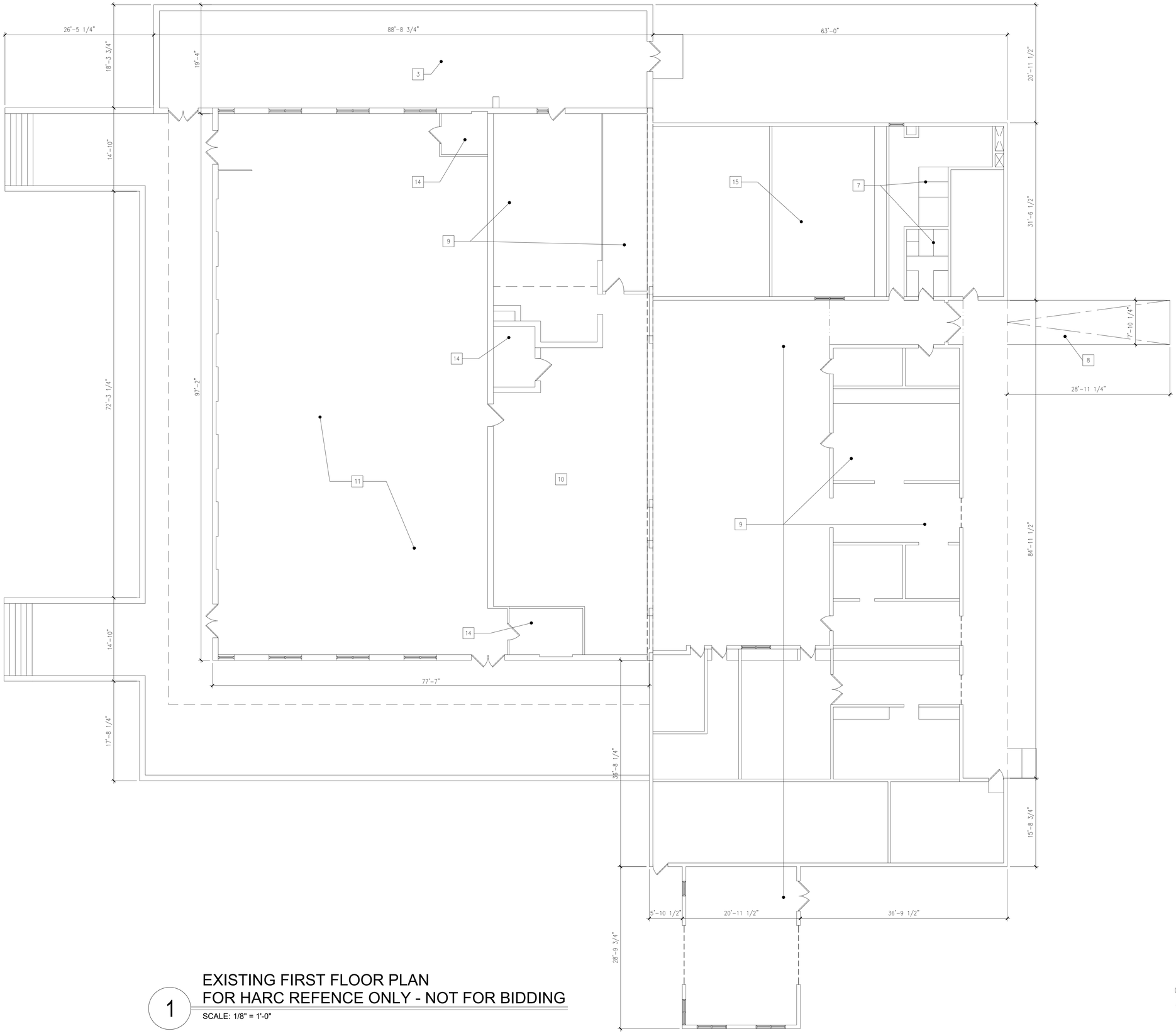
Sheet Number:

AE1.1.2

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 – City of Key West – Truman Waterfront 1B\4-CDs\Drawings\Arch\AE113.dwg, 3/21/2019 10:24 PM, scale: 1'-0" = 1'-0", erica poole



EXISTING FIRST FLOOR PLAN
FOR HARC REFENCE ONLY - NOT FOR BIDDING

1

SCALE: 1/8" = 1'-0"

0 8 16 24
GRAPHIC SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. EXISTING USES NOT ALL UTILITIZED.
2. KITCHEN EQUIPMENT NO LONGER CONNECTED OR FUNCTIONAL.
3. EXISTING AIR CONDITIONING SYSTEM FOR PUBLIC WORKS NON FUNCTIONAL.
4. NEW UNITS ON PAL GYM SIDE TO BE SALVAGED.

EXISTING BUILDING DESCRIPTION:

SQUARE FOOTAGES:
PUBLIC WORKS/PAL GYM – 13,012 SF
HORSE STABLES–1,467 SF
HORSE RUN–3,900 SF
BUILDING INFORMATION:
CMU WALLS–EXTERIOR
WOOD FRAME WALLS–INTERIOR
PRECAST DOUBLE TEE ROOF,LOW SLOPE (MEMBRANE)
STUCCO FINISH EXTERIOR
PAINTED FINISH INTERIOR
PRECAST DOUBLE TEE ROOF
CONCRETE SLAB FLOOR–EPOXIED

CODED NOTES X

1. EXISTING DRIVEWAY
2. EXISTING PARKING LOT AREA
3. EXISTING HORSE STABLES
4. EXISTING CONSTRUCTION TRAILER
5. EXISTING WALKWAYS
6. EXISTING HORSE RUN
7. EXISTING BATHROOM
8. EXISTING RAMP
9. EXISTING PUBLIC WORKS STORAGE
10. EXISTING PAL WEIGHT GYM
11. EXISTING PAL BOXING GYM/MAT ROOM
12. EXISTING PERIMETER WALKWAY
13. NOT USED
14. EXISTING OFFICE
15. EXISTING MESS HALL KITCHEN (DECOMISSIONED, STORAGE)

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:24 PM

Drawing Size	Project #:
24x36	18070
Drawn By: NC	Checked By: AA

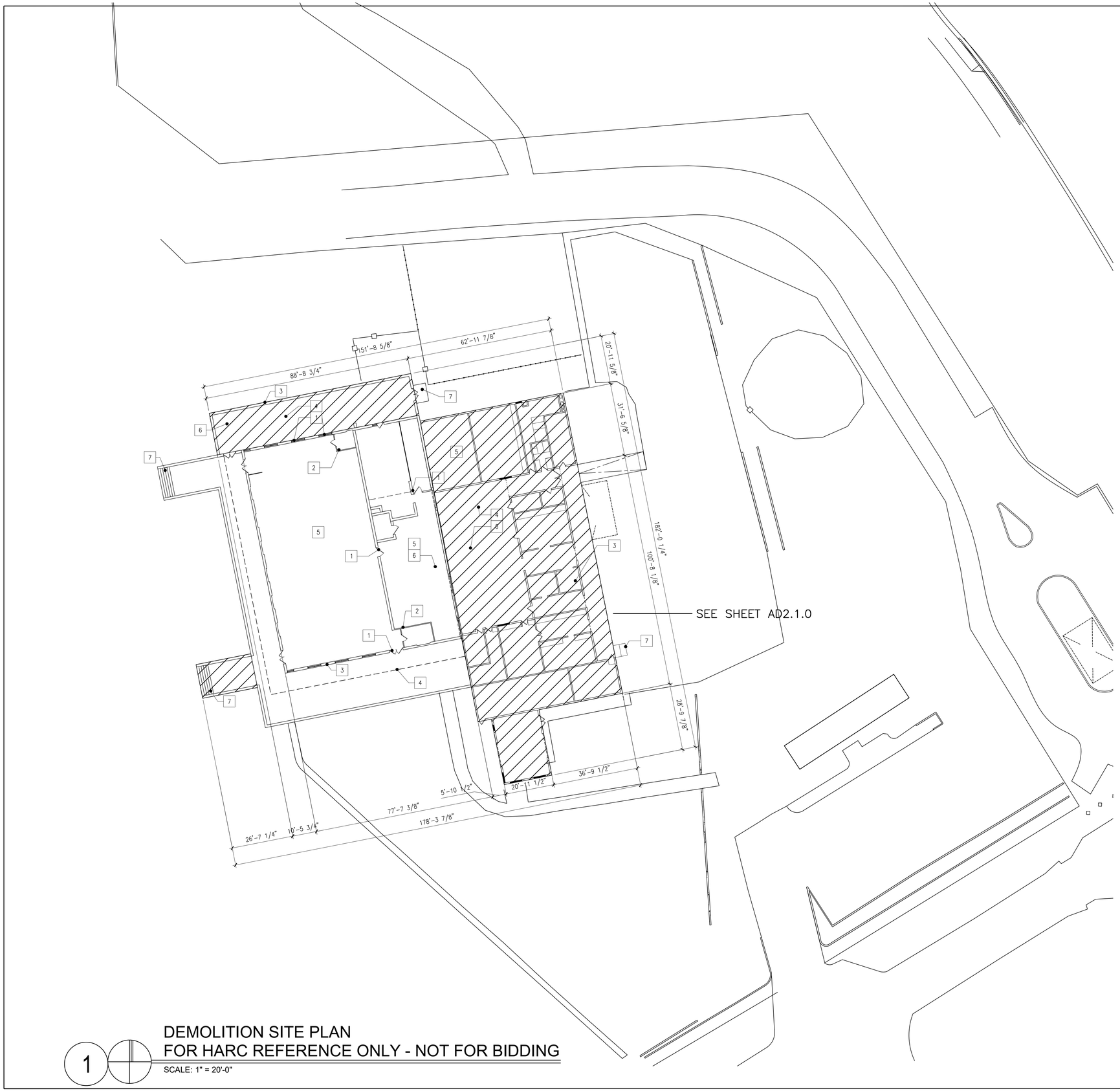
Title:
EXISTING
FIRST FLOOR PLAN

Sheet Number:

AE2.1.0

Date: March 22, 2019

©2018 by K2M Design, Inc.



DEMO CODED NOTES X

1. DEMO EXISTING DOORS AND WINDOWS
2. DEMO EXISTING INTERIOR WALL
3. DEMO EXISTING EXTERIOR WALL
4. DEMO EXISTING ROOF
5. DEMO EXISTING CABINETRY, COUNTERTOPS, AND APPLIANCES
6. DEMO EXISTING CONCRETE SLAB
7. REMOVE EXISTING SIDE CURB, PATHWAYS , STEPS & PAVEMENT

PLAN LEGEND:

- TO BE DEMOLISHED
- EXISTING TO REMAIN

0 20 40 60
GRAPHIC SCALE: 1" = 20'-0"

1

DEMOLITION SITE PLAN
FOR HARC REFERENCE ONLY - NOT FOR BIDDING

SCALE: 1" = 20'-0"

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:23 PM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
RV	AA

Title:

DEMOLITION SITE PLAN

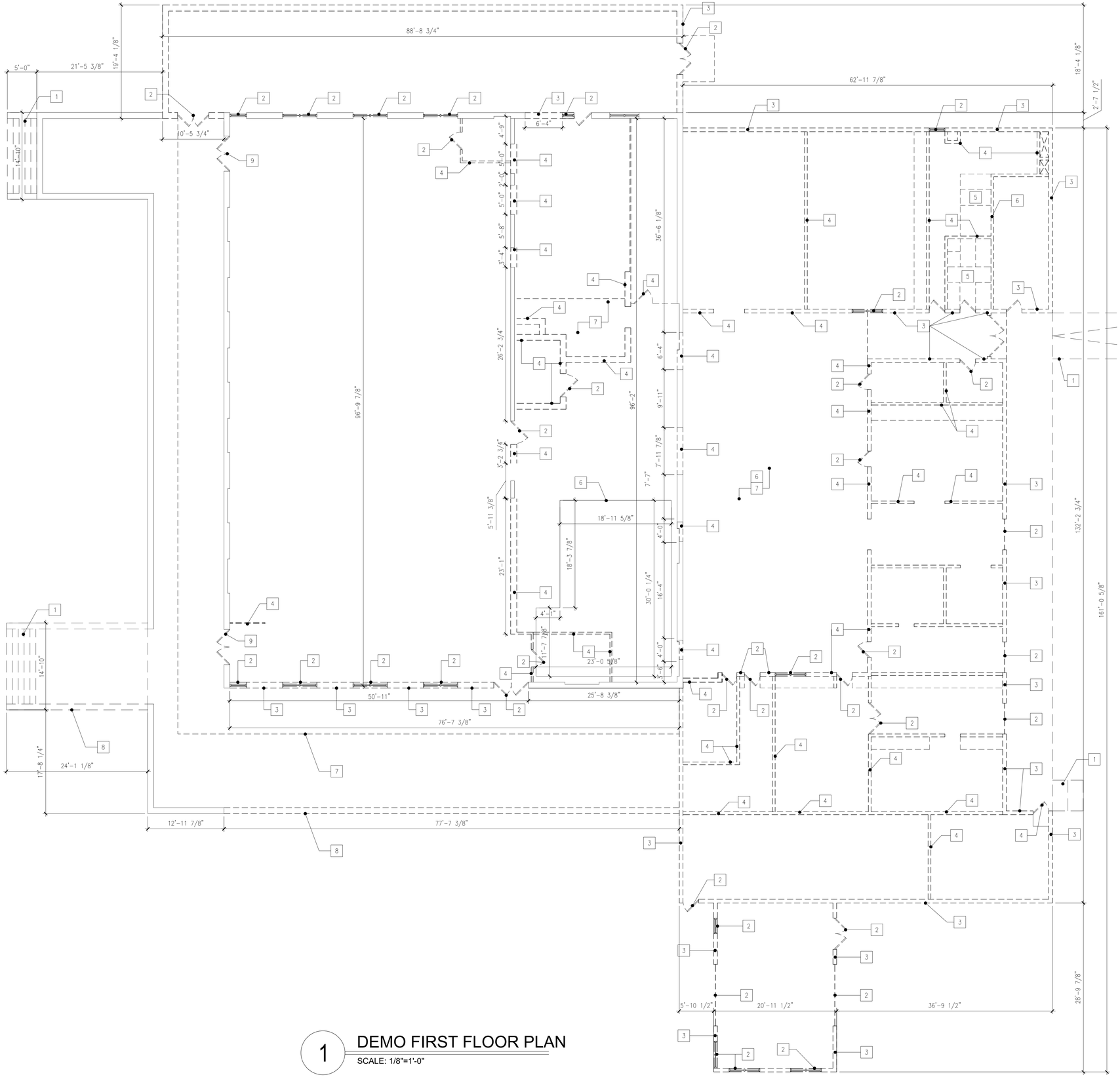
Sheet Number:

AD1.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\K-CDs\Drawings\Arch\AD1.1.1.dwg, 3/21/2019 10:23 PM, scale: 1"=20" = 1"=20", eliza poole



1 DEMO FIRST FLOOR PLAN

SCALE: 1/8"=1'-0"

GENERAL NOTES

1. DEBRIS TO BE REMOVED BY CONTRACTOR.
2. DEMO TO BE COMPLETE IN LOCATIONS NOTED – FOUNDATION TO ROOF, ASSOCIATED UTILITIES.
3. NOTIFY ARCHITECT/ENGINEER OF ALL UNFORSEEN CONDITIONS.
4. ALL EXISTING TO REMAIN TO BE PRESERVED. DO NOT DAMAGE EXISTING STRUCTURE TO REMAIN.
5. ALL FILL TO BE PRESERVED ON SITE FOR FUTURE USE.
6. SALVAGE ALL EXISTING HVAC/PLUMBING EQUIPMENT FOR REVIEW BY CITY. CITY TO REPURPOSE AS NEEDED AT OTHER SITES.
7. SEE SD-1.0 FOR STRUCTURAL DEMO
8. ABANDON ALL EXISTING FLOOR DRAINS IN CURRENT PAL EQUIPMENT GYM.
9. ALL WINDOWS AND DOORS TO BE DEMOLISHED
10. SEE SD-1.0 FOR ADDITIONAL STRUCTURE DETAILS

CODED NOTES

X

1	DEMO EXISTING STAIRS / RAMP
2	DEMO EXISTING WINDOW/DOORS(ALL)
3	DEMO PORTION OF EXTERIOR WALL
4	DEMO INTERIOR WALL AS SHOWN
5	DEMO EXISTING BATHROOM+KITCHEN CABINETS,COUNTERTOPS,FIXTURES,AND APPLIANCES
6	DEMO SLAB AND PREPARE SURFACE FOR NEW SLAB
7	DEMO ROOF
8	DEMO SLAB
9	DEMO DOOR AND REPLACING THEM WITH IMPACT RATED

GRAPHIC SCALE: 1/8" = 1'-0"

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST

1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:23 PM

Drawing Size	Project #:
24x36	18070
Drawn By: NC	Checked By: AA

Title:

DEMOLITION
FIRST FLOOR PLAN

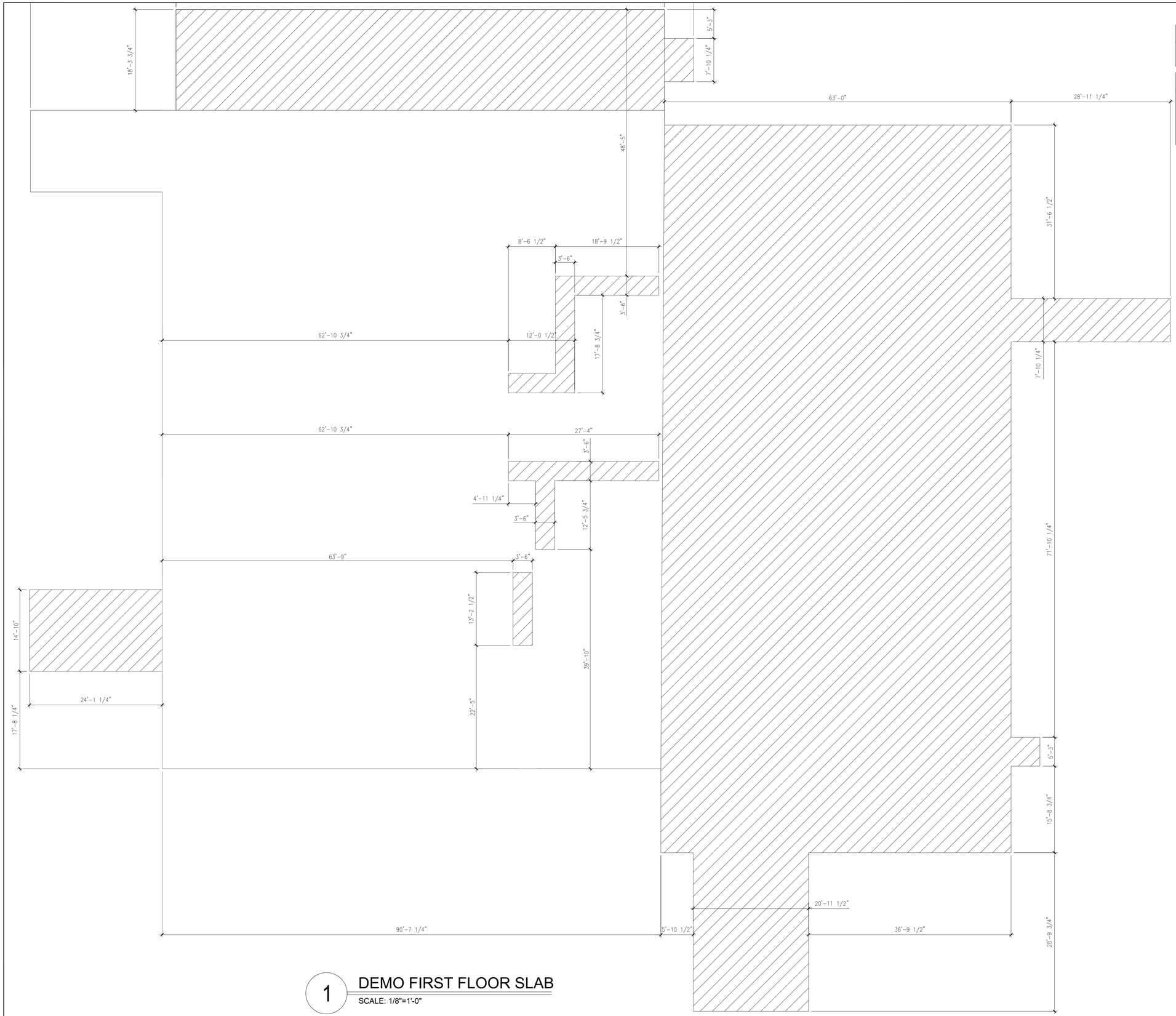
Sheet Number:

AD2.1.0

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 – City of Key West – Truman Waterfront 1B\4-CDs\Drawings\Arch\AD2.1.0.dwg, 3/21/2019 10:23 PM, scale: 1"=1'-0", erica poole



1 DEMO FIRST FLOOR SLAB

SCALE: 1/8"=1'-0"

GENERAL NOTES

1. SEE SHEET SD-1.0 FOR ADDITIONAL DEMO DETAILS

LEGEND

- EXISTING FOUNDATION SLAB TO BE REMOVED
- EXISTING FOUNDATION SLAB TO REMAIN

0 8 16 24

GRAPHIC SCALE: 1/8" = 1'-0"

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST

1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:23 PM

Drawing Size	Project #:
24x36	18070
Drawn By: NC	Checked By: AA

Title:

DEMOLITION
FIRST FLOOR
SLAB PLAN

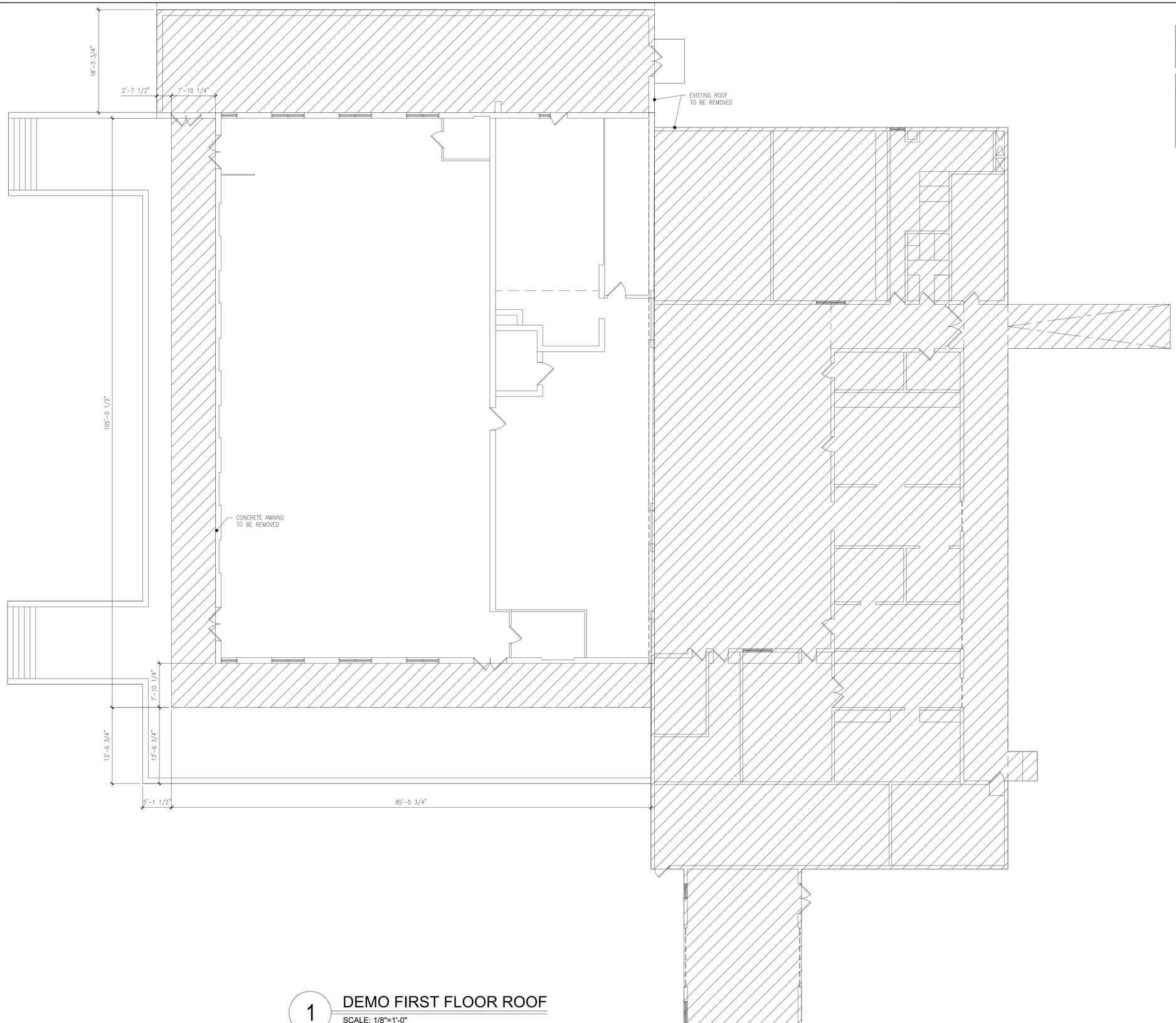
Sheet Number:

AD2.2.0

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CD\Drawings\Arch\AD220.dwg, 3/21/2019 10:23 PM, scale: 1'-0" = 1'-0", erica poole



1 DEMO FIRST FLOOR ROOF

SCALE: 1/8"=1'-0"

GENERAL NOTES

1. SEE SHEET SD-1.0 FOR ADDITIONAL DEMO DETAILS

LEGEND

EXISTING ROOF TO BE REMOVED

EXISTING ROOF TO REMAIN

0 8 16 24

GRAPHIC SCALE: 1/8" = 1'-0"

ARCHITECT:

K2M DESIGN

Architecture, Engineering,
Interior Design,
Asset Management,
Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:23 PM

Drawing Size	Project #:
24x36	18070
Drawn By: NC	Checked By: AA

Title:

DEMOLITION
FIRST FLOOR
ROOF PLAN

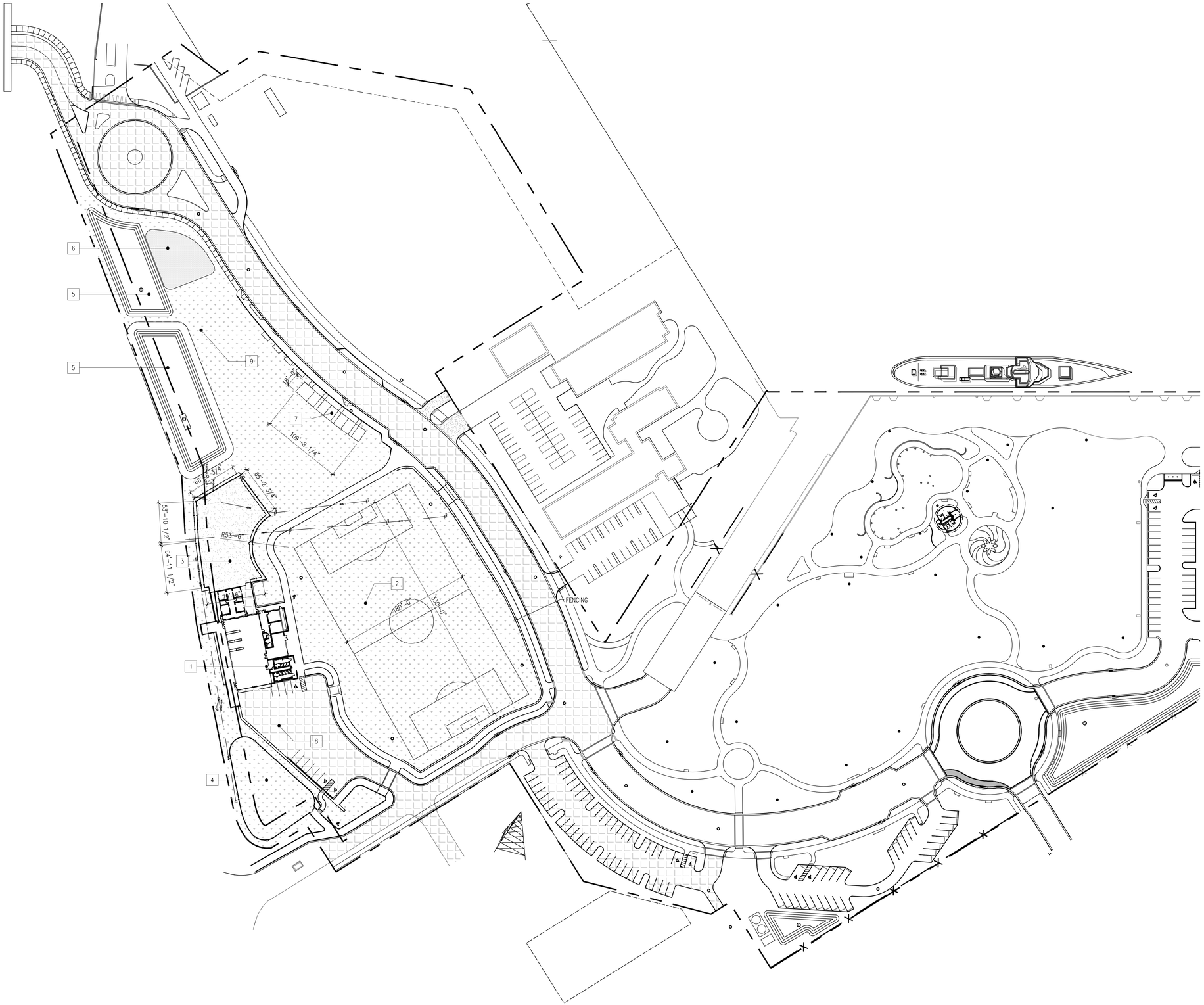
Sheet Number:

AD2.3.0

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\K-CD\Drawings\Arch\AD230.dwg, 3/21/2019 10:23 PM, scale: 1'-0" = 1'-0", erica poole



1 N

PROPOSED ARCHITECTURAL SITE PLAN

SCALE: 1/64" = 1'-0"

GENERAL NOTES

1. NEW FENCING AND SITE LIGHT POLES THROUGHOUT TO MATCH EXISTING ALREADY PRESENT AT THE TRUMAN WATERFRONT PARK DEVELOPMENT.
2. HORSE STABLE FENCING TO BE TWO-FOLD
   - -EXTERIOR FENCLINE MATCHING EXISTING
   - -OFFSET 2' INWARDS TO BE BARN FENCING FOR HORSE SEPARATION FROM PUBLIC CONTACT

CODED NOTES

X

1	PUBLIC WORKS BUILDING W/ BATHROOMS, CONCESSIONS STAND, HORSE STABLES
2	SOCCER FIELD (59,500 SQ FT)
3	HORSE RUN (10,390 SQ FT)
4	DOG PARK (9, 880 SQ FT)
5	EXISTING RETENTION POND
6	FRUIT TREE GROVE (4,912 SQ FT)
7	EXISTING PARKING TO REMAIN
8	NEW PARKING LOT/STAGING AREA (16, 098 SQ FT)
9	NEW GRASS FIELD

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST

1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:25 PM

Drawing Size	Project #:
24x36	18070
Drawn By: BK	Checked By: AA

Title:

PROPOSED ARCHITECTURAL SITE PLAN

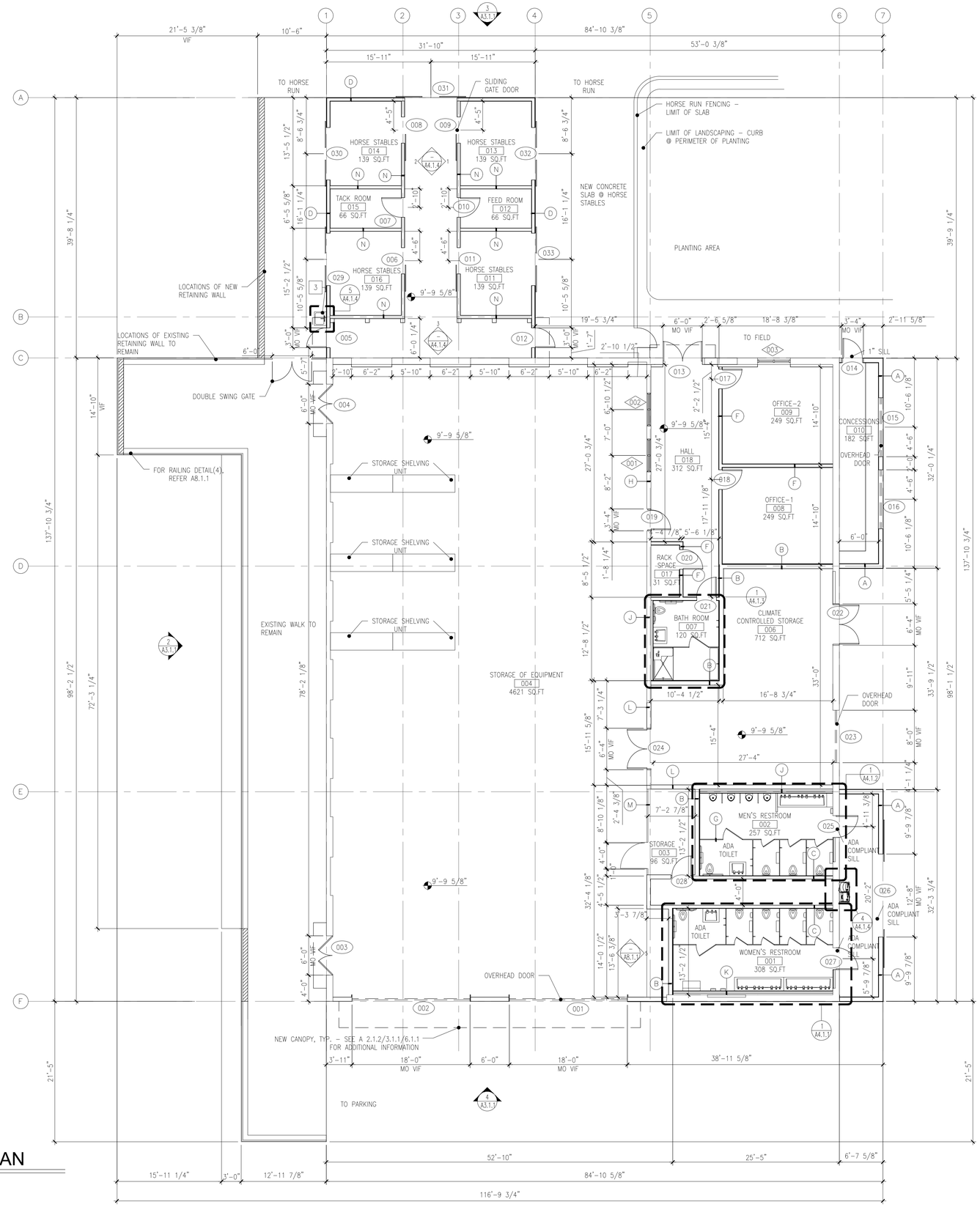
Sheet Number:

A1.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\K-CDA\Drawings\Arch\A1111.dwg, 3/21/2019 10:25 PM, scale: 1'-0" = 1'-0", eliza poole



1 FIRST FLOOR PLAN

SCALE: 1/8"=1'-0"

GENERAL NOTES

1. SHELVING UNITS BY OTHERS – SEE SPEC FOR EXPANDED INFORMATION.
2. RAILING TO MATCH EXISTING STYLE/TYPE OF TRUMAN WATERFRONT PARK EXISTING RAILS.
3. SEE A9.1.1 FOR WALL SCHEDULE AND DETAILS
4. SEE A6.1.1 FOR ARCHITECTURAL DETAILS.
5. SEE STRUCTURAL FOR LOCATIONS OF NEW SLAB
6. 2" STEP DOWN SILL @ ALL EXTERIOR DOORS – U.N.O.
7. REPAINT ALL EXISTING TO REMAIN INTERIOR WALLS AT PUBLIC WORKS STORAGE.

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST

1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:27 PM

Drawing Size	Project #:
24x36	18070
Drawn By: NC	Checked By: AA

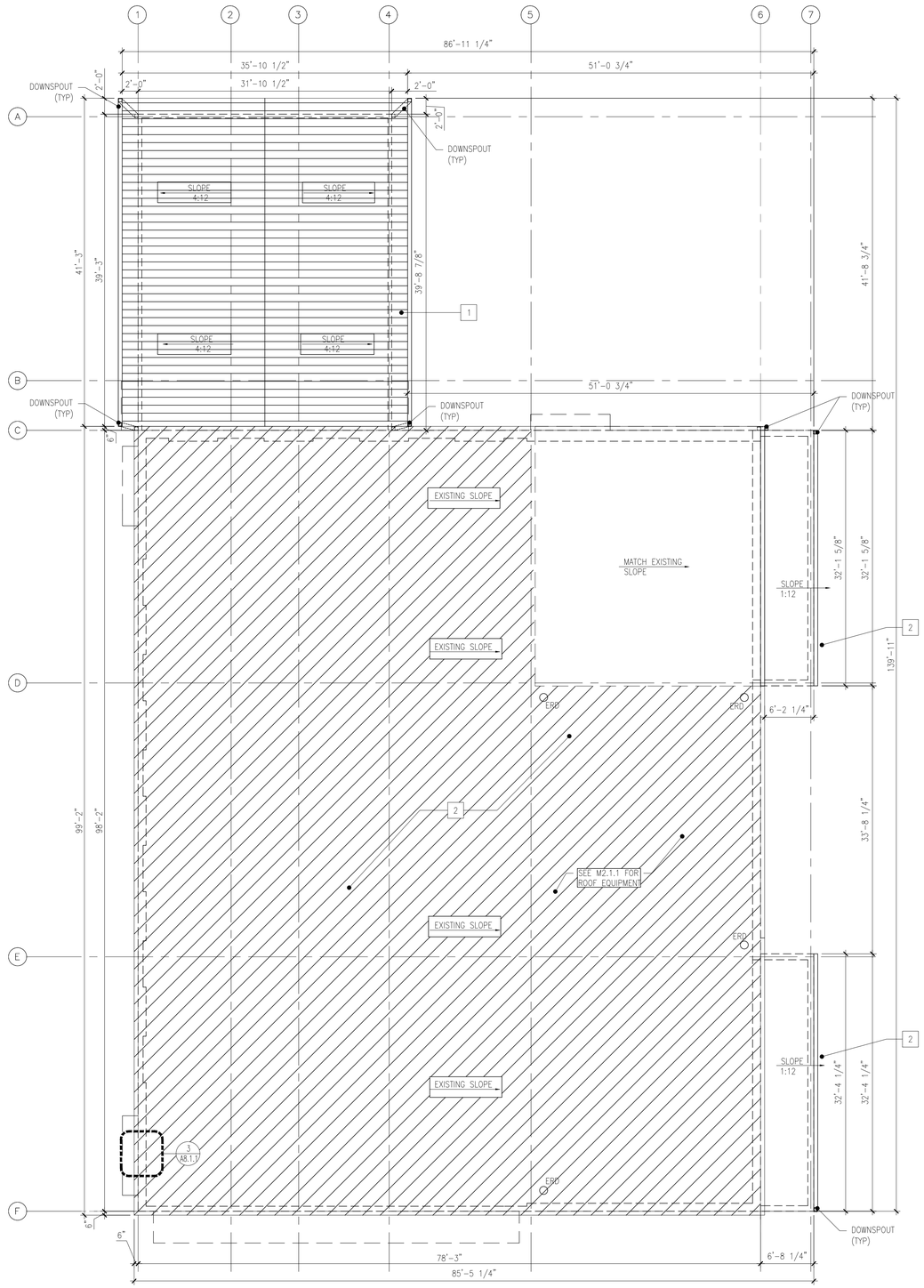
Title:
FIRST FLOOR PLAN

Sheet Number:

A2.1.0

Date: March 22, 2019

©2018 by K2M Design, Inc.



1 ROOF PLAN

SCALE: 1/8"=1'-0"

GENERAL NOTES

1. EXISTING ROOF TO RECEIVE NEW MEMBRANE ROOFING.
2. EXISTING ROOF DRAINS TO REMAIN (ERD). CONTRACTOR TO VFY DRAINAGE LOCATION. CAP OFF EXISTING ROOF VENTS TO BE ABANDONED.
3. MATCH EXISTING DOUBLE TEE OVERHANG DETAIL AT NEW RAISED ROOF.
4. GUTTER TO BE SEAMLESS PER SPEC, MATCH ROOFING.
5. GUTTER TO PAVEMENT BELOW – CORE & TRENCH – FILL W/ 8" GRAVEL FOR DRAINAGE TO SUBSOIL BELOW.
6. SEE SHEET M2.1.1 FOR MECHANICAL ROOF PLAN

CODED NOTES

X

1 METAL STANDING SEAM ROOF, INSTALL PER MANUF. SPECS

2 MEMBRANE ROOF, INSTALL PER MANUF. SPECS

LEGEND

EXISTING ROOF

NEW ROOF TO BE INSTALLED

0 8 16 24

GRAPHIC SCALE: 1/8" = 1'-0"

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/27/2019 11:31 AM

Drawing Size	Project #:
24x36	18070
Drawn By: NC	Checked By: AA

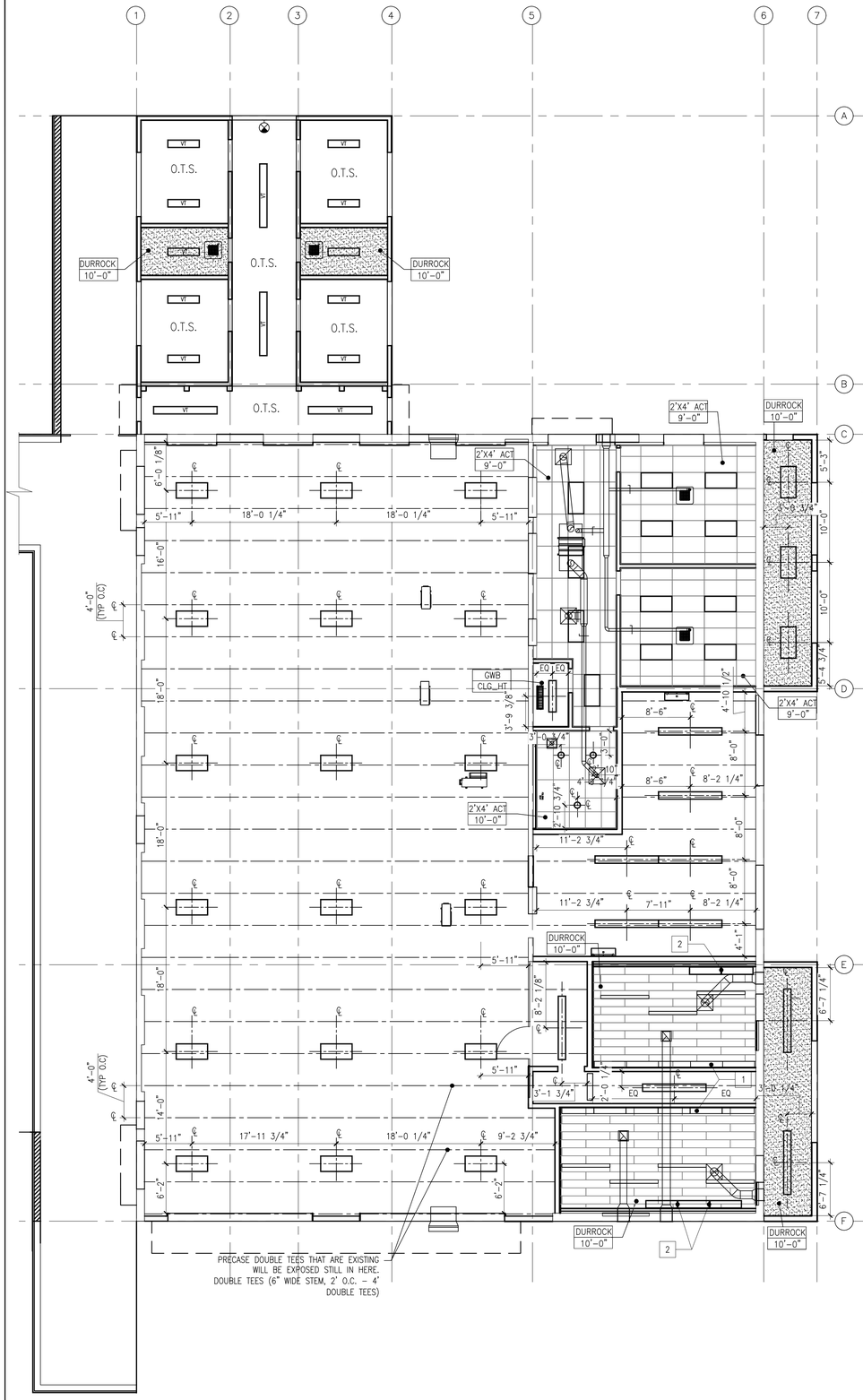
Title:
ROOF PLAN

Sheet Number:

A2.1.2

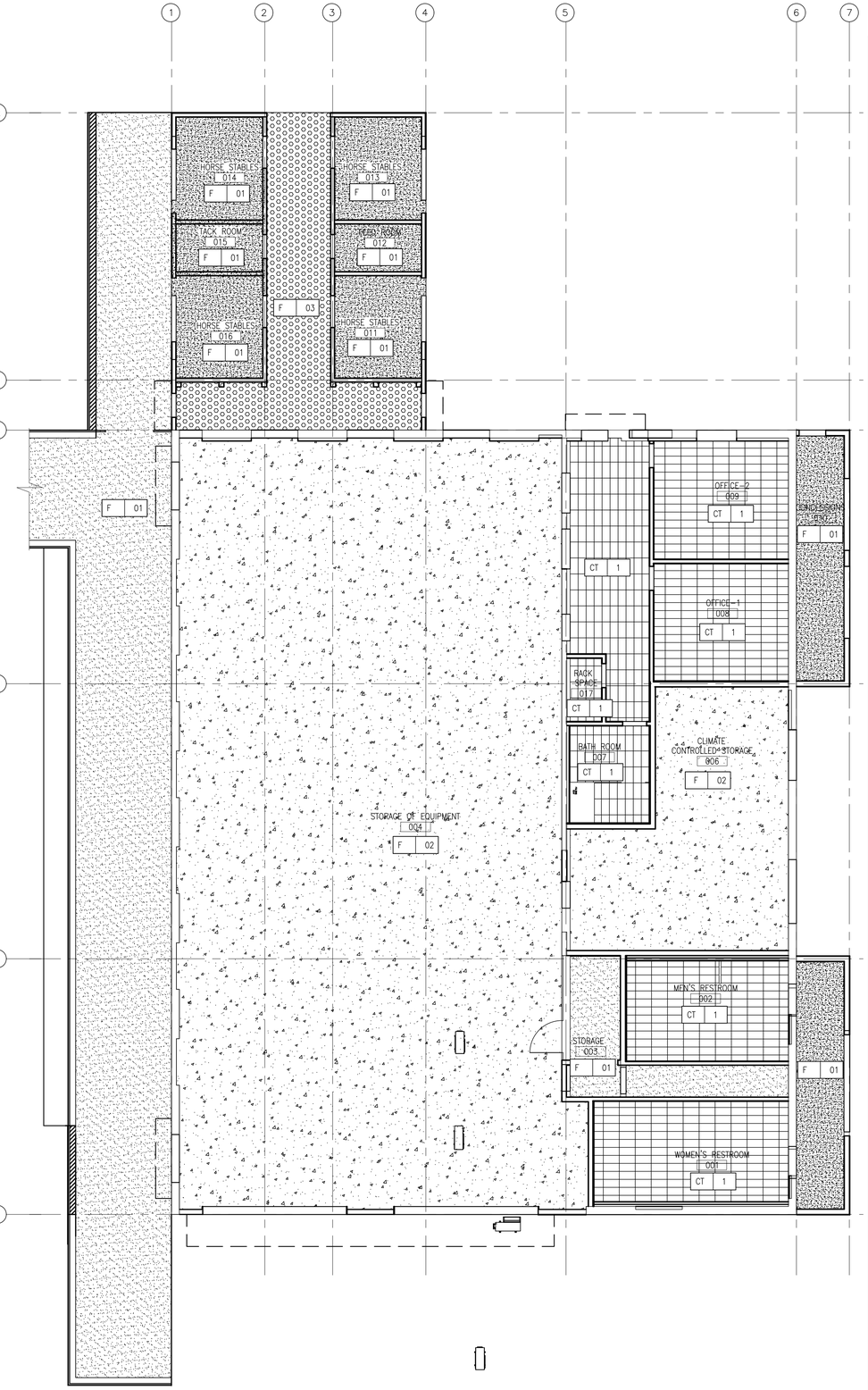
Date: March 22, 2019

©2018 by K2M Design, Inc.



1 REFLECTED CEILING PLAN

SCALE: 1/8"=1'-0"



2 FINISH FLOOR PLAN

SCALE: 1/8"=1'-0"

CEILING LEGEND:

- NEW RETURN AIR. REFER TO MECH.
- NEW SUPPLY AIR. REFER TO MECH.
- NEW 2X4 CEILING GRID
- RECESSED LED DOWNLIGHT REFER TO ELECTRICAL PLANS
- LED HIGH BAY LIGHT. REFER TO ELECTRICAL PLANS.
- SURFACE MOUNTED LENSE STRIP LIGHT. REFER TO ELECTRICAL PLANS.
- SURFACE MOUNTED LENSE STRIP LIGHT. REFER TO ELECTRICAL PLANS.
- VT — SURFACE MOUNTED VAPORTITE LIGHT. REFER TO ELECTRICAL PLANS.
- NEW 8' UTILITY LIGHT. REFER TO ELECTRICAL PLANS.
- CLG_TYP — CEILING TYPE
- CLG_HT — CEILING HEIGHT

O.T.S. = OPEN TO STRUCTURE
A.C.T. = ACOUSTICAL CEILING TILE
E.T.R. = EXISTING TO REMAIN

FL 00 FLOOR FINISH LEGEND

F 01	CONCRETE
F 02	EPOXY PAINTED CONCRETE
F 03	CONCRETE W/METAL DIAMOND GRATE
CT 1	12X24 TILE

CODED NOTES X

1. COVE LIGHT; REFER TO ELECTRICAL PLANS
2. VANITY FIXTURE; REFER TO ELECTRICAL PLANS

0 8 16 24
GRAPHIC SCALE: 1/8" = 1'-0"

ARCHITECT:
K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting
Key Largo, FL
Key West, FL
Marathon, FL
URL: www.k2mdesign.com
PROF. REG. AA26001059
Building Relationships Based on Trust and Results
Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:
STRUCTURAL ENGINEER: Meridian Engineering LLC
CIVIL ENGINEER: Perez Engineering & Development
IRRIGATION: Blue Island Lighting & Irrigation Inc.

Submissions:
DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL 33040

PLOTTED: 3/21/2019 10:30 PM

Drawing Size	Project #:
24x36	18070
Drawn By: XXX	Checked By: XXX

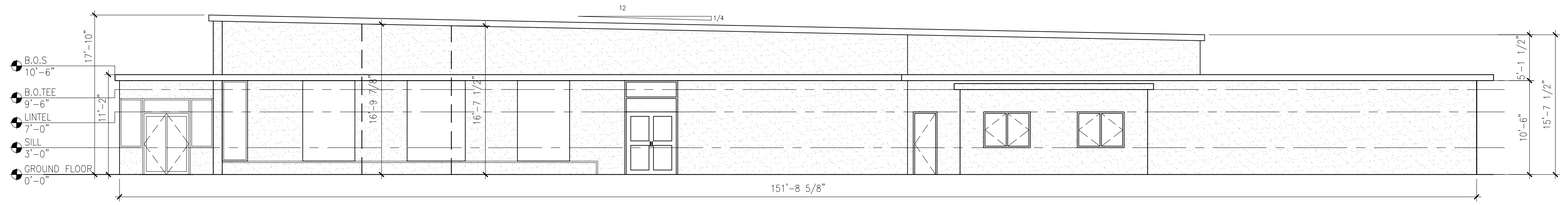
Title: REFLECTED CEILING PLAN & FINISH FLOOR PLAN

Sheet Number: A2.2.1

Date: March 22, 2019

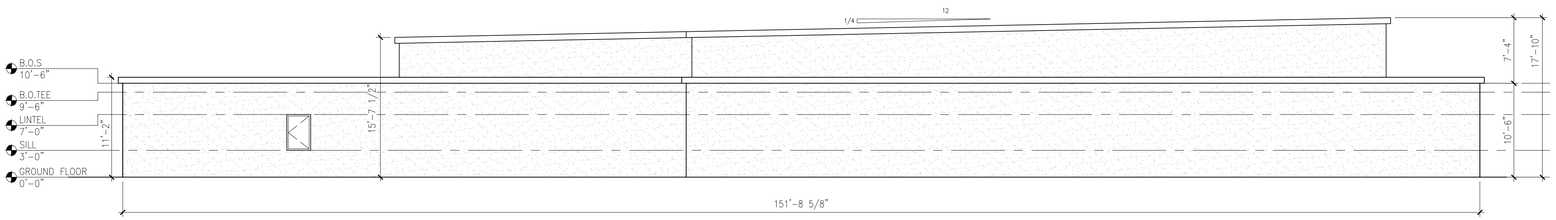
©2018 by K2M Design, Inc.

z:\2018\18070 – City of Key West – Truman Waterfront 1B\K-CDs\Drawings\Arch\A221.dwg, 3/21/2019 10:30 PM, scale: 1'-0" = 1'-0", eric poole



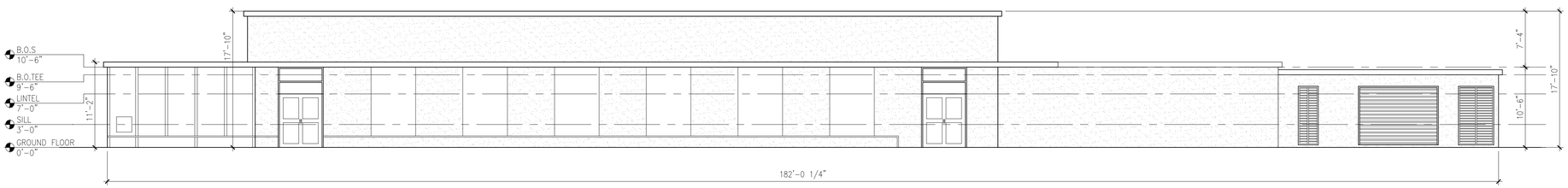
4 SOUTH ELEVATION

SCALE: 1/8"=1'-0"



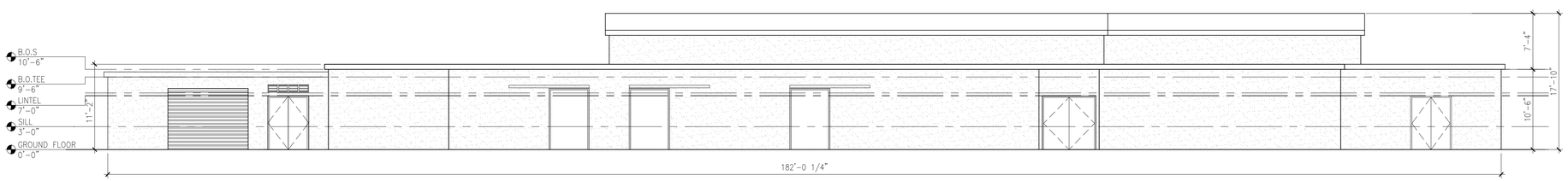
3 NORTH ELEVATION

SCALE: 1/8"=1'-0"



2 WEST ELEVATION

SCALE: 1/8"=1'-0"



1 EAST ELEVATION
FOR HARC REFERENCE ONLY - NOT FOR BIDDING

SCALE: 1/8"=1'-0"

0 8 16 24
GRAPHIC SCALE: 1/8" = 1'-0"

ARCHITECT:

K2M DESIGN

Architecture, Engineering,
Interior Design,
Asset Management,
Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 5:41 PM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
BK	AA

Title:
EXISTING
EXTERIOR
ELEVATIONS

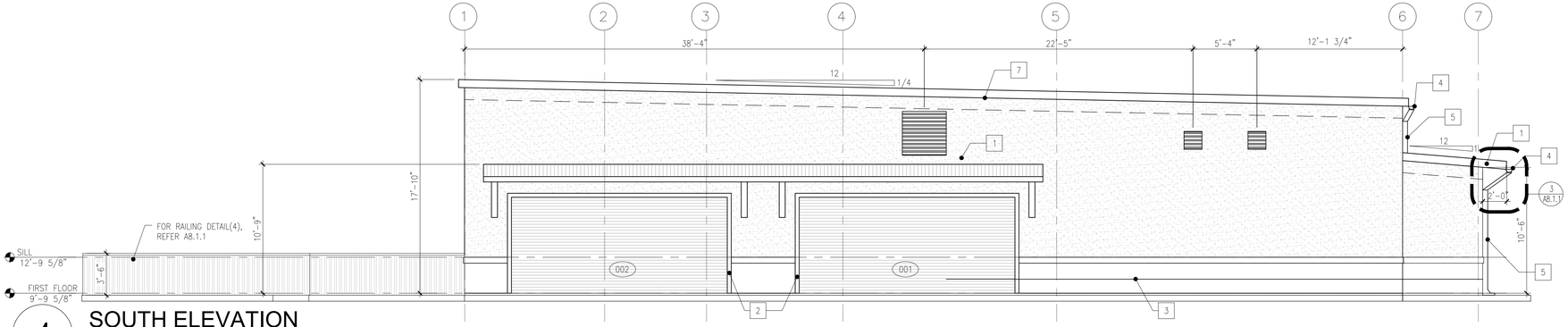
Sheet Number:

AE3.1.1

Date: March 22, 2019

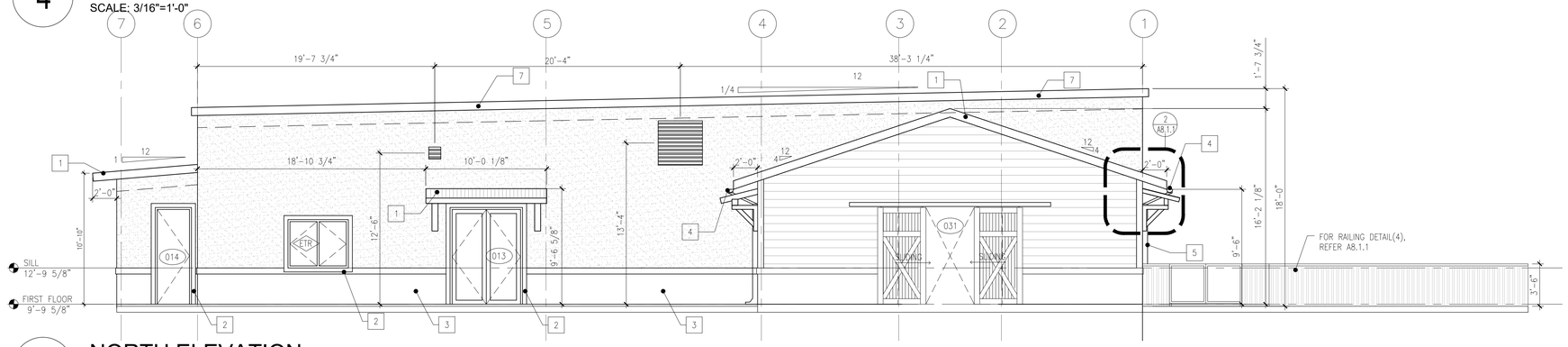
©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Arch\AE311.dwg, 3/21/2019 5:41 PM, scale: 1'-0" = 1'-0", bryan bushy



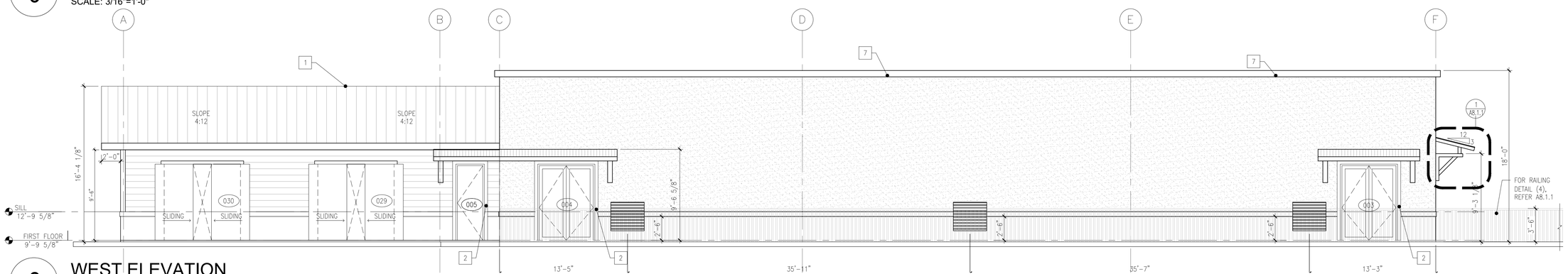
4 SOUTH ELEVATION

SCALE: 3/16"=1'-0"



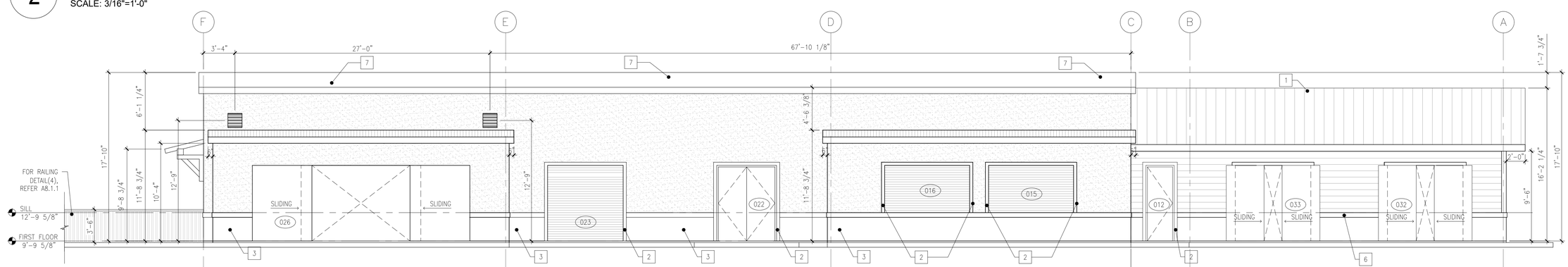
3 NORTH ELEVATION

SCALE: 3/16"=1'-0"



2 WEST ELEVATION

SCALE: 3/16"=1'-0"



1 EAST ELEVATION

SCALE: 3/16"=1'-0"

GRAPHIC SCALE: 3/16" = 1'-0"

GENERAL NOTES

1. EXISTING DOUBLE TEE ROOF (ABOVE PAL GYM) TO REMAIN
2. REMAING PORTIONS OF LOWER ROOF TO BE RAISED TO MATCH LINE OF EXISTING UPPER DOUBLE TEE ROOF. VIF.
3. REFINISH EXISTING TO REMAIN EXTERIOR WALLS – STUCCO PATCH, REPAINT, NEW WATERTABLE LINE.
4. WATER TABLE TO MATCH EXISTING @ FULL PERIMETER OF BUILDING
5. PATCH & REPAIR EXISTING STUCCO FINISH OR REQUIRED PAINT.

CODED NOTES

X

1	5V CRIMP METAL ROOF
2	1"X4" STUCCO TRIM,TYP
3	SMOOTH STUCCO
4	GUTTER
5	DOWN SPOUT
6	HARDI-BOARD SIDING
7	MEMBRANE ROOF

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST

1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 5:41 PM

Drawing Size	Project #:
24x36	18070
Drawn By: NC	Checked By: AA

Title:

EXTERIOR ELEVATIONS

Sheet Number:

A3.1.1

Date: March 22, 2019

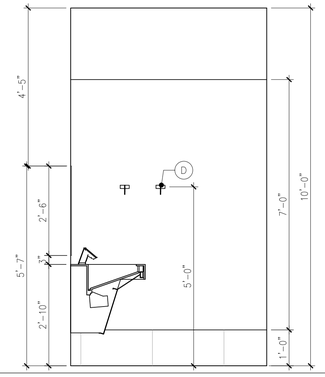
©2018 by K2M Design, Inc.

J:\2018\18070 – City of Key West – Truman Waterfront 1B\4-CD\Drawings\Arch\A311.dwg, 3/21/2019 5:41 PM, scale: 1'-0" = 1'-0", bryan busby

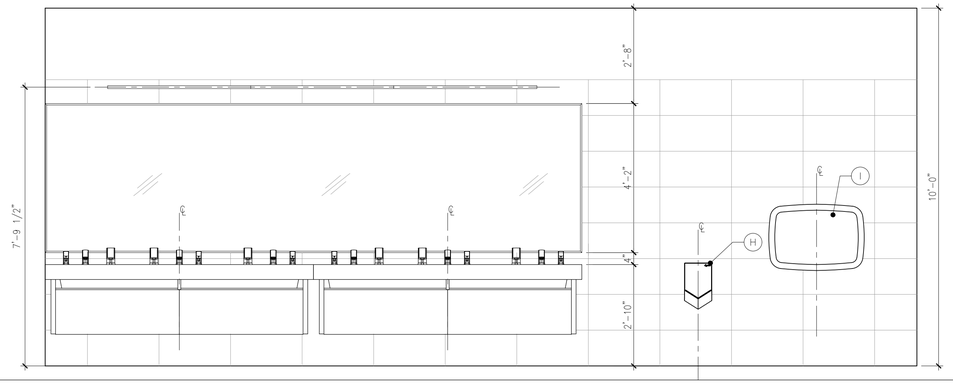
ACCESSORY SCHEDULE

- (A) TOILET PAPER DISPENSER (ADA COMPLIANT)
- (B) UNDER-COUNTER SOAP DISPENSERS
- (C) SANITARY NAPKIN RECEPTACLE
- (D) COAT BUMPER HOOK
- (E) 42" GRAB BAR 1-1/2"ø
- (F) 36" GRAB BAR 1-1/2"ø
- (G) TOILET SEAT COVER DISPENSER
- (H) HAND DRYER
- (I) BABY CHANGING STATION

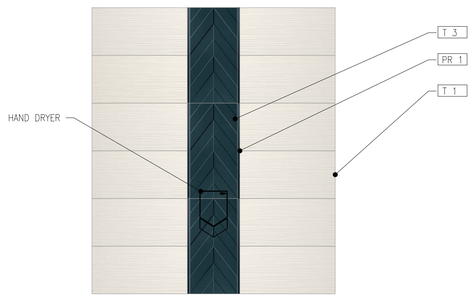
NOT USED



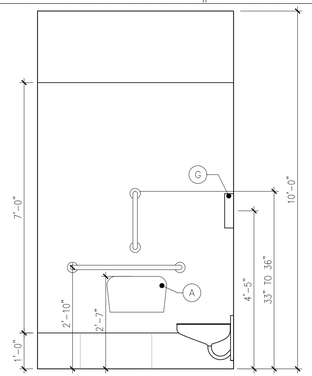
INTERIOR ELEVATION-WOMEN'S RESTROOMS#001 SCALE: 1/2"=1'-0" 7



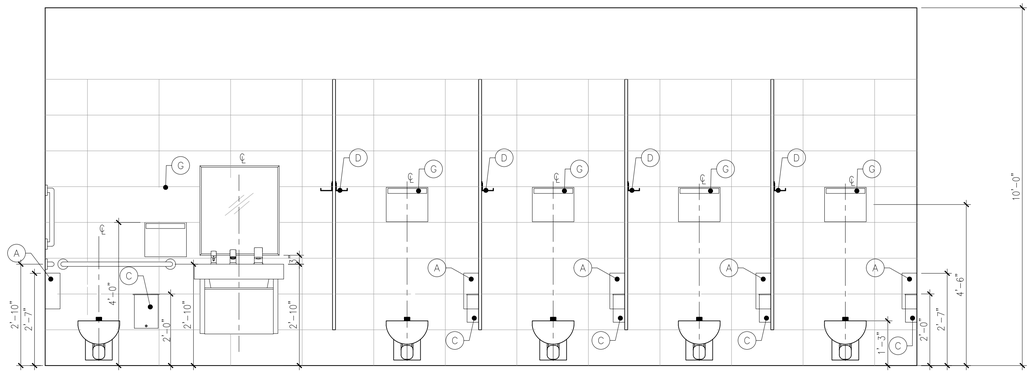
INTERIOR ELEVATION-WOMEN'S RESTROOMS#001 SCALE: 1/2"=1'-0" 3



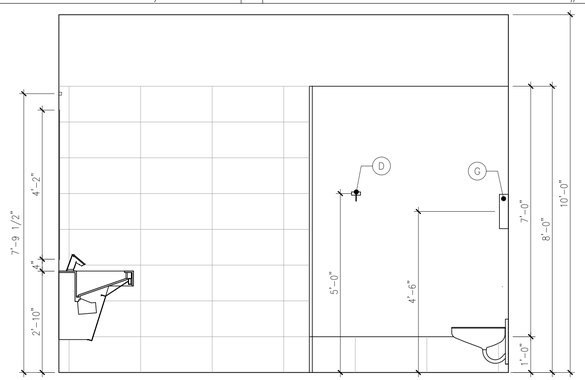
ACCENT TILES PATTERN SCALE: 1/2"=1'-0" 6



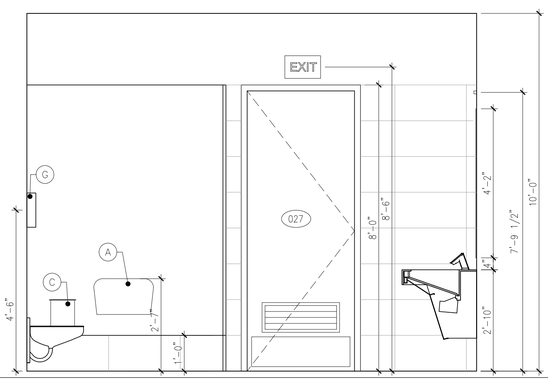
INTERIOR ELEVATION-WOMEN'S RESTROOMS#001 SCALE: 1/2"=1'-0" 6



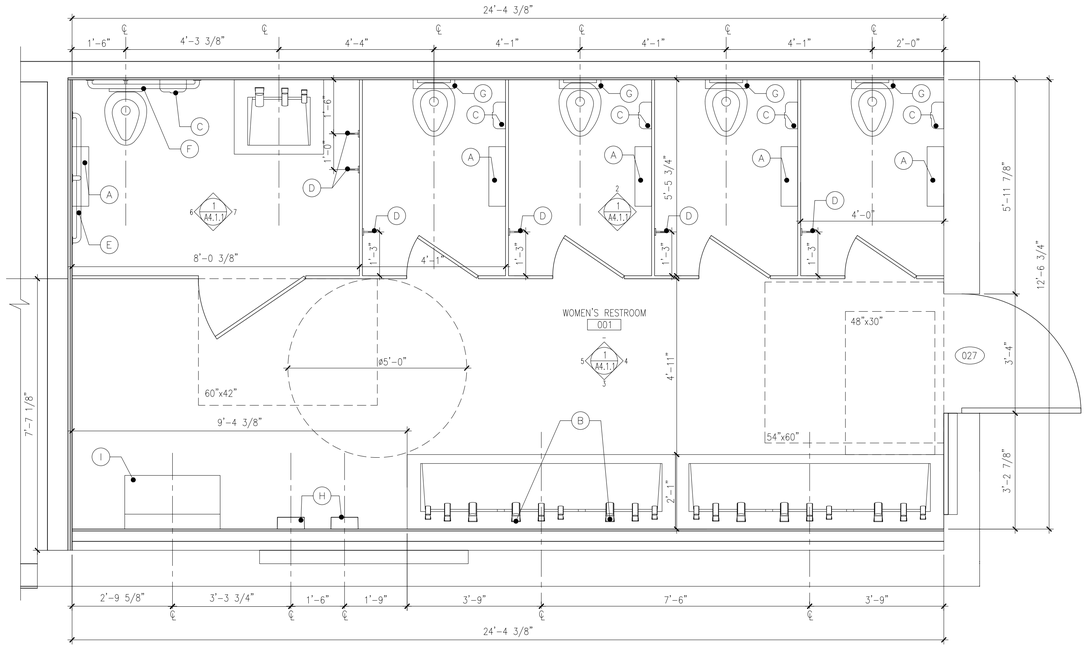
INTERIOR ELEVATION-WOMEN'S RESTROOMS#001 SCALE: 1/2"=1'-0" 2



INTERIOR ELEVATION-WOMEN'S RESTROOMS#001 SCALE: 1/2"=1'-0" 5



INTERIOR ELEVATION-WOMEN'S RESTROOMS#001 SCALE: 1/2"=1'-0" 4



WOMEN'S RESTROOM #001 SCALE: 1/2"=1'-0" 1

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST

1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 5:41 PM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
RV	AA

Title:

WOMEN'S RESTROOM ENLARGED PLAN

Sheet Number:

A4.1.1

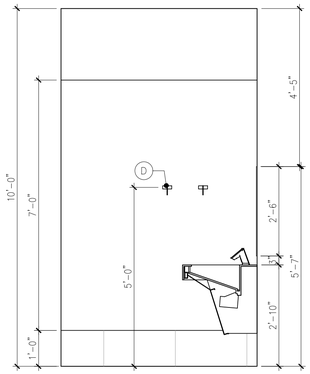
Date: March 22, 2019

©2018 by K2M Design, Inc.

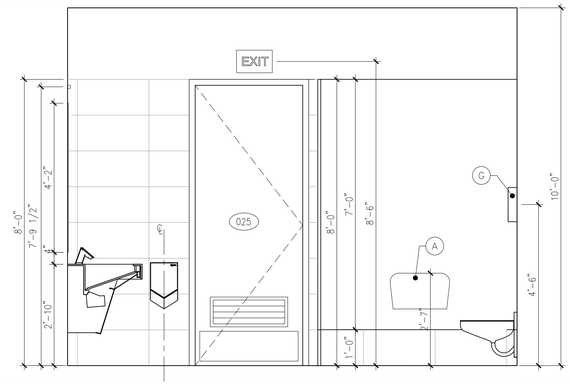
J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Arch\A4111.dwg, 3/21/2019 5:41 PM, scale: 1"=10" = 1"=10", bryan bushby

ACCESSORY SCHEDULE

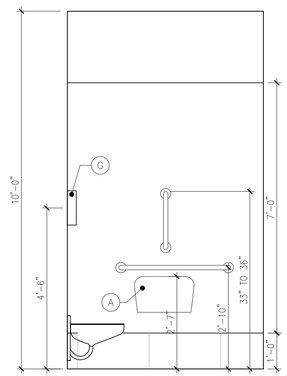
- (A) TOILET PAPER DISPENSER (ADA COMPLIANT)
- (B) UNDER-COUNTER SOAP DISPENSERS
- (C) SANITARY NAPKIN RECEPTACLE
- (D) COAT BUMPER HOOK
- (E) 42" GRAB BAR 1-1/2"ø
- (F) 36" GRAB BAR 1-1/2"ø
- (G) TOILET SEAT COVER DISPENSER
- (H) HAND DRYER
- (I) BABY CHANGING STATION



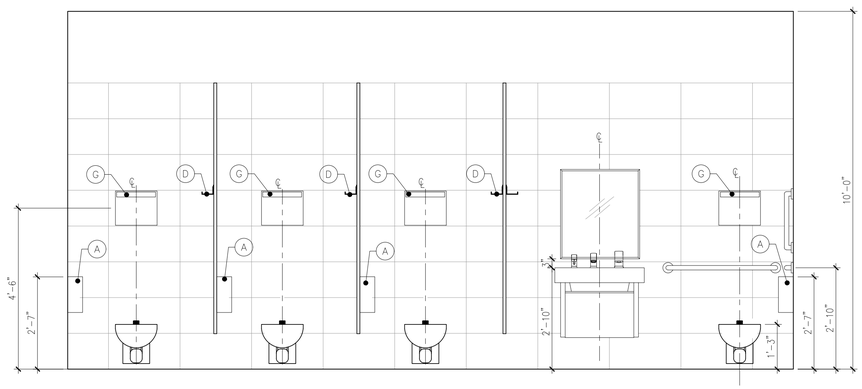
INTERIOR ELEVATION-MEN'S RESTROOMS#002 SCALE: 1/2"=1'-0" 7



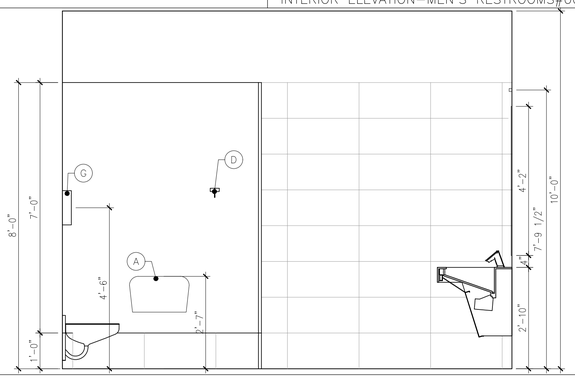
INTERIOR ELEVATION-MEN'S RESTROOMS#002 SCALE: 1/2"=1'-0" 3



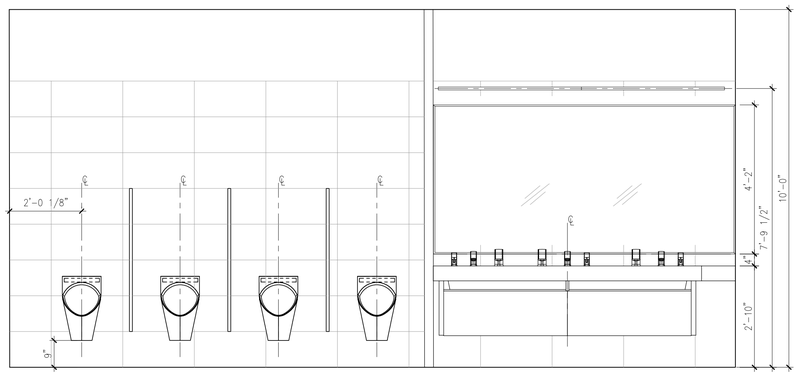
INTERIOR ELEVATION-MEN'S RESTROOMS#002 SCALE: 1/2"=1'-0" 6



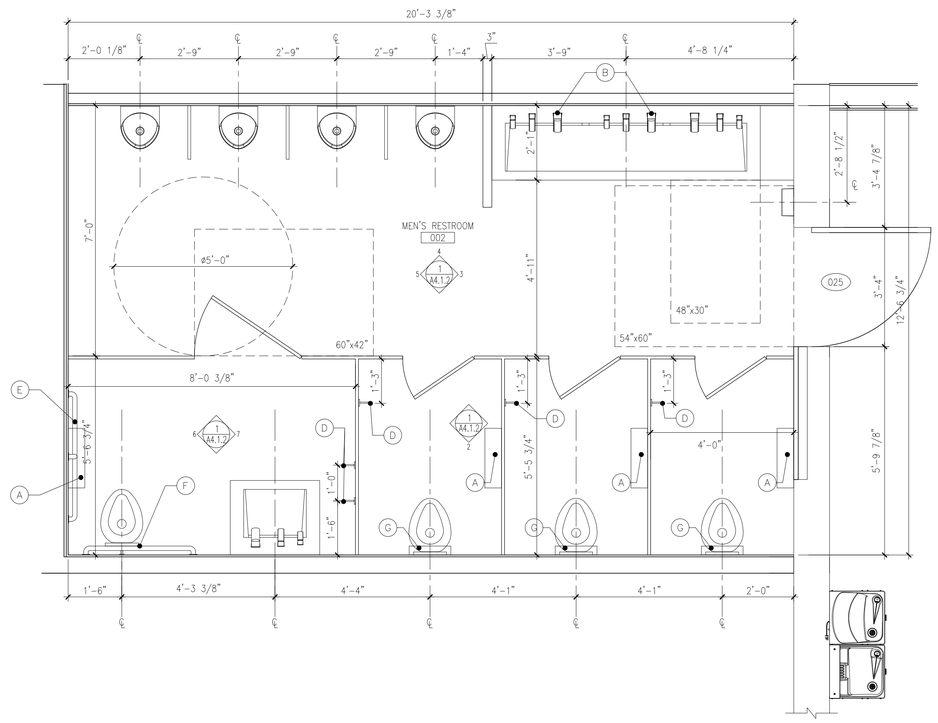
INTERIOR ELEVATION-MEN'S RESTROOMS#002 SCALE: 1/2"=1'-0" 2



INTERIOR ELEVATION-MEN'S RESTROOMS#002 SCALE: 1/2"=1'-0" 5



INTERIOR ELEVATION-MEN'S RESTROOMS#002 SCALE: 1/2"=1'-0" 4



MEN'S RESTROOM #002 SCALE: 1/2"=1'-0" 1

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST

1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 5:41 PM

Drawing Size	Project #:
24x36	18070
Drawn By: RV	Checked By: AA

Title:
MEN'S RESTROOM ENLARGED PLAN

Sheet Number:

A4.1.2

Date: March 22, 2019

©2018 by K2M Design, Inc.

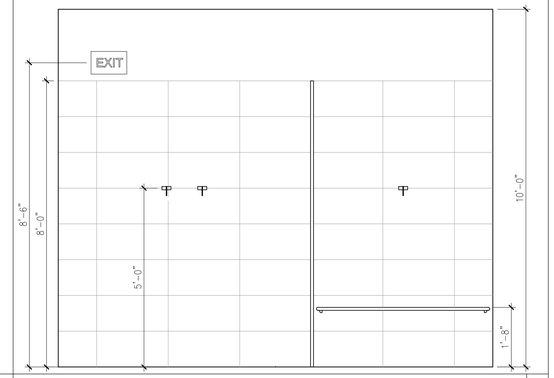
J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CD\Drawings\Arch\A412.dwg, 3/21/2019 5:41 PM, scale: 1"=1'-0", bryan busby

ACCESSORY SCHEDULE

- (A) TOILET PAPER DISPENSER (ADA COMPLIANT)
- (B) UNDER-COUNTER SOAP DISPENSERS
- (C) SANITARY NAPKIN RECEPTACLE
- (D) COAT BUMPER HOOK
- (E) 42" GRAB BAR 1-1/2"ø
- (F) 36" GRAB BAR 1-1/2"ø
- (G) TOILET SEAT COVER DISPENSER
- (H) HAND DRYER
- (I) BABY CHANGING STATION
- (J) SHOWER BENCH

DETAIL SCALE: 1/2"=1'-0" 15

DETAIL SCALE: 1/2"=1'-0" 11

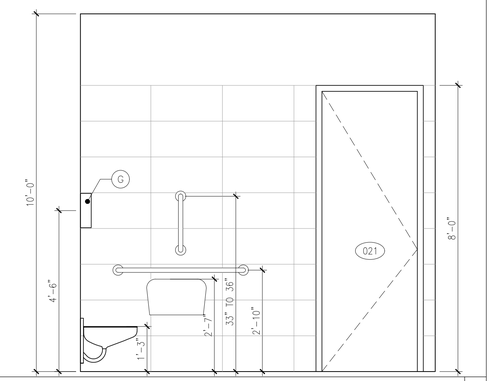


INTERIOR ELEVATION SCALE: 1/2"=1'-0" 3

DETAIL SCALE: 1/2"=1'-0" 14

DETAIL SCALE: 1/2"=1'-0" 10

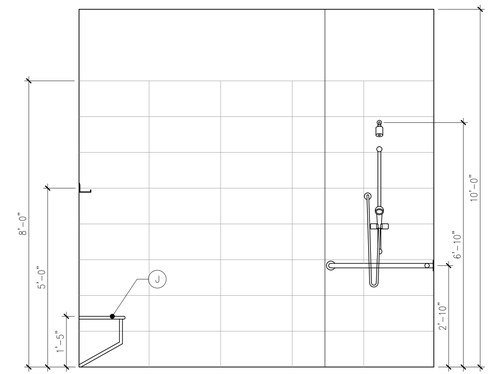
DETAIL SCALE: 1/2"=1'-0" 6



INTERIOR ELEVATION SCALE: 1/2"=1'-0" 2

DETAIL SCALE: 1/2"=1'-0" 13

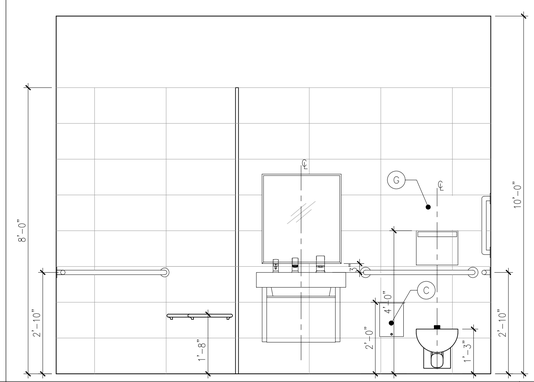
DETAIL SCALE: 1/2"=1'-0" 9



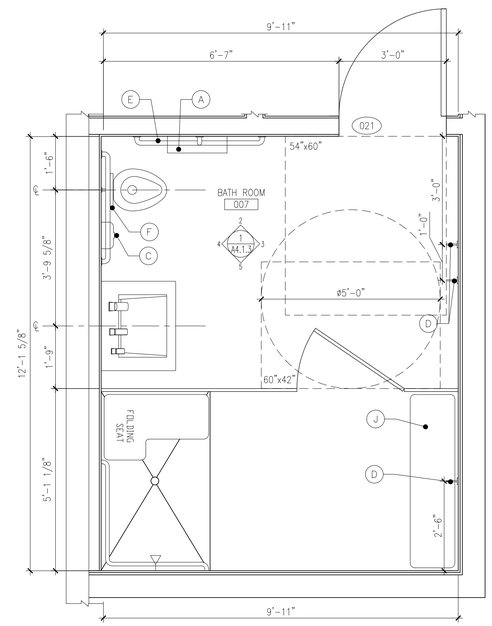
INTERIOR ELEVATION SCALE: 1/2"=1'-0" 5

DETAIL SCALE: 1/2"=1'-0" 12

DETAIL SCALE: 1/2"=1'-0" 8



INTERIOR ELEVATION SCALE: 1/2"=1'-0" 4



ENLARGED PLAN SCALE: 1/2"=1'-0" 1

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST

1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 5:41 PM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
FS	AA

Title:

BATHROOM ENLARGED PLAN

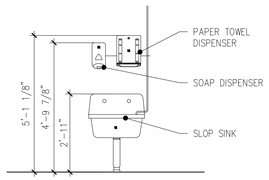
Sheet Number:

A4.1.3

Date: March 22, 2019

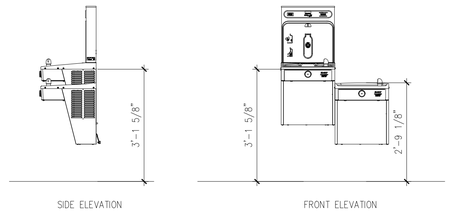
©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Arch\A4113.dwg, 3/21/2019 5:41 PM, scale: 1'-0" = 1'-0", bryan bushby



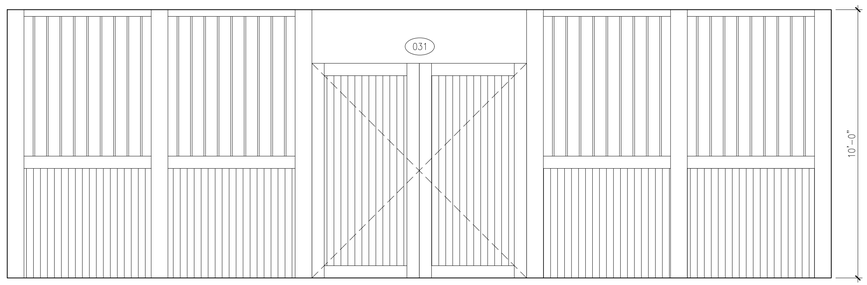
* SEE MANUF. SPEC

SLOP SINK SCALE: 3/8"=1'-0" 5

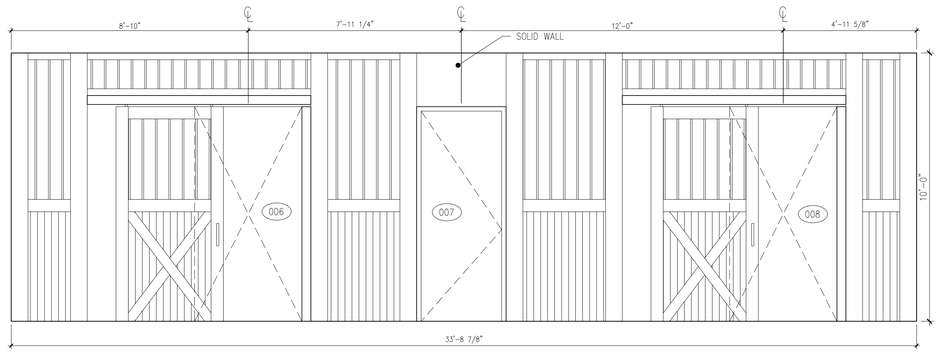


* SEE MANUF. SPEC

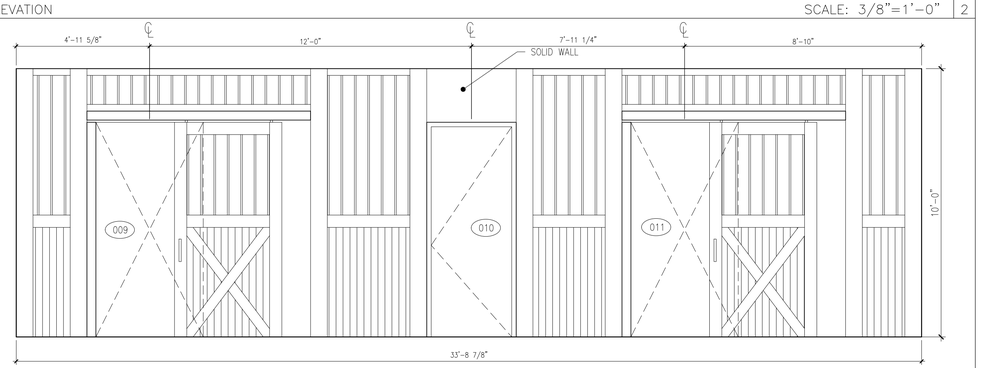
DRINKING FOUNTAION SCALE: 3/8"=1'-0" 4



INTERIOR ELEVATION SCALE: 3/8"=1'-0" 3



INTERIOR ELEVATION SCALE: 3/8"=1'-0" 2



INTERIOR ELEVATION SCALE: 3/8"=1'-0" 1

NOT USED SCALE: 1/2"=1'-0" 15

NOT USED SCALE: 1/2"=1'-0" 11

NOT USED SCALE: 1/2"=1'-0" 14

NOT USED SCALE: 1/2"=1'-0" 10

NOT USED SCALE: 1/2"=1'-0" 13

NOT USED SCALE: 1/2"=1'-0" 9

NOT USED SCALE: 1/2"=1'-0" 12

NOT USED SCALE: 1/2"=1'-0" 8

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST

1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 5:41 PM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
RV	AA

Title:

HORSE BARN CORRIDOR ENLARGED ELEVATIONS

Sheet Number:

A4.1.4

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront (18)\4-CDs\Drawings\Arch\A414.dwg, 3/21/2019 5:41 PM, scale: 1"=0" = 1'-0", bryan bushby

FINISH SCHEDULE LEGEND

FLOOR

NOTE	DESCRIPTION	MANUFACTURER	STYLE/MODEL	COLOR	REMARKS
PTD	EPOXY PAINTED-COLOR AND TYPE BY OWNER				
CT1	12"x24" CERAMIC FLOOR TILE AT RESTROOMS	CERAMIC TECHNICS	CUMBERLAND EARTHSTONE	WARM GREY	CONTRACTOR TO SUBMIT GROUT COLOR CHART FOR SELECTION

BASE

NOTE	DESCRIPTION	MANUFACTURER	STYLE/MODEL	COLOR	REMARKS
PTD.	PTD. – 3/4"x6" PAINTED WOOD BASE W/ OGEE PROFILE. ALL WOOD TO BE PRE-PRIMED FINGER JOINTED PINE PAINT GRADE TYPE.			SHERWIN WILLIAMS SW 7008	
CT1	3"x12" BULLNOSE BASE AT RESTROOMS TO MATCH FLOOR.	CERAMIC TECHNICS	CUMBERLAND EARTHSTONE	WARM GREY	CONTRACTOR TO SUBMIT GROUT COLOR CHART FOR SELECTION

WALLS

NOTE	DESCRIPTION	MANUFACTURER	STYLE/MODEL	COLOR	REMARKS
PTD 1	PAINTED, EGGSHELL FINISH	SHERWIN WILLIAMS OR APPROVED EQUAL	EMERALD INTERIOR LATEX	SW 6476	
PTD 2	PAINTED, EGGSHELL FINISH	SHERWIN WILLIAMS OR APPROVED EQUAL	EMERALD INTERIOR LATEX	SW 6471	
T 1	GENERAL TILE AT RESTROOMS	CERAMIC TECHNICS	SASSUOLO DIMENSIONAL	WHITE LINE MATTE 16"X32"	CONTRACTOR TO SUBMIT GROUT COLOR CHART FOR SELECTION
T 2	ACCENT TILE AT RESTROOMS	CERAMIC TECHNICS	SASSUOLO DIMENSIONAL	DEEP BLUE CHEVRON	CONTRACTOR TO SUBMIT GROUT COLOR CHART FOR SELECTION
PR 1	ACCENT PROFILE BEHIND HAND DRYER	CERAMIC TECHNICS	PROFILES/ SASSUOLO DIMENSIONAL	BRONZE+ DEEP BLUE	CONTRACTOR TO SUBMIT GROUT COLOR CHART FOR SELECTION

CEILING

NOTE	DESCRIPTION	MANUFACTURER	STYLE/MODEL	COLOR	REMARKS
GYP.	GYPSUM BOARD, PAINTED WHITE, FLAT FINISH.			SHERWIN WILLIAMS SW 7008	
CONC.	EXISTING EXPOSED PRE-CAST DOUBLE T				
DUR.	DURROCK, PAINTED WHITE , FLAT FINISH			SHERWIN WILLIAMS SW 7008	
ACT1	2X4 ACOUSTICAL CEILING TILE	ARMSTRONG OR APPROVED EQUAL	OPTIMA TEGULAR	WHITE	15/16" GRID, WHITE
ACT2	1X6 ACOUSTICAL CEILING TILE	ARMSTRONG OR APPROVED EQUAL	OPTIMA TEGULAR	WHITE	15/16" GRID, WHITE
WD.	EXPOSED WOOD TRUSSES				

MISC.

NOTE	DESCRIPTION	MANUFACTURER	STYLE/MODEL	COLOR	REMARKS
DOOR	PAINTED WHITE, SEMI-GLOSS FINISH.	SHERWIN WILLIAMS OR APPROVED EQUAL		SHERWIN WILLIAMS SW 7008	
TRIM	3/4x6" COLONIAL PROFILES TRIM AROUND ALL DOORS AND WINDOWS. ALL WOOD TO BE PRE-PRIMED FINGER JOINTED PINE PAINT GRADE TYPE. PAINT WHITE SEMI-GLOSS FINISH.			SHERWIN WILLIAMS SW 7008	

FINISH SCHEDULE

ROOM NO.	ROOM NAME	FLOOR	BASE	WALLS	CEILING	REMARKS	ROOM NO.
001	WOMEN'S BATHROOM	CT1	CT1	PTD1	ACT2		001
002	MEN'S BATHROOM	CT1	CT1	PTD1	ACT2		002
003	STORAGE	PTD	N/A	PTD1	CONC.		003
004	STORAGE OF EQUIPMENT	PTD	N/A	PTD1	CONC.		004
006	CLIMATE CONTROLLED STORAGE	PTD	N/A	PTD1	CONC.		006
007	BATHROOM	CT1	CT1	PTD1	ACT1		007
008	OFFICE–1	CT1	PTD.	PTD1	ACT1		008
009	OFFICE–2	CT1	PTD.	PTD1	ACT1		009
010	CONCESSIONS	CT1	CT1	PTD1	DUR.	CACTUS MAT 3'X5' – (3) TO BE PROVIDED	010
011	HORSE STABLES	PTD	N/A	WD1	WD.	3/4" RUBBER DIAMOND TOP HORSE MAT	011
012	FEED ROOM	PTD	N/A	WD1	WD.	DIAMOND GRATE OVERLAY	012
013	HORSE STABLES	PTD	N/A	WD1	WD.	3/4" RUBBER DIAMOND TOP HORSE MAT	013
014	HORSE STABLES	PTD	N/A	WD1	WD.	3/4" RUBBER DIAMOND TOP HORSE MAT	014
015	TACK ROOM	PTD	N/A	WD1	WD.	DIAMOND GRATE OVERLAY	015
016	HORSE STABLES	PTD	N/A	WD1	WD.	3/4" RUBBER DIAMOND TOP HORSE MAT	016
017	RACK SPACE	CT1	PTD.	PTD1	GYP.		017
018	HALL	CT1	PTD.	PTD1	ACT1		018

NOTE: "CONTRACTOR SHALL SUBMIT ALL FINISH SAMPLES, WHETHER INTERIOR OR EXTERIOR, AT THE SAME TIME SO A UNIFORMED, FINAL COLOR AND TEXTURE SELECTION / COORDINATION MAY OCCUR. IF FINISH SAMPLES ARE NOT SUBMITTED AT ONE TIME THEY SHALL BE HELD UNTIL SUCH TIME THAT ALL FINISH SELECTION CAN BE MADE. NOTE: IF CONTRACTOR FAILS TO SUBMIT FINISH SAMPLES IN A TIMELY, COHESIVE FASHION AND CAUSES DELAY IN MATERIAL ORDERING, IT SHALL NOT BE GROUNDS FOR CONTRACT EXTENSION OR REQUEST FOR ADDITIONAL FUNDING BY CONTRACTOR NOR REPRESENTS ANY NEGLIGENT ACT, ERROR, OR OMISSION BY DESIGN PROFESSIONAL. THE CONTRACTOR IS SOLELY LIABLE FOR DELAYS OR MATERIAL COST INCREASES."

EQUIPMENT SCHEDULE

ROOM	FIXTURE	DESCRIPTION	MANUFACTURER	MODEL NO.	MAT./FIN.	COLOR	REMARKS
001	HAND DRYER	DYSON AIRBLADE V	DYSON	AB08	STEEL	SILVER	2/BATHROOM
	EXHAUST FAN	EXHAUST FAN ON ROOF	GREENHECK	G	ALUMINUM	TBD	1/BATHROOM
	BABY CHANGING STATION	CHANGING STATION	KOALA	KB200–01	POLYETHYLENE	GRAY	1/WOMENS ROOM
007	HAND DRYER	DYSON AIRBLADE V	DYSON	AB08	STEEL	SILVER	1/BATHROOM
011/012/013/ 014/015/016	WALL MOUNTED FANS	OSCILLATING WALL MOUNT FAN (24" DIAMETER)	GLOBAL INDUSTRIAL	607050	ALUMINUM	SILVER	CAN ADJUST SIZE PER REQUIREMENTS OF INDIVIDUAL SPACES. (4) FOR HALLWAY, (1) PER STABLE, (1) TACK ROOM, (1) FEED ROOM

DOOR HARDWARE SCHEDULE

QUANTITY	ITEM	MANUFACTURER	MODEL #	FINISH
GROUP 1 – OFFICE LOCK				
3	HINGES – 4 1/2 X 4 1/2	HAGER	BB1279	CHROME
1	LOCKSET W/KEY	SCHLAGE	AL50PD ANSI F82	US626
1	LEVEL STYLE HANDLE	SATURN OR EQUAL		
1	WALL MOUNTED STOP	IVES	WS40QCCV	US32D
1	CLOSER	LCN QUEST	1260 SERIES	ALBHMA
3	SILENCER	GLYNN JOHNSON		
GROUP 2 – ENTRY LOCK – TO BE UNLOCKED DURING BUSINESS HOURS				
3	HINGES – 4 1/2 X 4 1/2	HAGER		
1	ENTRANCE LOCKSET WITH DEAD BOLT	SCHLAGE		
1	PUSH/PULL HANDLE	E.T.R.		
1	WEATHER STRIPPING			
1	CLOSER	LCN QUEST	1260 SERIES	ALBHMA
REF: 1008.1.8.3 (2.2) A readily visible sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting back-ground.				
GROUP 3 – RESTROOM LOCK – PRIVACY LOCK				
3	HINGES – 4 1/2 X 4 1/2	HAGER	BB1279	
1	PRIVACY LOCK SET	SCHLAGE	AL40S 01 LEVER	
1	LEVER STYLE HANDLE	SATURN		
1	CLOSER	LCN QUEST	1260 SERIES	ALBHMA
1	WALL MOUNTED STOP	IVES	WS40QCCV	US32D
3	SILENCER	GLYNN JOHNSON		
GROUP 4 – PASSAGE LATCH				
3	HINGES – 4 1/2 X 4 1/2	HAGER	BB1279	SATIN
1	PASSAGE SET	SCHLAGE	AL10S	US262
1	LEVER STYLE HANDLE	SATURN		
1	CLOSER	LCN QUEST	1260 SERIES	ALBHMA
3	SILENCER	GLYNN JOHNSON		
1	STAINLESS STEEL KICKPLATE	IVES	8400	
1	WALL MOUNTED STOP	IVES	WS40QCCV	US32D
GROUP 5 – STOREROOM LOCK				
3	HINGES – 4 1/2 X 4 1/2	HAGER	BB1279	CHROME
1	LOCKSET W/KEY	SCHLAGE	AL80PD ANSI F82	US626
1	LEVEL STYLE HANDLE	SATURN OR EQUAL		
1	WALL MOUNTED STOP	IVES	WS40QCCV	US32D
1	CLOSER	LCN QUEST	1260 SERIES	ALBHMA
3	SILENCER	GLYNN JOHNSON		
GROUP 6 – EXIT DOOR – EXTERIOR				
3	HINGES – 4 1/2 X 4 1/2	HAGER	BB1279	CHROME
1	LOCKSET	SCHLAGE	20–057	
1	EXIT DEVICE	VON DUPRIN PANIC BAR	99L	
1	CLOSER	LCN QUEST – ALUM	1370	ALBHMA 689
1	THRESHOLD	36" NATIONAL GUARD	#613	
1	SWEEP	36" NATIONAL GUARD	C627A	
1	WALL MOUNTED STOP	IVES	WS407CCV	US32D
3	SILENCER	GLYNN JOHNSON		
1	AUTOMATIC SWING OPENER			
GROUP 7 – EXIT DOOR – CORRIDOR				
3	HINGES – 4 1/2 X 4 1/2	HAGER	BB1279	CHROME
1	HANDLE	SATURN OR EQUAL		
1	EXIT DEVICE	VON DUPRIN PANIC BAR	99L	
1	CLOSER	LCN QUEST – ALUM	1370	ALBHMA 689
1	WALL MOUNTED STOP	IVES	WS407CCV	US32D
3	SILENCER	GLYNN JOHNSON		
1	ASTRAGAL	NATIONAL GUARD	114NA	
	AUTOMATIC FLUSH BOLTS	IVES	FB41	
1	COORDINATOR	IVES	COR60	

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 5:41 PM

Drawing Size	Project #:
24x36	18070
Drawn By: RV	Checked By: AA

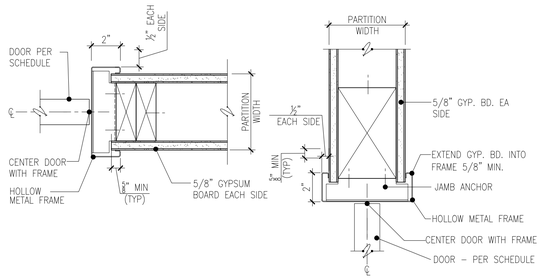
Title:
FINISH, EQUIPMENT & DOOR HARDWARE SCHEDULES

Sheet Number:
A6.1.1

Date: March 22, 2019

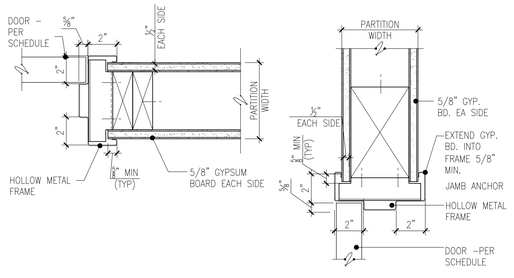
©2018 by K2M Design, Inc.

J:\2018\18070 – City of Key West – Truman Waterfront 1B\K-CDA\Drawings\Arch\A611.dwg, 3/21/2019 5:41 PM, scale: 1'-0" = 1'-0", bryan bailey



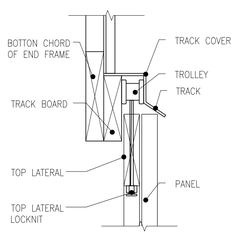
1 IMPACT DOOR JAMB
SCALE: 3/8"=1'-0"

2 IMPACT DOOR HEAD
SCALE: 3/8"=1'-0"

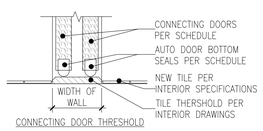


3 INTERIOR DOOR JAMB
SCALE: 3/8"=1'-0"

4 INTERIOR DOOR JAMB
SCALE: 3/8"=1'-0"



BARN DOOR DETAIL



5 BARN DOOR DETAILS
SCALE: 1 1/2"=1'-0"

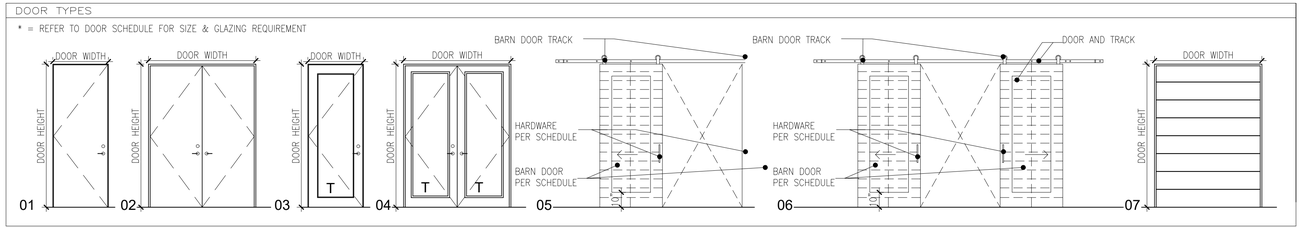
DOOR SCHEDULE

DOOR NO.	ROOM FROM	ROOM TO	DOOR NOMINAL SIZE	DOOR TYPE	DOOR MATL	DOOR FINISH	FRAME MATL	FRAME FINISH	HARDWARE	GLAZING		FIRE RATING	REMARKS
001	STORAGE OF EQUIPMENT	OUTSIDE	18'–0"x10'–0"	7	STEEL	FACTORY PTD.	STEEL	FACTORY PTD.	PROVIDED	NO			IMPACT RATED OVERHEAD ROLLING DOOR
002	STORAGE OF EQUIPMENT	OUTSIDE	18'–0"x10'–0"	7	STEEL	FACTORY PTD.	STEEL	FACTORY PTD.	PROVIDED	NO			IMPACT RATED OVERHEAD ROLLING DOOR
003	STORAGE OF EQUIPMENT	OUTSIDE	(2)3'–0"x7'–0"	4	ALUMINUM	FACTORY PTD.	ALUMINUM	FACTORY PTD.	6	YES			IMPACT RATED ALUMINUM ENTRY DOOR
004	STORAGE OF EQUIPMENT	OUTSIDE	(2)3'–0"x7'–0"	4	ALUMINUM	FACTORY PTD.	ALUMINUM	FACTORY PTD.	6	YES			IMPACT RATED ALUMINUM ENTRY DOOR
005	HORSE STABLE HALL	OUTSIDE	3'–0"x8'–0"	3	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	6	NO			IMPACT RATED ALUMINUM ENTRY DOOR
006	HORSE STABLES	HORSE STABLE HALL	4'–0"x7'–0"	5	WOOD	STAINED	WOOD	STAINED	TBD	NO			HORSE STABLE DOOR – TBD BY CONTRACTOR
007	TACK ROOM	HORSE STABLE HALL	3'–0"x7'–0"	1	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	5	NO			INTERIOR DOOR
008	HORSE STABLES	HORSE STABLE HALL	4'–0"x7'–0"	5	WOOD	STAINED	WOOD	STAINED	TBD	NO			HORSE STABLE DOOR – TBD BY CONTRACTOR
009	HORSE STABLES	HORSE STABLE HALL	4'–0"x7'–0"	5	WOOD	STAINED	WOOD	STAINED	TBD	NO			HORSE STABLE DOOR – TBD BY CONTRACTOR
010	FEED ROOM	HORSE STABLE HALL	3'–0"x7'–0"	1	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	5	NO			INTERIOR DOOR
011	HORSE STABLES	HORSE STABLE HALL	4'–0"x7'–0"	5	WOOD	STAINED	WOOD	FACTORY PTD.	TBD	NO			HORSE STABLE DOOR – TBD BY CONTRACTOR
012	HORSE STABLE HALL	OUTSIDE	3'–0"x8'–0"	3	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	6	NO			IMPACT RATED ALUMINUM ENTRY DOOR
013	OFFICE HALL	OUTSIDE	(2)3'–0"x7'–0"	4	ALUMINUM	FACTORY PTD.	ALUMINUM	FACTORY PTD.	2	YES – FROSTED			IMPACT RATED ALUMINUM ENTRY DOOR
014	CONCESSIONS	OUTSIDE	3'–0"x8'–0"	3	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	5	NO			IMPACT RATED ALUMINUM ENTRY DOOR
015	CONCESSIONS	OUTSIDE	9'–0"x8'–0"	7	STEEL	FACTORY PTD.	STEEL	FACTORY PTD.	PROVIDED	NO			IMPACT RATED OVERHEAD ROLLING DOOR
016	CONCESSIONS	OUTSIDE	9'–0"x8'–0"	7	STEEL	FACTORY PTD.	STEEL	FACTORY PTD.	PROVIDED	NO			IMPACT RATED OVERHEAD ROLLING DOOR
017	OFFICE–2	OFFICE HALL	3'–0"x7'–0"	1	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	1	YES – FROSTED			INTERIOR DOOR
018	OFFICE–1	OFFICE HALL	3'–0"x7'–0"	1	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	1	YES – FROSTED			INTERIOR DOOR
019	HALL	STORAGE OF EQUIPMENT	3'–4"x7'–0"	1	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	5	NO		1–HOUR	INTERIOR DOOR
020	RACK SPACE	OFFICE HALL	3'–0"x7'–0"	1	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	4	NO			INTERIOR DOOR
021	BATH ROOM	OFFICE HALL	3'–0"x7'–0"	1	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	3	NO			INTERIOR DOOR
022	CLIMATE CONTROLLED STORAGE	OUTSIDE	6'–4"x8'–0"	4	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	6	NO			IMPACT RATED ALUMINUM ENTRY DOOR
023	COMMUNITY SERVICES STORAGE	OUTSIDE	8'–0"x8'–0"	7	STEEL	FACTORY PTD.	STEEL	FACTORY PTD.	PROVIDED	NO			IMPACT RATED OVERHEAD ROLLING DOOR
024	COMMUNITY SERVICES STORAGE	STORAGE OF EQUIPMENT	3'–4"x7'–0"	2	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	5	NO			INTERIOR DOOR
025	MEN'S RESTROOM	OUTSIDE	3'–0"x7'–0"	1	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	2	NO			IMPACT RATED ALUMINUM ENTRY DOOR
026	RESTROOM VESTIBULE	OUTSIDE	12'–8"X8'–0"	_	ALUMINUM	FACTORY PTD.	ALUMINUM	FACTORY PTD.	PADLOCK	NO			GATE TO MATCH EXISTING FENCING ON SITE – 2 PANEL SLIDING
027	WOMEN'S RESTROOM	OUTSIDE	3'–0"x7'–0"	1	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	2	NO			IMPACT RATED ALUMINUM ENTRY DOOR
028	CHASE SPACE	STORAGE OF EQUIPMENT	3'–0"x7'–0"	1	HOLLOW METAL	FACTORY PTD.	HOLLOW METAL	FACTORY PTD.	4	NO			INTERIOR DOOR
029	OUTSIDE	HORSE STABLE	8'–0"x8'–0"	6	WOOD	STAINED	WOOD	STAINED	PADLOCK	NO			HORSE STABLE DOOR – TBD BY CONTRACTOR
030	OUTSIDE	HORSE STABLE	8'–0"x8'–0"	6	WOOD	STAINED	WOOD	STAINED	PADLOCK	NO			HORSE STABLE DOOR – TBD BY CONTRACTOR
031	OUTSIDE	HORSE STABLE	8'–0"x8'–0"	6	WOOD	STAINED	WOOD	STAINED	PADLOCK	NO			HORSE STABLE DOOR – TBD BY CONTRACTOR
032	OUTSIDE	HORSE STABLE	8'–0"x8'–0"	6	WOOD	STAINED	WOOD	STAINED	PADLOCK	NO			HORSE STABLE DOOR – TBD BY CONTRACTOR
033	OUTSIDE	HORSE STABLE	8'–0"x8'–0"	6	WOOD	STAINED	WOOD	STAINED	PADLOCK	NO			HORSE STABLE DOOR – TBD BY CONTRACTOR

NOTES:
1.

DOOR TYPES

* = REFER TO DOOR SCHEDULE FOR SIZE & GLAZING REQUIREMENT



SYMBOLS

T	TEMPERED SAFETY GLASS
ALUM.	ALUMINUM. FINISHED BY MANUFACTURER.
HM	HOLLOW METAL. PAINTED.
SWD	SOLID WOOD DOOR.
HWD	HOLLOW WOOD DOOR.

GLAZING TYPES

GENERAL NOTES

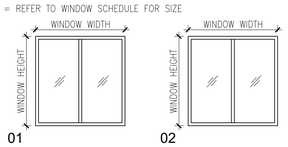
1. CONTRACTOR SHALL VERIFY SPECIFIC ROUGH OPENING SIZES PRIOR TO ORDERING ALL WINDOWS AND DOORS.
2. REFER TO EXTERIOR ELEVATIONS, A311 SERIES, FOR EXTERIOR FINISH SCHEDULE.
3. ALL DOOR GLAZING, SIDELIGHTS, AND TRANSITIONS TO BE TEMPERED SAFETY GLASS WHETHER NOTED OR NOT.
4. ANY HOLLOW METAL FRAME IN CONTACT WITH ANY WET AREAS SHALL BE GALVANIZED MIN. G–60 WHETHER NOTED OR NOT.
5. EGRESS DOORS TO THE EXTERIOR, TO A STAIRWELL, OR TO EXIT PASSAGEWAY SHALL RECEIVE A TACTILE SIGN STATING 'EXIT' ADJACENT TO THE DOOR.
6. ANY ENTRY DOORS WITH DEADBOLT TO RECEIVE A SIGN ON OR ADJACENT TO THE DOOR STATING 'THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED.' THE SIGN SHALL BE IN LETTERS 1" HIGH ON A CONTRASTING BACKGROUND.

WINDOW SCHEDULE

WINDOW NO. <10>	WINDOW NOMINAL SIZE	FRAME TYPE	FRAME MANUFACTURER	FRAME MODEL	FRAME MATERIAL	DETAILS HEAD	DETAILS JAMB	DETAILS INTER.	DETAILS SILL	GLAZING	REMARKS <10>	WINDOW NO.
001	5'–0"x4'–0"	2	PER NOA	PER NOA	ALUMINUM	PER NOA	PER NOA	PER NOA	4'–0"	YES	INTERIOR WINDOW FROM OFFICE HALL TO PUBLIC WORKS STORAGE	001
002	5'–0"x4'–0"	2	PER NOA	PER NOW	ALUMINUM	PER NOA	PER NOA	PER NOA	4'–0"	YES	INTERIOR WINDOW FROM OFFICE HALL TO PUBLIC WORKS STORAGE	002
003	5'–0"x4'–0"	1	PER NOA	PER NOW	ALUMINUM	PER NOA	PER NOA	PER NOA	4'–0"	YES	IMPACT RATED HORIZONTAL SLIDER WINDOW W/ SCREEN	003

WINDOW TYPES

* = REFER TO WINDOW SCHEDULE FOR SIZE



SYMBOLS

T	TEMPERED GLASS
HM	HOLLOW METAL.
WD	SOLID CORE WOOD DOOR.
ALUM	ALUMINUM.
PTD	PAINTED. REFER TO FINISH SCHEDULE.
MANUF	FACTORY APPLIED FINISH. REFER TO FINISH SCHEDULE.
STN	STAINED. REFER TO FINISH SCHEDULE.
STL	STEEL
S	SMOKE LABELED / SEALED

GLAZING TYPES

ABBREVIATIONS

GENERAL NOTES

1. CONTRACTOR SHALL VERIFY SPECIFIC ROUGH OPENING SIZES PRIOR TO ORDERING ALL WINDOWS,
2. REFER TO EXTERIOR ELEVATIONS, A311 SERIES, FOR EXTERIOR FINISH SCHEDULE.
3. ALL GLAZING DIRECTLY ADJACENT TO DOORS TO BE TEMPERED SAFETY GLASS WHETHER NOTED OR NOT.
4. SHUTTERS TO BE PROVIDED BY OTHERS FOR HORSE STABLE WINDOW OPENINGS AND EXTERIOR BARN DOOR OPENING.

ARCHITECT:
K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting
Key Largo, FL
Key West, FL
Marathon, FL
URL: www.k2mdesign.com
PROF. REG. AA26001059
Building Relationships Based on Trust and Results
Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:
STRUCTURAL ENGINEER: Meridian Engineering LLC
CIVIL ENGINEER: Perez Engineering & Development
IRRIGATION: Blue Island Lighting & Irrigation Inc.

Submissions:
DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 5:41 PM

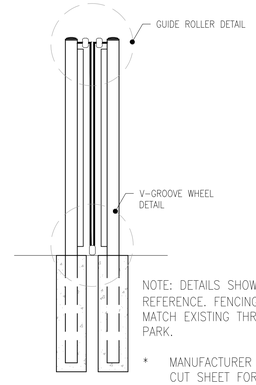
Drawing Size	Project #:
24x36	18070
Drawn By: RV	Checked By: AA

Title: DOOR AND WINDOW SCHEDULE

Sheet Number: A6.2.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

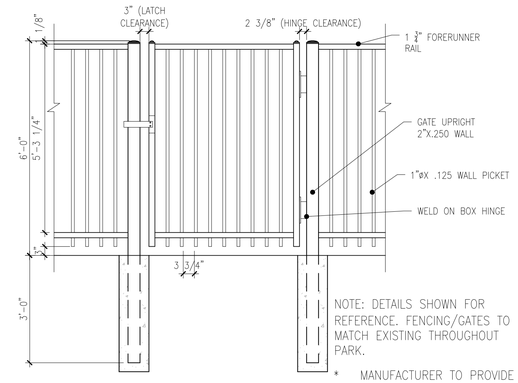


NOTE: DETAILS SHOWN FOR REFERENCE. FENCING/GATES TO MATCH EXISTING THROUGHOUT PARK.

* MANUFACTURER TO PROVIDE CUT SHEET FOR APPROVAL

NOT USED

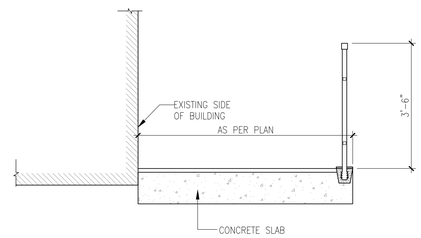
FENCE SIDE VIEW SCALE: 1/2"=1'-0" 12



NOTE: DETAILS SHOWN FOR REFERENCE. FENCING/GATES TO MATCH EXISTING THROUGHOUT PARK.

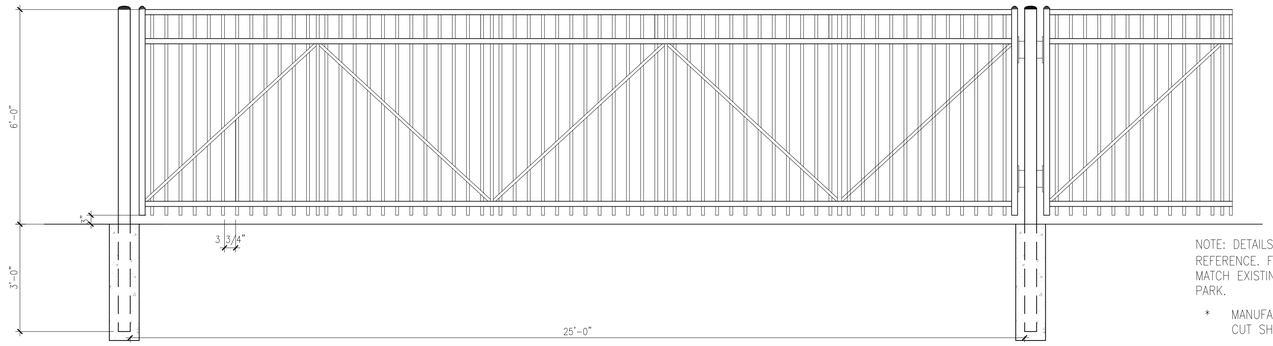
* MANUFACTURER TO PROVIDE CUT SHEET FOR APPROVAL

SINGLE GATE ARRANGEMENT SCALE: 1/2"=1'-0" 8



* SEE STRUCTURAL FOR RAILING NOTATION/DETAIL

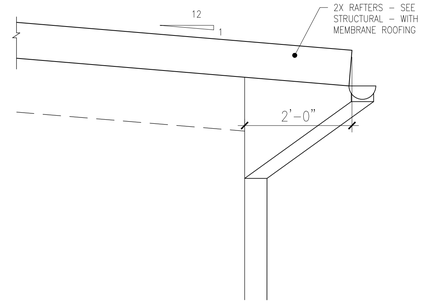
RAILING DETAIL SCALE: 1/2"=1'-0" 4



NOTE: DETAILS SHOWN FOR REFERENCE. FENCING/GATES TO MATCH EXISTING THROUGHOUT PARK.

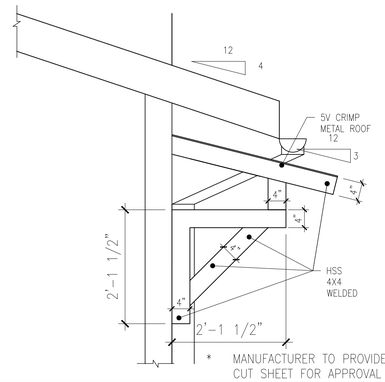
* MANUFACTURER TO PROVIDE CUT SHEET FOR APPROVAL

FENCE ELEVATION SCALE: 1/2"=1'-0" 7



RAFTER DETAIL SCALE: 3/4"=1'-0" 3

FENCE TOP VIEW SCALE: 1/2"=1'-0" 6

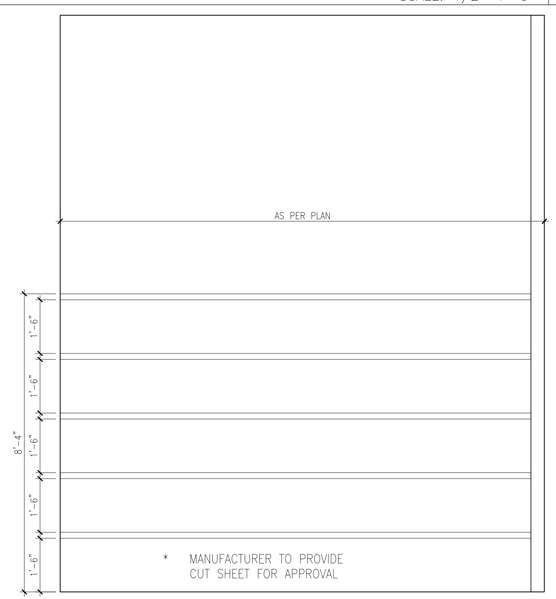


* MANUFACTURER TO PROVIDE CUT SHEET FOR APPROVAL

ROOF DETAIL SCALE: 3/4"=1'-0" 2

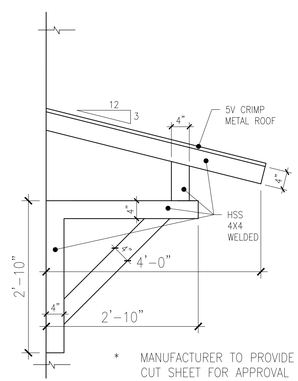
NOT USED

NOT USED



* MANUFACTURER TO PROVIDE CUT SHEET FOR APPROVAL

SHELVING ELEVATION SCALE: 1/2"=1'-0" 5



* MANUFACTURER TO PROVIDE CUT SHEET FOR APPROVAL

ROOF DETAIL SCALE: 3/4"=1'-0" 1

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 5:41 PM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
PS	AA

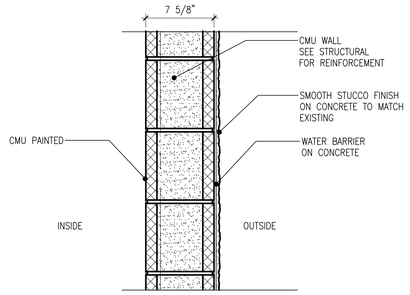
Title:
EXTERIOR DETAILS

Sheet Number:
A8.1.1

Date: March 22, 2019

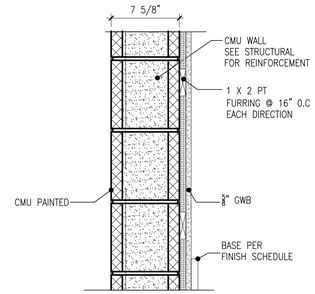
©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Arch\A811.dwg, 3/21/2019 5:41 PM, scale: 1"=10" = 1'-0", bryan bustby



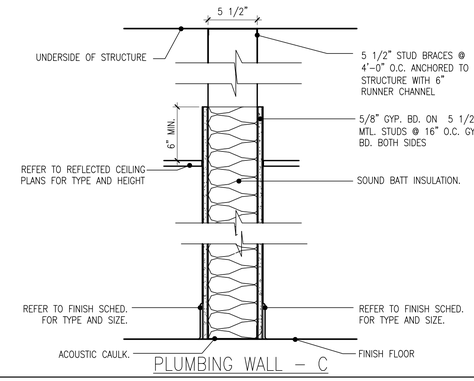
CMU WALL – A

WALL TYPE – A SCALE: 1/2"=1'–0" 16



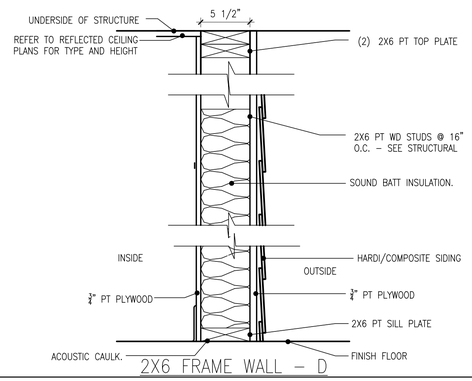
CMU WALL – B

WALL TYPE – B SCALE: 1/2"=1'–0" 12



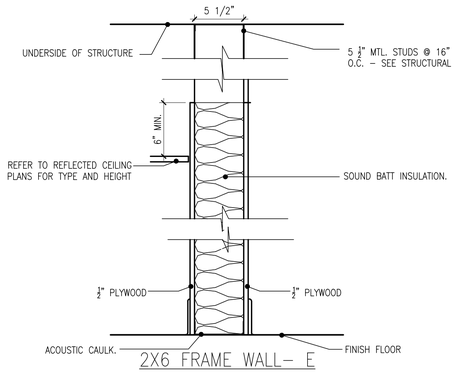
PLUMBING WALL – C

WALL TYPE –C SCALE: 1/2"=1'–0" 8



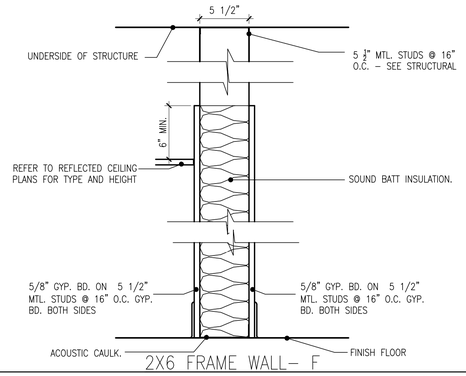
2X6 FRAME WALL – D

WALL TYPE – D SCALE: 1/2"=1'–0" 4



2X6 FRAME WALL– E

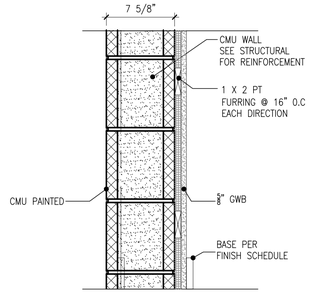
WALL TYPE – E SCALE: 1/2"=1'–0" 15



2X6 FRAME WALL– F

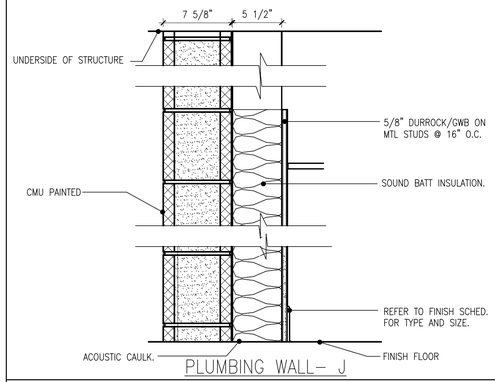
WALL TYPE – F SCALE: 1/2"=1'–0" 11

WALL TYPE – G SCALE: 1/2"=1'–0" 7



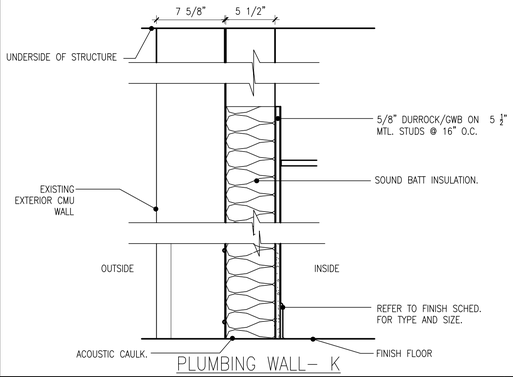
CMU WALL – H

WALL TYPE – H SCALE: 1/2"=1'–0" 3



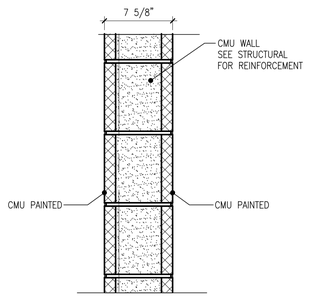
PLUMBING WALL– J

WALL TYPE – J SCALE: 1/2"=1'–0" 14



PLUMBING WALL– K

WALL TYPE – K SCALE: 1/2"=1'–0" 10



CMU WALL – L

WALL TYPE – L SCALE: 1/2"=1'–0" 6

WALL TYPE – M SCALE: 1/2"=1'–0" 2

WALL TYPE – N SCALE: 1/2"=1'–0" 13

DETAIL SCALE: 1/2"=1'–0" 9

DETAIL SCALE: 1/2"=1'–0" 5

WALL TYPE–E SCALE: 1/2"=1'–0" 1

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 5:41 PM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
XXX	XXX

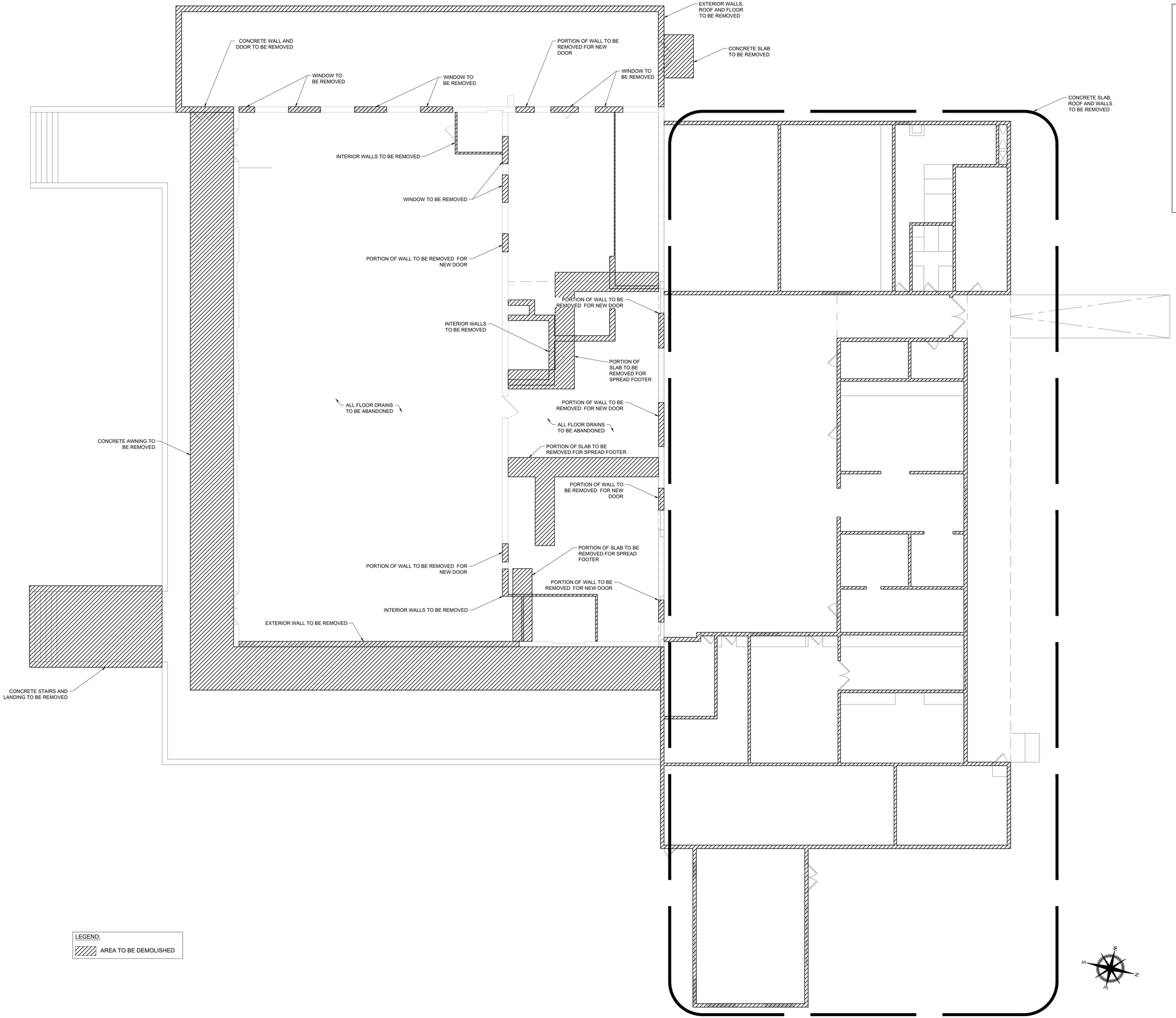
Title:
WALL TYPES
AND
INTERIOR DETAILS

Sheet Number:
A9.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Arch\A911.dwg, 3/21/2019 5:41 PM, scale: 1'-0" = 1'-0", bryan bailey



DEMOLITION NOTES:

PROTECT ALL EXISTING CONSTRUCTION . NOT SCHEDULED FOR REMOVAL, AT ALL TIMES. PROVIDE ADEQUATE SHORING AND/OR BRACING TO PREVENT DAMAGE. PROMPTLY REPAIR DAMAGE CAUSED TO ADJACENT FACILITIES BY DEMOLITION WORK AT NO COST TO THE OWNER.

PROVIDE TEMPORARY BARRICADES AND OTHER FORMS OF PROTECTION AS REQUIRED TO PROTECT INDIVIDUALS FROM INJURY. PROVIDE SECURITY LOCKS OR OTHER MEANS TO PREVENT INADVERTENT ENTRY INTO WORK ZONE.

CONSTRUCT DUST PROOF PARTITIONS TO SEPARATE WORK AREA WHERE NOISY OR DUSTY OPERATIONS ARE PERFORMED. KEEP WORK AREAS CLEAN TO LIMIT DUST AND DIRT TRACKING TO NON-CONSTRUCTION ZONES.

MAINTAIN EXISTING UTILITIES FOR USE BY OWNER AND PROTECT FROM DAMAGE WHEN SERVICE INTERRUPTION IS UNAVOIDABLE, COORDINATE WITH OWNER AND UTILITY COMPANIES. PROVIDE TEMPORARY UTILITY SERVICE AS REQUIRED BY OWNER.

SHORING AND BRACING:

PROVIDE ADEQUATE SHORING AND BRACING AT ALL LOCATIONS WHERE NEW OPENINGS ARE SHOWN TO BE CUT INTO EXISTING LOAD BEARING WALLS.

SHORING SHALL BE PERFORMED BY AN EXPERIENCED SHORING CONTRACTOR.

SHORING SHALL BE CONTINUOUS TO THE LOWEST LEVEL AND BE ADEQUATELY DISTRIBUTED TO PREVENT DAMAGE TO EXISTING GRADE SLABS.

Meridian Engineering LLC
201 Front Street, Suite 203
Key West, Florida 33040
AUTHORIZATION #29401
ph:305-293-3263 fax:293-4899

Seal:

NOT VALID FOR CONSTRUCTION UNLESS SIGNED AND SEALED IN THIS BLOCK

RICHARD J. MILELLI
PE #58315

General Notes:

TRUMAN WATERFRONT 1B REMODEL

ISSUED BID SET

KEY WEST, FLORIDA

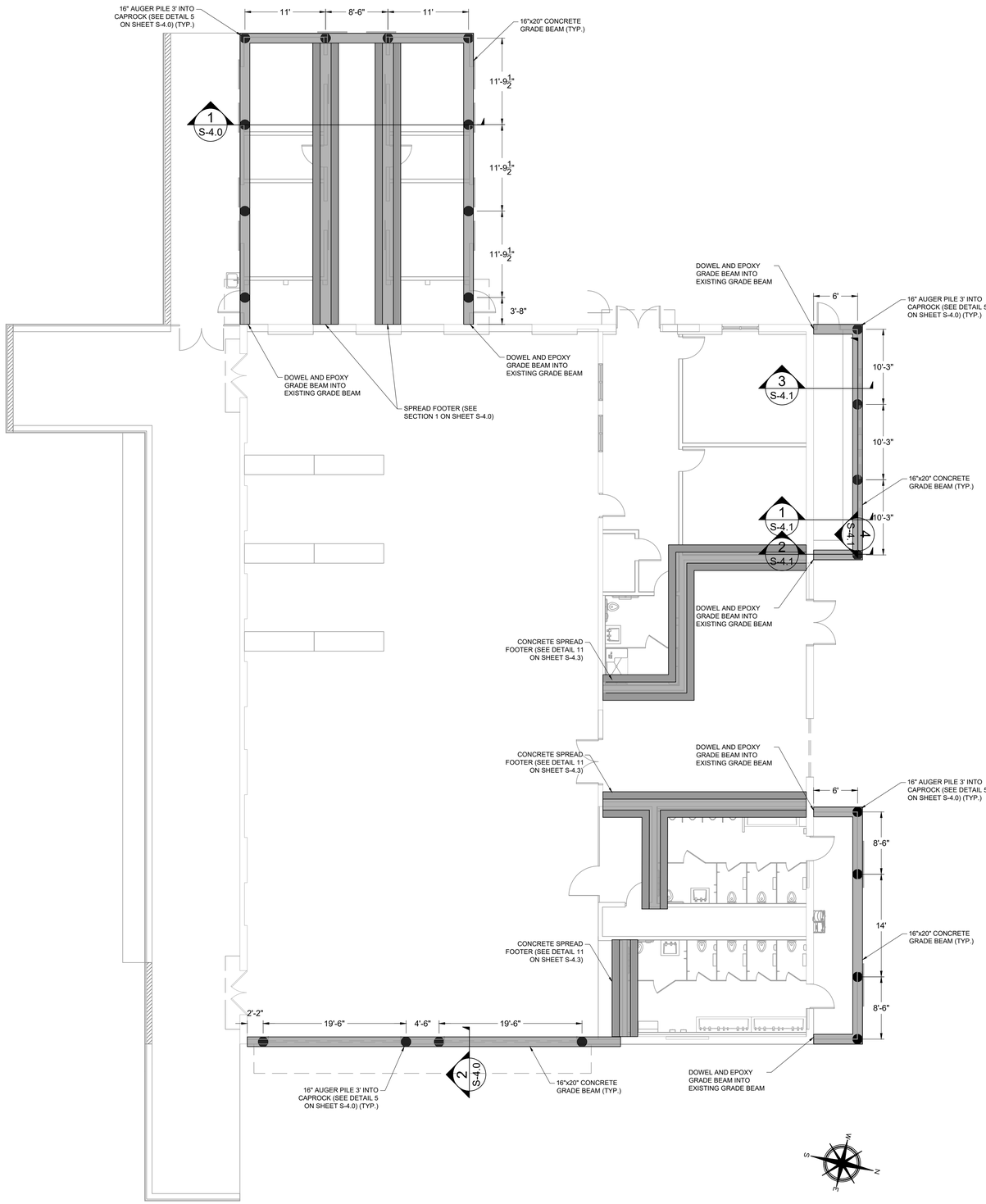
Drawn By: ANF	Checked By: RJM
Project No. AS NOTED	Scale:
AutoCad File No.	

Revisions:

Title:
DEMOLITION PLAN

Sheet Number:
SD-1.0

Date: MARCH 22, 2019



FOUNDATION & CONCRETE NOTES

1. ALL FOOTINGS ARE TO BE PLACED ON FIRM, UNDISTURBED, NATURAL ROCK UNLESS OTHERWISE NOTED.
2. AUGER PILE DIAMETERS AND EMBEDMENT INTO ROCK SHALL BE NO LESS THAN 16" DIAMETER NOR LESS THAN 3' INTO ROCK UNLESS OTHERWISE NOTED.
3. CENTER ALL FOOTINGS UNDER WALLS, COLUMNS OR GRID LINES UNLESS OTHERWISE NOTED.
4. ALL CAST-IN-PLACE CONCRETE SHALL BE MADE WITH TYPE I PORTLAND CEMENT, STONE AGGREGATE AND SHALL DEVELOP AT LEAST 4000 PSI COMPRESSIVE STRENGTH IN 28 DAYS. (UNLESS OTHERWISE NOTED.)
5. ALL CONCRETE WORK AND REINFORCING DETAILS SHALL BE CONSTRUCTED IN ACCORDANCE WITH ACI 318. EXPOSED EDGES OF CONCRETE SHALL HAVE ½" CHAMFER. USE STANDARD HOOKS ON DOWELS UNLESS OTHERWISE NOTED.
6. CONCRETE FORMS SHALL BE WETTED IMMEDIATELY PRIOR TO PLACING CONCRETE.
7. MIXING, PLACING AND CURING OF ALL CONCRETE MUST BE IN ACCORDANCE WITH ACI 305R, HOT WEATHER CONCRETING. NEW CONCRETE EXPOSED TO DIRECT SUNLIGHT SHALL BE COVERED AND SPRAYED.
8. ALL REINFORCING SHALL BE HIGH STRENGTH DEFORMED BARS CONFORMING TO ASTM A-615, GRADE 60.
9. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185 AND SHALL BE LAPPED ONE FULL MESH AND AT SIDE AND END SPLICES AND WIRED TOGETHER.
10. REINFORCEMENT COVERAGE SHALL BE 2" MINIMUM WHEN FORMS ARE USED AND 3" MINIMUM WHEN POURED AGAINST THE EARTH, UNLESS OTHERWISE NOTED.
11. LAP SPLICES SHALL BE A MINIMUM OF 48 BAR DIAMETERS. MAKE ALL BARS CONTINUOUS AROUND CORNERS.
12. PROVIDE ALL ACCESSORIES NECESSARY TO SECURE REINFORCING IN PROPER POSITION AS INDICATED ON THE DRAWINGS AND IN ACCORDANCE WITH ACI 318. ALL ACCESSORIES TO BE GALVANIZED.
13. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED STEEL
14. MANUFACTURED STRAPS AND ANCHORS SHALL BE GALVANIZED AND SHALL BE FASTENED PER THE MANUFACTURER RECOMMENDATIONS. IN NO EVENT SHALL A STRUCTURAL MEMBER SUCH AS PIER, SILL, JOIST, PLATE, RAFTER OR TRUSS BE WITHOUT ANCHORAGE DEVICES FOR HURRICANE PROTECTION, UNLESS SPECIFICALLY NOTED AND ADDRESSED BY OTHER MEANS.
15. AUGER PILES SHALL BE SET AT LEAST 3 FT INTO THE NATURAL LIMEROCK FORMATION(APPROXIMATELY 9' BELOW THE SURFACE), AS PER GEOTECHNICAL REPORT PREPARED BY NUTTING ENGINEERS.
16. ANY AREA WHERE NEW SPREAD FOUNDATION IS TO BE CONSTRUCTED, CONTRACTOR TO ENSURE THAT THE ORGANIC SILTS SOILS FOUND AT BEGINNING AT 2-4 FT DEPTHS AND TERMINATING AT 6-7 FT DEPTHS ARE FULLY REMOVED AND CLEAN FILL SHALL BE ADDED. SOFT COMPRESSIBLE SILT SHALL BE REPLACED WITH COMPACTED STRUCTURAL FILL AS PER GEOTECHNICAL REPORT PREPARED BY NUTTING ENGINEERING.
17. THE BUILDING IS DESIGNED USING A 2500 PSF SOIL BEARING PRESSURE WHICH SHALL BE ACHIEVED WITH THE SOIL REPLACEMENT PREVIOUSLY MENTIONED, AS PER GEOTECHNICAL REPORT PREPARED BY NUTTING ENGINEERING.

STRUCTURAL NOTES:
1. THE WORK DEPICTED ON THESE DRAWINGS IS DESIGNED TO COMPLY WITH THE 2017 FLORIDA BUILDING CODE AND ASCE 7-10. THE BUILDING IS DESIGNED TO WITHSTAND THE PRESSURES ASSOCIATED WITH 180 MPH WIND LOADS IN ACCORDANCE WITH ASCE 7-10 AND A FLOOR LIVE LOAD OF 40 PSF.
2. ENGINEERS WRITTEN APPROVAL MUST BE SECURED FOR ALL STRUCTURAL SUBSTITUTIONS AND/OR MODIFICATIONS.
3. THE CONTRACTOR SHALL VERIFY ALL OPENINGS THROUGH FLOORS, ROOFS AND WALLS WITH MECHANICAL AND ELECTRICAL CONTRACTORS. RESPECTIVE CONTRACTORS SHALL PROVIDE ALL HANGERS, CONNECTORS, ETC AND APPROVAL THEREOF.
4. PROVIDE TEMPORARY BRACING AND SUPPORT NECESSARY TO WITHSTAND ALL CONSTRUCTION AND WIND LOADS UNTIL ALL FIELD CONNECTIONS ARE COMPLETED AND SHEAR WALLS AND DECKS ARE IN PLACE.
5. PROVIDE SHOP AND ERECTION DRAWINGS FOR ALL REINFORCING, PRECAST CONCRETE, STRUCTURAL STEEL, LAMINATED FRAMING MEMBERS AND METAL DECKING AND VERIFY/COORDINATE EXISTING AND PROPOSED DIMENSIONS PRIOR TO FABRICATION.
6. ALL PRECAST CONCRETE, STRUCTURAL STEEL AND OTHER MAJOR STRUCTURAL SHOP DRAWINGS SUBMITTED SHALL INCLUDE CALCULATIONS AND BEAR THE SEAL OF A FLORIDA PROFESSIONAL ENGINEER.
7. WATERPROOFING, VAPOR BARRIERS, WATERSTOPS, ETC SHALL BE PROVIDED AS INDICATED.
8. ALL DOUBLE MEMBER BEAMS TO BE FASTENED TOGETHER W/ GLUE AND NAIL TOGETHER W/ (3) 3" MIN. 16D RING SHANK NAILS 12" O.C.
9. A 10 MIL UNDERSLAB VAPOR BARRIER SHALL BE INSTALLED BENEATH ALL SLABS ON GRADE.
10. THE PROPOSED AREA OF WORK IS IN FLOOD ZONE AE (EL 7 FT) ACCORDING TO FLOOD INSURANCE RATE MAP 12087C-1516K, COMMUNITY # 125129, DATED 02-18-2005. THE PROPOSED FINISHED FLOOR IS AT ELEV. ±9.8' (NGVD 29).
11. CONTRACTOR TO REFERENCE SITE SURVEY PREPARED BY REECE & ASSOCIATES FOR BENCHMARK INFORMATION.

Meridian Engineering LLC
201 Front Street, Suite 203
Key West, Florida 33040
AUTHORIZATION #29401
ph:305-293-3263 fax:293-4899

Seal:

NOT VALID FOR CONSTRUCTION UNLESS SIGNED AND SEALED IN THIS BLOCK

RICHARD J. MILELLI
PE #58315

General Notes:

TRUMAN WATERFRONT 1B REMODEL

ISSUED BID SET

KEY WEST, FLORIDA

Drawn By:	Checked By:
ANF	RJM
Project No.	Scale:
AS NOTED	

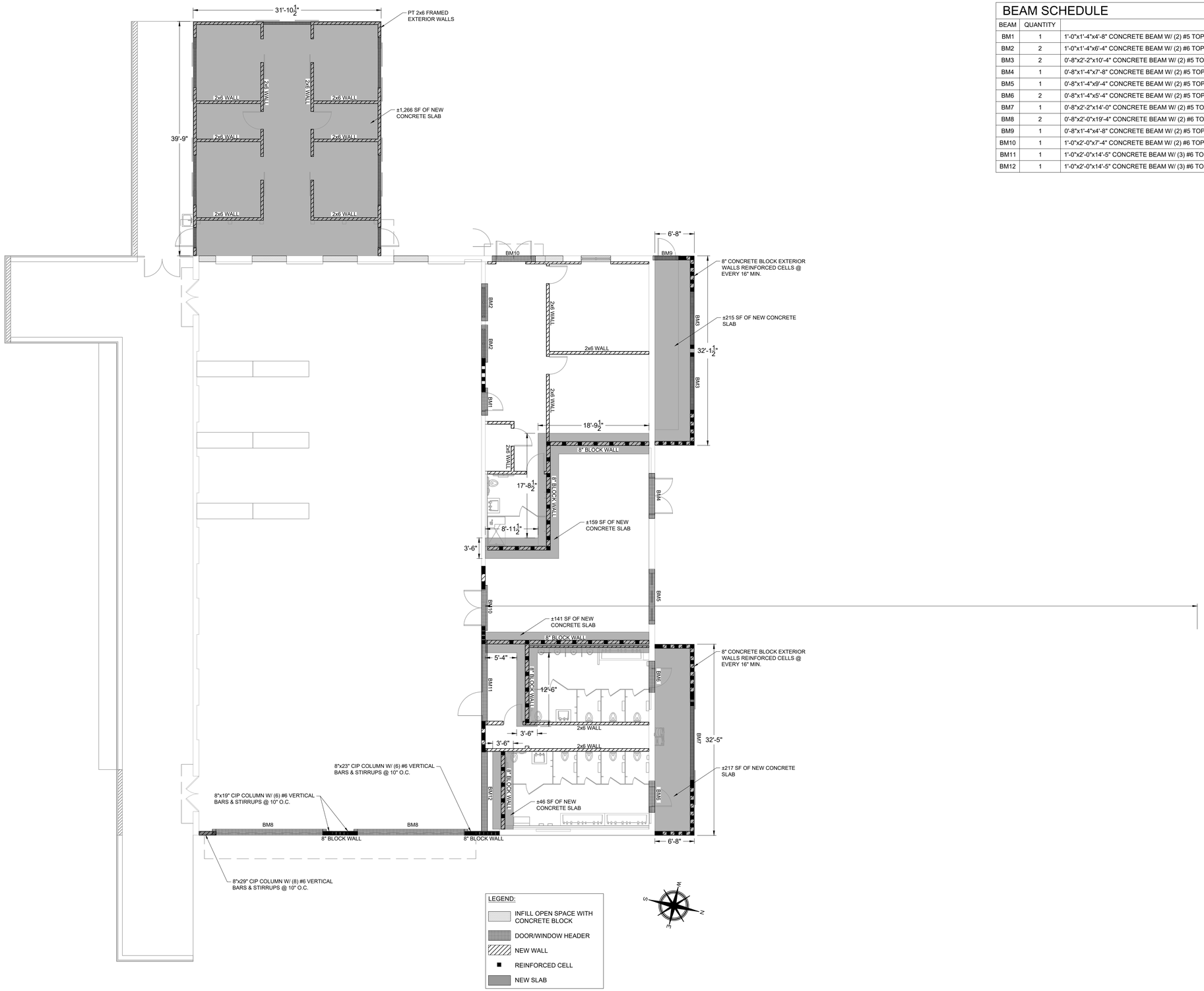
AutoCad File No.

Revisions:

Title:
FOUNDATION PLAN

Sheet Number:
S-1.0

Date: MARCH 22, 2019



BEAM SCHEDULE

BEAM	QUANTITY	SIZE & DESCRIPTION
BM1	1	1'-0"x1'-4"x4'-8" CONCRETE BEAM W/ (2) #5 TOP BARS, (2) #5 BOTTOM BARS, & #3 HOOPS @ 10" O.C.
BM2	2	1'-0"x1'-4"x6'-4" CONCRETE BEAM W/ (2) #6 TOP BARS, (2) #6 BOTTOM BARS, & #3 HOOPS @ 10" O.C.
BM3	2	0'-8"x2'-2"x10'-4" CONCRETE BEAM W/ (2) #5 TOP BARS, (2) #5 MIDDLE BARS, (2) #5 BOTTOM BARS, & #3 HOOPS @ 10" O.C.
BM4	1	0'-8"x1'-4"x7'-8" CONCRETE BEAM W/ (2) #5 TOP BARS, (2) #5 BOTTOM BARS, & #3 HOOPS @ 10" O.C.
BM5	1	0'-8"x1'-4"x9'-4" CONCRETE BEAM W/ (2) #5 TOP BARS, (2) #5 BOTTOM BARS, & #3 HOOPS @ 10" O.C.
BM6	2	0'-8"x1'-4"x5'-4" CONCRETE BEAM W/ (2) #5 TOP BARS, (2) #5 BOTTOM BARS, & #3 HOOPS @ 10" O.C.
BM7	1	0'-8"x2'-2"x14'-0" CONCRETE BEAM W/ (2) #5 TOP BARS, (2) #5 MIDDLE BARS, (2) #5 BOTTOM BARS, & #3 HOOPS @ 10" O.C.
BM8	2	0'-8"x2'-0"x19'-4" CONCRETE BEAM W/ (2) #6 TOP BARS, (2 LAYERS) (2) #6 BOTTOM BARS, & #3 HOOPS @ 10" O.C.
BM9	1	0'-8"x1'-4"x4'-8" CONCRETE BEAM W/ (2) #5 TOP BARS, (2) #5 BOTTOM BARS, & #3 HOOPS @ 10" O.C.
BM10	1	1'-0"x2'-0"x7'-4" CONCRETE BEAM W/ (2) #6 TOP BARS, (2) #6 BOTTOM BARS, & #3 HOOPS @ 10" O.C.
BM11	1	1'-0"x2'-0"x14'-5" CONCRETE BEAM W/ (3) #6 TOP BARS, (2 LAYERS) (3) #6 BOTTOM BARS, & #3 HOOPS @ 10" O.C.
BM12	1	1'-0"x2'-0"x14'-5" CONCRETE BEAM W/ (3) #6 TOP BARS, (2 LAYERS) (3) #6 BOTTOM BARS, & #3 HOOPS @ 10" O.C.

Meridian Engineering LLC
201 Front Street, Suite 203
Key West, Florida 33040
AUTHORIZATION #29401
ph:305-293-3263 fax:293-4899

Seal:

NOT VALID FOR CONSTRUCTION UNLESS SIGNED AND SEALED IN THIS BLOCK

RICHARD J. MILELLI
PE #58315

General Notes:

TRUMAN WATERFRONT 1B REMODEL

ISSUED BID SET

KEY WEST, FLORIDA

Drawn By:	Checked By:
ANF	RJM
Project No.	Scale:
AS NOTED	

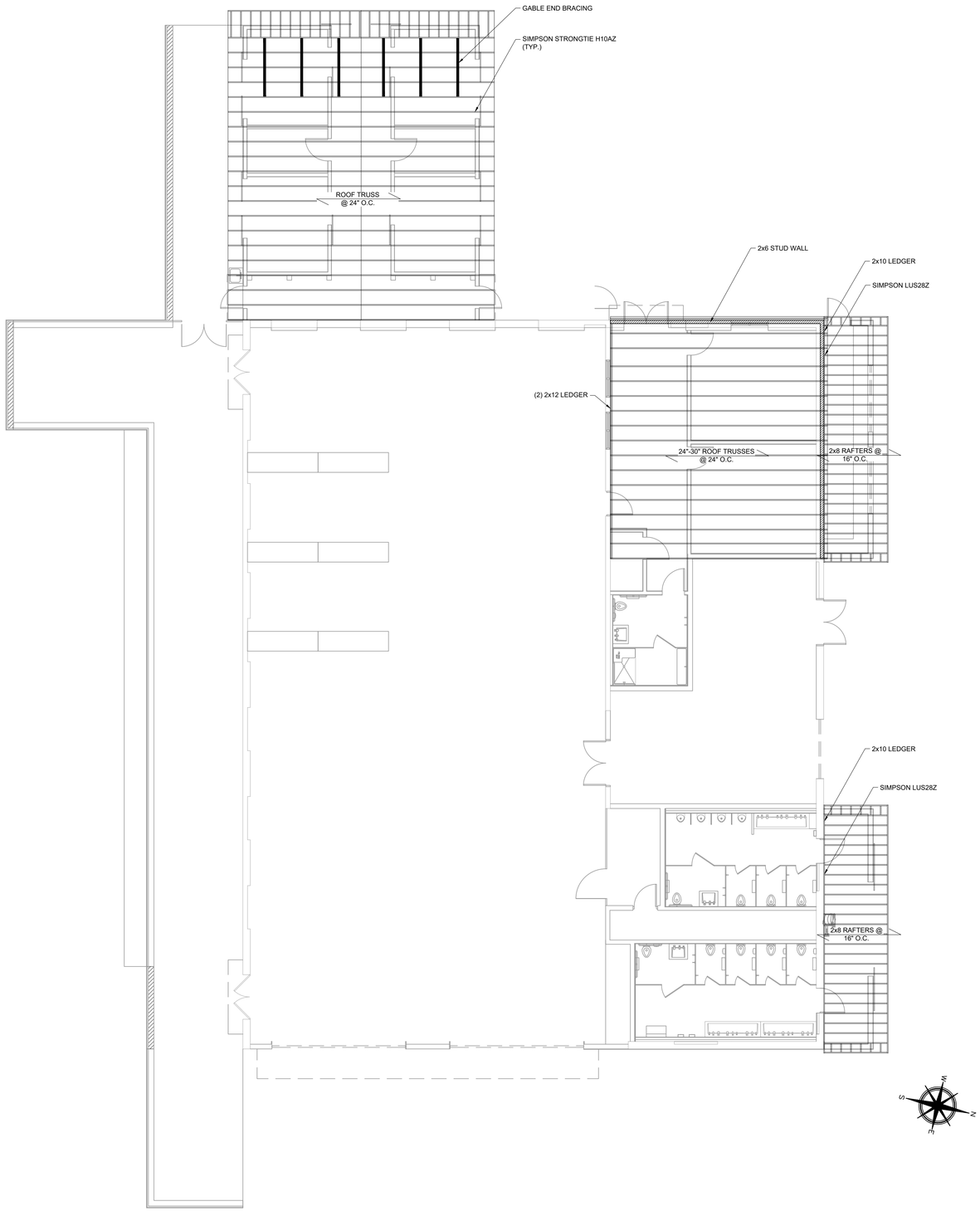
AutoCad File No.

Revisions:

Title:
STRUCTURAL PLAN

Sheet Number:
S-2.0

Date: MARCH 22, 2019



TRUSS NOTES:

1. TRUSS DETAILS HEREIN ARE FOR SCHEMATIC PURPOSES ONLY. THE TRUSS MANUFACTURER SHALL VERIFY TRUSS LAYOUT AND PROVIDE TRUSS DESIGN.
2. WOOD TRUSSES SHALL BE FABRICATED BY A LICENSED FABRICATOR AND FURNISHED IN ACCORDANCE WITH DESIGNS AND CALCULATIONS PREPARED, SIGNED AND SEALED BY A STATE OF FLORIDA REGISTERED PROFESSIONAL ENGINEER. WOOD TRUSSES SHALL BE DESIGNED IN ACCORDANCE WITH THE "NATIONAL DESIGN SPECIFICATIONS FOR STRESS GRADE LUMBER AND ITS FASTENINGS" BY THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION (LATEST REVISION) AND "DESIGN SPECIFICATIONS FOR LIGHT METAL PLATE CONNECTED WITH TRUSSES", BY TRUSS PLATE INSTITUTE.
3. THE DESIGN AND SHOP DRAWINGS AS WELL AS THE FABRICATION OF WOOD TRUSSES, WILL BE SUBJECT TO THE INSPECTIONS AND APPROVAL OF THE ENGINEER OF RECORD.
4. THE HANDLING, ERECTION, AND FIXING OF WOOD TRUSSES SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS NOTED ON THE DESIGN DRAWINGS FOR THE WOOD TRUSSES.
5. WOOD TRUSSES SHALL BE DESIGNED FOR 180 MPH WIND SPEED.
6. ALL TRUSSES, INCLUDING GIRDERS AND GIRDER TRUSSES, SHALL BE ANCHORED IN COMPLIANCE WITH THE TRUSS MANUFACTURER'S FINAL TRUSS REQUIREMENTS USING APPROPRIATE TRUSS TIES DESIGNED TO MEET THE UPLIFT AND LATERAL LOADS AS SPECIFIED BY THE TRUSS MANUFACTURER. TRUSS MANUFACTURER SHALL PROVIDE ALL HURRICANE STRAPPING AND DETAILS FOR ROOF CONNECTIONS.
7. TRUSS MANUFACTURER TO PROVIDE WEB OPENING IN FLOOR TRUSSES FOR A/C DUCT WORK. COORDINATE WITH MECHANICAL CONTRACTOR.

ASCE 7-10 WIND LOAD DATA

PER FBC 2017 - CH. 28, 30

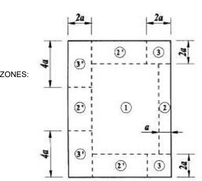
WIND SPEED 180 MPH
CATAGORY/EXPOSURE: C
MEAN ROOF HEIGHT: 17'-4"
ROOF ANGLE: 1.19 DEG.
WIND PRESSURES (PSF)

NOMINAL
MONOSLOPE ROOF ZONES:
ZONE 1: -48.2
ZONE 2: -57.2
ZONE 2': -57.2
ZONE 3: -35.9
ZONE 3': 13.1

WALL ZONES:
ZONE 4: 36.2/ -40.2
ZONE 5: 38.6/ -45.0

ULTIMATE
MONOSLOPE ROOF ZONES:
ZONE 1: -80.4
ZONE 2: -95.3
ZONE 2': -95.3
ZONE 3: -59.9
ZONE 3': -21.8

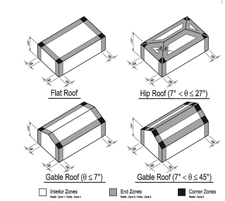
WALL ZONES:
ZONE 4: 60.3/ -67.0
ZONE 5: 64.3/ -75.1



Interior Zones
Roofs - Zone 1 / Walls - Zone 4

End Zones
Roofs - Zone 2 / Walls - Zone 5

Corner Zones
Roofs - Zone 3



Meridian Engineering LLC
201 Front Street, Suite 203
Key West, Florida 33040
AUTHORIZATION #29401
ph:305-293-3263 fax:293-4899

Seal:

NOT VALID FOR CONSTRUCTION UNLESS SIGNED AND SEALED IN THIS BLOCK

RICHARD J. MILELLI
PE #58315

General Notes:

TRUMAN WATERFRONT 1B REMODEL

ISSUED BID SET

KEY WEST, FLORIDA

Drawn By:	Checked By:
ANF	RJM
Project No.	Scale:
AS NOTED	

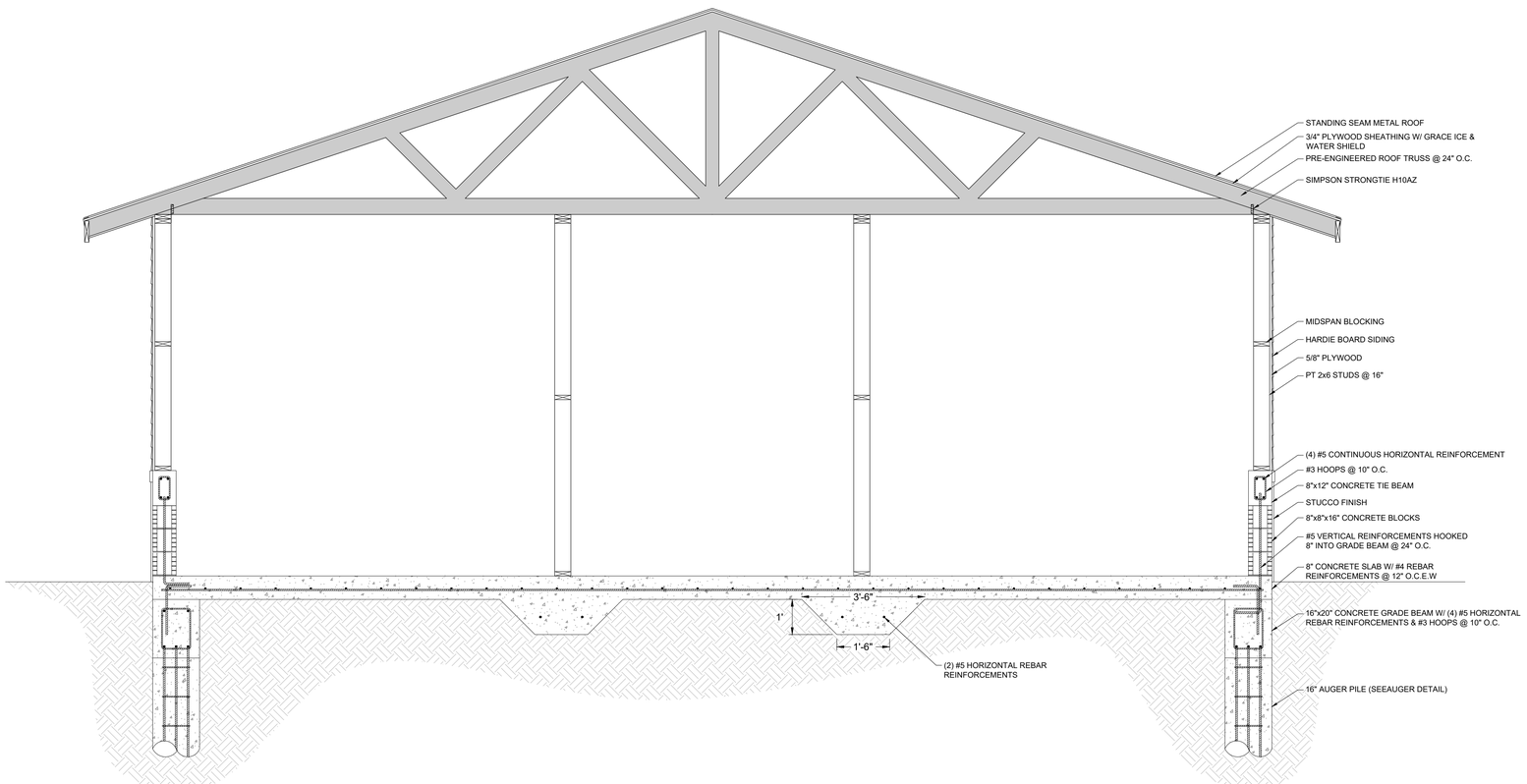
AutoCad File No.

Revisions:

Title:
ROOF FRAMING PLAN

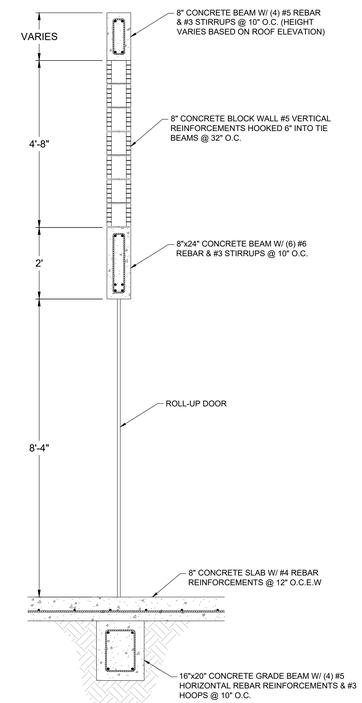
Sheet Number:
S-3.0

Date: MARCH 22, 2019



1 S-4.0 HORSE STABLE SECTION

SCALE: N.T.S.



2 S-4.0 GARAGE DOOR SECTION

SCALE: N.T.S.

Meridian Engineering LLC
201 Front Street, Suite 203
Key West, Florida 33040
AUTHORIZATION #29401
ph:305-293-3263 fax:293-4899

Seal:

NOT VALID FOR CONSTRUCTION UNLESS SIGNED AND SEALED IN THIS BLOCK

RICHARD J. MILELLI
PE #58315

General Notes:

TRUMAN WATERFRONT 1B REMODEL
ISSUED BID SET
KEY WEST, FLORIDA

Drawn By:	Checked By:
ANF	RJM
Project No.	Scale:
AS NOTED	

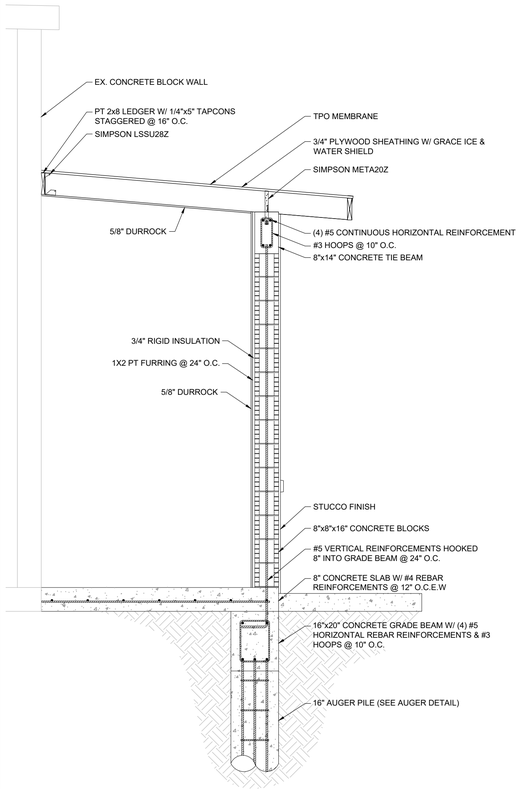
AutoCad File No.

Revisions:

Title:
STRUCTURAL SECTIONS AND DETAILS

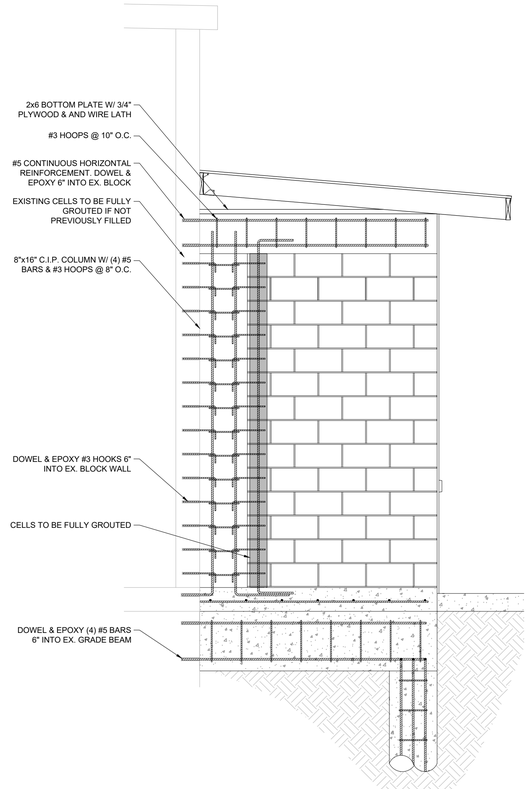
Sheet Number:
S-4.0

Date: MARCH 22, 2019



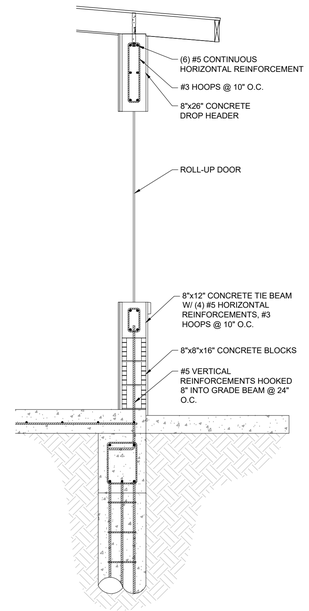
1 S-4.1 CONCESSTION STAND SECTION

SCALE: N.T.S.



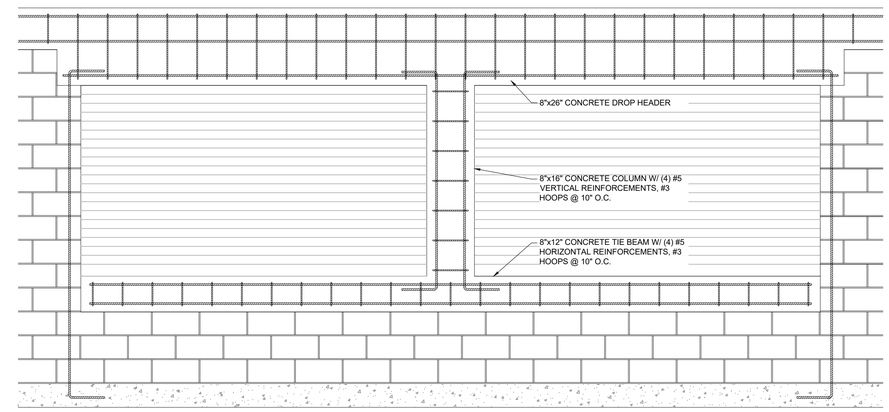
2 S-4.1 CONCRETE WALL CONNECTION SECTION

SCALE: N.T.S.



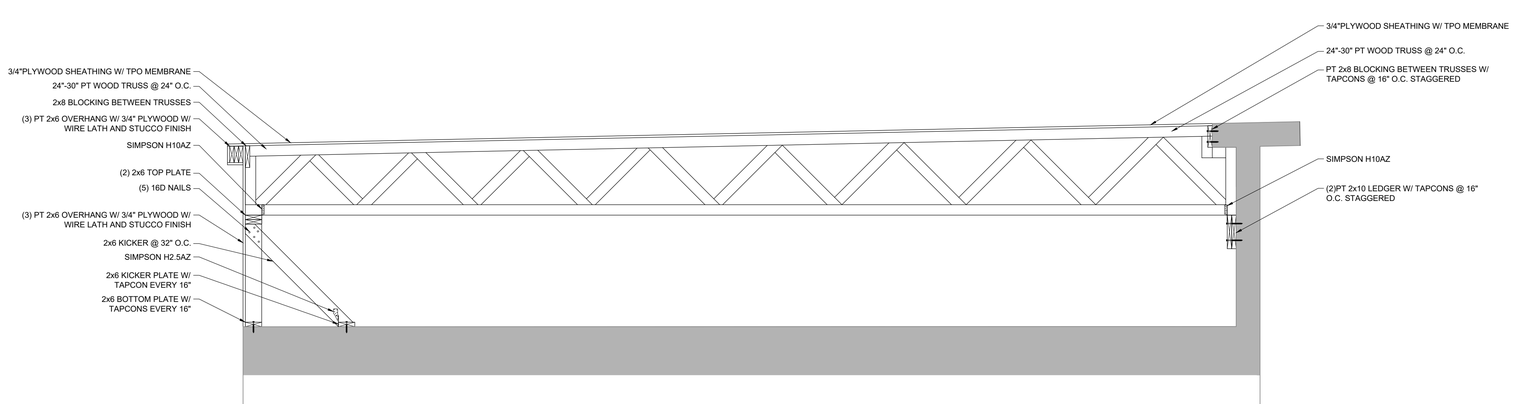
3 S-4.1 CONCESSION STAND SECTION

SCALE: N.T.S.



4 S-4.1 CONCESSION STAND SECTION

SCALE: N.T.S.



5 S-4.1 ROOF SECTION

SCALE: N.T.S.

Meridian Engineering LLC
201 Front Street, Suite 203
Key West, Florida 33040
AUTHORIZATION #29401
ph:305-293-3263 fax:293-4899

Seal:

NOT VALID FOR CONSTRUCTION UNLESS SIGNED AND SEALED IN THIS BLOCK

RICHARD J. MILELLI
PE #58315

General Notes:

TRUMAN WATERFRONT 1B REMODEL

ISSUED BID SET

KEY WEST, FLORIDA

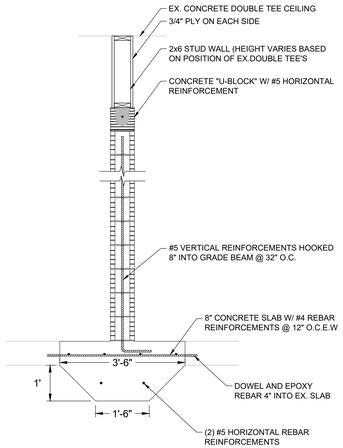
Drawn By:	Checked By:
ANF	RJM
Project No.	Scale:
AS NOTED	
AutoCad File No.	

Revisions:

Title:
STRUCTURAL SECTIONS AND DETAILS

Sheet Number:
S-4.1

Date: MARCH 22, 2019

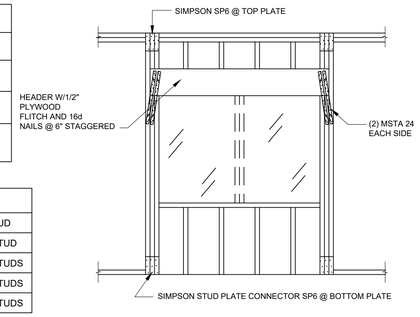


1 / S-4.3 TYPICAL INTERIOR BLOCK WALL DETAIL

SCALE: N.T.S.

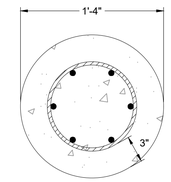
HEADER SCHEDULE	
OPENING SIZE	BEAM
< OR = 6'-0"	(3) 2"X8" W/ (2) ½" PLYWOOD FLITCH
6'-0" - 8'-0"	(3) 2"X10" W/ (2) ½" PLYWOOD FLITCH
8'-0" - 10'-0"	(3) 2"X12" W/ (2) ½" PLYWOOD FLITCH

STUD SCHEDULE AT HEADERS	
< OR = 3'-0" OPENING	1 JACK STUD/1 KING STUD
3'-0" - 6'-0" OPENING	2 JACK STUDS/1 KING STUD
6'-0" - 8'-0" OPENING	2 JACK STUDS/2 KING STUDS
8'-0" - 10'-0" OPENING	2 JACK STUDS/3 KING STUDS
10'-0" - 12'-0" OPENING	3 JACK STUDS/3 KING STUDS



2 / S-4.2 TYPICAL HEADER DETAIL

SCALE: NTS



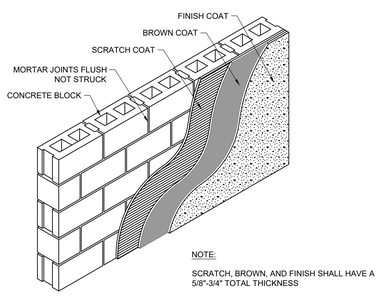
16" DIAMETER CONCRETE AUGER PILE W/ (6) #5 VERTICAL BARS, #3 TIES @ 10" O.C. 3' INTO ROCK. CLEAN HOLES BEFORE PLACING 4,000 PSI CONCRETE

3 / S-4.2 TYPICAL AUGER DETAIL

SCALE: N.T.S.

TRUSS NOTES:

1. TRUSS DETAILS HEREIN ARE FOR SCHEMATIC PURPOSES ONLY. THE TRUSS MANUFACTURER SHALL VERIFY TRUSS LAYOUT AND PROVIDE TRUSS DESIGN.
2. WOOD TRUSSES SHALL BE FABRICATED BY A LICENSED FABRICATOR AND FURNISHED IN ACCORDANCE WITH DESIGNS AND CALCULATIONS PREPARED, SIGNED AND SEALED BY A STATE OF FLORIDA REGISTERED PROFESSIONAL ENGINEER. WOOD TRUSSES SHALL BE DESIGNED IN ACCORDANCE WITH THE "NATIONAL DESIGN SPECIFICATIONS FOR STRESS GRADE LUMBER AND ITS FASTENINGS" BY THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION (LATEST REVISION) AND "DESIGN SPECIFICATIONS FOR LIGHT METAL PLATE CONNECTED WITH TRUSSES", BY TRUSS PLATE INSTITUTE.
3. THE DESIGN AND SHOP DRAWINGS AS WELL AS THE FABRICATION OF WOOD TRUSSES, WILL BE SUBJECT TO THE INSPECTIONS AND APPROVAL OF THE ENGINEER OF RECORD.
4. THE HANDLING, ERECTION, AND FIXING OF WOOD TRUSSES SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS NOTED ON THE DESIGN DRAWINGS FOR THE WOOD TRUSSES.
5. WOOD TRUSSES SHALL BE DESIGNED FOR 180 MPH WIND SPEED.
6. ALL TRUSSES, INCLUDING GIRDERS AND GIRDER TRUSSES, SHALL BE ANCHORED IN COMPLIANCE WITH THE TRUSS MANUFACTURER'S FINAL TRUSS REQUIREMENTS USING APPROPRIATE TRUSS TIES DESIGNED TO MEET THE UPLIFT AND LATERAL LOADS AS SPECIFIED BY THE TRUSS MANUFACTURER. TRUSS MANUFACTURER SHALL PROVIDE ALL HURRICANE STRAPPING AND DETAILS FOR ROOF CONNECTIONS.
7. TRUSS MANUFACTURER TO PROVIDE WEB OPENING IN FLOOR TRUSSES FOR A/C DUCT WORK. COORDINATE WITH MECHANICAL CONTRACTOR.

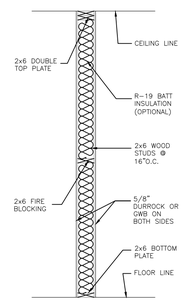


NOTE:

SCRATCH, BROWN, AND FINISH SHALL HAVE A 5/8"-3/4" TOTAL THICKNESS

4 / S-4.2 TYPICAL STUCCO DETAIL

SCALE: N.T.S.

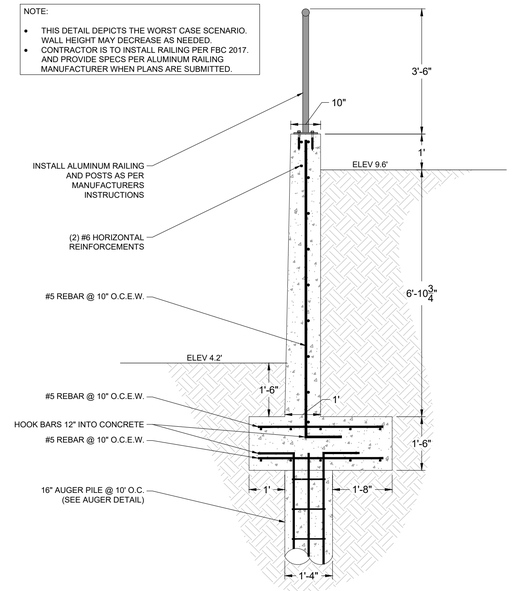


5 / S-4.2 TYPICAL 2X6 WALL DETAIL

SCALE: NTS

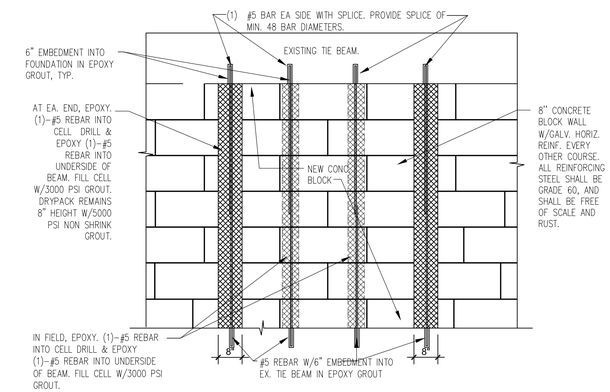
NOTE:

- THIS DETAIL DEPICTS THE WORST CASE SCENARIO. WALL HEIGHT MAY DECREASE AS NEEDED.
- CONTRACTOR IS TO INSTALL RAILING PER FBC 2017. AND PROVIDE SPECS PER ALUMINUM RAILING MANUFACTURER WHEN PLANS ARE SUBMITTED.



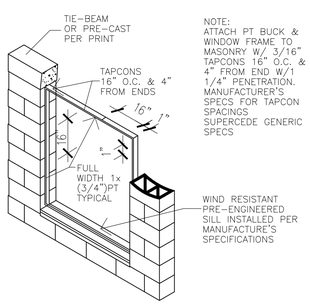
6 / S-4.2 PARKING LOT RETAINING WALL DETAIL

SCALE: 1/2" = 1'-0"



7 / S-4.2 TYPICAL FILL-IN OPENING (BLOCK)

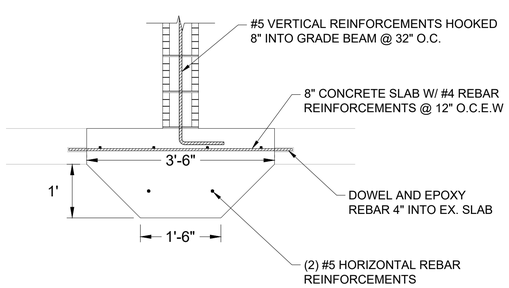
SCALE: NTS



NOTE:
ATTACH PT BUCK & WINDOW FRAME TO MASONRY W/ 3/16" TAPCONS 16" O.C. & 4" FROM END W/1 1/4" PENETRATION. MANUFACTURER'S SPECS FOR TAPCON SPACINGS SUPERCEDE GENERIC SPECS

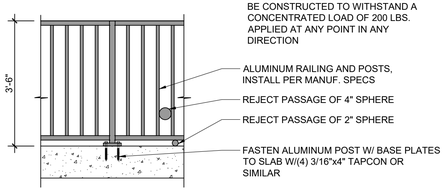
8 / S-4.2 TYPICAL BUCK DETAIL

SCALE: NTS



9 / S-4.2 SPREAD FOOTER DETAIL

SCALE: NTS

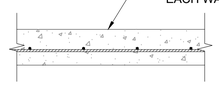


NOTE: HANDRAIL AND GUARDRAIL TO BE CONSTRUCTED TO WITHSTAND A CONCENTRATED LOAD OF 200 LBS. APPLIED AT ANY POINT IN ANY DIRECTION

NOTE: CONTRACTOR IS TO INSTALL RAILING PER FBC 2017. AND PROVIDE SPECS PER ALUMINUM RAILING MANUF WHEN PLANS ARE SUBMITTED.

10 / S-4.2 ALUMINUM RAILING CONNECTION FOR TOP MOUNTING TO FRAMING

SCALE: NTS



8" CONCRETE SLAB W/ #4 REBAR REINFORCEMENTS @ 12" O.C.E.W, ADD CONTROL JOINTS EVERY 10' EACH WAY

11 / S-4.2 TYPICAL SLAB DETAIL

SCALE: NTS

DOOR PRESSURE CALCULATIONS			
DOOR NO.	SIZE	ZONE	MINIMUM ALLOWABLE PRESSURES
001	18'-0"x10'-0"	4	+39.3 / -43.3
002	18'-0"x10'-0"	5	+39.3 / -46.5
003	6'-0"x7'-0"	5	+43.8 / -55.5
004	6'-0"x7'-0"	5	+43.8 / -55.5
005	3'-0"x8'-0"	4	+45.5 / -49.5
012	3'-0"x8'-0"	4	+45.5 / -49.5
013	6'-0"x8'-0"	4	+43.4 / -47.4
014	3'-0"x8'-0"	5	+45.5 / -58.9
015	9'-0"x8'-0"	5	+42.1 / -52.1
016	9'-0"x8'-0"	5	+42.1 / -52.1
022	6'-4"x8'-0"	4	+43.2 / -47.3
023	8'-0"x8'-0"	4	+42.5 / -46.5
026	12'-8"x8'-0"	5	+41.1 / -50.0
029	8'-0"x8'-0"	4	+42.5 / -46.5
030	8'-0"x8'-0"	5	+42.5 / -52.9
031	8'-0"x8'-0"	5	+42.5 / -52.9
032	8'-0"x8'-0"	5	+42.5 / -52.9
033	8'-0"x8'-0"	4	+42.5 / -46.5
WINDOW PRESSURE CALCULATIONS			
WINDOW	SIZE	ZONE	MINIMUM ALLOWABLE PRESSURES
003	4'-0"x5'-0"	5	+46.1 / -60.0

N
W E
S

Meridian Engineering LLC
201 Front Street, Suite 203
Key West, Florida 33040
AUTHORIZATION #29401
ph:305-293-3263 fax:293-4899

Seal:

NOT VALID FOR CONSTRUCTION UNLESS SIGNED AND SEALED IN THIS BLOCK

RICHARD J. MILELLI
PE #58315

General Notes:

TRUMAN WATERFRONT 1B REMODEL

ISSUED BID SET

KEY WEST, FLORIDA

Drawn By: ANF	Checked By: RJM
Project No. AS NOTED	Scale:

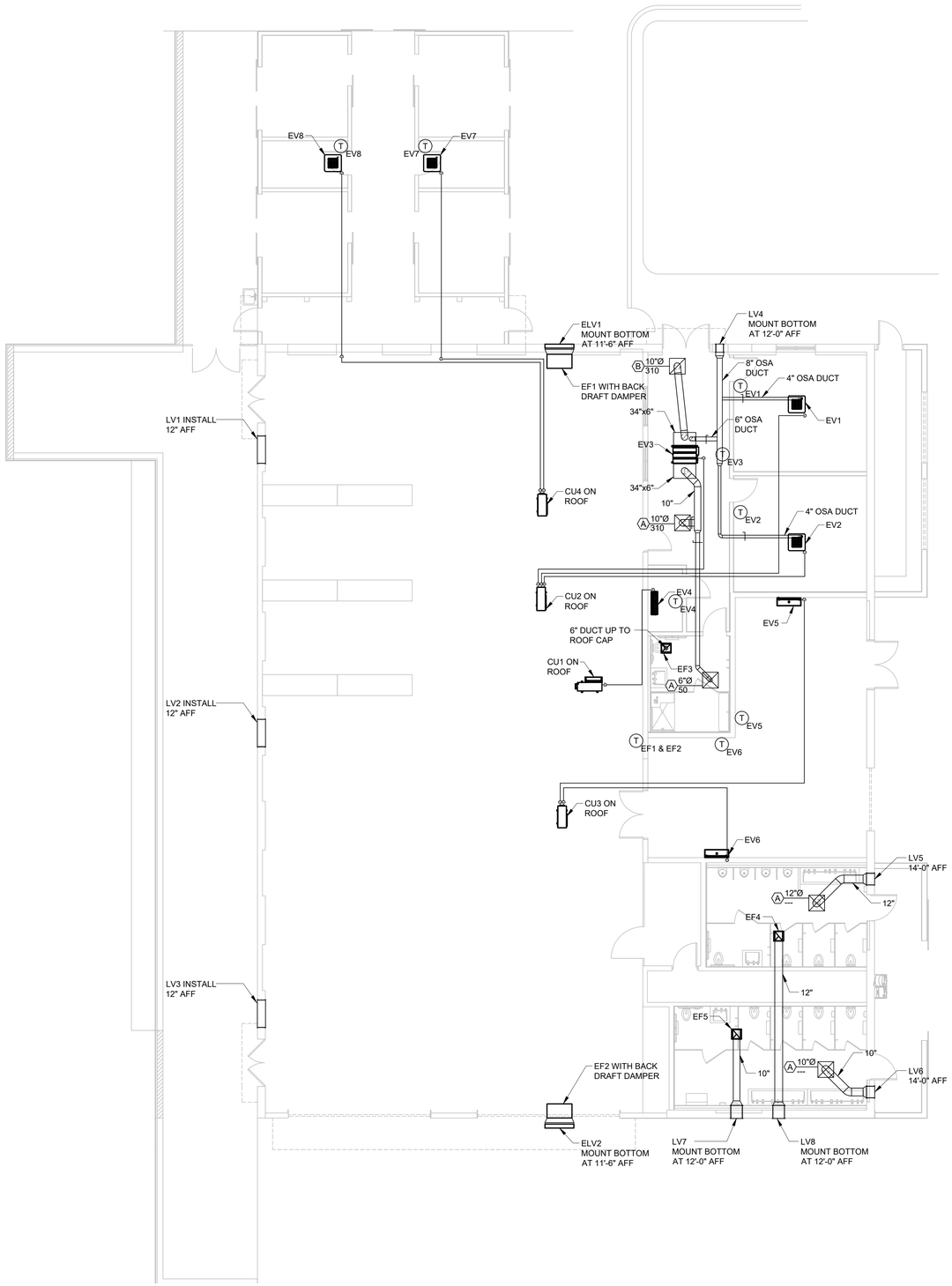
AutoCad File No.

Revisions:

Title: STRUCTURAL SECTIONS AND DETAILS

Sheet Number: S-4.2

Date: MARCH 22, 2019



1 MECHANICAL PLAN
1/8" = 1'-0"

MECHANICAL GENERAL NOTES

1. NOTES APPLY TO ALL MECHANICAL SHEETS.
2. EACH CONTRACTOR IS RESPONSIBLE FOR HAVING THOROUGH KNOWLEDGE OF ALL DRAWINGS AND SPECIFICATIONS AS THEY RELATE TO THIS WORK.
3. PROVIDE ALL MATERIALS FOR A COMPLETE INSTALLATION IN ALL RESPECTS READY FOR INTENDED USE AND IN STRICT ACCORDANCE WITH STATE AND LOCAL CODES AND MANUFACTURER'S RECOMMENDATIONS.
4. EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
5. COORDINATE THE INSTALLATION OF THE MECHANICAL SYSTEMS WITH OTHER TRADES TO ENSURE A NEAT AND ORDERLY INSTALLATION. INSTALL DUCTWORK AND PIPING AS TIGHT TO STRUCTURE AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATE INSTALLATION OF DUCTWORK AND PIPING TO AVOID CONFLICTS WITH ELECTRICAL PANELS, LIGHTING FIXTURES, ETC. ANY MODIFICATIONS REQUIRED DUE TO LACK OF COORDINATION WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AT NO EXTRA COST TO THE OWNER.
6. DURING INSTALLATION OF NEW WORK, AVOID DAMAGING EXISTING SURFACES AND EQUIPMENT TO REMAIN. REPAIR DAMAGE CAUSED DURING CONSTRUCTION AT NO EXTRA COST TO THE OWNER.
7. ALL MECHANICAL EQUIPMENT SHOWN ON THE MECHANICAL PLANS SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR UNLESS NOTED OTHERWISE.
8. NEW MECHANICAL EQUIPMENT, DUCTWORK AND PIPING ARE SHOWN AT APPROXIMATE LOCATIONS. FIELD MEASURE FINAL DUCTWORK AND PIPING LOCATIONS PRIOR TO FABRICATION AND MAKE ADJUSTMENTS AS REQUIRED TO FIT THE DUCTWORK AND PIPING WITHIN THE AVAILABLE SPACE. VERIFY THAT FINAL EQUIPMENT LOCATIONS MEET MANUFACTURER'S RECOMMENDATIONS REGARDING SERVICE CLEARANCE AND PROPER AIRFLOW CLEARANCE AROUND EQUIPMENT.
9. DUCTWORK IDENTIFICATION AND INSTALLATION SHALL ADHERE TO GOVERNING CODES.
10. INSTALL DUCTWORK AND PIPING PARALLEL TO BUILDING COLUMN LINES UNLESS OTHERWISE SHOWN OR NOTED.
11. OVERHEAD HANGERS AND SUPPORTS FOR EQUIPMENT, DUCTWORK AND PIPING SHALL BE FASTENED TO BUILDING JOISTS OR BEAMS. DO NOT ATTACH HANGERS AND SUPPORTS TO THE ABOVE FLOOR SLAB OR ROOF.
12. COORDINATE LOCATION OF EQUIPMENT SUPPORTS WITH LOCATION OF EQUIPMENT ACCESS PANELS/DOORS TO ENABLE SERVICE OF EQUIPMENT.
13. SEAL PENETRATIONS THROUGH THE BUILDING COMPONENTS IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS. FIREPROOF PENETRATIONS THROUGH FIRE RATED COMPONENTS IN ACCORDANCE WITH U.L. REQUIREMENTS.
14. COORDINATE THE EXACT MOUNTING SIZE AND FRAME TYPE OF DIFFUSERS, REGISTERS AND GRILLES WITH THE SUPPLIER TO MEET THE CEILING, WALL AND DUCT INSTALLATION REQUIREMENTS.
15. SPRINKLER HEAD AND LIGHTING FIXTURE LOCATIONS TAKE PRECEDENCE OVER DIFFUSER LOCATIONS. ADJUST LOCATION OF CEILING DIFFUSERS, REGISTERS AND GRILLES AS REQUIRED TO ACCOMMODATE FINAL CEILING GRID, SPRINKLER, AND LIGHTING LOCATIONS.
16. ALL CEILING DIFFUSERS ARE 4-WAY PATTERN UNLESS NOTED OTHERWISE.
17. LOCATE AND SET THERMOSTATS AT LOCATIONS SHOWN ON PLANS. VERIFY EXACT LOCATIONS WITH ARCHITECT PRIOR TO INSTALLATION. INSTALL DEVICES WITH TOP OF DEVICE AT MAXIMUM 48" AFF TO MEET ADA REQUIREMENTS UNLESS NOTED OTHERWISE ON PLANS. INSTALL WIRING IN CONDUIT PROVIDED BY ELECTRICAL CONTRACTOR.
18. DUCTWORK CROSSING FIRE RATED WALLS OR OTHER FIRE RATED ASSEMBLIES SHALL BE MINIMUM 26 GAUGE SHEET METAL.
19. PROVIDE FIRE OR FIRE/SMOKE DAMPERS, AS APPLICABLE, IN DUCTWORK AT CEILINGS AND WALLS AT LOCATIONS SHOWN ON THE PLANS. FIRE AND FIRE/SMOKE DAMPERS SHALL CONFORM TO NFPA AS APPLICABLE. COORDINATE SLEEVE LENGTH WITH REQUIREMENTS OF INSTALLED LOCATION.
20. PROVIDE WALL OR DUCT ACCESS PANELS OR DOORS FOR ACCESS TO FIRE AND FIRE/SMOKE DAMPERS. ACCESS PANEL OR DOOR SHALL BE MINIMUM SIZE OF 10" BY 10" AND SHALL BE INSTALLED WITHIN 12" OF DAMPER. PROVIDE A REMOVABLE DUCT SECTION WHERE DUCT SIZE IS TOO SMALL FOR A 10" BY 10" ACCESS DOOR.
21. PROVIDE A MANUAL BALANCING DAMPER IN EACH BRANCH DUCT TAKEOFF FROM MAIN SUPPLY, RETURN, OUTDOOR AND EXHAUST AIR DUCTS. LOCATE DAMPERS A MINIMUM 4'-0" AWAY FROM DIFFUSERS. PROVIDE ACCESS AS REQUIRED.
22. PROVIDE A PREFABRICATED 45 DEGREE, HIGH EFFICIENCY, RECTANGULAR/ROUND BRANCH DUCT TAKEOFF FITTING WITH MANUAL BALANCING DAMPER AND LOCKING QUADRANT FOR BRANCH DUCT CONNECTIONS AND TAKE-OFFS TO INDIVIDUAL DIFFUSERS, REGISTERS AND GRILLES.
23. BRANCH DUCTWORK TO AIR OUTLETS SHALL BE SAME SIZE AS OUTLET NECK SIZE UNLESS NOTED OTHERWISE. TYPICAL BRANCH DUCT FITTING DETAIL IS APPLICABLE THROUGHOUT.
24. RIGID DUCTWORK INSULATION: PROVIDE 3/4 LB DENSITY, 2" R-6 THICK, INSULATION WRAP ON RIGID ROUND AND RECTANGULAR, CONCEALED, SUPPLY AND RETURN AIR DUCTS AND ON OUTSIDE AIR DUCTS. CONTRACTOR'S OPTION TO FURNISH AND INSTALL 1-1/2 LB DENSITY, 1-1/2" R-6 THICK INTERNAL DUCT LINER ON RECTANGULAR SUPPLY AND RETURN AIR DUCTS IN LIEU OF DUCTWRAP.
25. DUCT SIZES INDICATED ARE INSIDE CLEAR DIMENSIONS AND REPRESENTATIVE OF THE INSIDE EQUIVALENT FREE AREA REQUIRED TO MAINTAIN THE AIR FLOW SPECIFIED. IF DUCT LINING IS REQUIRED, INCREASE DUCT SIZE TO MAINTAIN ORIGINAL INSIDE DIMENSIONS. IF DUCT SIZES NEED TO BE ALTERED FOR SPACE REQUIREMENTS, ENSURE THE ORIGINAL INSIDE DUCT EQUIVALENT FREE AREA IS MAINTAINED.
26. CONTRACTOR'S OPTION TO SUBSTITUTE ROUND DUCT OF EQUAL FREE AREA FOR RECTANGULAR DUCT AND VICE VERSA. DIMENSIONS OF RECTANGULAR DUCT MAY BE ADJUSTED AS NECESSARY TO INSTALL DUCT IN AVAILABLE SPACE AS LONG AS FREE AREA IS MAINTAINED.
27. PROVIDE THERMAFLEX TYPE G-KM, M-KE, FLEXMASTER TYPE 8, OR APPROVED EQUAL FLEXIBLE DUCTWORK. FLEXIBLE DUCTWORK SHALL BE LISTED UNDER UL 181 AS CLASS 1 AIR DUCT AND BE PROVIDED WITH INTEGRAL R-6, 3/4 LB DENSITY FIBERGLASS INSULATION. FLEXIBLE DUCTWORK SHALL NOT EXCEED 5'-0" IN LENGTH AND SHALL BE INSTALLED AND SUPPORTED TO AVOID SHARP BENDS AND SAGGING.
28. FOR ALL EXPOSED DUCTWORK, PROVIDE DUCT THAT IS SUITABLE FOR PAINTING. ENSURE THAT ALL EXPOSED DUCTWORK IS PROPERLY PREPARED AND READY FOR PAINTING. COORDINATE COLOR WITH ARCHITECT.
29. PROVIDE A NEW SET OF AIR FILTERS IN UNITS PRIOR TO TESTING, ADJUSTING AND BALANCING AND BEFORE TURNING SYSTEM(S) OVER TO OWNER.
30. PROVIDE A COMPLETE TEST AND BALANCE FOR HVAC SYSTEM. AIR BALANCE SHALL BE WITHIN 5% OF SCHEDULED AIRFLOWS.
31. INSTALL VTR'S AND EXHAUST FANS A MINIMUM OF 10 FT FROM OUTSIDE AIR INTAKE.

MECHANICAL SYMBOLS

(SYMBOLS APPLY ONLY WHEN USED ON DRAWINGS)

SYMBOL	DESCRIPTION
18/12	RECTANGULAR DUCT 18" WIDE BY 12" DEEP (INSIDE CLEAR DIMENSIONS)
12"Ø	12"Ø DIAMETER ROUND DUCT (INSIDE CLEAR DIMENSIONS)
	SUPPLY DUCT IN SECTION (UP / DOWN)
	RETURN OR EXHAUST DUCT IN SECTION (UP / DOWN)
	ELBOW WITH TURNING VANES
	VOLUME/BALANCE DAMPER
	MOTORIZED DAMPER
	SUPPLY AIR DIFFUSER
	RETURN OR EXHAUST AIR GRILLE
CD 12"Ø 500	DIFFUSER OR GRILLE TYPE BRANCH DUCT & NECK SIZE CFM
T	THERMOSTAT
S	TEMPERATURE SENSOR
C	CO2 SENSOR
H	HUMIDISTAT
D	SMOKE DETECTOR
TM	TIMER
FD	FIRE DAMPER
ANNOTATION	
X	PLAN KEYNOTE
XXX	MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
	CONNECTION POINT OF NEW WORK TO EXISTING
1 M1.1.1	DETAIL REFERENCE: UPPER NUMBER INDICATES DETAIL NUMBER, LOWER NUMBER INDICATES SHEET NUMBER
1 M1.1.1	SECTION CUT DESIGNATION

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
BAS	BUILDING AUTOMATION SYSTEM
BFF	BELOW FINISHED FLOOR
CD	CEILING SUPPLY AIR DIFFUSER
CF	CEILNG FAN
CFM	CUBIC FEET PER MINUTE
CU	CONDENSING UNIT
DDC	DIRECT DIGITAL CONTROL
EA	EXHAUST AIR
EAG	EXHAUST AIR GRILLE
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
ETR	EXISTING TO REMAIN
GC	GENERAL CONTRACTOR
IN WC	INCHES OF WATER COLUMN
MAX	MAXIMUM
MBH	1000 BTU PER HOUR
MC	MECHANICAL CONTRACTOR
MFR	MANUFACTURER
MIN	MINIMUM
MS	MOP SINK
OA	OUTSIDE AIR
PC	PLUMBING CONTRACTOR
RA	RETURN AIR
RAG	RETURN AIR GRILLE
RAW	RETURN AIR WALL GRILLE
RC	REFRIGERATION CONTRACTOR
REF	REFERENCE
RH	RADIANT HEATER
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SAW	SUPPLY AIR WALL REGISTER
TYP	TYPICAL
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
VTR	VENT THRU ROOF
WH	WATER HEATER

ARCHITECT:
K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting
Key Largo, FL
Key West, FL
Marathon, FL
URL: www.k2mdesign.com
PROF. REG. AA26001059
Building Relationships Based on Trust and Results
Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:
STRUCTURAL ENGINEER: Meridian Engineering LLC
CIVIL ENGINEER: Perez Engineering & Development
IRRIGATION: Blue Island Lighting & Irrigation Inc.

Submissions:
DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:39 PM

Drawing Size	Project #: 18070
Drawn By: JBC	Checked By: JCW

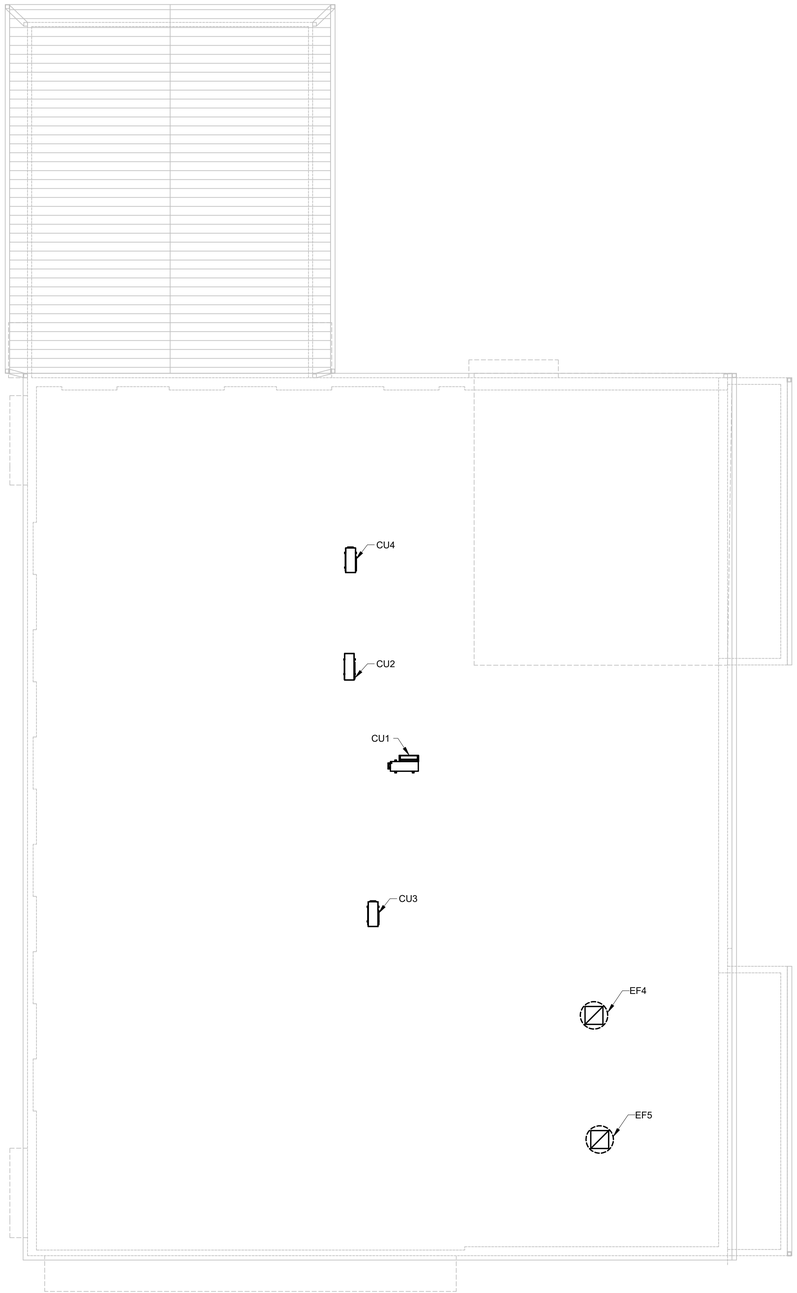
Title: MECHANICAL PLAN

Sheet Number: M1.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Mech\18070 MECH SHEET SET.dwg, 3/21/2019 10:39 PM, scale: 1'-0" = 1'-0", erica.poole



1 MECHANICAL ROOF PLAN
1/8" = 1'-0"

ARCHITECT:
K2M DESIGN
Architecture, Engineering,
Interior Design,
Asset Management,
Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:39 PM

Drawing Size	Project #: 18070
Drawn By: JBC	Checked By: JCW

Title:
MECHANICAL ROOF PLAN

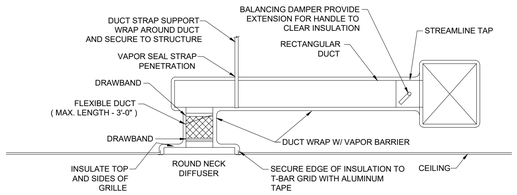
Sheet Number:
M2.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

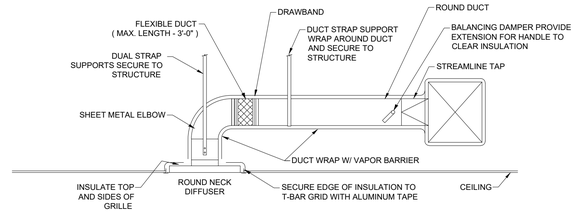
J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\March\18070-MECH SHEET SET.dwg, 3/21/2019 10:39 PM, scale: 1'-0" = 1'-0", erica.poole

NOTE:
FLEXIBLE DUCT CONNECTIONS SHALL BE INSTALLED TO ADC STANDARDS AND SEALED TO UL STANDARDS PER AMC 603 AND 604.2.1. AS A MINIMUM, THE CONTRACTOR SHALL SECURE THE FLEXIBLE DUCT TO GRILLE AND METAL DUCT WITH DRAWBANDS, AND WRAP 3" WIDE ALUMINUM TAPE EQUAL TO HARDCAST "FOIL GRIP" AROUND DRAWBAND AND EXPOSED END OF FLEXIBLE DUCT INSULATION.

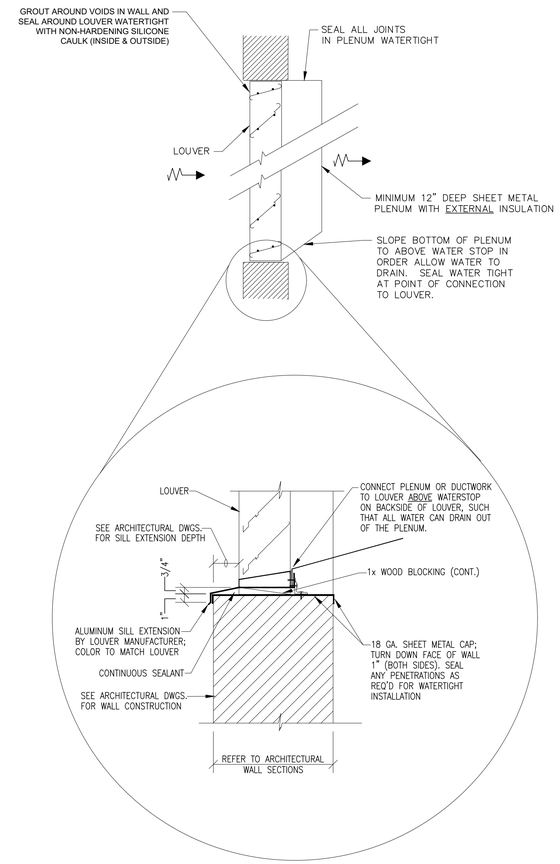


8 DIFFUSER CONNECTION TO RECTANGULAR DUCT
N.T.S.

NOTE:
FLEXIBLE DUCT CONNECTIONS SHALL BE INSTALLED TO ADC STANDARDS AND SEALED TO UL STANDARDS PER AMC 603 AND 604.2.1. AS A MINIMUM, THE CONTRACTOR SHALL SECURE THE FLEXIBLE DUCT TO ENDS OF METAL DUCT WITH DRAWBANDS, AND WRAP 3" WIDE ALUMINUM TAPE EQUAL TO HARDCAST "FOIL GRIP" AROUND DRAWBAND AND EXPOSED END OF FLEXIBLE DUCT INSULATION.

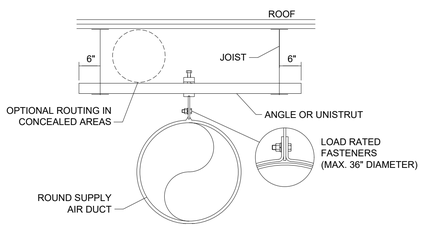


7 DIFFUSER CONNECTION TO ROUND DUCT
N.T.S.

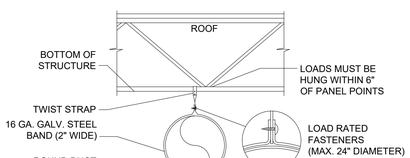


5 INTAKE LOUVER INSTALLATION DETAIL
N.T.S.

PARALLEL TO STRUCTURE



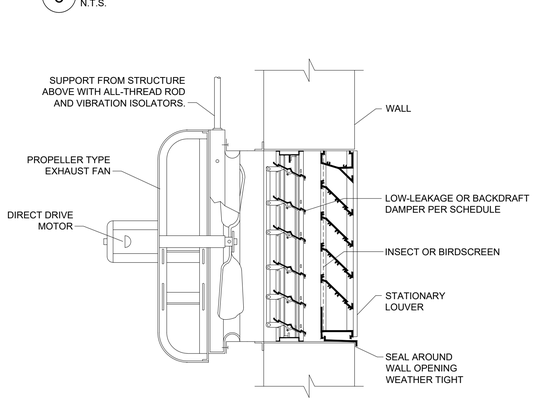
PERPENDICULAR TO STRUCTURE



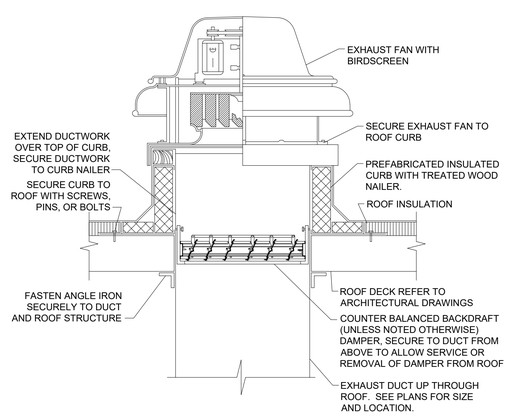
NOTE:

1. FOR DUCTS LARGER THAN 36" DIAMETER, USE TWO HANGER RODS, WIRES OR STRAPS TO SUPPORT DUCT FROM EACH SIDE.

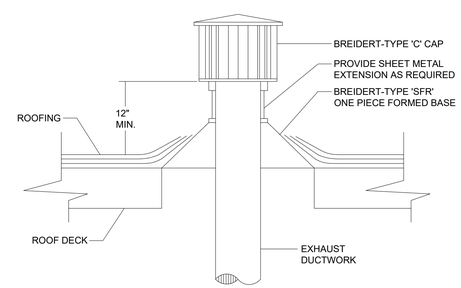
6 ROUND DUCT SUPPORT
N.T.S.



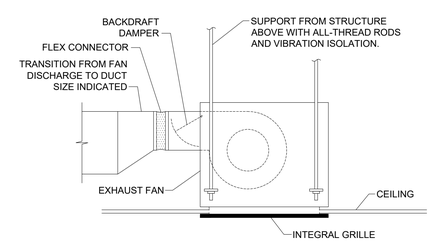
4 SIDEWALL PROPELLER EXHAUST FAN
N.T.S.



3 DOWNBLAST EXHAUST FAN
N.T.S.



2 ROOF EXHAUST CAP DETAIL
N.T.S.



1 CEILING MOUNTED CABINET EXHAUST FAN
N.T.S.

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:39 PM

Drawing Size	Project #: 18070
Drawn By: JBC	Checked By: JCW

Title:
MECHANICAL DETAILS

Sheet Number:
M3.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Mech\18070 MECH SHEET SET.dwg, 3/21/2019 10:39 PM, scale: 1"=0" = 1'-0", erica poole

LOUVER SCHEDULE

MARK	MANUFACTURER	MODEL	SIZE	NET FREE AREA (FT²)	AIRFLOW (CFM)	FINISH	NOTES
LV1	GREENHECK	ESD-635DE	42" X 36"	5.81	4500	TO BE CHOSEN BY ARCH	A, B
LV2	GREENHECK	ESD-635DE	42" X 36"	5.81	4500	TO BE CHOSEN BY ARCH	A,B
LV3	GREENHECK	ESD-635DE	42" X 36"	5.81	4500	TO BE CHOSEN BY ARCH	A, B
LV4	GREENHECK	ESD-635DE	12" X 12"	0.19	100	TO BE CHOSEN BY ARCH	A
LV5	GREENHECK	ESD-635DE	18" X 18"	0.80	560	TO BE CHOSEN BY ARCH	A
LV6	GREENHECK	ESD-635DE	18" X 18"	0.80	350	TO BE CHOSEN BY ARCH	A
LV7	GREENHECK	ESD-635DE	18" X 18"	0.80	350	TO BE CHOSEN BY ARCH	A
LV8	GREENHECK	ESD-635DE	18" X 18"	0.80	560	TO BE CHOSEN BY ARCH	A
ELV1	GREENHECK	ESD-635DE	44" X 44"	7.7	6750	TO BE CHOSEN BY ARCH	A
ELV2	GREENHECK	ESD-635DE	44" X 44"	7.7	6750	TO BE CHOSEN BY ARCH	A

GENERAL INFORMATION:
1. ALL LOUVERS SHALL BE MIAMI-DADE COUNTRY APPROVED.

NOTES:
A. PROVIDE INSECT SCREEN
B. PROVIDE MECHANICAL MOTORIZED DAMPER INTERLOCKED WITH EXHAUST FAN.

HEAT PUMP SCHEDULE

MARK	SERVICE	MANUFACTURER	MODEL	STYLE	NOMINAL TONS	COOLING CAPACITY (MBH)	HEATING CAPACITY (MBH)	SEER	SUPPLY FAN CFM	SUPPLY FAN E.S.P. (IN. WC)	OSA (CFM)	ELECTRICAL V/PH	ELECTRICAL MCA	ELECTRICAL MOCP	REFRIGERATION LINESET GAS	REFRIGERATION LINESET LIQUID	WEIGHT (LBS)
EV1	OFFICE	MITSUBISHI	SLZ-KA09NA	CEILING CASSETTE	0.75	8.2	9.4	---	320	---	25	208/1	1	15	3/8	1/4	36
EV2	OFFICE	MITSUBISHI	SLZ-KA09NA	CEILING CASSETTE	0.75	8.1	9.4	---	320	---	25	208/1	1	15	3/8	1/4	36
EV3	CORRIDOR & BATHROOM	MITSUBISHI	SEZ-KD12NA4	CEILING CONCEALED	1.0	11.0	12.4	---	360	0.25"	50	208/1	1	15	3/8	1/4	47
EV4	DATA RACK	MITSUBISHI	PKA-A12HA6	WALL MOUNTED	1.0	11.0	---	---	370	---	---	208/1	1	15	1/2	1/4	29
EV5	CLIMATE STORAGE	MITSUBISHI	MSZ-FH09NA	WALL MOUNTED	0.75	8.6	12.0	---	300	---	---	208/1	1	15	3/8	1/4	29
EV6	CLIMATE STORAGE	MITSUBISHI	MSZ-FH09NA	WALL MOUNTED	0.75	8.6	12.0	---	300	---	---	208/1	1	15	3/8	1/4	29
EV7	FEED ROOM	MITSUBISHI	SLZ-KA09NA	CEILING CASSETTE	0.75	8.1	9.1	---	320	---	---	208/1	1	15	3/8	1/4	36
EV8	TRACK ROOM	MITSUBISHI	SLZ-KA09NA	CEILING CASSETTE	0.75	8.2	9.1	---	320	---	---	208/1	1	15	3/8	1/4	36
CU1	EV4	MITSUBISHI	PUY-A12NHA6	---	1.0	11.0	---	15.2	---	---	---	208/1	13	15			37
CU2	EV1, EV2, & EV3	MITSUBISHI	MXZ-3B30NA	---	2.5	27.3	31.2	17.5	---	---	---	208/1	18	25			150
CU3	EV5 & EV6	MITSUBISHI	MXZ-2B20NA	---	1.5	17.2	24.0	18.0	---	---	---	208/1	15	20			130
CU4	EV7 & EV8	MITSUBISHI	MXZ-2B20NA	---	1.5	16.3	18.2	15.2	---	---	---	208/1	15	20			130

NOTES:
A. R410-A REFRIGERANT
B. EQUIPMENT SHALL BE BY THE SAME MANUFACTURER.
C. PROVIDE WITH CONDENSER COIL COATING FOR COASTAL APPLICATIONS.
D. PROVIDE WITH FLOAT SWITCH IN AUXILIARY DRAIN PAN TO SHUT OFF UNIT WHEN WATER IS PRESENT.
E. PROVIDE FLEXIBLE DUCT CONNECTORS AT ALL CONNECTIONS TO DUCTED UNITS.
F. SPECIFIED FAN ESP ACCOUNTS FOR DUCT LOSSES EXTERNAL TO UNIT.
G. PROVIDE WITH PROGRAMMABLE 7-DAY THERMOSTAT WITH AUTOMATIC CHANGEOVER FROM COOLING/HEATING.
H. PROVIDE DISCONNECT SWITCH.
I. ROUTE CONDENSATE TO APPROVED LOCATION.
J. PROVIDE CONDENSATE PUMP.
K. PROVIDE FILTER BOX.
L. COORDINATE EXACT UNIT LOCATIONS AND ACCESS PANELS WITH ARCHITECT PRIOR TO INSTALLATION.
M. REFRIGERATION LINE SETS ARE TO BE PROVIDED AND INSTALLED BY THE CONTRACTOR. COORDINATE THE HORIZONTAL AND VERTICAL REFRIGERANT PIPE ROUTING AND FITTINGS TO DETERMINE PIPE SIZES FOR REFRIGERANT PIPING. MANUFACTURER SHALL PROVIDE DETAILED REFRIGERANT PIPING DIAGRAMS INCLUDING DIMENSIONAL DATA FOR ALL REFRIGERANT PIPING DEVICES. THE MANUFACTURER SHALL SIZE AND LOCATE THE ASSOCIATED REFRIGERANT TRAPS BASED ON THE ACTUAL ROUTING AND PROVIDE OTHER APPURTENANCES AS REQUIRED TO PROVIDE A FULLY FUNCTIONAL AND OPERATIONAL SYSTEM. COORDINATE WITH THE MANUFACTURER LOCATIONS FOR ALL REFRIGERANT PIPING DEVICES TO MAINTAIN SERVICEABILITY AND ACCESSIBILITY. FOLLOW ALL MANUFACTURER'S REQUIREMENTS FOR MAXIMUM BRANCH LINESET LENGTH AND TOTAL LINESET LENGTH.
N. SECURE TO ROOF AND PLATFORM PER FBC. COORDINATE WITH ARCHITECTURE AND STRUCTURAL.
O. CONTACT WILL McGEHEE WITH AIRETECH CORPORATION (479-756-8600, WILL@AIRETECHCORP.COM) FOR ADDITIONAL INFORMATION AND ASSISTANCE WITH MITSUBISHI PRODUCTS.

EXHAUST FAN SCHEDULE

MARK	MANUFACTURER	MODEL	MOUNTING	CFM	E.S.P. (IN. WC)	DRIVE	FAN HP	WATTS	FAN RPM	V/Ph	CONTROL	NOTES
EF-1,2	GREENHECK	SBE-3H30	WALL	6750	0.32"	BELT	1		835	120/1	THERMOSTAT	A-C, E, G, H
EF-3	GREENHECK	SP-A50-90-VG	CEILING	100	0.25"	DIRECT		22.3	910	120/1	W/ LIGHTS	A-G
EF-4	GREENHECK	SP-A710	CEILING	560	0.25"	DIRECT		285	1080	120/1	W/ LIGHTS	A-G
EF-5	GREENHECK	SP-A410	CEILING	350	0.25"	DIRECT		121	1000	120/1	W/ LIGHTS	A-G

NOTES:
A. PROVIDE GRAVITY BACKDRAFT DAMPER.
B. PROVIDE DISCONNECT SWITCH.
C. PROVIDE MOTOR MOUNTED ELECTRONIC SPEED CONTROL.
D. PROVIDE WITH INTEGRAL GRILLE.
E. PROVIDE WITH VIBRATION ISOLATION KIT.
F. INTERLOCK FAN OPERATION WITH RESTROOM LIGHTING CONTROLS.
G. PROVIDE LINE VOLTAGE THERMOSTAT.
H. REFER TO LOUVER SCHEDULE.

OSA CALCULATIONS

CLASSIFICATION	AREA FT2 (A_z)	CFM PER AREA FT2 (R_a)	OCCUPANT DENSITY (#/1000 FT²)	CFM PER PERSON (R_p)	ZONE EFFECTIVENESS (E_z)
OFFICE	450	0.06	5	5.0	0.8
CORRIDOR	352	0.06	0	5.0	0.8

$V_{bz} = R_p P_z + R_a A_z$

(5.0*5*450/1000)+(450*0.06+352*0.06) = 59.4

$V_{oz} = V_{bz} / E_z$

59.4 / 0.8 = 74.2

TOTAL REQUIRED: 74.2
TOTAL SUPPLIED: 100

AIR DEVICE SCHEDULE

MARK	SERVICE	MANUFACTURER	MODEL	STYLE	FRAME TYPE	FACE SIZE	NECK SIZE	MAX NC	NOTES
A	SUPPLY	TITUS	TDC-AA	ALUMINUM LOUVERED FACE DIFFUSER	SURFACE	24" X 24"	REF PLAN	30	A-E
B	RETURN	TITUS	PAR-AA	ALUMINUM PERFORATED RETURN DIFFUSER	SURFACE	24" X 24"	REF PLAN	30	A-E
C	EXHAUST	TITUS	50F	ALUMINUM EGGCRATE EXHAUST WITH ALUMINUM BORDER AND GRID	SURFACE	24" X 24"	REF PLAN	30	A-E

NOTES:
A. NECK SIZE SHOWN ON DRAWINGS.
B. DAMPER AT TAKE-OFF TO DEVICE.
C. FINISH TO BE SELECTED BY ARCHITECT.
D. PROVIDE NECK FOR DUCT CONNECTION.
E. FRAME TYPE TO MATCH CEILING CONSTRUCTION, COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLAN.

ARCHITECT:
K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting
Key Largo, FL
Key West, FL
Marathon, FL
URL: www.k2mdesign.com
PROF. REG. AA26001059
Building Relationships Based on Trust and Results
Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:
STRUCTURAL ENGINEER:
Meridian Engineering LLC
CIVIL ENGINEER:
Perez Engineering & Development
IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:
DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:39 PM

Drawing Size	Project #: 18070
Drawn By: JBC	Checked By: JCW

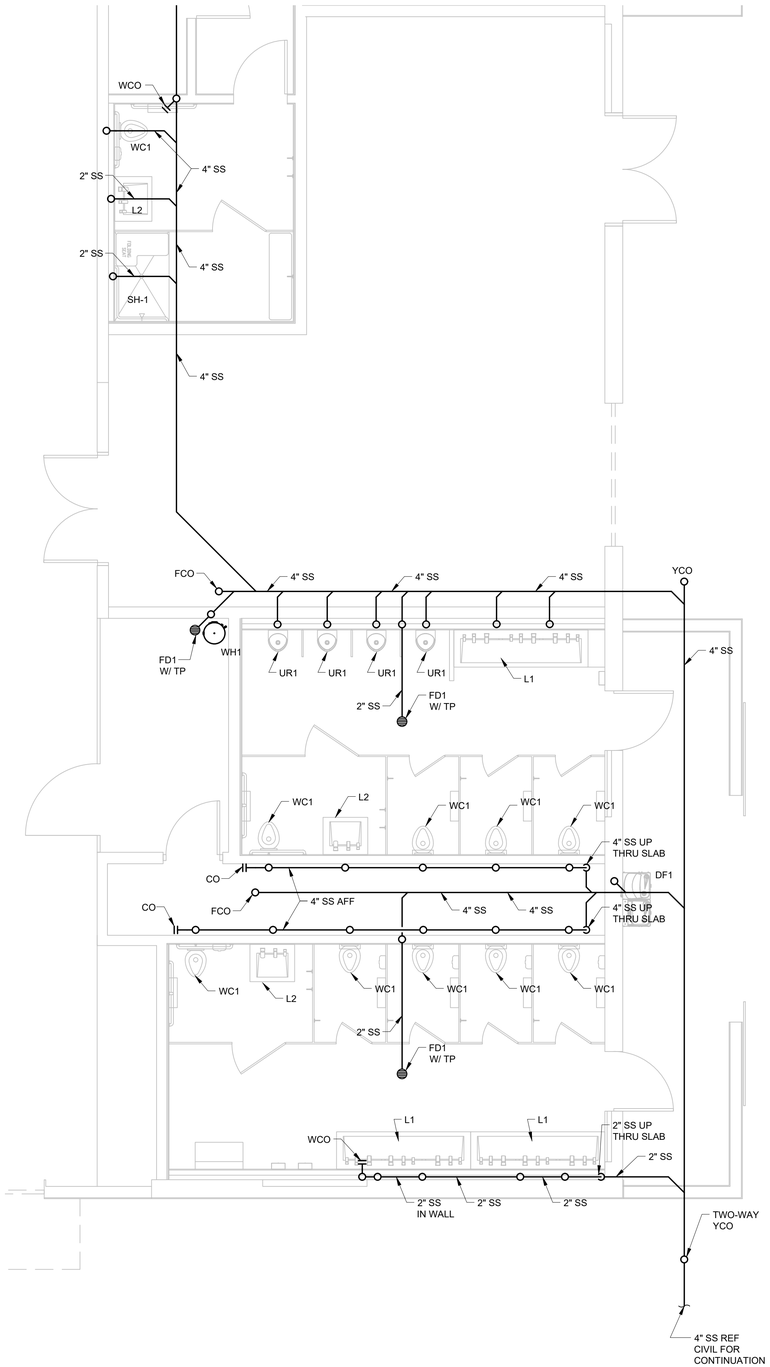
Title:
MECHANICAL SCHEDULES

Sheet Number:
M3.1.2

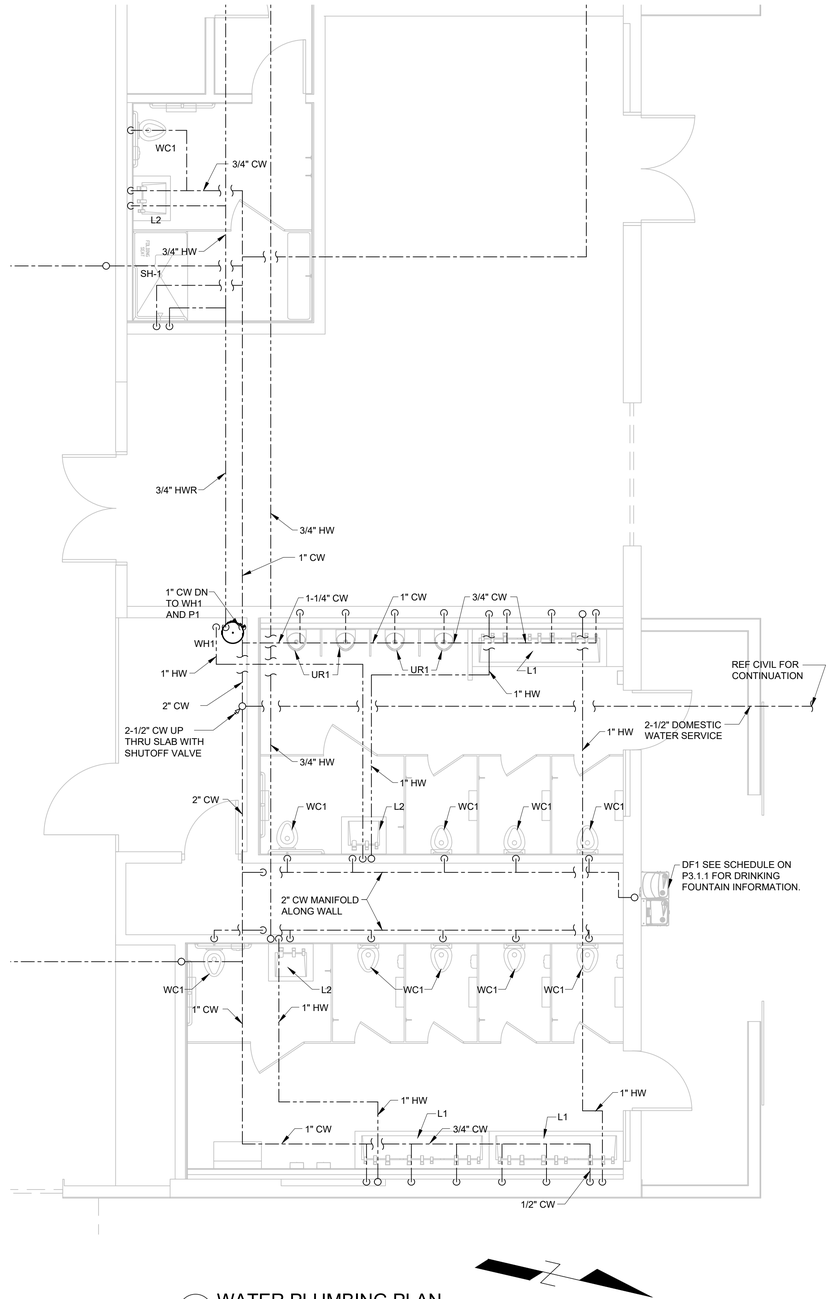
Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Main\18070 MECH SHEET SET.dwg, 3/21/2019 10:39 PM, scale: 1'-0" = 1'-0", erica poole



1 DWV PLUMBING PLAN
1/4" = 1'-0"



2 WATER PLUMBING PLAN
1/4" = 1'-0"

PLUMBING GENERAL NOTES

1. NOTES APPLY TO ALL PLUMBING SHEETS.
2. EACH CONTRACTOR IS RESPONSIBLE FOR HAVING THOROUGH KNOWLEDGE OF ALL DRAWINGS AND SPECIFICATIONS AS THEY RELATE TO THIS WORK. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED DUE TO LACK OF THIS KNOWLEDGE.
3. PROVIDE ALL MATERIALS FOR A COMPLETE INSTALLATION IN ALL RESPECTS READY FOR INTENDED USE AND IN STRICT ACCORDANCE WITH STATE AND LOCAL CODES AND MANUFACTURER'S RECOMMENDATIONS. OBTAIN AND PAY FOR ALL PERMITS REQUIRED BY THIS WORK.
4. EXISTING CONDITIONS WERE TAKEN FROM ORIGINAL DRAWINGS AND SITE VISITS AND MAY NOT REFLECT EXACT "AS-BUILT" CONDITIONS. COORDINATE NEW WORK AND DEMOLITION WITH OTHER DISCIPLINES AND EXISTING CONDITIONS PRIOR TO CONSTRUCTION.
5. DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF WORK. REVIEW THE GENERAL NOTES AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY THE ARCHITECT OR OWNER'S CONSTRUCTION MANAGER OF ANY CONFLICTS OR DISCREPANCIES.
6. PROVIDE A CONSTRUCTION RECORD SET OF "AS-BUILT" DOCUMENTS TO THE ARCHITECT OR OWNER'S CONSTRUCTION MANAGER REFLECTING ANY VARIANCES OF INSTALLED PIPING LOCATIONS OR EQUIPMENT CONTRARY TO THE CONSTRUCTION DOCUMENTS.
7. PROVIDE TO THE ARCHITECT OR OWNER'S CONSTRUCTION MANAGER A COPY OF INSPECTION REPORTS AND APPROVAL CERTIFICATES FROM LOCAL AND STATE INSPECTIONS.
8. PLANS AND SPECIFICATIONS GOVERN WHERE THEY EXCEED CODE REQUIREMENTS.
9. REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATION AND MOUNTING HEIGHTS OF PLUMBING FIXTURES.
10. DO NOT SCALE FLOOR PLANS FOR EXACT HORIZONTAL LOCATION OF PIPE ROUTING.
11. INSTALL CONCEALED PIPING TIGHT TO THE STRUCTURE AND AS HIGH AS POSSIBLE. INSTALL EXPOSED PIPING TIGHT TO THE STRUCTURE, WALL OR CEILING AND AS HIGH AS POSSIBLE. COORDINATE WITH OTHER TRADES TO AVOID CONFLICTS. COORDINATE LOCATIONS OF PIPING IN EXPOSED AREAS WITH ARCHITECT.
12. COORDINATE PIPING INSTALLATION WITH STRUCTURAL GRADE BEAMS, FOOTINGS, COLUMN PIERS, ETC. SLEEVE PIPING THROUGH GRADE BEAMS, FOOTINGS, ETC. WHERE REQUIRED AND AS NOTED ON PLANS.
13. COORDINATE PIPE ROUTING AWAY FROM ELECTRICAL PANELS. DO NOT INSTALL PIPING OVER ELECTRICAL PANELS.
14. COORDINATE SEWER AND WATER CONNECTIONS WITH CIVIL AND AHJ. PROVIDE PRESSURE REDUCING VALVE AND BACKFLOW PREVENTER AS SHOWN OR REQUIRED BY AHJ. VERIFY INVERT AND SLOPE OF INCOMING SANITARY SEWER BEFORE TRENCHING.
15. REFER TO RISER DIAGRAMS AND PLUMBING FIXTURE SCHEDULE FOR ALL PIPING AND PIPE SIZES NOT SHOWN ON PLAN.
16. SANITARY AND STORM SEWER PIPING SHOWN IS BASED ON 1/4" PER FOOT FALL FOR ALL PIPE SMALLER THAN 3" DIAMETER AND 1/8" PER FOOT FALL FOR PIPE 3" DIAMETER AND LARGER.
17. ALL SEWER PIPING BELOW SLAB TO BE 2" DIAMETER MINIMUM.
18. PROVIDE ACCESS DOORS TO ALL CONCEALED VALVES AND CLEAN-OUTS; AND NOT ABOVE AN ACCESSIBLE CEILING.
19. PROVIDE TRAP GUARDS OR TRAP SEAL PRIMERS AND 1/2" COPPER TUBING CONNECTION TO ALL FOOR DRAINS AS SHOWN OR AS REQUIRED BY AHJ. CONTRACTOR SHALL VERIFY REQUIREMENTS.
20. INSTALL VTR'S, EXHAUST FANS, AND FLUES A MINIMUM 5'-0" FROM PARAPET OR OUTSIDE WALL AND 10'-0" FROM EQUIPMENT WITH OUTSIDE AIR INTAKE.
21. PROVIDE INSULATION ON HOT AND COLD WATER PIPING, ROOF DRAIN BODIES, AND HORIZONTAL ROOF DRAIN PIPING.
22. INSTALL WATER PIPE ON INSIDE OF EXTERIOR WALL INSULATION TO PREVENT FREEZING.
23. WHEN DEEP FROST LOCATIONS ARE ENCOUNTERED, ROUTE SANITARY LINES UNDER BUILDING AS MUCH AS POSSIBLE.
24. PROVIDE PVC SLEEVE FOR ALL COLD/HOT WATER FLOOR PIPE PENETRATIONS. MAKE SLEEVE LARGE ENOUGH FOR INSULATION. SEAL WITH GRAY MASTIC AND ENSURE OF NO WATER PENETRATIONS.
25. PROVIDE FIRE SEAL WHERE PIPES PENETRATE FIRE RATED ASSEMBLY.
26. PROVIDE AND INSTALL WATTS 8A VACUUM BREAKER ON ANY THREADED EXTERIOR OR INTERIOR FAUCETS.
27. VALVES SHALL BE LINE SIZE UNLESS NOTED OTHERWISE.
28. ALL WATER SHUT-OFF VALVES SHALL BE "BALL LOCK" TYPE. PROVIDE SHUT-OFF VALVES AT EACH TERMINATION PONT OF ASSOCIATED EQUIPMENT.
29. WATER HAMMER ARRESTORS SHALL BE SIZE "A" UNLESS NOTED OTHERWISE. PROVIDE WATER HAMMER ARRESTORS AS REQUIRED BY AHJ AND/OR CODE OR AS RECOMMENDED BY EQUIPMENT MANUFACTURERS.
30. CLEAN FAUCET AERATORS AND PIPE STRAINERS PRIOR TO TURNING BUILDING OVER TO THE OWNER.
31. FIELD ADJUST WATER CLOSET FLUSHING MECHANISM FOR PROPER FLUSHING OPERATION.
32. PROVIDE SEISMIC BRACING BASED ON APPROPRIATE SEISMIC ZONE REQUIREMENTS PER LOCAL AND NATIONAL CODES. CONTRACTOR'S RESPONSIBILITY INCLUDES STRUCTURAL ENGINEER'S CERTIFICATION ON DETAILS SUBMITTED FOR PERMITTING.

PLUMBING SYMBOLS

(SYMBOLS APPLY ONLY WHEN USED ON DRAWINGS)

SYMBOL	DESCRIPTION
	DOMESTIC COLD WATER (CW)
	DOMESTIC HOT WATER (HW)
	DOMESTIC HOT WATER RETURN (HWR)
SS	SANITARY SEWER (SS)
GW	GREASE WASTE (GW)
FW	FILTERED WATER (FW)
RO	REVERSE OSMOSIS WATER (RO)
A	COMPRESSED AIR (A)
V	VENT (V)
T	TEPID WATER (T)
110	TEMPERED WATER (110°F)
G	NATURAL GAS (G)
LP	LIQUID PROPANE (LP)
CD	CONDENSATE (CD)
	PIPE: RISE / FALL / TEE DOWN
	SHUT-OFF VALVE (SOV)
	SHUT-OFF VALVE IN VERTICAL
	UNION
	CAP
	VACUUM RELIEF VALVE
	FLOOR CLEANOUT (FCO)
	FLOOR DRAIN, ROUND (FD)
	FLOOR DRAIN, SQUARE (FD)
FS /	FLOOR SINK (FS), FULL / HALF GRATE
	CHECK VALVE
	DOUBLE CHECK VALVE
	REDUCED PRESSURE ZONE (RPZ)
	GAS PRESSURE REGULATOR
	GAS VALVE
	AUTOMATIC GAS VALVE
	FREEZE PROOF WALL HYDRANT (FPWH)
	HOSE BIBB (HB)
	WALL CLEANOUT (WCO)
	PUMP
	EXISTING ITEMS TO BE REMOVED OR RELOCATED (SHOWN HATCHED AND NOTED)

ANNOTATION

X	PLAN KEYNOTE
XXX	PLUMBING EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
	CONNECTION POINT OF NEW WORK TO EXISTING
1 M1.1.1	DETAIL REFERENCE: UPPER NUMBER INDICATES DETAIL NUMBER, LOWER NUMBER INDICATES SHEET NUMBER
1 M1.1.1	SECTION CUT DESIGNATION

ABBREVIATIONS

3CS	THREE-COMPARTMENT SINK
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
BAS	BUILDING AUTOMATION SYSTEM
BFF	BELOW FINISHED FLOOR
BFP	BACKFLOW PREVENTER
EC	ELECTRICAL CONTRACTOR
ETR	EXISTING TO REMAIN
EW	EYE WASH
EWC	ELECTRIC WATER COOLER
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FS	FLOOR SINK
FPWH	FREEZE PROOF WALL HYDRANT
GC	GENERAL CONTRACTOR
IN WC	INCHES OF WATER COLUMN
HB	HOSE BIBB
HS	HAND SINK
I.E.	INVERT ELEVATION
MAX	MAXIMUM
MBH	1000 BTU PER HOUR
MC	MECHANICAL CONTRACTOR
MFR	MANUFACTURER
MHB	MIXING HOSE BIBB
MIN	MINIMUM
MS	MOP SINK
OA	OUTSIDE AIR
PC	PLUMBING CONTRACTOR
PS	PREP SINK
RC	REFRIGERATION CONTRACTOR
REF	REFERENCE
RH	RADIANT HEATER
RPZ	REDUCED PRESSURE ZONE
RTU	ROOF TOP UNIT
SOV	SHUT-OFF VALVE
TYP	TYPICAL
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UR	URINAL
VBF	VENT BELOW FLOOR
VBG	VENT BELOW GRADE
VTR	VENT THRU ROOF
WC	WATER CLOSET
WH	WATER HEATER

ARCHITECT:
K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting
Key Largo, FL
Key West, FL
Marathon, FL
URL: www.k2mdesign.com
PROF. REG. AA26001059
Building Relationships
Based on Trust and Results
Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:
STRUCTURAL ENGINEER: Meridian Engineering LLC
CIVIL ENGINEER: Perez Engineering & Development
IRRIGATION: Blue Island Lighting & Irrigation Inc.

Submissions:
DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:39 PM

Drawing Size	Project #: 18070
Drawn By: JBC	Checked By: JCW

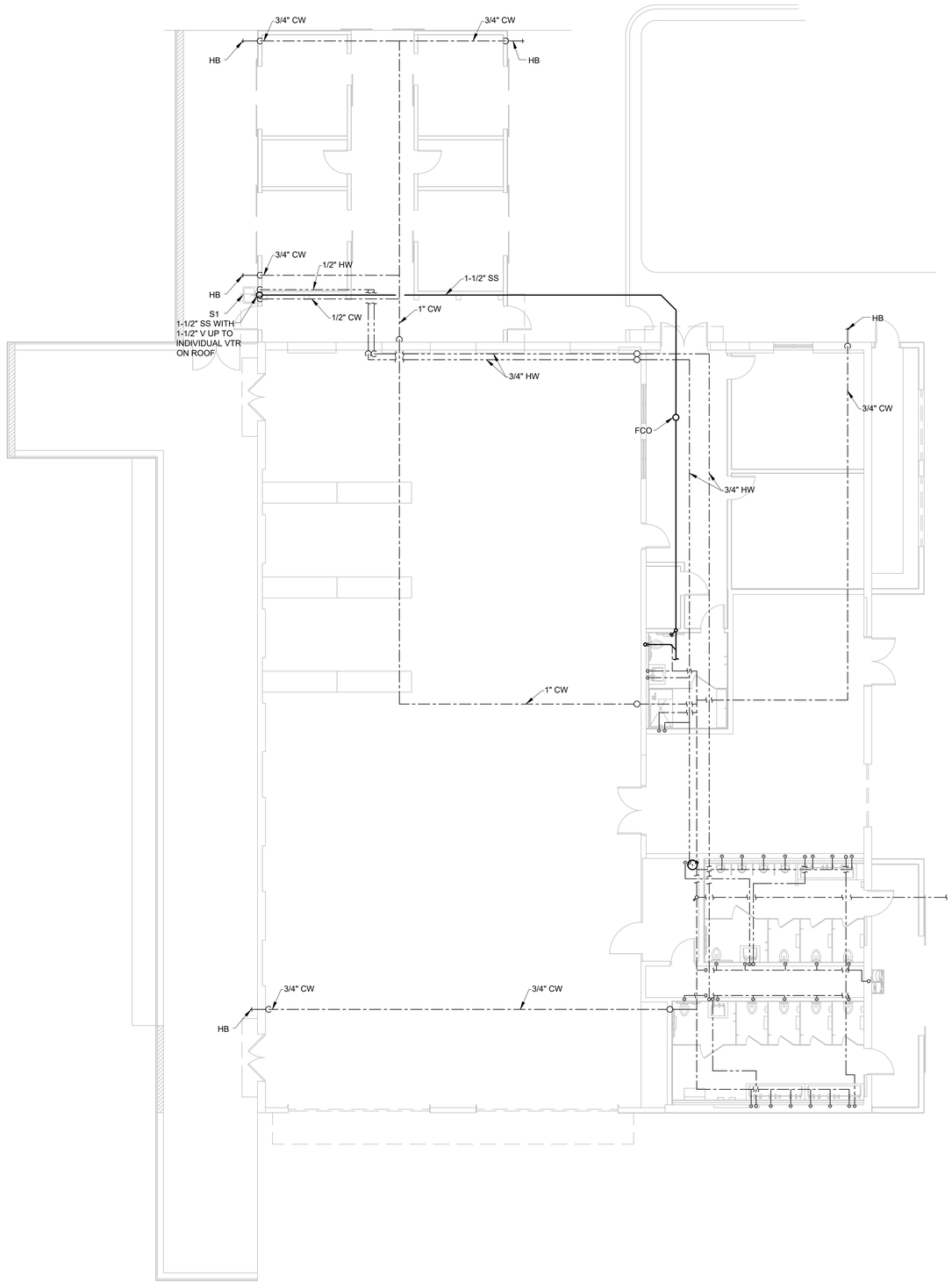
Title: PLUMBING PLANS

Sheet Number:
P1.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Plumb\18070 PLUMB SHEET SET.dwg, 3/21/2019 10:39 PM, scale: 1'-0" = 1'-0", erica poole



1 OVERALL PLUMBING PLAN
1/8" = 1'-0"

N

ARCHITECT:

K2M DESIGN

Architecture, Engineering,
Interior Design,
Asset Management,
Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:39 PM

Drawing Size	Project #: 18070
Drawn By: JBC	Checked By: JCW

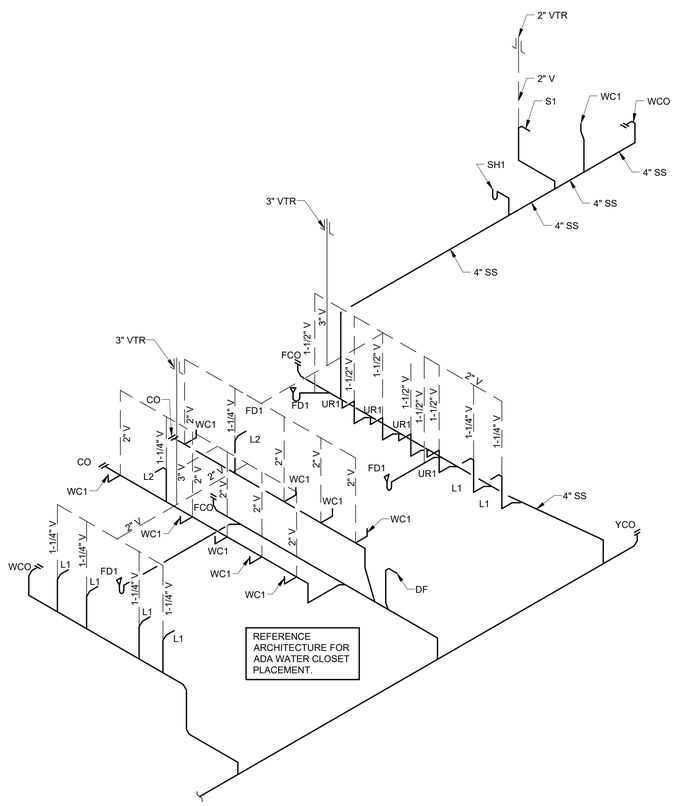
Title:
OVERALL
PLUMBING PLAN

Sheet Number:
P1.1.2

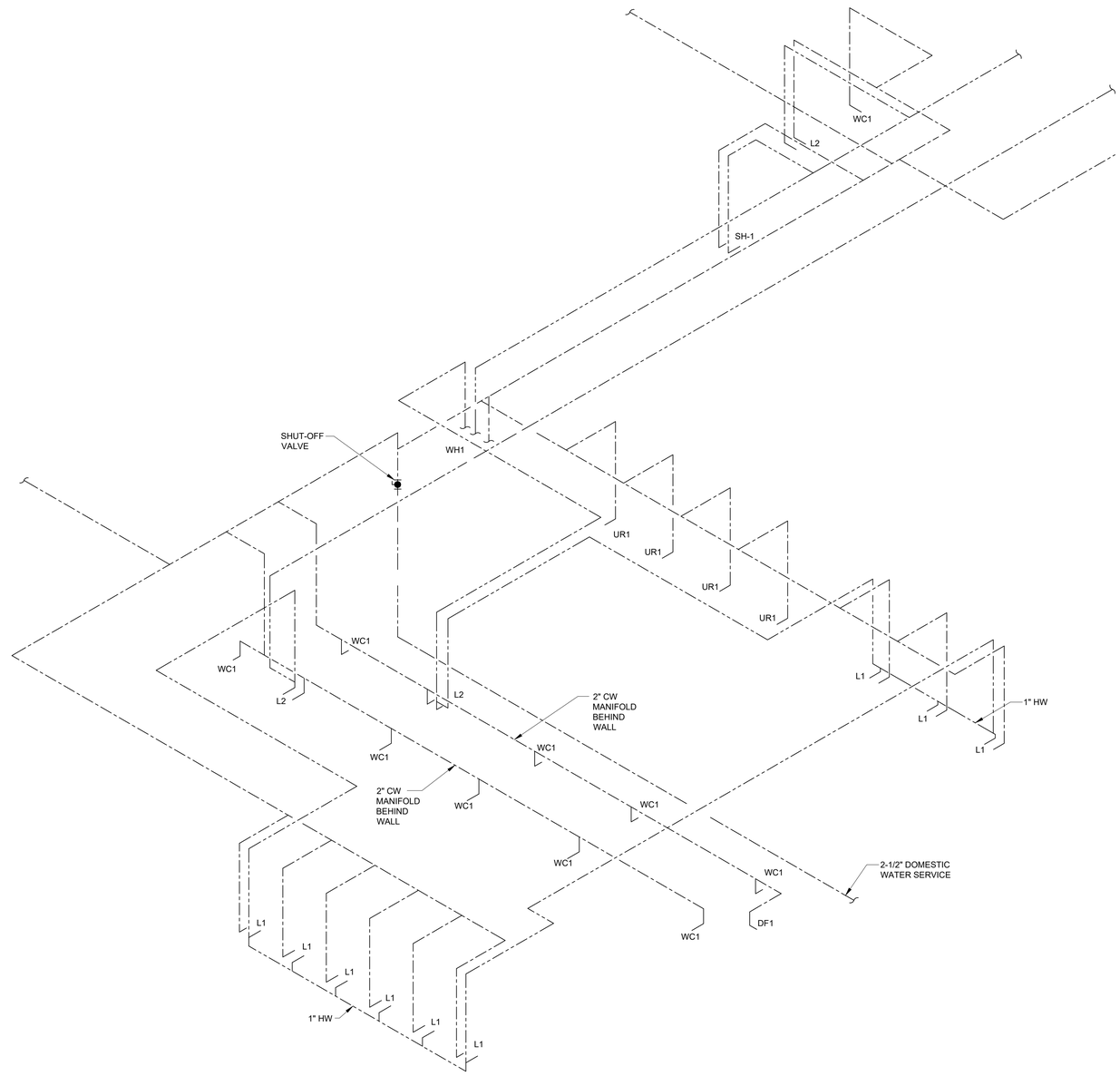
Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Plumb\18070 PLUMB SHEET SET.dwg, 3/21/2019 10:39 PM, scale: 1'-0" = 1'-0", elisa poole



1 DWV PLUMBING RISER
NTS



1 WATER PLUMBING RISER
NTS

ARCHITECT:

K2M DESIGN

Architecture, Engineering,
Interior Design,
Asset Management,
Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:39 PM

Drawing Size	Project #: 18070
Drawn By: JBC	Checked By: JCW

Title:
WATER
PLUMBING
PLAN

Sheet Number:
P2.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Plumb\18070 PLUMB SHEET SET.dwg, 3/21/2019 10:39 PM, scale: 1'-0" = 1'-0", eliza poole

SHOWER SCHEDULE

FIXTURE	BRANCH SIZES (MIN.) CW	HW	WASTE	VENT	DESCRIPTION
ROLL-IN ACCESSIBLE SHOWER	1/2"	1/2"	2"	1-1/2"	ACCESSIBLE ROLL IN SHOWER REFER TO ARCH FOR SURROUND & OTHER ACCESSORIES.

COMPONENT	MANUFACTURER	MODEL	DESCRIPTION	ALTERNATES
SHOWER TRIM	KOHLER	K-T8979-4-CP	CHROME (POLISHED), SHOWER TRIM. ADA COMPLIANT	
SHOWER HEAD WALL MOUNT	SPEAKMAN COMPANY	S-2005-HB-E175	CHROME (POLISHED), 1.75 GPM FLOW RATE. PROVIDE SHOWER ARM AND FLANGE	
SHOWER PAN	MINCEY MARBLE	SP-3162-C/SF	MATTE/TEXTURED NON-SLIP FLOOR. SHOWER DRAIN FOR USE WITH PRE-FORMED SHOWER BASE AND WITH 2" CAULKING CONNECTION. #2250 SOLID WHITE COLOR. (DRAIN CUTOUT PROVIDED VERIFY CONNECTION LOCATION PRIOR TO ORDER)	
SHOWER PRESSURE BALANCING VALVE	KOHLER	RITE - TEMP PRESSURE, K-11748-KS-NA	DIVERTER INCLUDED.	
SHOWER FLOOR DRAIN	KOHLER	K-9135-CP	POLISHED CHROME FINISH. COORDINATE DRAIN CONNECTION SIZES WITH EXISTING CONDITIONS	
HANDHELD SHOWER ASSEMBLY	SPEAKMAN COMPANY	WLG-141.1	CHROME-PC FINISH. 2.0 GPM FLOW RATE. HANDHELD SHOWER ASSMBLY. SHOWER BAR INCLUDED. PROVIDE FLEXIBLE HOSE CONNECTION.	

FIXTURES LISTED ARE FOR BIDDING PURPOSES ONLY. FIXTURE MANUFACTURER, MODEL, STYLE, COLOR, ETC. SHALL BE APPROVED BY ARCHITECT AND OWNER.

PLUMBING FIXTURE SCHEDULE

MARK	FIXTURE	MANUFACTURER	MODEL	BRANCH SIZES (MIN.) CW	HW	WASTE	VENT	NOTES
WC1	WATER CLOSET (ACCESSIBLE)	ZURN	Z5615.258	1-1/4"	---	4"	2"	MOUNT CONTROLS ON ACCESSIBLE SIDE OF TOILET. COORDINATE WITH FIXTURE SUPPLIER FOR LEFT/RIGHT HAND FLUSH LEVER TO COMPLY WITH ADA REQUIREMENTS, WHERE APPLICABLE.
UR1	URINAL (ACCESSIBLE)	ZURN	Z5768.207	1"	---	2"	2"	MOUNT CONTROLS ON ACCESSIBLE SIDE OF TOILET. COORDINATE WITH FIXTURE SUPPLIER FOR LEFT/RIGHT HAND FLUSH LEVER TO COMPLY WITH ADA REQUIREMENTS, WHERE APPLICABLE.
L1	LAVATORY (ACCESSIBLE)	SLOAN	AD-83000	1/2"	1/2"	1-1/2"	1-1/2"	PROVIDE P-TRAP WITH CLEANOUT, STOP VALVES, SUPPLIES, ESCUTCHEONS. PROVIDE TRURBO LAV GUARD 2 E-Z SERIES PROTECTIVE PIPE COVERS FOR ALL EXPOSED PIPING. PROVIDE TMV, SET FOR 105°F DISCHARGE.
L2	LAVATORY	SLOAN	AD-81000	1/2"	1/2"	1-1/2"	1-1/2"	PROVIDE P-TRAP WITH CLEANOUT, STOP VALVES, SUPPLIES, ESCUTCHEONS. PROVIDE TRURBO LAV GUARD 2 E-Z SERIES PROTECTIVE PIPE COVERS FOR ALL EXPOSED PIPING. PROVIDE TMV, SET FOR 105°F DISCHARGE.
DF1	DRINKING FOUNTAIN	ELKAY	LVRCGRNTL8WSK	1/2"	---	1-1/2"	1-1/2"	BI-LEVEL, NON-FILTERED, REFRIGERATED, ADA VANDAL-RESISTANT, STAINLESS STEEL DRINKING FOUNTAIN WITH BOTTLE FILLING STATION.
S1	HAND SINK	SLOAN	ESS-2100	1/2"	1/2"	1-1/2"	1-1/2"	PROVIDE P-TRAP WITH CLEANOUT, STOP VALVES, SUPPLIES, ESCUTCHEONS. PROVIDE TMV SET TO 105°F DISCHARGE.
HB	HOSE BIBB	WATTS	SC8	1/2"	---	---	---	CAST BRASS THREADED SILLCOCK WITH FLANGE, CAST IRON HANDWHEEL, AND TAMPER-PROOF VACUUM BREAKER. 3/4" N.P.T. INLET, AND 3/4" H.P.T. OUTLET. MOUNT 24" AFF

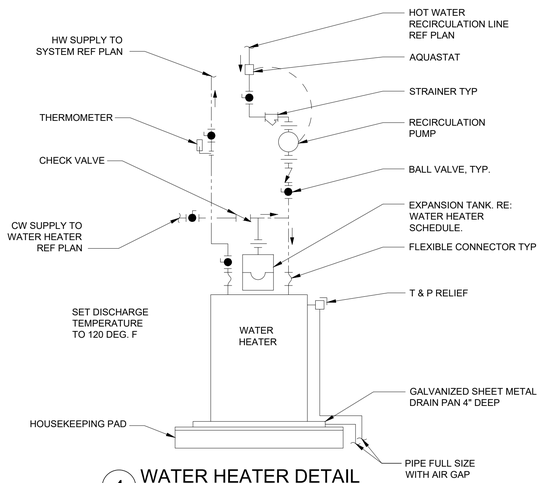
SITE WATER FOUNTAIN SCHEDULE

MARK	FIXTURE	MANUFACTURER	MODEL	BRANCH SIZES (MIN.) CW	HW	WASTE	VENT	NOTES
DF2	DRINKING FOUNTAIN	ELKAY	LK4420DB	1/2"	---	1-1/2"	---	BI-LEVEL PEDESTAL WITH PET STATION, NON-FILTERED, NON-REFRIGERATED, STAINLESS STEEL DRINKING FOUNTAIN. COLOR TO BE DETERMINED BY .

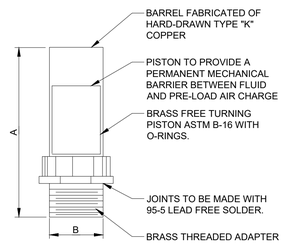
SPECIALTY PLUMBING FIXTURE SCHEDULE

MARK	FIXTURE	MANUFACTURER	MODEL	DESCRIPTION	NOTES
WHA	WATER HAMMER ARRESTOR	ZURN	1250 SERIES	CONFORM TO PDI WH-201, ANSI A112.26.1M, ASSE 1010; TEMP TO 250°F, MAX 350 PSIG WORKING PRESSURE	A
TMV	TEMPERATURE MIXING VALVE	WATTS	USG-B	+/- 3°F UP TO 120°F, WITH BUILT-IN CHECK VALVES, BRASS BODY, AND COPPER THERMOSTAT.	
TP	TRAP PRIMER	SIOUX CHIEF	695	BRONZE PRIMER VALVE WITH REMOVABLE OPERATING PARTS, INTEGRAL VACUUM BREAKER, AND GASKETED ACCESS COVER.	
FD1	FLOOR DRAIN	ZURN	Z415B	CAST IRON BODY WITH BOTTOM OUTLET, COMBINATION INVERTIBLE MEMBRANE CLAMP AND ADJUSTABLE COLLAR WITH SEEPAGE SLOTS, "TYPE B" POLISHED NICKEL-BRONZE, LIGHT DUTY STRAINER.	
FCO	FLOOR CLEANOUT	ZURN	ZN1400	CAST IRON BODY, ABS TAPERED THREAD PLUG, SCORIATED POLISHED NICKEL-BRONZE LIGHT DUTY TOP, ADJUSTABLE TO FINISHED FLOOR.	B
WCO	WALL CLEANOUT	ZURN	Z1470	THREADED, COUNTERSUNK BRONZE OR POLYPROPYLENE CLEANOUT PLUG. PROVIDE DRILLED TAP FOR CENTER SCREW AND STAINLESS STEEL COVER.	
YCO	YARD CLEANOUT	ZURN	Z1449	CAST IRON FERRULE AND PLUG, DURA-COATED CAST IRON, DOUBLE-FLANGED HOUSING, AND EXTRA HEAVY DUTY SCORIATED CAST IRON COVER WITH LIFTING DEVICE AND VANDAL-PROOF SCREWS.	B
---	VALVES	NIBCO	FP-600-A	FULL PORT BRASS BALL VALVE WITH PLASTIC JACKETED LEVER TYPE HANDLE.	

NOTES:
A. SIZE PER MANUFACTURER'S RECOMMENDATION.
B. CLEANOUT SHALL BE SAME SIZE AS PIPE BEING SERVED.



4 WATER HEATER DETAIL
N.T.S.



PPP SIZE	P.D.I. SYMBOL	FIXTURE UNIT RATINGS	A SIZE	B SIZE
1/2"	A	1 - 11	5"	1/2"
3/4"	B	12 - 32	5"	3/4"
1"	C	33 - 60	7"	1"
1-1/4"	D	61 - 113	7"	1-1/4"
1-1/2"	E	114 - 154	9"	1-1/2"
2"	F	155 - 330	9"	2"

NOTE: SEE WATER RISER DIAGRAMS FOR LOCATIONS OF SHOCK ABSORBERS.

3 WATER HAMMER ARRESTOR DETAIL
N.T.S.

ELECTRIC WATER HEATING SYSTEM SCHEDULE

WATER HEATERS

MARK	MANUFACTURER	MODEL	TANK SIZE (GAL)	INPUT (kW)	ELECTRICAL V/PH	MOCP
WH-1	A.O. SMITH	DRE-52-6	50	6.0	240/1	35

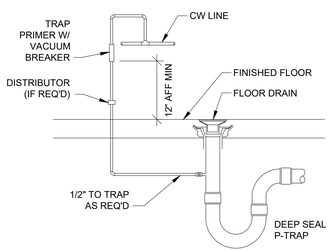
EXPANSION TANKS

MANUFACTURER	MODEL	DESCRIPTION
WATTS	PLT-12	FIXED BLADDER TYPE EXPANSION TANK. 4.5 GALLON MINIMUM TOTAL CAPACITY, FACTORY STANDARD PRECHARGE CAPACITY.

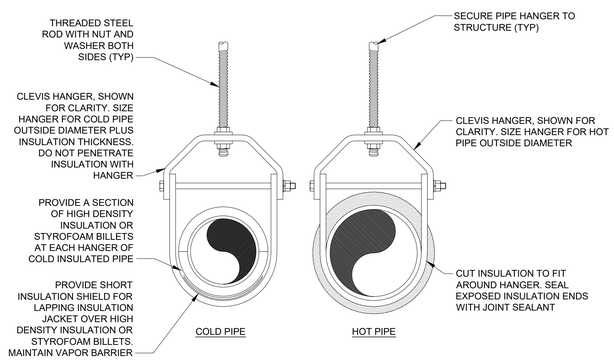
PUMPS

MARK	MANUFACTURER	MODEL	HP - V/PH/HZ	GPM - HEAD	DESCRIPTION
P-1	BELL & GOSSETT	NBF 9U/LW	41W - 120/1/60	5 - 5 FT	BRONZE WET ROTOR INLINE CIRCULATOR PUMP WITH 3/4" SWEATED CONNECTIONS.

NOTES:
A. PROVIDE ASME TEMPERATURE AND PRESSURE RELIEF VALVE.
B. PROVIDE 4" THICK CONCRETE HOUSEKEEPING PAD OR WATER HEATER STAND.
C. 120°F OUTLET TEMPERATURE.
D. ROUTE DRAIN PAN AND T&P DRAIN PIPING TO FLOOR DRAIN.



2 FLOOR DRAIN DETAIL
N.T.S.



REFER TO SPECIFICATIONS FOR INSULATION TYPES, INSULATION THICKNESSES, HANGER TYPES, HANGER ROD CONNECTIONS TO STRUCTURE, AND HANGER SPACING.

1 INSULATED PIPE HANGER
N.T.S.

ARCHITECT:
K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting
Key Largo, FL
Key West, FL
Marathon, FL
URL: www.k2mdesign.com
PROF. REG. AA26001059
Building Relationships Based on Trust and Results
Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:
STRUCTURAL ENGINEER: Meridian Engineering LLC
CIVIL ENGINEER: Perez Engineering & Development
IRRIGATION: Blue Island Lighting & Irrigation Inc.

Submissions:
DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:39 PM

Drawing Size	Project #: 18070
Drawn By: JBC	Checked By: JCW

Title: PLUMBING DETAILS AND SCHEDULES

Sheet Number: P3.1.1

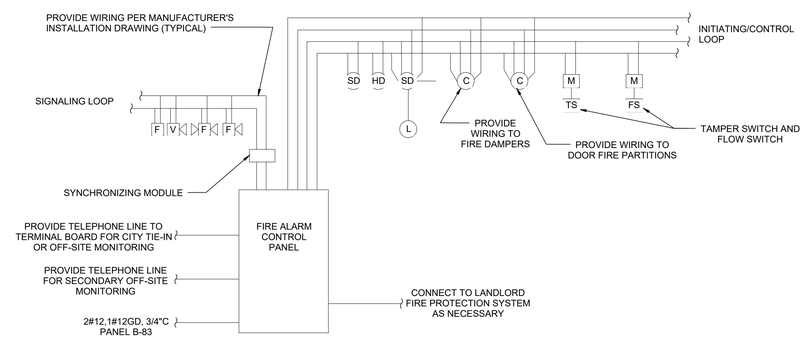
Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Plumb\18070 PLUMB SHEET SET.dwg, 3/21/2019 10:39 PM, scale: 1"=0" = 1'0", antoja poole

ABBREVIATIONS

AC	ABOVE COUNTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AL	ALUMINUM
BAS	BUILDING AUTOMATION SYSTEM
CF	CEILING FAN
CU	COPPER
DDC	DIRECT DIGITAL CONTROL
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EM	EMERGENCY LIGHTING
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
GC	GENERAL CONTRACTOR
GFCI/GFI	GROUND FAULT CIRCUIT INTERRUPTER
GR	GROUND
IG	ISOLATED GROUND
HD	HAND DRYER
LTG	LIGHTING
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MCB	MAIN CIRCUIT BREAKER
MFR	MANUFACTURER
MIN	MINIMUM
MLO	MAIN LUG ONLY
NL	NIGHT LIGHT
PC	PLUMBING CONTRACTOR
PNLBD	PANELBOARD
RC	REFRIGERATION CONTRACTOR
RCPTS	RECEPTACLES
REF	REFERENCE
RH	RADIANT HEATER
RTU	ROOF TOP UNIT
SC	SECURITY CAMERA
TYP	TYPICAL
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
WH	WATER HEATER
WP	WEATHER PROOF COVERPLATE
WR	WEATHER RESISTANT RECEPTACLE
XFMR	TRANSFORMER



TYPICAL FIRE ALARM SYSTEM WIRING DIAGRAM

FIRE ALARM SYSTEM NOTES

1. THIS DIAGRAM REPRESENTS A TYPICAL SYSTEM AND IS NOT INTENDED FOR INSTALLATION. SYSTEM SUPPLIER SHALL PROVIDE INSTALLATION DRAWINGS AND SCHEMATIC WIRING DIAGRAM TO LOCAL AHJ. EXACT SYSTEM REQUIREMENTS SHALL BE COORDINATED WITH THE SYSTEM SUPPLIER. INSTALLER SHALL BE NICET CERTIFIED.
2. SYSTEM SUPPLIER SHALL SUPERVISE INSTALLATION, PROGRAM AND TEST SYSTEM, AND INSTRUCT OWNER ON SYSTEM OPERATION. IT IS FIRE ALARM CONTRACTOR'S RESPONSIBILITY TO INSTALL A SYSTEM THAT MEETS ALL LOCAL FIRE CODE REQUIREMENTS.
3. ALL FIRE ALARM WIRING SHALL BE PLENUM RATED. EXPOSED FIRE ALARM WIRING, 10'-0" AFF AND BELOW SHALL BE INSTALLED IN CONDUIT TO ABOVE ACCESSIBLE CEILING SPACE OR STRUCTURE.
4. ALL CONTROL CABINETS SHALL BE GROUNDED PER NEC REQUIREMENTS.
5. COORDINATE CITY TIE-IN REQUIREMENTS WITH LOCAL AUTHORITY HAVING JURISDICTION.
6. DEVICES THAT MAY BE SHOWN ON PLANS ARE TYPICAL LOCATIONS AND AMOUNTS. REVISE AS NECESSARY TO MEET LOCAL CODE REQUIREMENTS. THE FIRE ALARM SUBMITTAL IS TO BE A DEFERRED SUBMITTAL THAT IS SUBMITTED BY THE FIRE ALARM SYSTEM SUPPLIER.
7. FIRE ALARM SYSTEM SHALL BE SIMPLEX, NOTIFIER, FCI, SIEMENS, OR GAMEWELL.
8. INSTALL FIRE ALARM PULL STATION AT EACH EXIT.
9. INSTALL SMOKE DETECTOR IN EACH ROOM, HORN/STROBE IN EACH CORRIDOR AND EGRESS PATH, AND DUCT SMOKE DETECTORS FOR EACH RTU.
10. FIRE ALARM SYSTEM SUPPLIER TO PROVIDE ALL MATERIALS NECESSARY TO MAKE A FULLY OPERATIONAL AND CODE COMPLIANT SYSTEM.
11. SUPPLIER AND INSTALLER TO FOLLOW ALL NFPA 72 AND NFPA 13 REQUIREMENTS AND ANY AMENDMENTS BY LOCAL JURISDICTION.
12. FACP SHALL HAVE A MINIMUM 24 HR BATTERY BACKUP.
13. FACP SHALL BE FULLY ANALOG ADDRESSABLE.

ELECTRICAL SYMBOLS

(SYMBOLS APPLY ONLY WHEN USED ON DRAWINGS)

SYMBOL	DESCRIPTION
	INCANDESCENT OR HID FIXTURE (WALL MOUNTED / CEILING MOUNTED)
	PENDANT LIGHT
	CEILING LIGHT FIXTURE
	CEILING LIGHT FIXTURE, NIGHT LIGHT
	DOWN LIGHT FIXTURE (STANDARD / NIGHT LIGHT)
	EXIT FIXTURE (WALL MOUNTED / CEILING MOUNTED) (SHADED QUADRANT DENOTES LIT FACE)
	UTILITY LIGHT
	TRACK LIGHT
	EMERGENCY FIXTURE
$	SWITCH, SINGLE POLE
$OS	SWITCH, OCCUPANCY SENSOR
$$OS	SWITCH, BI-LEVEL OCCUPANCY SENSOR
OS	OCCUPANCY SENSOR, CEILING MOUNTED
$3	SWITCH, 3-WAY
$4	SWITCH, 4-WAY
$D	SWITCH, DIMMER
$M	SWITCH, MANUAL MOTOR
$T	SWITCH, TIMER
3$T	SWITCH, 3-WAY TIMER
$K	SWITCH, KEYED
	RECEPTACLE, DUPLEX
	RECEPTACLE, DUPLEX, ISOLATED GROUND
	RECEPTACLE, DOUBLE DUPLEX
	RECEPTACLE, DOUBLE DUPLEX, ISOLATED GROUND
	RECEPTACLE, SIMPLEX
	RECEPTACLE, SIMPLEX, TWIST LOCK
	RECEPTACLE, SIMPLEX, TWIST LOCK, ISOLATED GROUND
	RECEPTACLE, DUPLEX, TWIST LOCK
	RECEPTACLE, DUPLEX, TWIST LOCK, ISOLATED GROUND
	RECEPTACLE, SPECIAL
	RECEPTACLE, DUPLEX (CEILING MOUNTED / FLOOR MOUNTED)
	RECEPTACLE, DUPLEX, FLOOR MOUNTED, ISOLATED GROUND
	RECEPTACLE, SPECIAL, FLOOR MOUNTED
	RECEPTACLE, PLUG-MOLD
J	JUNCTION BOX
A	ALARM JUNCTION BOX
R	REMOTE TEST/RESET JUNCTION BOX
	DISCONNECT (FUSED / NON-FUSED)
	CONDUIT SLEEVE
	PANEL (SURFACE / FLUSH MOUNTED)
	DATA (WALL / FLOOR MOUNTED)
	TELEPHONE (WALL / FLOOR MOUNTED)
	LOW VOLTAGE CABLE BOX FOR OTHER
	MOTOR
	TELEPOWER POLE
	PUSH BUTTON
	BUZZER
D	SMOKE DETECTOR
T	THERMOSTAT
SP	SPEAKER
	HORN / STROBE
LD 2	PANEL CIRCUIT HOMERUN

ANNOTATION

X	PLAN KEYNOTE
	CONNECTION POINT OF NEW WORK TO EXISTING
1 E1.1.1	DETAIL REFERENCE: UPPER NUMBER INDICATES DETAIL NUMBER, LOWER NUMBER INDICATES SHEET NUMBER
1 E1.1.1	SECTION CUT DESIGNATION

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:39 PM

Drawing Size	Project #: 18070
Drawn By: JMC	Checked By: JDL

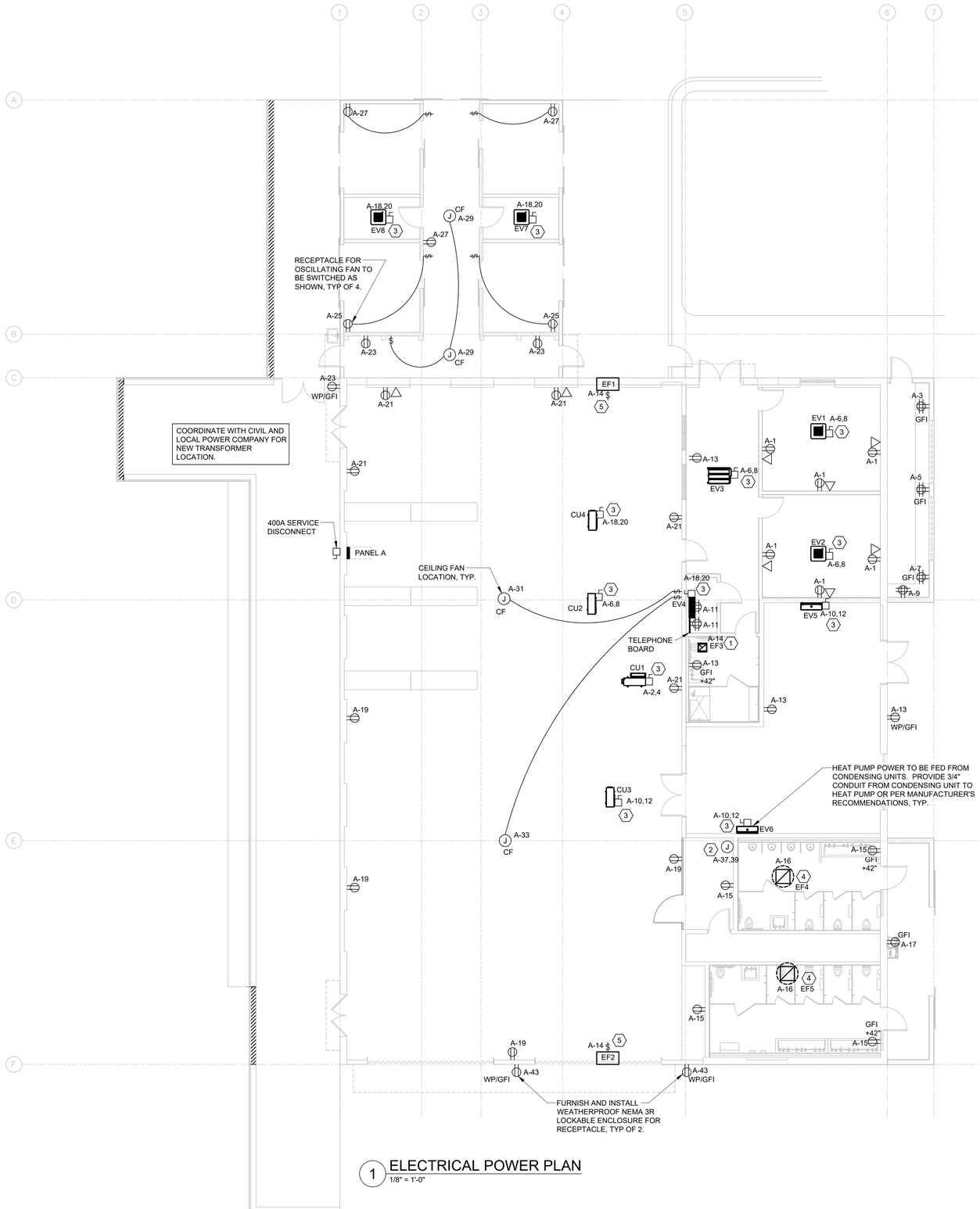
Title:
ELECTRICAL NOTES AND SPECIFICATIONS

Sheet Number:
E0.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Elec\ELEC SHEET SET.dwg, 3/21/2019 10:39 PM, scale: 1"-0" = 1'-0", ericp pcole



1 ELECTRICAL POWER PLAN
1/8" = 1'-0"

GROUND WIRE SIZING CHART

BRKR AMPS		WIRE SIZE				
15-20	PHASE	12	10	8	6	4
	GROUND	12	10	8	6	4
25-30	PHASE	10	8	6	4	3
	GROUND	10	8	6	4	3
35-50	PHASE	8	6	4	3	2
	GROUND	10	8	4	4	4
60	PHASE	6	4	3	2	1
	GROUND	10	6	6	4	4
70	PHASE	6	4	3	2	1
	GROUND	8	4	4	3	2
80-90	PHASE	4	3	2	1	1/0
	GROUND	8	6	4	4	3
100	PHASE	3	2	1	1/0	2/0
	GROUND	8	6	4	4	3

PER NEC 250.122(B)

GENERAL NOTES

1. PROVIDE SEALS AT RACEWAY PENETRATIONS TO THE EXTERIOR. REFER TO ARCHITECTURAL DOCUMENTS FOR SEALING REQUIREMENTS AT ALL EXTERIOR MOUNTED DEVICES, FIXTURES, ENCLOSURES AND RACEWAY PENETRATIONS.
2. PROVIDE A SEPARATE EQUIPMENT GROUNDING CONDUCTOR (SIZE PER NEC) IN PVC TYPE CONDUIT, POWER CIRCUITS, ISOLATED GROUND CIRCUITS, OR AS SHOWN ON PLANS. CONDUIT SHALL BE SIZED PER NEC BASED ON THWN 600 VOLT COPPER SINGLE CONDUCTORS, PLUS THE EQUIPMENT GROUNDING CONDUCTOR.
3. WIRING DEVICES: DEVICE MOUNTING HEIGHTS ARE FROM FINISHED FLOOR TO CENTER OF OUTLET BOX UNLESS NOTED OTHERWISE ON PLANS. COORDINATE THE STANDARD MOUNTING HEIGHTS WITH MASONRY:
   A. SWITCHES +46"
   B. RECEPTACLES +20"
   C. VOICE/DATA +20"
4. WIRING SHALL INCLUDE FINAL CONNECTION TO ALL EQUIPMENT IN CONFORMANCE WITH EQUIPMENT SUPPLIER WIRING DIAGRAMS.
5. CONTRACTOR IS RESPONSIBLE FOR PROVIDING COMPLETE PANELBOARD IDENTIFICATION SCHEDULES. SCHEDULES SHALL IDENTIFY THE USE OF LOAD SERVED FOR EACH CIRCUIT AND THE DEVICE OR EQUIPMENT THE PANEL IS FED FROM.
6. BRANCH CIRCUIT CONDUCTORS SHALL BE MINIMUM #12 AWG UNLESS NOTED OTHERWISE IN SCHEDULES. WHERE 20A BRANCH CIRCUITS HAVE #8 AND LARGER WIRE SPECIFIED, #10 AWG WIRE SHALL BE USED FOR THE FINAL CONNECTION (15-FT MAXIMUM).
7. WHERE BRANCH CIRCUITS ARE GROUPED, SIZE CONDUIT AND DERATE CURRENT CARRYING CONDUCTORS PER NEC.
8. PROVIDE HANDLE TIES ON ALL MULTIWIRE BRANCH CIRCUITS TO MEET NEC REQUIREMENTS.
9. CONDUITS EXTENDING BEYOND EXTERIOR WALL: STUB OUT 2'-0" BELOW GRADE TO 5'-0" BEYOND EXTERIOR WALLS UNLESS NOTED OTHERWISE. COORDINATE LOCATION AND PROVIDE CONNECTION TO SITE CONDUITS.
11. SUPPORTS FROM STRUCTURE: NO ATTACHMENT OF ANY TYPE SHALL BE MADE TO BRIDGING OR JOIST WEB MEMBERS. UTILIZE ONLY THE TOP AND BOTTOM CHORDS FOR SUPPORTING THE ELECTRICAL SYSTEM INSTALLATIONS.
12. ALL ATTACHMENTS TO STRUCTURE ARE TO BE MADE IN CONFORMANCE WITH LOCAL REQUIREMENTS. NO ATTACHMENT TO THE METAL DECOR OR CONCRETE SHALL BE ALLOWED.
13. PROVIDE LIQUID-TIGHT FLEXIBLE METAL CONDUIT AND WIRING FROM DISCONNECT SWITCH OR JUNCTION BOX TO EQUIPMENT KNOCKOUT OR ELECTRICAL CONNECTION POINT.
14. UPON COMPLETION OF ELECTRICAL INSTALLATION AND PRIOR TO ENERGIZING CIRCUIT, INSPECT WIRE AND CABLE FOR PHYSICAL DAMAGE, PHYSICAL DAMAGE.

KEYNOTES

1. CONNECT EXHAUST FAN TO LIGHT SWITCH CONTROLLING ROOM LIGHTING. ONLY CONNECT TO MOTOR RATED SWITCH.
2. INSTALL JUNCTION BOX FOR WATER HEATER PER MANUFACTURER'S RECOMMENDATIONS. COORDINATE FINAL LOCATION WITH PLUMBING PLANS.
3. PROVIDE NEMA 1, 240V, 30A-2P NON-FUSED DISCONNECT FOR MAINTENANCE.
4. CONNECT EXHAUST FAN TO TIMER. FAN TO BE POWERED FROM LIGHTS IN ROOM.REFER TO MECHANICAL SCHEDULE.
5. EXHAUST FAN TO BE CONTROLLED BY THERMOSTAT, REFER TO MECHANICAL PLANS FOR LOCATION. FURNISH AND INSTALL SWITCH FOR DISCONNECTING MEANS.

FINAL ELECTRICAL UNDER REVIEW BY KEYS ENERGY

0 8 16 24
GRAPHIC SCALE: 1/8" = 1'-0"

ARCHITECT:
K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting
Key Largo, FL
Key West, FL
Marathon, FL
URL: www.k2mdesign.com
PROF. REG. AA26001059
Building Relationships Based on Trust and Results
Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:
STRUCTURAL ENGINEER: Meridian Engineering LLC
CIVIL ENGINEER: Perez Engineering & Development
IRRIGATION: Blue Island Lighting & Irrigation Inc.

Submissions:
DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 4/10/2019 7:29 AM

Drawing Size	Project #: 18070
Drawn By: JMC	Checked By: JDL

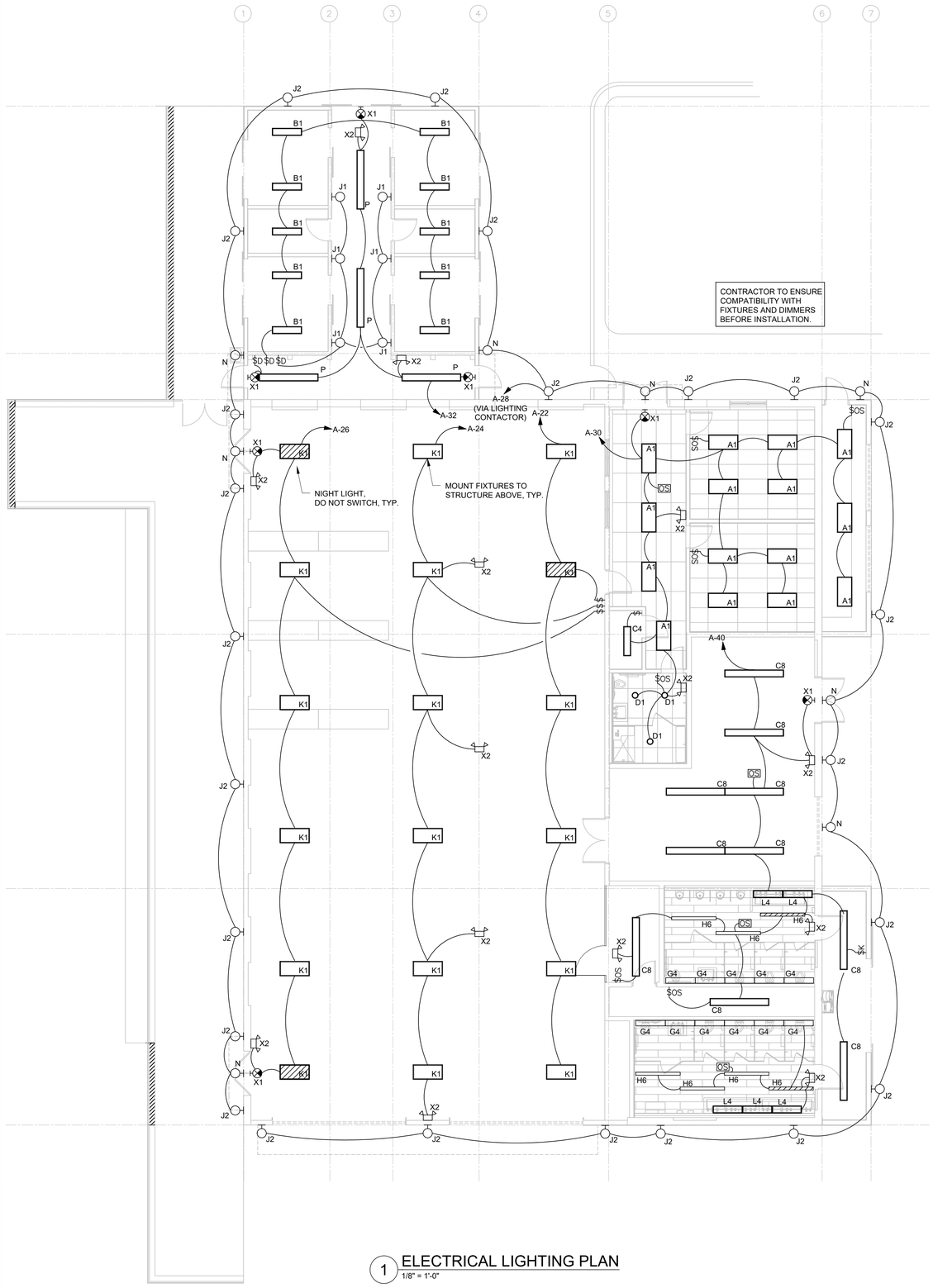
Title: ELECTRICAL POWER PLAN

Sheet Number: E1.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Elec\ELEC SHEET SET.dwg, 4/10/2019 7:29 AM, scale= 1'-0" = 1'-0", james mcghee



1 ELECTRICAL LIGHTING PLAN
1/8" = 1'-0"

LIGHTING FIXTURE SCHEDULE

TYPE	VENDOR	FURNISHED BY	CATALOG NUMBER	VOLTS	WATTS	LAMP	MOUNTING	DESCRIPTION
A1	COLUMBIA	CONTRACTOR	CFP24-4135	MVOLT	41	INTEGRAL LED	LAY-IN	2' x 4' FLAT PANEL FIXTURE
B1	COLUMBIA	CONTRACTOR	LXEN4-35LW-RFA-ED-U	MVOLT	37	INTEGRAL LED	SURFACE	4' SURFACE MOUNT VAPORTITE
C4	COLUMBIA	CONTRACTOR	LCL4-35-ML-ED-U-CSHC	MVOLT	19	INTEGRAL LED	SURFACE	4' SURFACE MOUNT LENSED STRIP
C8	COLUMBIA	CONTRACTOR	LCL8-40HL-EU	MVOLT	38	INTEGRAL LED	SURFACE	8' SURFACE MOUNT LENSED STRIP
D1	PRESCOLITE	CONTRACTOR	LF6SL-6LFSL-15L35K8-B24	MVOLT	16	INTEGRAL LED	RECESSED	4" LED DOWNLIGHT
G4	FOCAL POINT	CONTRACTOR	FWSL-FL-450-35K-1C-UNV-LD1-U-WH-4'	MVOLT	42	INTEGRAL LED	COVE LIGHT	PERIMETER COVE WALL WASH
H6	FOCAL POINT	CONTRACTOR	FSM4L-FL-375LF-35K-1C-UNV-LD1-WH-6FT	MVOLT	26	INTEGRAL LED	RECESSED	4" RECESSED LINEAR STRIP
J1	HI-LITE	CONTRACTOR	H-7512-91/HL-D-91-LED-BCM-120V	MVOLT	12	INTEGRAL LED	WALL MOUNTED	INTERIOR WALL SCONCE
J2	HI-LITE	CONTRACTOR	H-7412-B-91-LED/20W-BCM-120V	MVOLT	12	INTEGRAL LED	WALL MOUNTED	EXTERIOR WALL SCONCE
K1	COLUMBIA	CONTRACTOR	LLHV-4-35M-WST-ED-U-SFAWG-LHVQM5	MVOLT	138	INTEGRAL LED	SUSPENDED	LED HIGH BAY
L4	SONNEMAN LIGHTING	CONTRACTOR	STIX PLUS/SATIN WHITE	MVOLT	26	INTEGRAL LED	SURFACE	4' VANITY FIXTURE
M	SENTRY SPORTS	CONTRACTOR	DRAWING REFERENCE #SC360X225-30SB-50FC	MVOLT	64.8KW TOTAL	INTEGRAL LED	POLE MOUNTED	SPORTS LIGHTING ON POLE
N	ACUITY	CONTRACTOR	AFN	MVOLT	10	INTEGRAL LED	SURFACE	EXTERIOR EMERGENCY LIGHT
P	LUMENWERX	CONTRACTOR	VSPLPDI-PYC-HLO-LED-80-750-500-35-8FT-UNV-D1-2-TF-55ALSA-AL	MVOLT	53	INTEGRAL LED	SUSPENDED	SUSPENDED DIRECT/INDIRECT
R	HINKLEY	CONTRACTOR	HARBOR 2571SK-LED	MVOLT	42	INTEGRAL LED	POST MOUNTED	POST MOUNTED FIXTURE
X1	ACUITY	CONTRACTOR	LQM-S-W-1-G-120/277-EL N-SD	MVOLT	1	INTEGRAL LED	SURFACE MOUNTED	EXIT SIGN (SINGLE FACE)
X2	ACUITY	CONTRACTOR	ELM2 LED	MVOLT	2	INTEGRAL LED	WALL	EMERGENCY LIGHT

GENERAL LIGHTING NOTES

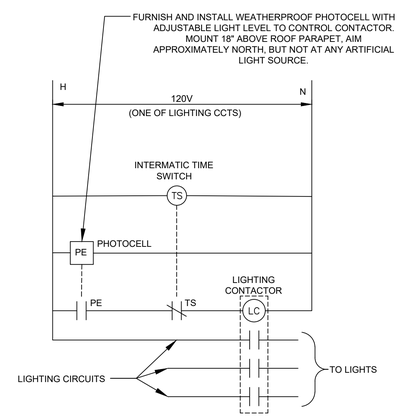
1. EXIT SIGN MOUNTING
   A. WALL FIXTURE: CENTER 12" ABOVE DOOR OPENING.
   B. CEILING/PENDANT FIXTURE: ON CEILING OR AT HEIGHT SPECIFIED ON DRAWINGS.
2. EMERGENCY LIGHT INSTALLATION

   FIXTURE MOUNTING

   A. WALL FIXTURE: 12" BELOW FINISHED CEILING OR +10'-0" IN AREAS OF EXPOSED STRUCTURE, UNLESS NOTED OTHERWISE.
   B. PENDANT FIXTURE: BOTTOM CHORD OF BAR JOIST OR AT HEIGHT SPECIFIED ON DRAWINGS.
   C. REMOTE HEAD FIXTURE: HEADS CENTERED ABOVE DOOR OPENING +9'-0", UNLESS NOTED OTHERWISE AND BATTERY PACK MOUNTED ON INTERIOR SIDE OF WALL 12" BELOW FINISHED CEILING OR AT BAR JOIST IN AREAS OF EXPOSED STRUCTURE.

   ELECTRICAL CONNECTION

   A. REFER TO MANUFACTURER'S WRITTEN INSTRUCTIONS. ALLOW BATTERY TO CHARGE CONTINUOUSLY FOR A MINIMUM OF 168 HOURS BEFORE INITIAL TESTING.
   B. AFTER EMERGENCY LIGHT HAS BEEN POWERED DO NOT TURN OFF FOR EXTENDED PERIODS OF TIME.
3. EXIT SIGNS, EMERGENCY LIGHTS, AND NIGHT LIGHTS SHALL NOT BE SWITCHED.
4. FURNISH AND INSTALL UNISTRUT AS REQUIRED TO MOUNT FIXTURE TO BAR JOIST.



NOTES:
1. CONTROL SHALL BE "ON" WITH PHOTOCELL, "OFF" WITH TIME SWITCH. VERIFY TIME SWITCH SETTING WITH OWNER.
2. FOR ACTUAL CIRCUITS CONTROLLED, AND CONTACTOR INFORMATION REFERENCE DRAWINGS.

2 TYPICAL LIGHTING CONTACTOR CONTROL DETAIL
NTS

0 8 16 24
GRAPHIC SCALE: 1/8" = 1'-0"

ARCHITECT:
K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting
Key Largo, FL
Key West, FL
Marathon, FL
URL: www.k2mdesign.com
PROF. REG. AA26001059
Building Relationships Based on Trust and Results
Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:
STRUCTURAL ENGINEER: Meridian Engineering LLC
CIVIL ENGINEER: Perez Engineering & Development
IRRIGATION: Blue Island Lighting & Irrigation Inc.

Submissions:
DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:39 PM

Drawing Size	Project #: 18070
Drawn By: JMC	Checked By: JDL

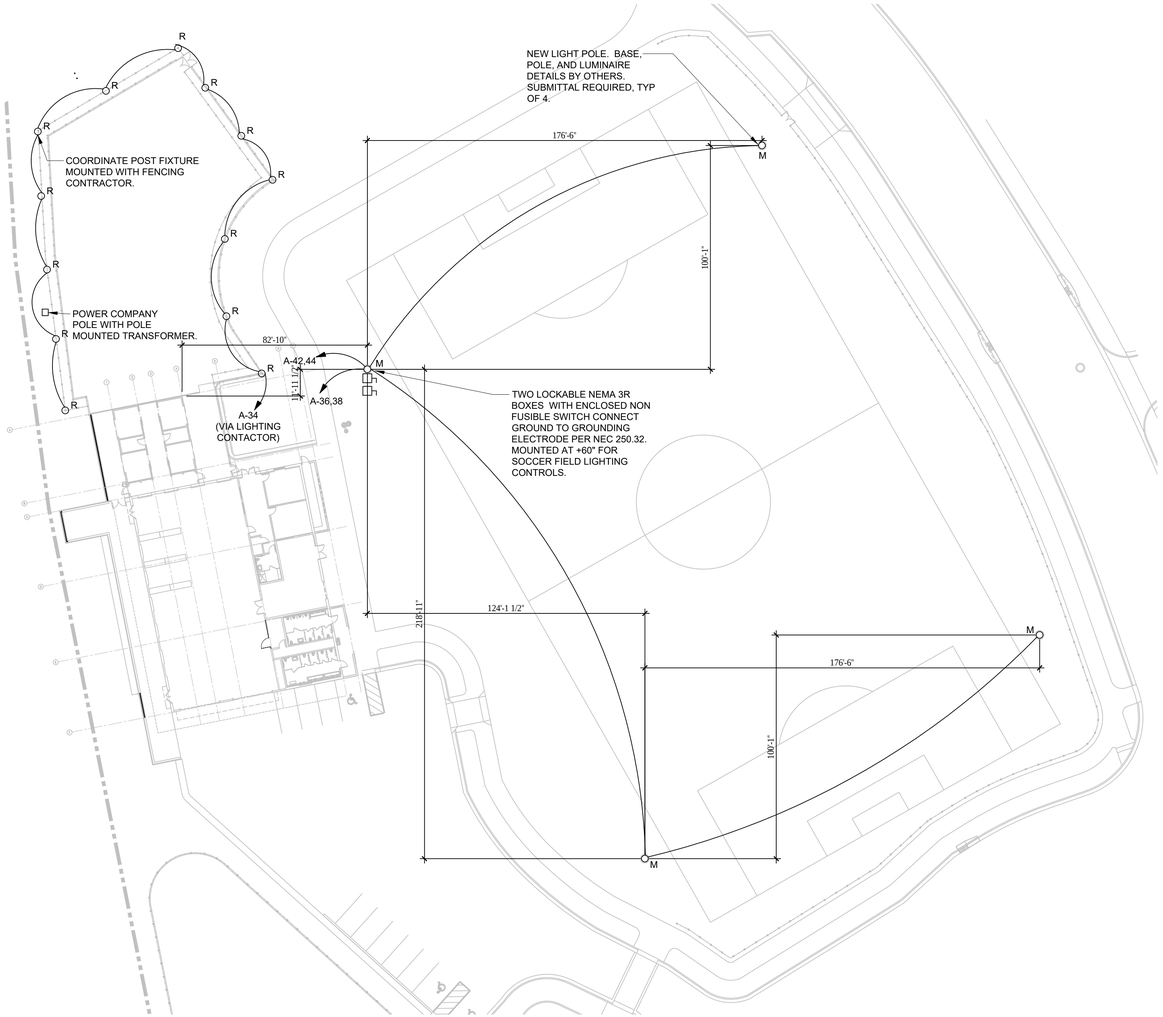
Title: ELECTRICAL LIGHTING PLAN

Sheet Number: E2.1.1

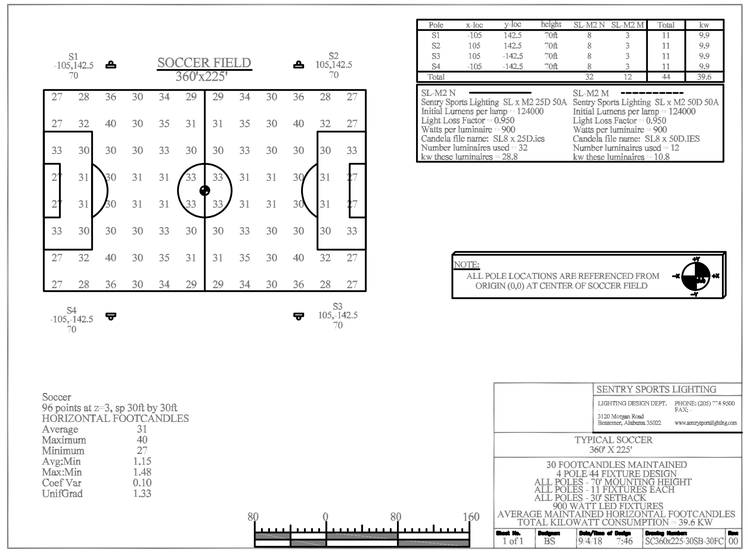
Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Elec\ELEC SHEET SET.dwg, 3/21/2019 10:39 PM, scale: 1'-0" = 1'-0", erica poole



1 SOCCER FIELD/HORSE RUN ELECTRICAL LIGHTING PLAN
1/32" = 1'-0"



Pole	x loc	y loc	height	SL-M2 N	SL-M2 M	Total	kw
S1	-105	142.5	70ft	8	3	11	9.9
S2	105	142.5	70ft	8	3	11	9.9
S3	105	-142.5	70ft	8	3	11	9.9
S4	-105	-142.5	70ft	8	3	11	9.9
Total				32	12	44	39.6

SL-M2 N
Sentry Sports Lighting SL x M2 25D 50A
Initial Lumens per lamp = 124000
Light Loss Factor = 0.950
Watts per luminaire = 900
Candela file name: SL8 x 25D.ies
Number luminaires used = 32
kw these luminaires = 28.8

SL-M2 M
Sentry Sports Lighting SL x M2 50D 50A
Initial Lumens per lamp = 124000
Light Loss Factor = 0.950
Watts per luminaire = 900
Candela file name: SL8 x 50D.IES
Number luminaires used = 12
kw these luminaires = 10.8

NOTE:
ALL POLE LOCATIONS ARE REFERENCED FROM ORIGIN (0,0) AT CENTER OF SOCCER FIELD

Soccer
96 points at z=3, sp 30ft by 30ft
HORIZONTAL FOOTCANDLES

Average	31
Maximum	40
Minimum	27
Avg:Min	1.15
Max:Min	1.48
Coef Var	0.10
UnifGrad	1.33

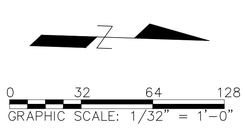
SENTRY SPORTS LIGHTING
LIGHTING DESIGN DEPT.
3120 Morgan Road
Hoover, Alabama 35022
PHONE: (205) 777-9000
FAX:
www.sentrysportslighting.com

TYPICAL SOCCER
360' X 225'

30 FOOTCANDLES MAINTAINED
4 POLE 44 FIXTURE DESIGN
ALL POLES - 70' MOUNTING HEIGHT
ALL POLES - 11 FIXTURES EACH
ALL POLES - 30' SETBACK
900 WATT LED FIXTURES
AVERAGE MAINTAINED HORIZONTAL FOOTCANDLES
TOTAL KILOWATT CONSUMPTION = 39.6 KW

Sheet No.	Designer	Date/Time of Design	Drawing Number	Rev
1 of 1	BS	9/4/18 7:46	SC360x225-30SB-30FC	00

2 SOCCER FIELD LIGHTING CALCULATIONS
SEE PLAN



ARCHITECT:

K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:39 PM

Drawing Size	Project #: 18070
Drawn By: JMC	Checked By: JDL

Title:
SITE LIGHTING PLAN

Sheet Number:
E3.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Elec\ELEC SHEET SET.dwg, 3/21/2019 10:39 PM, scale: 1'-0" = 1'-0", erica poole

A PANELBOARD NEW

120/240V, 1PH, 3W
400A MAIN LUGS ONLY
10,000 AIC
GROUND BAR

SURFACE MOUNT

	DESCRIPTION	WIRE	BRKR	PL	KVA A		KVA B		PL	BRKR	WIRE	DESCRIPTION	
1	OFFICE RECEPTS	12	20	1	1.08	1.35			2	15	12	CONDENSING UNIT CU1	2
3	CONCESSION STAND	12	20	1			0.50	1.35					4
5	CONCESSION STAND	12	20	1	0.50	1.87			2	25	10	CONDENSING UNIT CU2	6
7	CONCESSION STAND	12	20	1			0.50	1.87					8
9	CONCESSION STAND	12	20	1	0.50	1.56			2	20	12	CONDENSING UNIT CU3	10
11	DATA ROOM	12	20	1			0.72	1.56					12
13	MISC RECEPTS	12	20	1	0.72	0.60			1	20	12	EXHAUST FANS 1,2,3	14
15	RESTROOM/RECEPTS	12	20	1			0.72	0.02	1	20	12	EXHAUST FAN EF-4	16
17	WATER COOLER	12	20	1	0.50	1.56			2	20	12	CONDENSING UNIT CU4	18
19	STORAGE RECEPTS	12	20	1			0.72	1.56					20
21	STORAGE RECEPTS	12	20	1	0.90	0.83			1	20	12	STORAGE LIGHTING	22
23	STABLE RECEPTS	12	20	1			0.72	0.83	1	20	12	STORAGE LIGHTING	24
25	STABLE FANS	12	20	1	0.72	0.82			1	20	12	STORAGE LIGHTING	26
27	STABLE FANS	12	20	1			0.72	0.30	1	20	12	EXTERIOR LIGHTING (10)	28
29	STABLE CEILING FANS	12	20	1	0.80	0.75			1	20	12	OFFICE LIGHTING	30
31	PUBLIC STORAGE FAN	12	20	1			1.00	0.65	1	20	12	STABLE LIGHTING	32
33	PUBLIC STORAGE FAN	12	20	1	1.00	0.80			1	20	10	HORSE RUN LIGHTING (6,10)	34
35	FIRE ALARM SYSTEM	12	20	1			0.50	2.29	2	30	6	SOCCER FIELD LIGHTING (6)	36
37	WATER HEATER	8	35	2	3.00	2.29							38
39							3.00	1.00	1	20	12	RESTROOM/STORAGE LTG	40
41	PUMP P1	12	20	1	0.04	2.29			2	30	6	SOCCER FIELD LIGHTING (6)	42
43	EXTERIOR RECEPTACLES	12	20	1			0.36	2.29					44
45	SPACE				0.00	0.00						SPACE	46
47	SPACE						0.00	0.00				SPACE	48
49	SPACE				0.00	0.00						SPACE	50
51	SPACE						0.00	0.00				SPACE	52
53	SPACE				0.00	0.00						SPACE	54
55	SPACE						0.00	0.00				SPACE	56
	TOTAL CONNECTED				24.49	KVA	23.18	KVA					
	TOTAL CONNECTED				204.04	AMPS	193.20	AMPS					
	TOTAL LOAD				47.67	KVA	198.62	AMPS					
	PER NEC ARTICLE 220 FEEDER LOAD				50.46	KVA	210.26	AMPS					

	LOAD	DEMAND	LOAD		LOAD	DEMAND	LOAD			
	LIGHT	125 %	18.92		CONTIN	125 %	0.00		1.0	PHASE MULTIPLIER
**PER NEC 220.13	RECEP	**	10.59		NON-CONTIN	100 %	6.66		210	PANEL AMPS
EQUIPMENT COUNT THIS PANEL 4	KITCH	80 %	1.60		HVAC	100 %	12.69	COOL	(2)	TOTAL DEMAND / (VOLTAGE x PH MUL
	REFRG	100 %	0.00		SPARE	100 %	0.00			
					TOTAL FEEDER LOAD		50.46	KVA		

PANELBOARD NOTES

1. TERMINATE GROUND ON ISOLATED GROUND BUS.
2. INSTALL LOCKING DEVICE FURNISHED WITH PANELBOARD (LOCK-OFF FOR MAINTENANCE).
3. INSTALL LOCKING DEVICE FURNISHED WITH PANELBOARD (LOCK-ON FOR CRITICAL LOAD).
4. GFI BREAKER FOR PERSONNEL PROTECTION (5 mA).
5. GFI BREAKER FOR EQUIPMENT PROTECTION (30 mA).
6. CONDUCTOR SIZE SHOWN IN PANEL SCHEDULE HAS BEEN INCREASED FOR VOLTAGE DROP. EQUIPMENT GROUNDING CONDUCTOR SIZE SHALL BE INCREASED PROPORTIONALLY PER NEC. REFERENCE GROUND WIRE SIZING CHART.
7. REFER TO ONE-LINE DIAGRAM FOR AVAILABLE FAULT CURRENT FOR INTERRUPTING RATINGS.
8. REFER TO ONE-LINE DIAGRAM FOR WIRE SIZES.
9. FACTORY WIRED TO LOAD.
10. THRU CONTACTOR.

WARNING

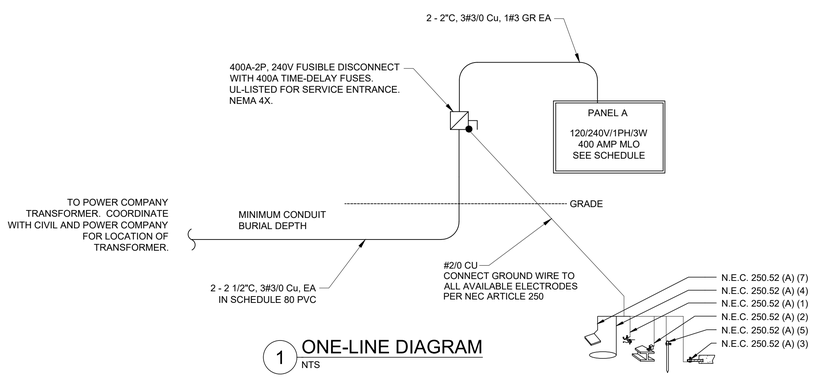
ARC FLASH AND SHOCK HAZARD.
APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIRED.

NOTES:

A. ALL SWITCHBOARDS AND PANELBOARDS SHALL HAVE A COMMERCIALLY PRODUCED PERMANENT LABEL APPLIED, SIMILAR TO THE ABOVE, TO WARN OF POTENTIAL ARC FLASH HAZARDS, IN ACCORDANCE WITH NEC 110.16 AND NFPA 70E.

B. LABELING MAY BE COMPLETED BY EQUIPMENT MANUFACTURER, EQUIPMENT VENDOR/SUPPLIER, OR THE CONTRACTOR. THE CONTRACTOR SHALL VERIFY THAT ALL SWITCHBOARDS AND PANELBOARDS ARE PROPERLY LABELED IN THE FIELD.

2 ARC FLASH DETAIL
NTS



1 ONE-LINE DIAGRAM
NTS

WIRE AND CONDUIT SIZES ARE BASED ON THWN COPPER WIRE AND EMT CONDUIT. ADJUST CONDUIT SIZE ACCORDINGLY FOR FIT 40% FILL TABLES FOR ALTERNATIVE CONDUIT AND WIRE TYPES.

A SIGN SHALL BE PLACED AT THE SERVICE ENTRANCE EQUIPMENT THAT INDICATES THE TYPE AND LOCATION OF ON-SITE EMERGENCY POWER SOURCES.

VERIFY LABEL IS PRESENT AT SERVICE ENTRANCE EQUIPMENT IDENTIFYING THE MAXIMUM AVAILABLE FAULT CURRENT PER NEC 110.24. A LABEL SHOULD ALSO IDENTIFY THE SOURCE OF SUPPLY FOR EACH PANEL PER NEC 408.4.

REPRESENTS THE PRELIMINARY CALCULATED AVAILABLE FAULT CURRENT IN RMS SYMMETRICAL AMPERES AT THE RESPECTIVE TRANSFORMER, PANEL, OR EQUIPMENT BASED ON INFORMATION RECEIVED FROM THE UTILITY AND ESTIMATED FEEDER LENGTH AND MATERIALS.

FINAL ELECTRICAL UNDER REVIEW BY KEYS ENERGY

ARCHITECT:
K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting
Key Largo, FL
Key West, FL
Marathon, FL
URL: www.k2mdesign.com
PROF. REG. AA26001059
Building Relationships Based on Trust and Results
Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:
STRUCTURAL ENGINEER: Meridian Engineering LLC
CIVIL ENGINEER: Perez Engineering & Development
IRRIGATION: Blue Island Lighting & Irrigation Inc.

Submissions:
DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 4/10/2019 7:29 AM

Drawing Size	Project #: 18070
Drawn By: JMC	Checked By: JDL

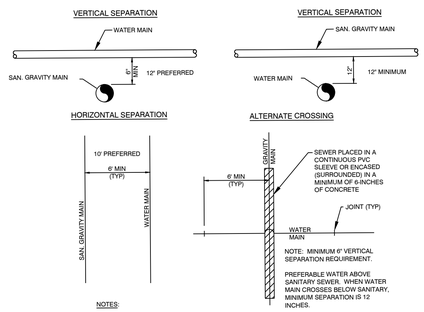
Title: ELECTRICAL DETAILS

Sheet Number:
E4.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

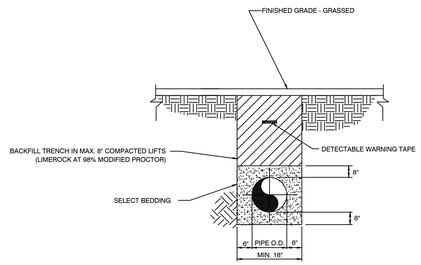
J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CD's\Drawings\Elec\ELEC SHEET SET.dwg, 4/10/2019 7:29 AM, scale: 1"=0" x 1"=0", james meghee



NOTES:

1. SANITARY SEWER GRAVITY MAINS CROSSING UNDER WATER MAINS, MUST MEET THE REQUIREMENTS OF VERTICAL SEPARATION.
2. SANITARY SEWER GRAVITY MAINS CROSSING OVER WATER MAINS, MUST MAINTAIN A MINIMUM VERTICAL SEPARATION OF 12 INCHES (BETWEEN THE INVERT OF THE UPPER PIPE AND THE CROWN OF THE LOWER PIPE), AND MEET THE REQUIREMENTS OF ALTERNATE CROSSING.

1 Sanitary Gravity Sewer and Water Main Separation Distances
NTS



2 Trench Restoration Detail
NTS

PVC PIPE RESTRAINT JOINT SCHEDULE

LENGTH (L) TO BE RESTRAINED

NOMINAL PIPE SIZE (IN.)	HORIZONTAL BENDS 90° BENDS L(FT.)	45° BENDS L(FT.)	22.5° BENDS L(FT.)	11.25° BENDS L(FT.)	VERTICAL OFFSETS "45° BENDS" (SEE NOTE 4) L1(FT.)	L2(FT.)	VALVES (SEE NOTE 5) L3(FT.)
4	20	8	4	2	20	3	50
6	28	10	5	2	28	4	70
8	36	14	6	3	36	5	90
10	40	18	8	4	45	6	110
12	50	20	9	4	52	8	120
14	56	23	10	5	60	9	140
16	60	26	11	6	67	10	160
18	69	29	12	6	74	12	180
20	75	32	13	7	80	13	195
24	76	33	15	7	81	14	200
30	88	36	18	9	97	16	235
36	100	40	20	10	110	20	270
42	115	48	23	11	125	24	300
48	125	52	25	12	140	30	340

REDUCERS (SIZE)	L FT.
6 X 4	35
8 X 6	35
8 X 4	65
10 X 8	35
10 X 6	65
12 X 10	35
12 X 8	65
16 X 12	65
16 X 10	95
20 X 18	35
20 X 16	65
20 X 12	120
24 X 20	65
24 X 18	95
24 X 16	120
30 X 24	80
30 X 20	150
36 X 30	80
36 X 24	150
42 X 36	80
42 X 30	150
48 X 42	80
48 X 36	150

TEES (NOTE 5) RUN SIZE	BRANCH SIZE	FT.
4"	4"	F.O.
6"	6"	50
	4"<LESS	F.O.
8"	8"	50
	6"<LESS	F.O.
10"	10"	50
	8"<LESS	F.O.
12"	12"	55
	10"<LESS	F.O.
16"	16"	60
	12"<LESS	F.O.
20"	20"	130
	16"<LESS	F.O.
24"	24"	130
	20"	90
	16"	40
	12"<LESS	F.O.
30"	30"	140
	24"	80
	20"	50
	16"<LESS	F.O.
36"	36"	180
	30"	120
	24"	50
	20"<LESS	F.O.
42"	42"	220
	36"	160
	30"	80
	24"	40
	20"<LESS	F.O.
48"	48"	250
	42"	180
	36"	90
	30"	40
	24"<LESS	F.O.

F.O. = FITTING ONLY

PVC PIPE RESTRAINT NOTES

1. THIS SCHEDULE SHALL BE UTILIZED ON ALL WATER, SEWER FORCE MAIN OR RECLAIMED WATER SYSTEMS. ALL FITTINGS SHALL BE RESTRAINED TO LENGTHS INDICATED ON THE ABOVE SCHEDULE, AT A MINIMUM.

2. ASSUMPTIONS: PVC PIPE, SAFETY FACTOR = 1.5, TEST PRESSURE = 150 PSI, SOIL = GM OR SM, TRENCH TYPE 3, DEPTH OF COVER = 36".

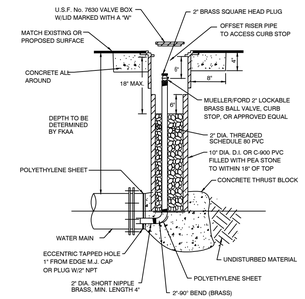
3. BENDS AND VALVES: SHALL BE RESTRAINED ON EACH SIDE OF FITTING.

4. VERTICAL OFFSETS: ARE APPROX. 3 FEET COVER ON TOP AND APPROX. 8 FEET COVER ON BOTTOM. PER THE DETAILS, L1 IS THE RESTRAINED LENGTH FOR THE UPPER (TOP) LEVEL. L1 IS THE RESTRAINED LENGTH FOR THE LOWER (DEEPER) LEVEL. ASSUME 45 DEGREE BENDS.

5. TEES: TOTAL LENGTH BETWEEN FIRST JOINTS OR RESTRAINED LENGTH ON EITHER SIDE OF TEE (RUN) SHALL BE A TOTAL DISTANCE OF 30 FEET (MIN) SEE SCHEDULE ABOVE FOR RESTRAINT LENGTH ON TEE "BRANCH" LINE.

6. HDPE TO PVC TRANSITIONS: THE PVC PIPE SIDE SHALL BE RESTRAINED 35 FEET (MIN.).

3 Restrained Joint Distances
NTS

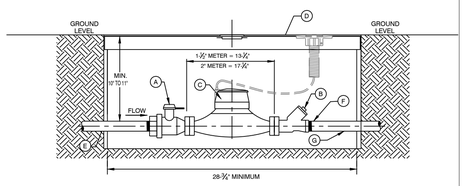


ELEVATION VIEW

NOTES:

1. TO BE USED AT LINE END WHERE FLUSH-OUT ASSEMBLY IS SPECIFIED.
2. ALL PIPE TO BE SCHEDULE 80 PVC.
3. ALL FITTINGS TO BE BRASS.

4 Flush-Out Assembly
NTS



ELEVATION VIEW

A= FORD LOCKABLE CURB STOP OR APPROVED EQUAL

METER DIAMETER	CURB STOP	
1-1/2"	No. BF13-676 W	*
2"	No. BF13-777 W	*

* "W" ON CATALOG NUMBER IS FOR PADLOCK WINGS & SHOULD OPEN TO THE LEFT.

B= FKAA APPROVED DUAL CHECK VALVE: MUELLER No. H-14242

C= SEALED REGISTER WATER METER

D= METER BOX AND LID
OLDCASTLE PRECAST #FL36-18 WITH 2 AMR(s) - "FKAA WATER"

E= 2" POLYETHYLENE TUBING (AWWA C-901)

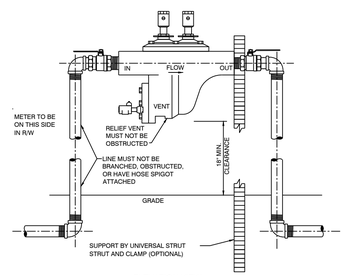
F= CUSTOMER TIE-IN POINT

G= CUSTOMER FURNISHED PIPING/TUBING

NOTE:

MINIMUM DISTANCES BETWEEN METER INLETS/OUTLETS AND THE CLOSEST FITTINGS SHALL BE MAINTAINED PER METER MANUFACTURER'S REQUIREMENTS.

5 1-1/2" & 2" Meter with Dual Check Valve
NTS

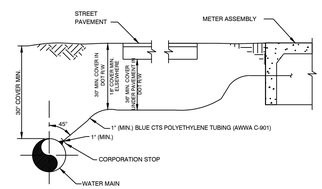


ELEVATION VIEW

NOTES:

1. THE ASSEMBLY MUST BE INSTALLED ON THE CUSTOMER'S PROPERTY, AS CLOSE TO THE METER AS PRACTICAL.
2. THE ASSEMBLY MUST BE ACCESSIBLE FOR TESTING ANNUALLY, AND FOR OVERHAUL EVERY FIVE YEARS.
3. ACCEPTABLE ASSEMBLIES ARE THOSE THAT ARE APPROVED BY EITHER ASSE OR FCCCHR AND MEET THE MINIMUM DESIGN STANDARDS OF THE AWWA.

6 ¾" to 2" Backflow Preventer
NTS



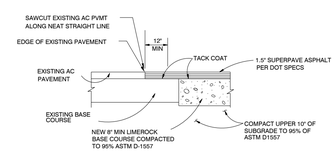
ELEVATION VIEW

NOTE:

1. SADDLES SHALL BE ROCKWELL INTERNATIONAL, TYPE 323, STYLE DOUBLE STRAP BRONZE SADDLES, FOR PVC AND DUCTILE IRON PIPE, OR APPROVED EQUAL. TAPPING SADDLES SHALL BE USED FOR ALL TAPS ON 2" PVC PIPE. 4" PVC PIPE OR GREATER SHALL HAVE A TAPPING SLEEVE AND VALVE.

2. CORPORATION STOPS SHALL BE FORD F-1000, FB-1000, OR APPROVED EQUAL. THE LARGEST CORPORATION STOP WHICH CAN BE TAPPED DIRECTLY INTO THE PIPE IS 1-INCH.

7 Service Connection
NTS



8 Asphalt Pavement And Connection To Existing Pvmt
NTS

CIVIL ENGINEERING • REGULATORY PERMITTING • CONSTRUCTION MANAGEMENT
Key West Office
1010 East Kennedy Drive, Suite 202
Key West, FL 33040
Tel: (305) 293-9440
PEREZ ENGINEERING & DEVELOPMENT, INC
CERTIFICATE OF AUTHORIZATION No. 8579
ALLEN E. PEREZ, P.E.
Florida P.E. NO. 51468
June 17, 2019

ORIGINAL: OCTOBER 2018

REVISIONS:
1
2
3
4
5
6

TRUMAN WATERFRONT
PHASE 1B

CIVIL DETAILS

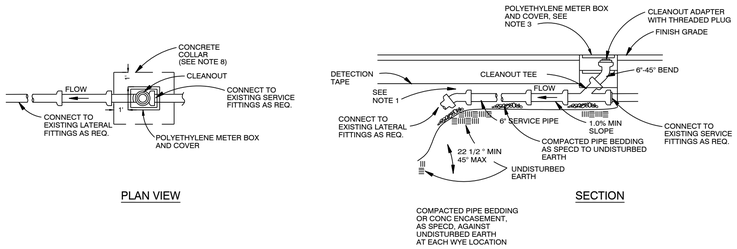
CITY OF KEY WEST
1300 WHITE STREET
KEY WEST, FL. 33040

JOB NO. 181055
DRAWN MSB
DESIGNED AEP
CHECKED AEP

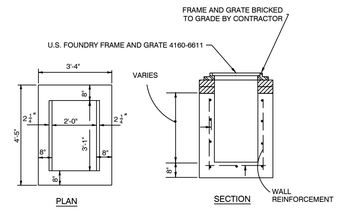
SHEET C-800

NOTES:

1. CONTRACTOR SHALL PROVIDE AN ADEQUATE SUPPLY OF 22 1/2°, 45° AND 6° WYES BENDS TO MEET VARYING FIELD CONDITIONS.
2. LENGTH OF SERVICE PIPE VARIES AT EACH SERVICE CONNECTION AND SHALL BE PROVIDED AS REQUIRED TERMINATE SERVICE AT LOCATION DIRECTED BY THE ENGINEER.
3. INSTALL MULTIPLE METER BOXES AS REQUIRED TO BRING TO GRADE.
4. IF SERVICE PIPE MATERIAL IS NOT THE SAME AS SEWER MAIN, CONNECTION SHALL BE APPROVED PRIOR TO CONSTRUCTION.
5. CONNECT AT TRENCH WALL OR AT SERVICE CONNECTION AT SEWER MAIN, AS DIRECTED BY THE ENGINEER.
6. WHERE ADEQUATE SEPARATION BETWEEN WATER MAIN AND SEWER LATERAL CANNOT BE PROVIDED INSTALL 8" SDR 35 SLEEVE AS DIRECTED BY THE ENGINEER.
7. FOR SERVICE CONNECTION REPAIRS: CONTRACTOR SHALL REPLACE A MINIMUM OF 6 LF OF OF 6 " PVC AND/OR FITTINGS AS REQUIRED.
8. ALL NEW CLEAN OUTS INSTALLED THAT ARE NOT IN CITY CONCRETE SIDEWALKS SHALL HAVE A 4" THICK CONCRETE COLLAR.



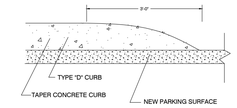
1 Typical Sewer Service Connection
NTS



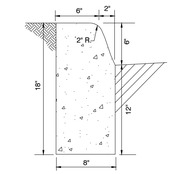
NOTES:

1. CONCRETE SHALL BE 4000 PSI AT 28 DAYS, TYPE II CEMENT
2. ALL REINFORCEMENT MAY BE WELDED WIRE AS PER ASTM C-478, #4 @ 12" O.C.E.W.
3. FRAME AND GRATE BRICKED TO GRADE BY CONTRACTOR.
4. BOTTOM INLETS SHALL BE USP PRODUCT NO. 3-3 OR EQUAL.
5. STRUCTURES TO BE SET ON COARSE AGGREGTE BEDDING

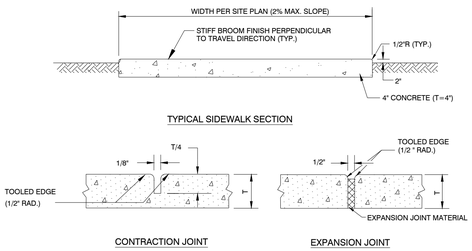
2 FDOT Ditch Bottom Inlet Type "C"
NTS



3 Tapered Curb Detail
NTS



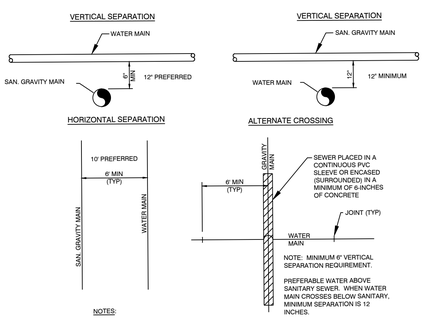
4 FDOT Type "D" CURB
NTS



NOTES:

1. PROVIDE EXPANSION JOINTS WHERE NEW SIDEWALKS ABUT STRUCTURES AND CONTRACTION JOINTS AT INTERVALS EQUAL TO SIDEWALK WIDTH.
2. REPLACE CONCRETE SIDEWALKS AT SCORED JOINTS TO AVOID A PATCHED APPEARANCE. PROVIDE 2-INCH LEVELING COURSE BENEATH NEW SIDEWALK.

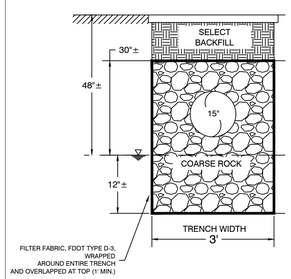
5 Typical 4" Sidewalk Detail
NTS



NOTES:

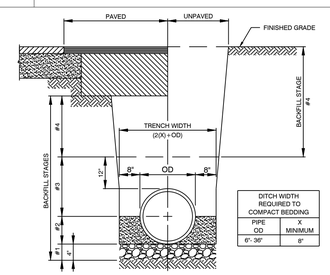
1. SANITARY SEWER GRAVITY MAINS CROSSING UNDER WATER MAINS, MUST MEET THE REQUIREMENTS OF VERTICAL SEPARATION.
2. SANITARY SEWER GRAVITY MAINS CROSSING OVER WATER MAINS, MUST MAINTAIN A MINIMUM VERTICAL SEPARATION OF 12-INCHES (BETWEEN THE INVERT OF THE UPPER PIPE AND THE CROWN OF THE LOWER PIPE), AND MEET THE REQUIREMENTS OF ALTERNATE CROSSING.

6 Sanitary Gravity Sewer and Water Main Separation Distances
NTS



NOTES:
1. COARSE ROCK SHALL BE NO. 57 STONE.
2. SELECT FILL SHALL BE PER 31 2300.

7 Exfiltration Trench Detail
NTS

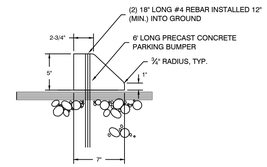


DITCH WIDTH REQUIRED TO COMPACT BEDDING	
PIPE OD	X MINIMUM
6"- 36"	8"

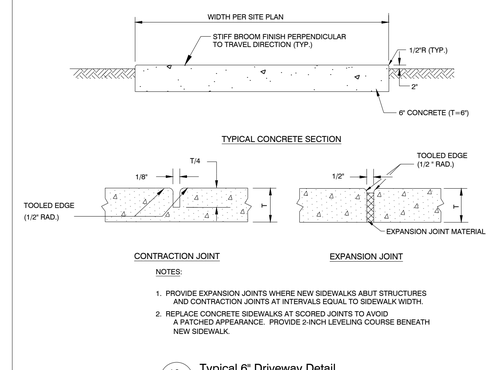
SCHEDULE	
STAGE	MATERIAL
#1	BEDDING: CLASS I, CRUSHED STONE PER 31 2300 W/WATERSTOP AT 100' INTERVALS.
#2	PIPE BEDDING: CLASS I OR CLASS II SOIL PER 31 2300
#3	PIPE BACKFILL: SELECT FILL PER 31 2300
#4	TRENCH BACKFILL: COMMON FILL PER 31 2300 PAVED ROADWAYS-IN 6" LIFTS UNPAVED ROADWAYS-IN 6" LIFTS GRASS SURFACE-IN 12" LIFTS

NOTES:
1. ALL BACKFILL SHALL BE PLACED IN LIFTS AND COMPACTED AS PER SPECIFICATION.
2. WHEN MIRGRATION OF FINES INTO COARSE SAND AND GRAVEL BEDDING IS POSSIBLE, INSTALL A GEOTEXTILE FABRIC BARRIER.

8 Pipe Bedding Detail
NTS



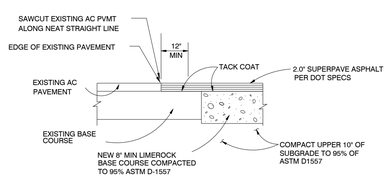
9 Concrete Parking Bumper Detail
NTS



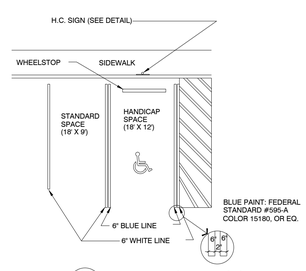
NOTES:

1. PROVIDE EXPANSION JOINTS WHERE NEW SIDEWALKS ABUT STRUCTURES AND CONTRACTION JOINTS AT INTERVALS EQUAL TO SIDEWALK WIDTH.
2. REPLACE CONCRETE SIDEWALKS AT SCORED JOINTS TO AVOID A PATCHED APPEARANCE. PROVIDE 2-INCH LEVELING COURSE BENEATH NEW SIDEWALK.

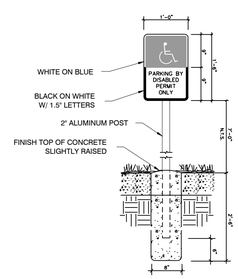
10 Typical 6" Driveway Detail
NTS



11 Asphalt Pavement And Connection To Existing Pvmt
NTS



12 Handicap Parking Detail
NTS

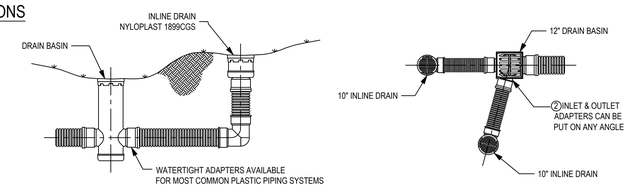


NOTES:
1. TOP SIGN SHALL HAVE A REFLECTORIZED BLUE BACKGROUND WITH WHITE REFLECTORIZED LEGEND AND BORDER
2. BOTTOM SIGN SHALL HAVE A RELECTORIZED WHITE BACKGROUND WITH BLACK OPAQUE LEGEND AND BORDER
3. SIGNS SHALL BE POLE MOUNTED AT LOCATIONS DEPICTED ON SITE PLAN AT A HEIGHT OF 84" ABOVE FINISHED GRADE.
4. ALL LETTERS ARE 1.5" SERIES "C"

13 Handicap Sign Details
NTS

TYPICAL INSTALLATIONS

TYPICAL INSTALLATION OF NYLOPLAST DRAIN BASIN AND INLINE DRAIN



1 - STRUCTURES & ADAPTERS AVAILABLE IN SIZES 8" - 30".
2 - ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360°.
3 - DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS.

14 NYLOPLAST DRAIN BASIN DETAILS
NTS

CIVIL ENGINEERING • REGULATORY PERMITTING • CONSTRUCTION MANAGEMENT
PEREZ ENGINEERING & DEVELOPMENT, INC
CERTIFICATE OF AUTHORIZATION No. 8579
Key West Office
1010 East Kennedy Drive, Suite 202
Key West, Florida 33040
Tel: (305) 293-9440
ALLEN E. PEREZ, P.E.
Florida P.E. NO. 51468
May 13, 2019

ORIGINAL: OCTOBER 2018

REVISIONS:
1
2
3
4
5
6

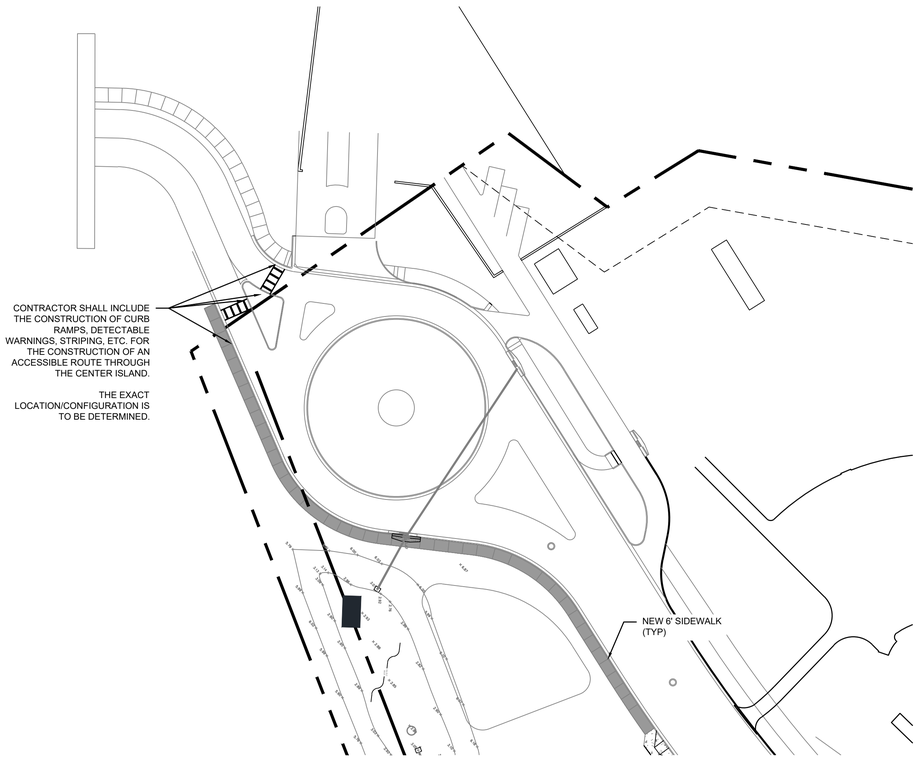
TRUMAN WATERFRONT
PHASE 1B

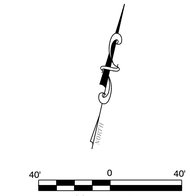
CIVIL DETAILS

CITY OF KEY WEST
1300 WHITE STREET
KEY WEST, FL. 33040

JOB NO. 181055
DRAWN MSB
DESIGNED AEP
CHECKED AEP

SHEET C-700





ENVIRONMENTAL LAND USE CONTROLS NOTE:
PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE "SOIL AND GROUND WATER MANAGEMENT PLAN", DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

CIVIL ENGINEERING • REGULATORY PERMITTING • CONSTRUCTION MANAGEMENT

PEREZ ENGINEERING & DEVELOPMENT, INC
CERTIFICATE OF AUTHORIZATION No. 8579

Key West Office
1010 East Kennedy Drive, Suite 202
Key West, Florida 33040
Tel: (305) 293-9440

ALLEN E. PEREZ, P.E.
Florida P.E. NO. 51468
May 13, 2019

ORIGINAL: *OCTOBER 2018*

REVISIONS:
1
2
3
4
5
6

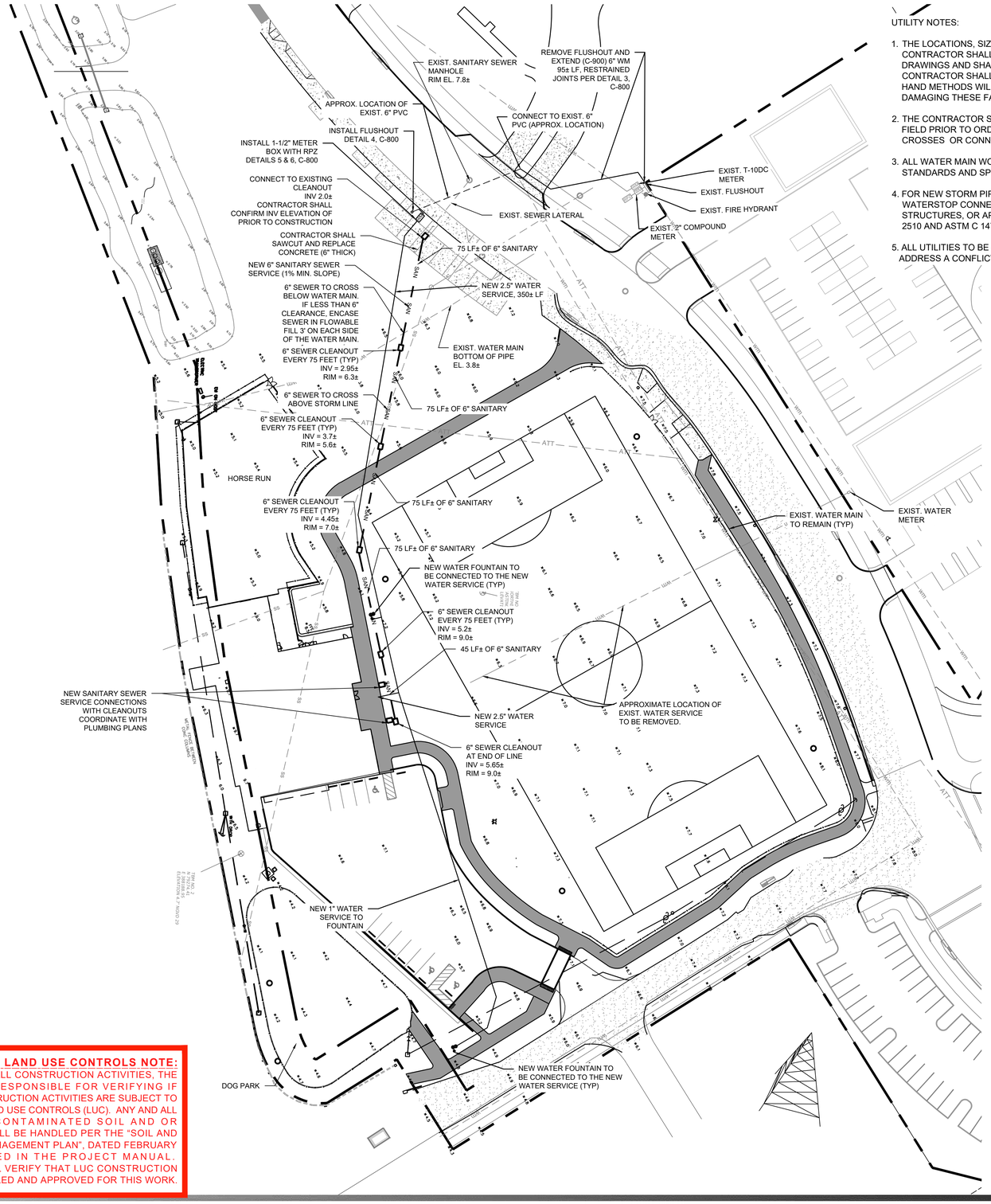
TRUMAN WATERFRONT
PHASE 1B

ALTERNATE SIDEWALK WORK

CITY OF KEY WEST
1300 WHITE STREET
KEY WEST, FL. 33040

JOB NO. *181055*
DRAWN *MSB*
DESIGNED *AEP*
CHECKED *AEP*

SHEET C-600



UTILITY NOTES:

1. THE LOCATIONS, SIZES, AND ELEVATIONS OF EXISTING UTILITIES AS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO OBTAIN ANY AVAILABLE RECORD DRAWINGS AND SHALL DETERMINE THE EXACT LOCATION AND ELEVATION IN THE FIELD. THE CONTRACTOR SHALL ANTICIPATE THAT SCANNING AND EXCAVATION USING LIGHT EQUIPMENT AND HAND METHODS WILL BE NECESSARY IN AREAS NEAR EXISTING UTILITIES AND STRUCTURES TO AVOID DAMAGING THESE FACILITIES.

2. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION AND ELEVATION OF UTILITIES IN THE FIELD PRIOR TO ORDERING NEW STRUCTURES AND PRIOR TO INSTALLING ANY NEW WORK THAT CROSSES OR CONNECTS TO EXISTING UTILITY SYSTEMS.

3. ALL WATER MAIN WORK SHALL CONFORM TO THE LATEST FLORIDA KEYS AQUEDUCT AUTHORITY'S STANDARDS AND SPECIFICATIONS.

4. FOR NEW STORM PIPE THE CONTRACTOR SHALL PROVIDE ADS PIPE ADAPTER FLEXIBLE WATERTIGHT WATERSTOP CONNECTION WITH PIPE ADAPTER FOR ADS CORRUGATED HDPE PIPE TO STORM STRUCTURES, OR APPROVED EQUAL ADS PIPE ADAPTERS MEETING THE REQUIREMENTS OF ASTM F 2510 AND ASTM C 1478 FOR WATERTIGHT FLEXIBLE CONNECTIONS.

5. ALL UTILITIES TO BE ABANDONED SHALL NOT BE DISTURBED/REMOVED UNLESS REQUIRED TO ADDRESS A CONFLICT. ABANDONED UTILITIES SHALL BE CAPPED AND LEFT IN PLACE.

40' 0 40'

SCALE 1"=40'

BAR IS TWO INCHES ON ORIGINAL DRAWINGS IF NOT TWO INCHES ON THIS SHEET ADJUST SCALES ACCORDINGLY

ENVIRONMENTAL LAND USE CONTROLS NOTE:
PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE "SOIL AND GROUND WATER MANAGEMENT PLAN", DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

CIVIL ENGINEERING • REGULATORY PERMITTING • CONSTRUCTION MANAGEMENT

PEREZ ENGINEERING & DEVELOPMENT, INC
CERTIFICATE OF AUTHORIZATION No. 8579

Key West Office
1010 East Kennedy Drive, Suite 202
Key West, Florida 33040
Tel: (305) 293-9440

ALLEN E. PEREZ, P.E.
Florida P.E. NO. 51468
June 17, 2019

ORIGINAL: OCTOBER 2018

REVISIONS:
1
2
3
4
5
6

TRUMAN WATERFRONT
PHASE 1B

WATER AND SEWER PLAN

CITY OF KEY WEST
1300 WHITE STREET
KEY WEST, FL. 33040

JOB NO. 181055
DRAWN MSB
DESIGNED AEP
CHECKED AEP

SHEET C-500

UTILITY NOTES:

1. THE LOCATIONS, SIZES, AND ELEVATIONS OF EXISTING UTILITIES AS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO OBTAIN ANY AVAILABLE RECORD DRAWINGS AND SHALL DETERMINE THE EXACT LOCATION AND ELEVATION IN THE FIELD. THE CONTRACTOR SHALL ANTICIPATE THAT SCANNING AND EXCAVATION USING LIGHT EQUIPMENT AND HAND METHODS WILL BE NECESSARY IN AREAS NEAR EXISTING UTILITIES AND STRUCTURES TO AVOID DAMAGING THESE FACILITIES.

2. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION AND ELEVATION OF UTILITIES IN THE FIELD PRIOR TO ORDERING NEW STRUCTURES AND PRIOR TO INSTALLING ANY NEW WORK THAT CROSSES OR CONNECTS TO EXISTING UTILITY SYSTEMS.

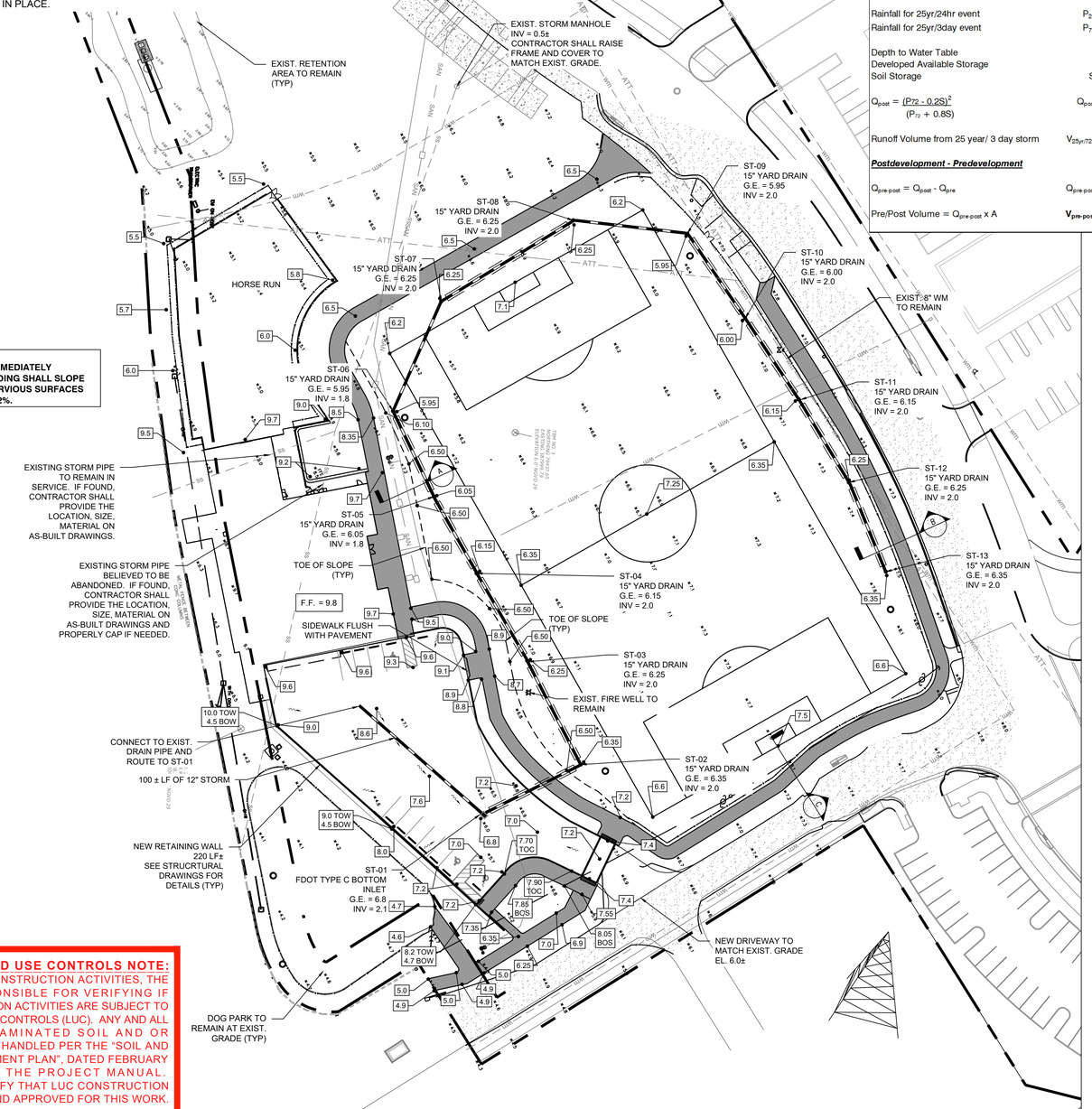
3. ALL WATER MAIN WORK SHALL CONFORM TO THE LATEST FLORIDA KEY AQUEDUCT AUTHORITY'S STANDARDS AND SPECIFICATIONS.

4. FOR NEW STORM PIPE THE CONTRACTOR SHALL PROVIDE ADS PIPE ADAPTER FLEXIBLE WATERTIGHT WATERSTOP CONNECTION WITH PIPE ADAPTER FOR ADS CORRUGATED HDPE PIPE TO STORM STRUCTURES, OR APPROVED EQUAL ADS PIPE ADAPTERS MEETING THE REQUIREMENTS OF ASTM F 2510 AND ASTM C 1478 FOR WATERTIGHT FLEXIBLE CONNECTIONS.

5. ALL UTILITIES TO BE ABANDONED SHALL NOT BE DISTURBED/REMOVED UNLESS REQUIRED TO ADDRESS A CONFLICT. ABANDONED UTILITIES SHALL BE CAPPED AND LEFT IN PLACE.

STORM STRUCTURE TABLE

Structure	Type	G.E.	Invert N	Invert S	Invert E	Invert W
ST-01	FDOT Type C Ditch Bottom Inlet	6.80	--	--	--	2.10(15")
ST-02	Nyloplast Yard Basin (15" Grate)	6.35	--	2.00(15")	--	--
ST-03	Nyloplast Yard Basin (15" Grate)	6.25	2.00(15")	2.00(15")	--	--
ST-04	Nyloplast Yard Basin (15" Grate)	6.15	2.00(15")	2.00(15")	--	--
ST-05	Nyloplast Yard Basin (15" Grate)	6.05	1.80(15")	1.80(15")	--	--
ST-06	Nyloplast Yard Basin (15" Grate)	5.95	1.80(15")	--	--	1.80(15")
ST-07	Nyloplast Yard Basin (15" Grate)	6.25	--	--	2.00(15")	2.00(15")
ST-08	Nyloplast Yard Basin (15" Grate)	6.25	--	--	2.00(15")	2.00(15")
ST-09	Nyloplast Yard Basin (15" Grate)	5.95	2.00(15")	--	2.00(15")	--
ST-10	Nyloplast Yard Basin (15" Grate)	6.00	2.00(15")	2.00(15")	--	--
ST-11	Nyloplast Yard Basin (15" Grate)	6.15	2.00(15")	2.00(15")	--	--
ST-12	Nyloplast Yard Basin (15" Grate)	6.25	2.00(15")	2.00(15")	--	--
ST-13	Nyloplast Yard Basin (15" Grate)	6.35	--	2.00(15")	--	--



NOTE:
PERVIOUS SURFACES IMMEDIATELY ADJACENT TO THE BUILDING SHALL SLOPE AWAY AT 10% AND IMPERVIOUS SURFACES SHALL SLOPE AWAY AT 2%.

ENVIRONMENTAL LAND USE CONTROLS NOTE:
PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE "SOIL AND GROUND WATER MANAGEMENT PLAN", DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

Water Quantity Calculations

Water Quantity - Predevelopment

Project Area	A =	4.375	ac	190,554	sf
Pervious Area		3.033	ac	132,114	sf
Impervious Area		1.342	ac	58,440	sf
% Impervious		30.67%			
Rainfall for 25yr/24hr event	P_{24} =	9	in		
Rainfall for 25yr/3day event	P_{72} =	12.23	in		
Depth to Water Table		4	ft		
Predeveloped Available Storage		8.18	in		
Soil Storage	S =	5.67	in		
$Q_{pre} = \frac{(P_{72} - 0.2S)^2}{(P_{72} + 0.8S)}$	Q_{pre} =	7.34	in		
Runoff Volume from 25 year/ 3 day storm	$V_{25yr/72h}$ =	32.12	ac-in		

Water Quantity - Postdevelopment

Project Area	A =	4.375	ac	190,554	sf
Pervious Area		3.421	ac	149,011	sf
Impervious Area		0.954	ac	41,543	sf
% Impervious		21.8%			
Rainfall for 25yr/24hr event	P_{24} =	9	in		
Rainfall for 25yr/3day event	P_{72} =	12.23	in		
Depth to Water Table		4	ft		
Developed Available Storage		8.18	in		
Soil Storage	S =	6.40	in		
$Q_{post} = \frac{(P_{72} - 0.2S)^2}{(P_{72} + 0.8S)}$	Q_{post} =	6.91	in		
Runoff Volume from 25 year/ 3 day storm	$V_{25yr/72h}$ =	30.24	ac-in		

Postdevelopment - Predevelopment

$Q_{pre\text{-}post} = Q_{post} - Q_{pre}$	$Q_{pre\text{-}post}$ =	-0.43	in
Pre/Post Volume = $Q_{pre\text{-}post}$ x A	$\mathbf{V_{pre\text{-}post}}$ =	**-1.88**	**ac-in**

Water Quality Calculations

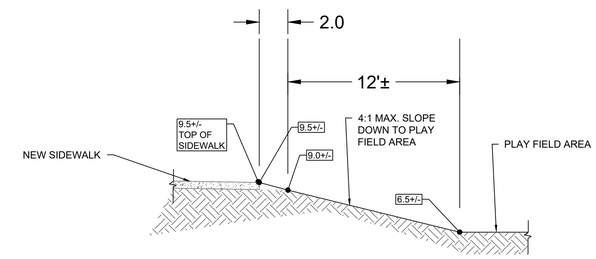
Water Quality

Project Area		4.375	ac	190,554	sf
Surface Water		0.000	ac	0	sf
Roof Area		0.272	ac	11,840	sf
Pavement/Walkways		0.682	ac	29,703	sf
Pervious area		3.421	ac	149,011	sf
Site area for Water Quality (Total area- (water surface + roof area))		4.103	ac	178,714	sf
Impervious area for water Quality (Site area for Water Quality - Pervious area)		0.682	ac	29,703	sf
% Impervious		17%			
A) One inch of runoff from project area		4.375	ac-in		
B) 2.5 inches times percent impervious (2.5 x percent impervious x (site area - surface water))		1.818	ac-in		

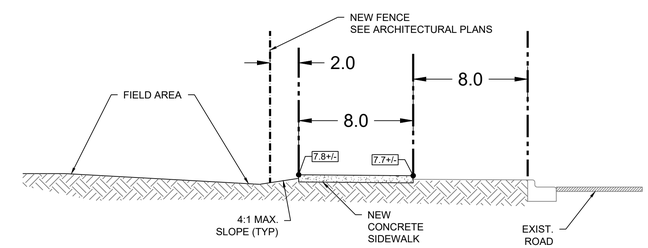
Comparision of Water Quality Methods

		4.375 ac-in	>	1.818 ac-in	
Volume required	4.375	ac-in		15,881	cf
Trench volume provided	4.375	ac-in		15,881	cf

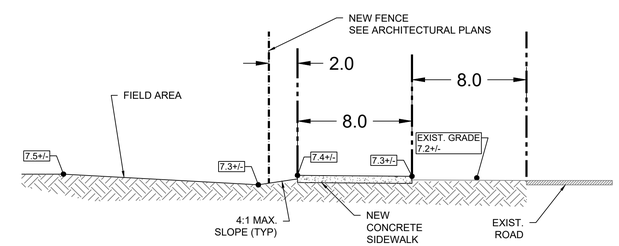
BAR IS TWO INCHES ON ORIGINAL DRAWINGS IF NOT TWO INCHES ON THIS SHEET ADJUST SCALES ACCORDINGLY



A Cross Section
NOT TO SCALE



B Cross Section
C-3 NOT TO SCALE



C Cross Section
C-3 NOT TO SCALE

Key West Office
1010 East Kennedy Drive, Suite 202
Key West, Florida 33040
Tel: (305) 293-9440
PEREZ ENGINEERING & DEVELOPMENT, INC
CERTIFICATE OF AUTHORIZATION No. 8579
CIVIL ENGINEERING • REGULATORY PERMITTING • CONSTRUCTION MANAGEMENT
ALLEN E. PEREZ, P.E.
Florida P.E. NO. 51468
May 13, 2019

ORIGINAL: OCTOBER 2018

REVISIONS:
1
2
3
4
5
6

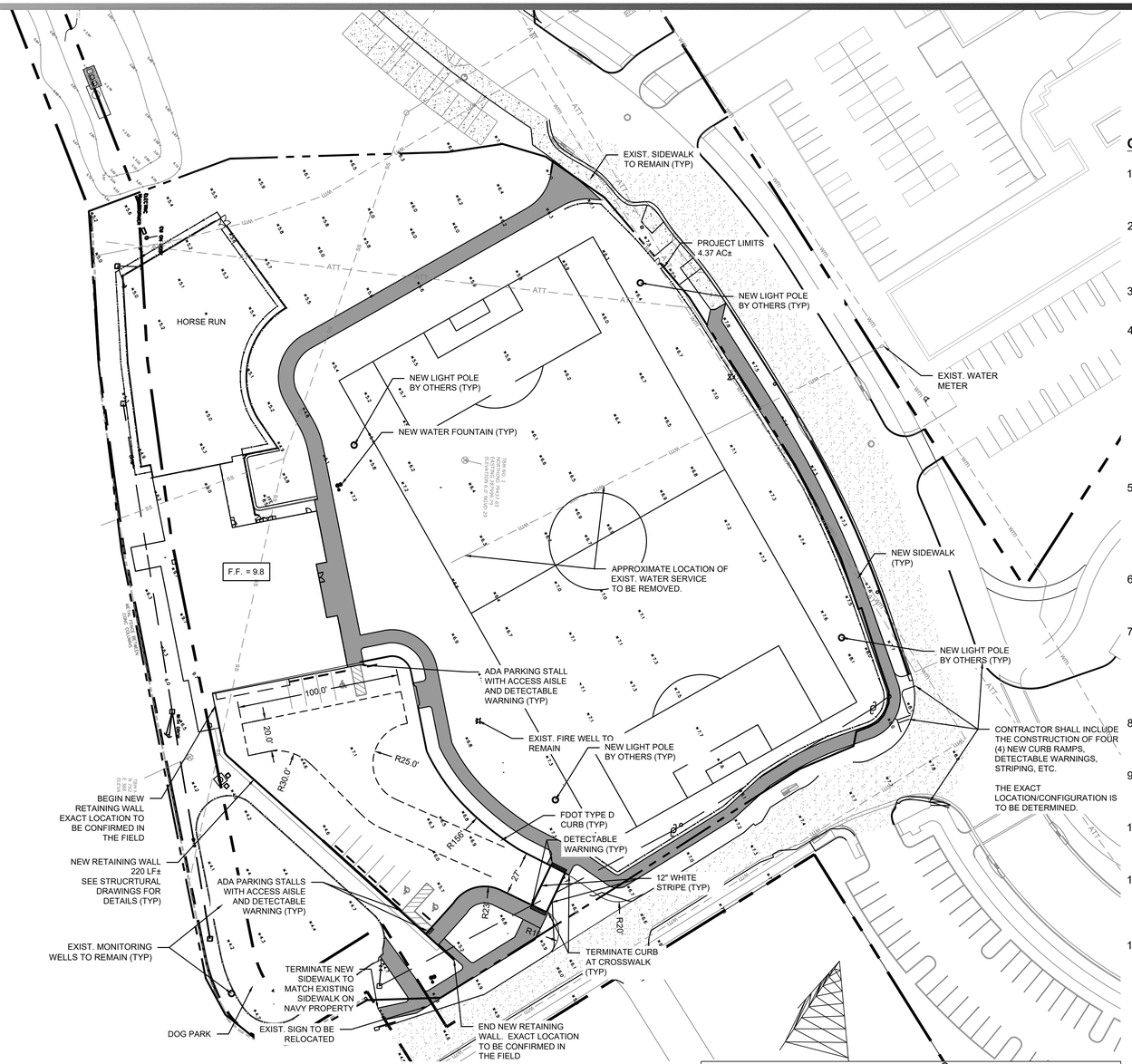
TRUMAN WATERFRONT
PHASE 1B

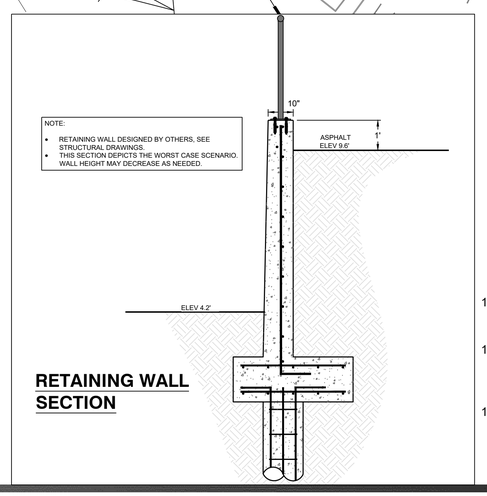
GRADING AND DRAINAGE PLAN

CITY OF KEY WEST
1300 WHITE STREET
KEY WEST, FL. 33040

JOB NO. 181055
DRAWN MSB
DESIGNED AEP
CHECKED AEP

SHEET C-400





RETAINING WALL SECTION

ENVIRONMENTAL LAND USE CONTROLS NOTE:
PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE "SOIL AND GROUND WATER MANAGEMENT PLAN", DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

GENERAL NOTES

1. THE CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS AND ADVISE THE ENGINEER OF ANY CONFLICTS OF REPRESENTATION BETWEEN DRAWINGS AND/OR SPECIFICATIONS PRIOR TO COMMENCING WITH CONSTRUCTION.

2. THE CONTRACTOR SHALL REVIEW THE SURVEY PREPARED BY REECE & ASSOCIATES DATED JULY 30TH, 2018 AND SHALL FIELD-VERIFY EXISTING CONDITIONS PRIOR TO PERFORMING ANY WORK UNDER THIS CONTRACT AND NOTIFY THE ENGINEER IN WRITING OF ANY DIFFERENCES BEFORE COMMENCING WITH ANY CONSTRUCTION.

3. HORIZONTAL COORDINATES ARE BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM. VERTICAL ELEVATIONS ARE BASED ON NGVD 1929 DATUM.

4. THE LOCATIONS, SIZES, AND ELEVATIONS OF EXISTING UTILITIES AS SHOWN ARE APPROXIMATE. THE CONTRACTOR SHALL COORDINATE WITH THE ENGINEER TO OBTAIN ANY AVAILABLE RECORD DRAWINGS AND SHALL DETERMINE THE EXACT LOCATION AND ELEVATION IN THE FIELD. THE CONTRACTOR SHALL ANTICIPATE THAT SCANNING AND EXCAVATION USING LIGHT EQUIPMENT AND HAND METHODS WILL BE NECESSARY IN AREAS NEAR EXISTING UTILITIES AND STRUCTURES TO AVOID DAMAGING THESE FACILITIES. THE CONTRACTOR SHALL CONTACT BELLSOUTH, THE LOCAL TELEPHONE COMPANY AND COMCAST, THE LOCAL CABLE TV PROVIDER TO VERIFY THE LOCATION OF BURIED TELEPHONE AND CABLE TV UTILITIES. NONE HAVE BEEN INDICATED ON THE DRAWINGS. CALL 1-800-432-4770 BEFORE DIGGING OR TRENCHING OPERATIONS BEGIN. CONTRACTOR SHALL ALSO CONTACT KEYS ENERGY TO LOCATE SECONDARY ELECTRIC LINES.

5. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION AND ELEVATION IN THE FIELD PRIOR TO INSTALLING ANY NEW WORK THAT CROSSES OR CONNECTS TO EXISTING UTILITY SYSTEMS. LOCATIONS OF NEW UTILITIES SHALL BE ADJUSTED IN A MANNER APPROVED BY THE ENGINEER TO AVOID CONFLICTS. DAMAGES TO UTILITIES RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED BY THE CONTRACTOR AT NO COST TO THE CLIENT.

6. ALL EXCAVATION, TRENCHING, SHEETING, SHORING AND BRACING SHALL BE INSTALLED AS REQUIRED IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS, INCLUDING OSHA (29 CFR 1926).

7. ALL ITEMS INDICATED TO BE REMOVED OR DEMOLISHED SHALL BE REVIEWED WITH THE OWNER TO DETERMINE IF THE ITEM IS TO BE PROPERTY OF THE CONTRACTOR. ALL ITEMS SHALL BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS, UNLESS OTHERWISE NOTED. NO SALVAGE VALUE IS EXPRESSED OR IMPLIED BY THESE CONTRACT DOCUMENTS FOR ANY ITEMS TO BE REMOVED OR DEMOLISHED.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SECURITY OF THE CONTRACTOR'S EQUIPMENT, MATERIALS, AND PERSONNEL, AND SHALL PROVIDE ADEQUATE BARRIERS TO PREVENT RISK TO OTHERS FROM THE CONTRACTOR'S ACTIVITIES.

9. WHERE ACTUAL DIMENSIONS AND SIZES ARE PROVIDED IN THE DRAWINGS, THEY SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS. LARGE SCALE DRAWINGS SHALL TAKE PRECEDENCE OVER SMALL SCALE DRAWINGS.

10. THE CONTRACTOR SHALL SEQUENCE HIS OPERATIONS SUCH THAT ORANGE MESH SAFETY FENCING IS PROVIDED ALONG ALL AREAS BEING TRENCHED AND NO TRENCH IS LEFT OPEN AT THE END OF THE WORK DAY.

11. NO CONNECTIONS FOR THE PURPOSE OF OBTAINING WATER SUPPLY DURING CONSTRUCTION SHALL BE MADE TO ANY FIRE HYDRANT OR BLOW-OFF STRUCTURE WITH OUT FIRST OBTAINING A CONSTRUCTION METER FROM THE FLORIDA KEYS AQUEDUCT AUTHORITY.

12. THE CONTRACTOR SHALL REVIEW THE GEOTECHNICAL EXPLORATION REPORT PREPARED BY NUTTING ENGINEERS, DATED APRIL 25, 2018.

13. IF UNSATISFACTORY MATERIAL FOR ADEQUATE BEARING IS ENCOUNTERED AT THE NORMAL SUBGRADE, THE UNSATISFACTORY MATERIAL SHALL BE REMOVED AND REPLACED WITH SUITABLE FOUNDATION STABILIZATION MATERIAL AS SPECIFIED. REMOVE SOILS AND OTHER MATERIALS THAT ARE NOT SUITABLE MATERIALS FOR TRENCH BOTTOM TO SIX INCHES UNDER PIPE, MINIMUM.

    REMOVE WET, YIELDING, OR MUCKY SOILS. REMOVE THE FOLLOWING SOILS:
    a. TYPE CH AND TYPE MH CLASS IV SOILS.
    b. ALL CLASS V SOILS.

    REMOVE ORGANIC MATERIAL INCLUDING ROOTS, MULCH, OR OTHER VEGETABLE MATTER, WHICH IN THE OPINION OF THE ENGINEER, WILL RESULT IN UNSATISFACTORY FOUNDATION CONDITIONS.

    REMOVE SOILS CONTAINING COBBLES, BOULDERS OR STONES LARGER THAN ONE AND ONE-HALF INCHES (1-1/2") IN DIAMETER.

    REMOVE LEDGE ROCK AND HARDPAN. REMOVE ROCK AND HARDPAN TO PROVIDE BEDDING WIDTH 24 INCHES WIDER THAN PIPE.

    REMOVE SOILS CONTAINING RUBBISH, TRASH, OR OTHER FOREIGN MATERIALS.

14. IN GENERAL, EXISTING STRUCTURES AND UTILITIES ARE NOTED AS EXISTING AND/OR SHOWN IN LIGHT LINE WEIGHT. NEW CONSTRUCTION IS SHOWN IN HEAVY LINE WEIGHT.

15. ALL FIELD LAYOUT AND SURVEYING FOR CONSTRUCTION OF THIS PROJECT SHALL BE PROVIDED BY THE CONTRACTOR AT HIS EXPENSE, UNDER THE DIRECTION OF A FLORIDA LICENSED PROFESSIONAL LAND SURVEYOR.

16. THE SUBJECT PROPERTY IS LOCATED WITHIN AN AE 7 FLOOD ZONE.

40' 0 40'
SCALE 1"=40'
BAR IS TWO INCHES ON ORIGINAL DRAWINGS IF NOT TWO INCHES ON THIS SHEET ADJUST SCALES ACCORDINGLY

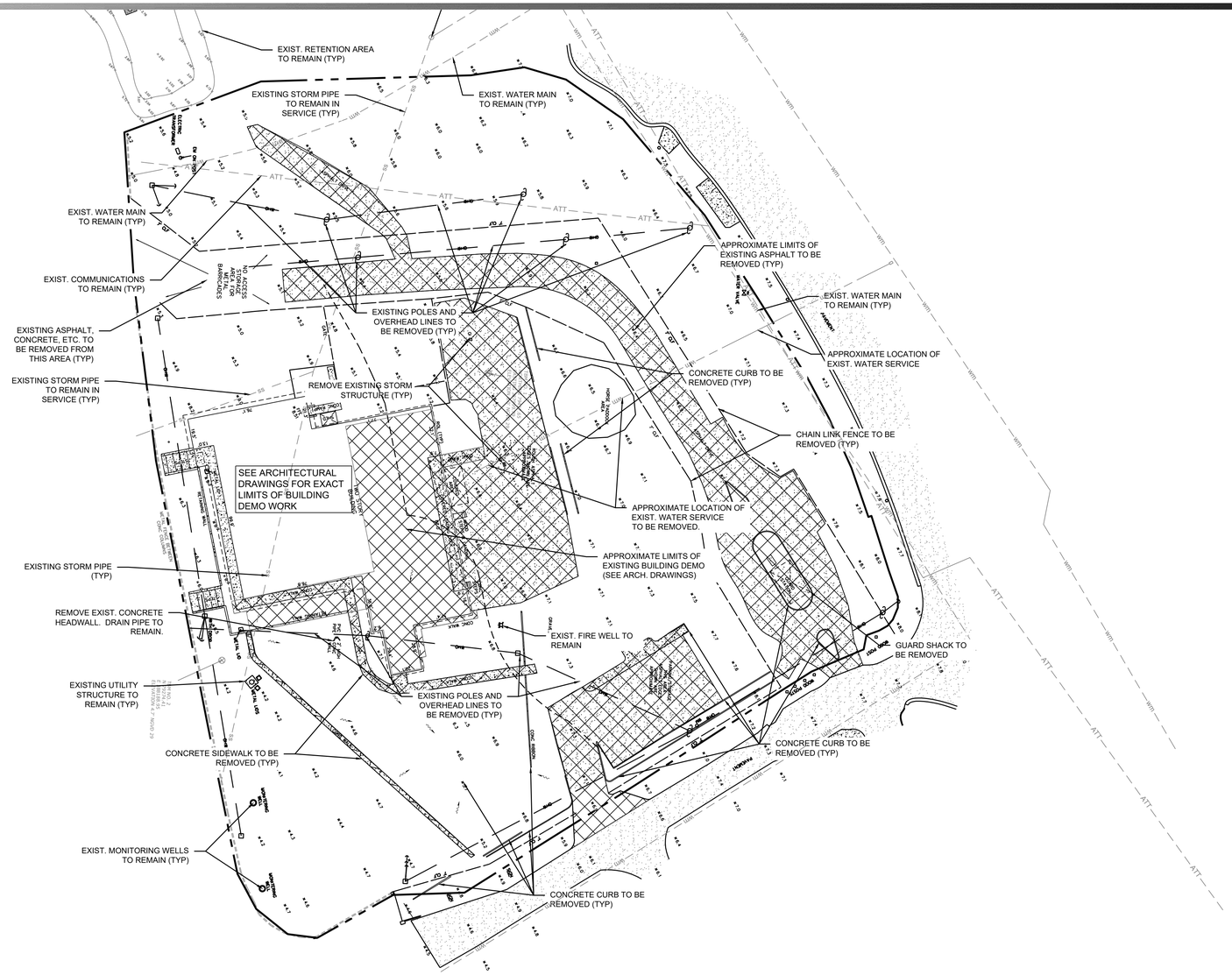
CIVIL ENGINEERING • REGULATORY PERMITTING • CONSTRUCTION MANAGEMENT
PEREZ ENGINEERING & DEVELOPMENT, INC
CERTIFICATE OF AUTHORIZATION No. 8579
Key West Office
1010 East Kennedy Drive, Suite 202
Key West, Florida 33040
Tel: (305) 293-9440
ALLEN E. PEREZ, P.E.
Florida P.E. NO. 51468
May 13, 2019

ORIGINAL: OCTOBER 2018
REVISIONS: 1 2 3 4 5 6

TRUMAN WATERFRONT
PHASE 1B
CIVIL SITE PLAN

CITY OF KEY WEST
1300 WHITE STREET
KEY WEST, FL. 33040

JOB NO. 181055
DRAWN MSB
DESIGNED AEP
CHECKED AEP
SHEET C-300



40' 0 40'

SCALE 1"=40'

BAR IS TWO INCHES ON ORIGINAL DRAWINGS IF NOT TWO INCHES ON THIS SHEET ADJUST SCALES ACCORDINGLY

DEMOLITION NOTES:

A. COORDINATE WORK WITH UTILITY COMPANIES; NOTIFY BEFORE STARTING WORK AND COMPLY WITH THEIR REQUIREMENTS; OBTAIN REQUIRED PERMITS.

B. PROTECT EXISTING UTILITIES TO REMAIN FROM DAMAGE.

C. DO NOT DISRUPT PUBLIC UTILITIES WITHOUT PERMIT FROM AUTHORITY HAVING JURISDICTION.

D. DO NOT CLOSE, SHUT OFF, OR DISRUPT EXISTING LIFE SAFETY SYSTEMS THAT ARE IN USE WITHOUT AT LEAST 7 DAYS PRIOR WRITTEN NOTIFICATION TO THE OWNER'S REPRESENTATIVE AND AUTHORITIES HAVING JURISDICTION.

E. DO NOT CLOSE, SHUT OFF, OR DISRUPT EXISTING UTILITY BRANCHES OR TAKE-OFFS THAT ARE IN USE WITHOUT AT LEAST 3 DAYS PRIOR WRITTEN NOTIFICATION TO THE OWNER'S REPRESENTATIVE.

F. CONTRACTOR SHALL LOCATE AND MARK UTILITIES TO REMAIN; MARK USING HIGHLY VISIBLE TAGS OR FLAGS, WITH IDENTIFICATION OF UTILITY TYPE; PROTECT FROM DAMAGE DUE TO SUBSEQUENT CONSTRUCTION, USING SUBSTANTIAL BARRICADES IF NECESSARY.

G. REMOVE EXPOSED PIPING, VALVES, METERS, EQUIPMENT, SUPPORTS, AND FOUNDATIONS OF DISCONNECTED AND ABANDONED UTILITIES.

H. DO NOT BEGIN REMOVAL UNTIL VEGETATION TO BE RELOCATED HAS BEEN REMOVED AND SPECIFIED MEASURES HAVE BEEN TAKEN TO PROTECT VEGETATION TO REMAIN.

I. PROTECT EXISTING STRUCTURES AND OTHER ELEMENTS THAT ARE NOT TO BE REMOVED.

J. MINIMIZE PRODUCTION OF DUST DUE TO DEMOLITION OPERATIONS.

K. CONTRACTOR SHALL ADJUST THE RIMS, GRATES, TOPS, OF ALL EXISTING STRUCTURES TO REMAIN TO MATCH PROPOSED GRADES.

ENVIRONMENTAL LAND USE CONTROLS NOTE:
PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE "SOIL AND GROUND WATER MANAGEMENT PLAN", DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.

CIVIL ENGINEERING • REGULATORY PERMITTING • CONSTRUCTION MANAGEMENT
Key West Office
1010 East Kennedy Drive, Suite 202
Key West, Florida 33040
Tel: (305) 293-9440
PEREZ ENGINEERING & DEVELOPMENT, INC
CERTIFICATE OF AUTHORIZATION No. 8579
ALLEN E. PEREZ, P.E.
Florida P.E. NO. 51468
May 13, 2019

ORIGINAL: OCTOBER 2018

REVISIONS:
1
2
3
4
5
6

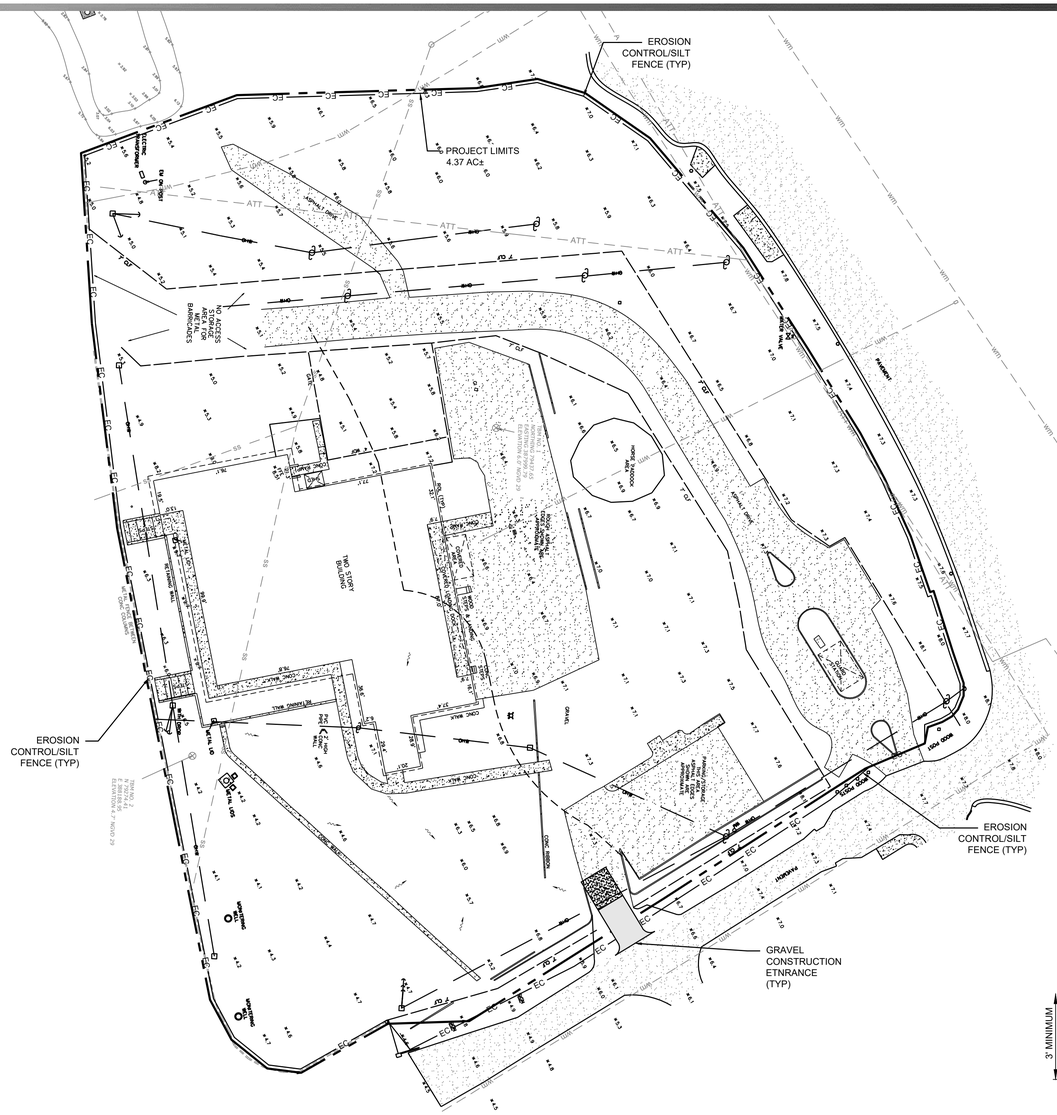
TRUMAN WATERFRONT
PHASE 1B

SITE DEMO PLAN

CITY OF KEY WEST
1300 WHITE STREET
KEY WEST, FL. 33040

JOB NO. 181055
DRAWN MSB
DESIGNED AEP
CHECKED AEP

SHEET C-200



EROSION CONTROL NOTES

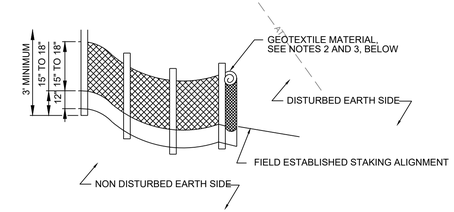
1. EROSION, SEDIMENT, AND TURBIDITY CONTROL MEASURES SHALL BE PROVIDED THROUGHOUT CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING AND REPAIRING ALL SLOPES AND SURFACES THROUGHOUT CONSTRUCTION AND UNTIL A STABLE SURFACE CONDITION EXISTS. THE CONTRACTOR SHALL MINIMIZE THE EXPOSED AREA AT ANY POINT DURING CONSTRUCTION AS MUCH AS PRACTICAL.
2. FILTER FABRIC SILT FENCE SHALL BE IN CONFORMANCE WITH SECTION 985, FDOT SPECIFICATION.
3. CONTRACTOR SHALL INSTALL EROSION CONTROLS NOTED ON DRAWINGS AND APPLICABLE PERMITS, EROSION CONTROLS SHALL BE MAINTAINED UNTIL A PERMANENT STAND OF GRASS IS PLANTED ONSITE.
4. BALED HAY OR STRAW BARRIERS SHALL BE CONSTRUCTED AND MAINTAINED IN CONFORMANCE WITH FDOT INDEX NO. 103.
5. SILT FENCE LOCATIONS SHOWN HEREON ARE FOR CLARITY ONLY AND SHOULD BE CONSTRUCTED WITHIN PROPERTY LINES.
6. PROVIDE EROSION CONTROL MEASURES CONSISTING OF STAKED SILT FENCES AND FILTER SOCK ALONG THE PROPOSED LIMITS OF CONSTRUCTION AS INDICATED ON THE DRAWINGS. PROVIDE ADDITIONAL MEASURES AS NECESSARY TO AVOID ADVERSE IMPACTS TO JURISDICTIONAL AREAS (WETLANDS OR WATER BODIES) AND OFF-SITE LANDS AND WATERBODIES. MAINTAIN THESE MEASURED DAILY UNTIL CONSTRUCTION ACCEPTANCE BY THE OWNER AND THEN REMOVE AND LEGALLY DISPOSE OF SAID MEASURES.
7. EROSION CONTROL SHALL MAINTAINED WITHIN CONSTRUCTION AREA BY QUICKLY STABILIZING DISTURBED AREA TO PREVENT THE RELEASE OF SEDIMENT. THIS SHALL BE ACCOMPLISHED USING GRASS COVER, FILTER SOCK AND OTHER MEANS ACCEPTABLE TO OWNER, ENGINEER AND REGULATORY AGENCIES.
8. DURING CONSTRUCTION, THE CONTRACTOR SHALL, AT THE REQUEST OF THE OWNER OR AS NECESSARY MODIFY, RELOCATE THE ENVIRO-FENCE AND/OR SILT FENCE TO ALLOW FOR ACCESS AND TO COMPLETE CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN ADEQUATE EROSION CONTROL AT ALL TIMES.
9. DURING CONSTRUCTION, THE CONTRACTOR WILL PROVIDE TEMPORARY SEEDING AND MULCHING FOR AREA THAT HAVE BEEN CLEARED (INCLUDING AREAS OF CONCRETE AND PAVEMENT REMOVAL) AND NOT REWORKED WITHIN 7 CALENDAR DAYS DURING THE WET SEASON (APRIL THROUGH SEPTEMBER AND 14 CALENDAR DAYS DURING THE DRY SEASON (OCTOBER THROUGH MARCH). ALSO, ALL SIDE SLOPES SHALL BE SODDED OR SEEDED AND MULCHED WITHIN 7 DAYS DURING WET SEASON AND 14 DAYS DURING THE DRY SEASON.
10. ALL SURFACE WATER DISCHARGE FROM SITE, INCLUDING DEWATERING DISCHARGE SHALL MEET STATE WATER QUALITY STANDARDS (LESS THAN 29 NTU ABOVE BACKGROUND) PRIOR TO REACHING ANY WATERS OF THE STATE INCLUDING WETLAND.
11. IN THE EVENT THAT THE EROSION PREVENTION AND CONTROL DEVICES SHOWN IN THESE PLANS PROVE NOT TO BE EFFECTIVE. ALTERNATE METHODS FOR MAINTAINING STATE WATER QUALITY STANDARDS FOR DISCHARGE FROM THE CONSTRUCTION SITE WILL BE REQUIRED. ANY ALTERNATE EROSION PREVENTION AND CONTROL DEVICES MUST BE APPROVED BY THE CITY AND SFWMD COMPLIANCE PERSONNEL PRIOR TO PLACEMENT.

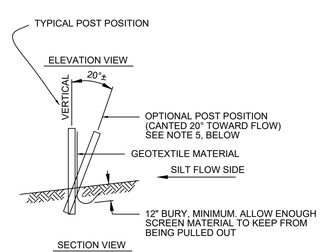
40' 0 40'
SCALE 1"=40'
BAR IS TWO INCHES ON ORIGINAL DRAWINGS IF NOT TWO INCHES ON THIS SHEET ADJUST SCALES ACCORDINGLY

SWPPP GENERAL NOTES

- ALL ARES WITHIN THE PROJECT LIMITS WILL BE SUBJECTED TO SOIL DISTURBANCE.
- THE ATTACHED BEST MANAGEMENT PRACTICES (BMP'S) DETAILS AND SPECIFICATIONS ARE ONLY A SUGGESTED APPROACH DEVELOPED FOR USE BY THE OWNER/CONTRACTOR TO ASSIST THEM IN IMPLEMENTING APPROPRIATE POLLUTION PREVENTION TECHNIQUES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING THE SWPPP.
- THE CONTRACTOR SHALL SUBMIT A "NOTICE OF INTENT TO USE GENERIC PERMIT FOR STORMWATER DISCHARGE FROM LARGE AND SMALL CONSTRUCTION ACTIVITIES, DEP FORM 62-621.300(4)(B)," ALSO KNOWN AS NOTICE OF INTENT OR NOI, TO THE DEPARTMENT; AND SUBMIT THE PERMIT FEE.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO IMPLEMENT THE BEST MANAGEMENT PRACTICES AS OUTLINED IN THE CIVIL DOCUMENTS, THE STORMWATER POLLUTION PREVENTION PLAN, AND SPECIFICATION.
- ANY ITEMS LISTED UNDER THE ABOVE REFERENCED KEYNOTES AS " CONTRACTOR TO LOCATE" SHALL BE DETERMINED BY CONTRACTOR IN ACCORDANCE WITH APPLICABLE CONSTRUCTION SCHEDULING.
- ALL WORK SHALL BE IN ACCORDANCE WITH THE "CONTAMINATED GROUNDWATER & SOILS MANAGEMENT PLAN" PREPARED BY E-SCIENCES, INC.
- THE CONTRACTOR SHALL SUBMIT AN EROSION AND SEDIMENT CONTROL PLAN FOR APPROVAL PRIOR TO STARTING CONSTRUCTION.

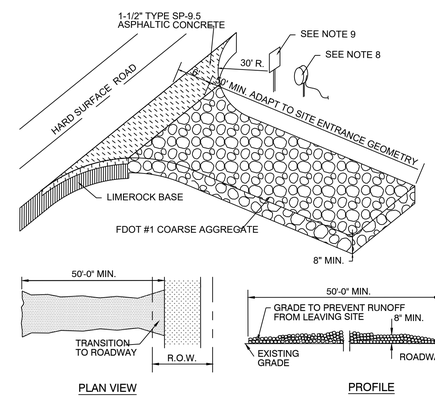
ENVIRONMENTAL LAND USE CONTROLS NOTE: PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE "SOIL AND GROUND WATER MANAGEMENT PLAN", DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.





NOTES:
1. POST: 2"X2" WOOD, P.T. OR 2-1/2"Ø STEEL AT 6' CENTERS, MAXIMUM.
2. GEOTEXTILE: GRAB TENSILE AT 90 LBS, TRAPEZOIDAL TEAR AT 35 LBS., MULLEN BURST AT 180 PSI.
3. GEOTEXTILE MATERIAL SHALL BE BURIED IN THE GROUND A MINIMUM OF 12" AND BACK FILLED.
4. ALSO SEE FDOT INDEX 199, "GEOTEXTILE CRITERIA", EROSION CLASS.
5. OPTIONAL POST POSITION REQUIRED WHEN SLOPE IS GREATER THAN 1:2.

1 Staked Silt Barrier Detail
NTS



NOTES:
1. STONE SIZE- 3 TO 5 INCH OPEN GRADED ROCK.
2. LENGTH- AS EFFECTIVE, BUT NOT LESS THAN 50 FEET.
3. THICKNESS- NOT LESS THAN 8 INCHES.
4. WIDTH- NOT LESS THAN FULL WIDTH OF ALL POINTS OF INGRESS OR EGRESS.
5. WASHING OF ALL VEHICLE UNDERCARRIAGE, WHEEL WELLS AND WHEELS IS MANDATORY TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC ROADWAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED STRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH, OR WATERCOURSE USING APPROVED METHODS.
6. MAINTENANCE- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC ROADWAY MUST BE REMOVED IMMEDIATELY.
7. DRAINAGE- ENTRANCE MUST BE PROPERLY GRADED OR INCORPORATE A DRAINAGE SWALE TO PREVENT RUNOFF FROM LEAVING THE CONSTRUCTION SITE.
8. PROVIDE WATER SUPPLY AND MINIMUM 100 FT. LONG HOSE AND SPIGOT AT EACH DESIGNATED CONSTRUCTION EXIT.
9. PROVIDE SIGNAGE AT EACH DESIGNATED EXIT REQUIRING WASHING OF ALL VEHICLES LEAVING SITE.
10. ENTRANCE LOCATIONS FOR SCHEMATIC PURPOSES ONLY AND ARE APPROXIMATE. CONTRACTOR TO COORDINATE ACTUAL LOCATIONS ACCORDING TO PHASING PLANS.

2 GRAVEL CONSTRUCTION ENTRANCE
NTS

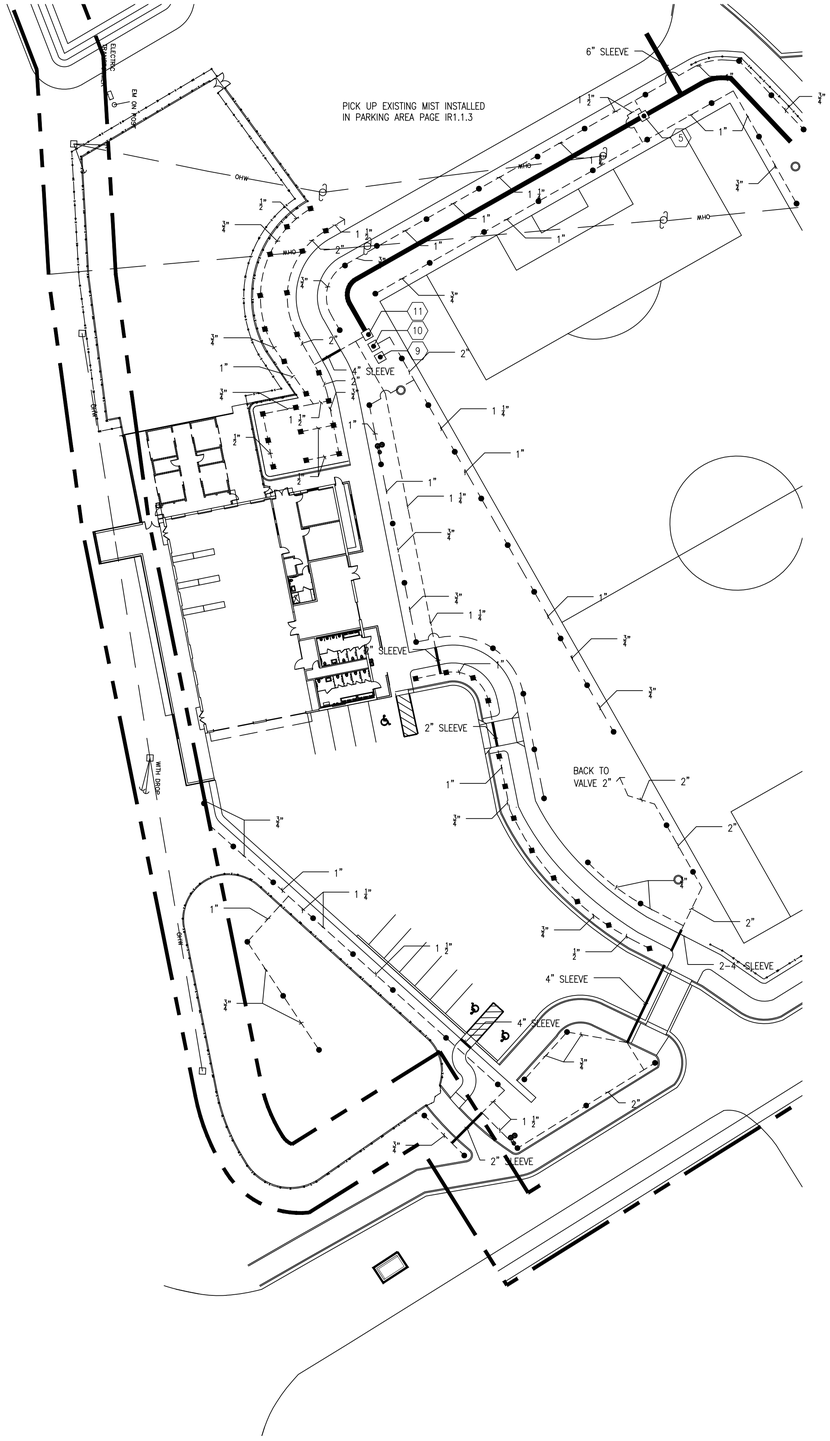
CIVIL ENGINEERING • REGULATORY PERMITTING • CONSTRUCTION MANAGEMENT
PEREZ ENGINEERING & DEVELOPMENT, INC
CERTIFICATE OF AUTHORIZATION No. 8579
Key West Office
1010 East Kennedy Drive, Suite 202
Key West, Florida 33040
Tel: (305) 293-9440
ALLEN E. PEREZ, P.E.
Florida P.E. NO. 51468
May 13, 2019

ORIGINAL: OCTOBER 2018
REVISIONS: 1 2 3 4 5 6

TRUMAN WATERFRONT
PHASE 1B
EROSION CONTROL PLAN

CITY OF KEY WEST
1300 WHITE STREET
KEY WEST, FL. 33040

JOB NO. 181055
DRAWN MSB
DESIGNED AEP
CHECKED AEP
SHEET C-100



1 IRRIGATION SITE PLAN

SCALE: 1/32" = 1'-0"

0 32 64 128

GRAPHIC SCALE: 1/32" = 1'-0"

ARCHITECT:

K2M DESIGN

Architecture, Engineering,
Interior Design,
Asset Management,
Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:42 PM

Drawing Size	Project #:
24x36	18070
Drawn By: BK	Checked By: AA

Title:

IRRIGATION
SITE PLAN

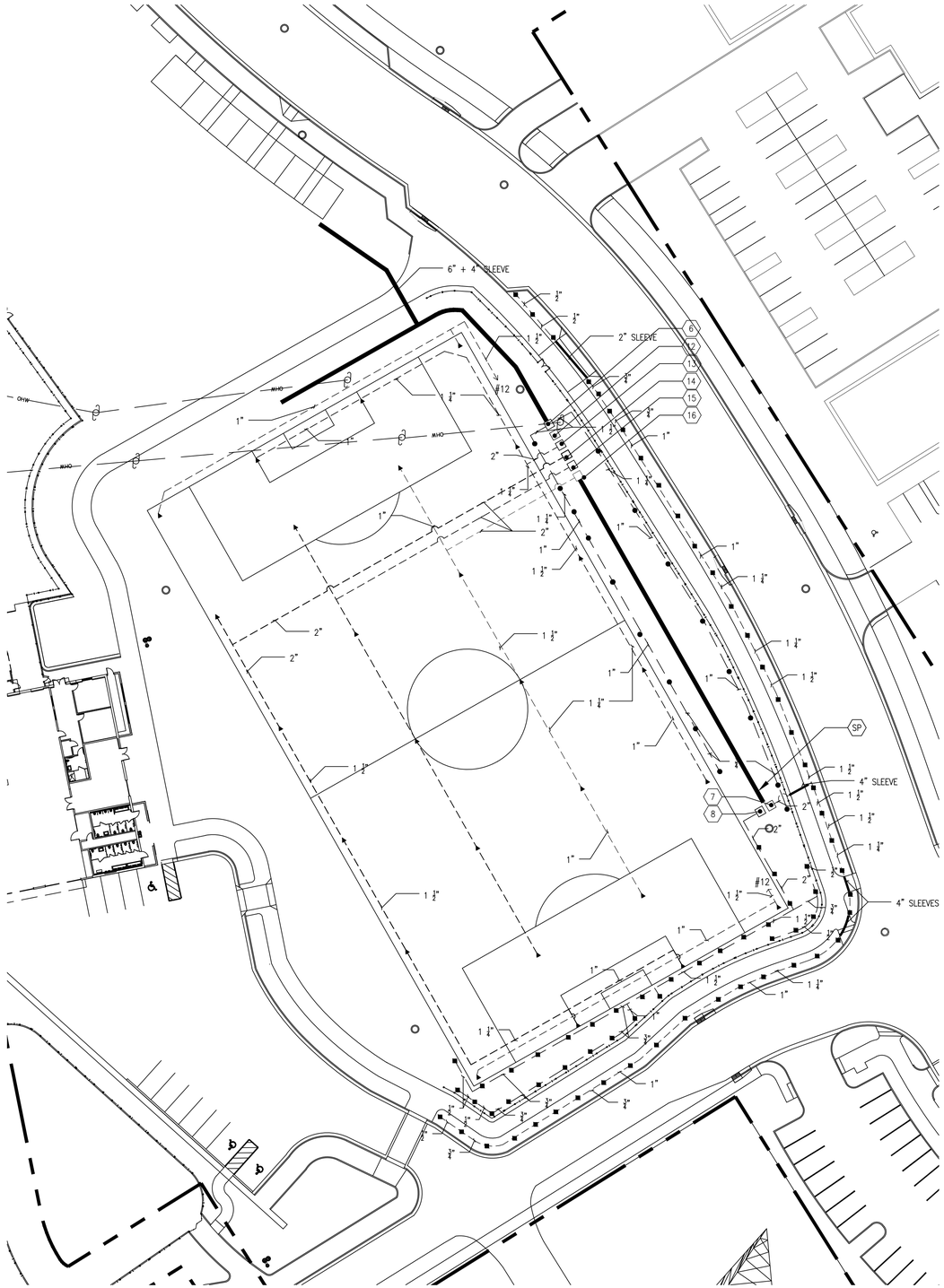
Sheet Number:

IR1.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Arch\18070 IRRIGATION SHEET SET.dwg, 3/21/2019 10:42 PM, scale: 1'-0" = 1'-0", white paste



1 IRRIGATION SITE PLAN

SCALE: 1/32" = 1'-0"

0 32 64 128

GRAPHIC SCALE: 1/32" = 1'-0"

ARCHITECT:

K2M DESIGN

Architecture, Engineering,
Interior Design,
Asset Management,
Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:42 PM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
BK	AA

Title:

IRRIGATION
SITE PLAN

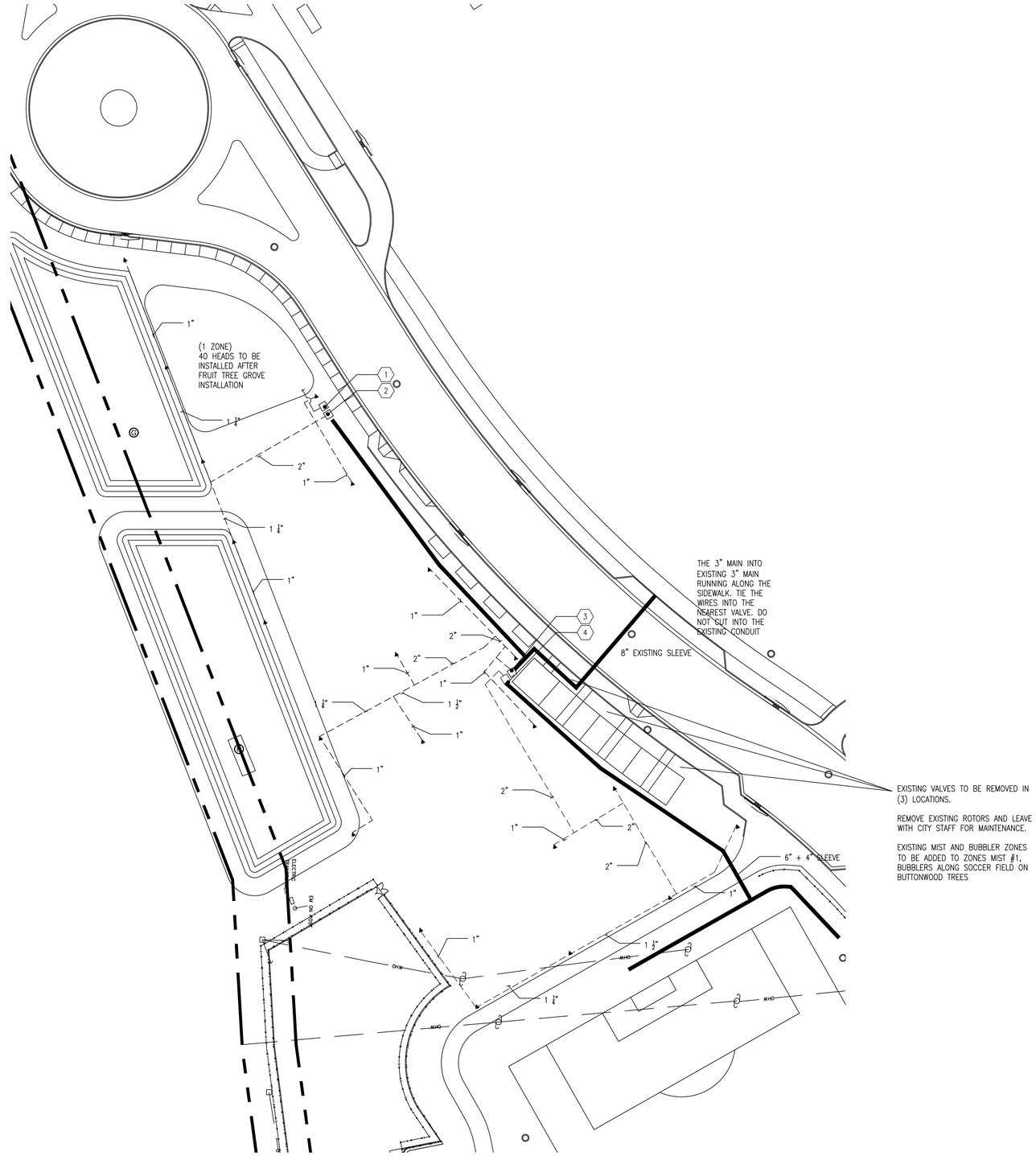
Sheet Number:

IR1.1.2

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Arch\18070 IRRIGATION SHEET SET.dwg, 3/21/2019 10:42 PM, scale: 1'-0" = 1'-0", erica poole



1 IRRIGATION SITE PLAN

SCALE: 1/32" = 1'-0"

0 32 64 128

GRAPHIC SCALE: 1/32" = 1'-0"

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:42 PM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
BK	AA

Title:

IRRIGATION SITE PLAN

Sheet Number:

IR1.1.3

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Arch\18070 IRRIGATION SHEET SET.dwg, 3/21/2019 10:42 PM, acad6: 1"=1'-0", ethan poole

GENERAL INFORMATION

- Remove 1 1/2” city water mainline from the 8” sleeve under road
- Tap the 3” mainline running along sidewalk
  - -Install with a 3” Spears PVC ball valve in a 12x18 valve box
  - -Include a 1” grey conduit with a Rainbird 2-wire communication cable
  - -Connect the conduit & wire in the nearest existing valve box
- Remove existing rotor zones & valves from parking area next to soccer field and across from amphitheater
- Combine existing mist with new mist, install along street & soccer field
- Combine existing two bubbler zones with existing bubbler zone at the park
- Remove wiring from the ESP4ME controller at amphitheater
- Water source to be the existing Hoover pump station & controller pump located by electrical equipment at Fort St. parking

○ = Rainbird 5004 rubber covered rotors
-Installed on Rainbird 1/2” funny pipe

□ = Rainbird 1800 series mist, 6” in turf & 12” in all plant beds
Nozzles to be field selected to cover with no overspray

△ = Rainbird 8005 stainless steel rubber covered rotors

-Quarter	#12 nozzle	12.0 GPM
-Half	#12 nozzle	12.0 GPM
-Full	#18 nozzle	17.8 GPM

All to be installed on Schedule 80 Rainbird swing joints

- Mainline 3” Schedule 40
- Wire- Rainbird (blue) 2 wire communication cable installed in 1” grey conduit
- Valves- Rainbird 2” PGA
  - -Installed with 2” SCD 80 PVC nipples
  - -Installed in 12 x 18 Rainbird valve box
- Decoders- FD-101 Rainbird: Installed with 3m DBY connectors
- Line surge protection: -LSP-1TURF with grounding rod & clamp

ZONES

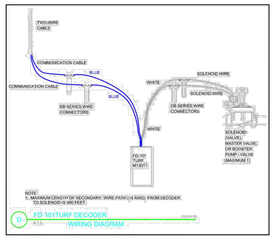
1-	40	6” 1806 Rainbird mist	85 GPM
2-	7	8005 Rainbird rotors	86.7 GPM
3-	7	8005 Rainbird rotors	96.2 GPM
4-	7	8005 Rainbird rotors	79.1 GPM
5-	20	5004 Rainbird rotors	80 GPM
6-	18	5004 Rainbird rotors	72 GPM
7-	42	1800 Rainbird mist	50.82 GPM
8-	30	1800 Rainbird mist	56.1 GPM
9-	22	5004 Rainbird rotors	88 GPM
10-	18	5004 Rainbird rotors	72 GPM
11-	33	1800 Rainbird mist	81 GPM

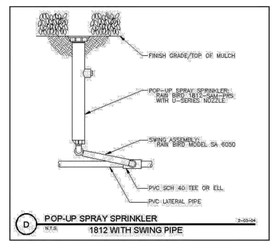
SOCCER FIELD ZONES

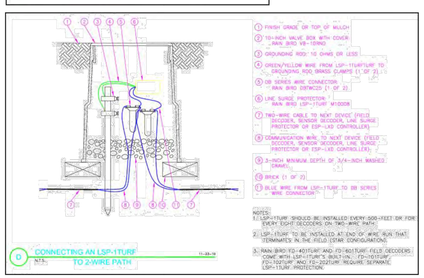
12-	4	8005 Rainbird rotors	48 GPM
13-	6	8005 Rainbird rotors	72 GPM
14-	6	8005 Rainbird rotors	72 GPM
15-	5	8005 Rainbird rotors	89 GPM
16-	5	8005 Rainbird rotors	89 GPM

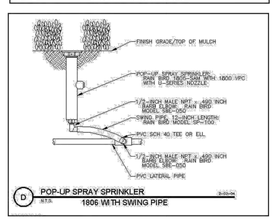
QUANTITIES TO BE VERIFIED BY CONTRACTOR

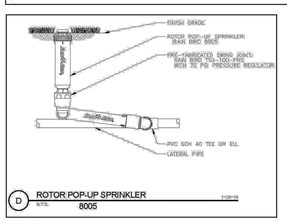
145	1800 Rainbird 6” & 12” pop-ups
78	5004 Rainbird rotors
26	8005 Rainbird rotors
1,440 ft	3” SCD 40 mainline
1,600 ft	1” Grey conduit
2,000 ft	Rainbird communication cable
16	FD-101 decoders
2	LSP-1TURF surge protectors

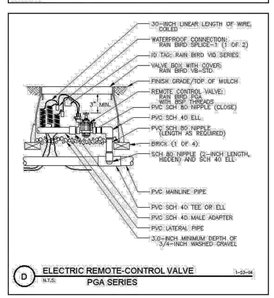


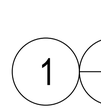












IRRIGATION SITE PLAN

SCALE: 1/32" = 1'-0"

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:42 PM

Drawing Size	Project #:
24x36	18070
Drawn By: BK	Checked By: AA

Title:

IRRIGATION NOTES & DETAILS

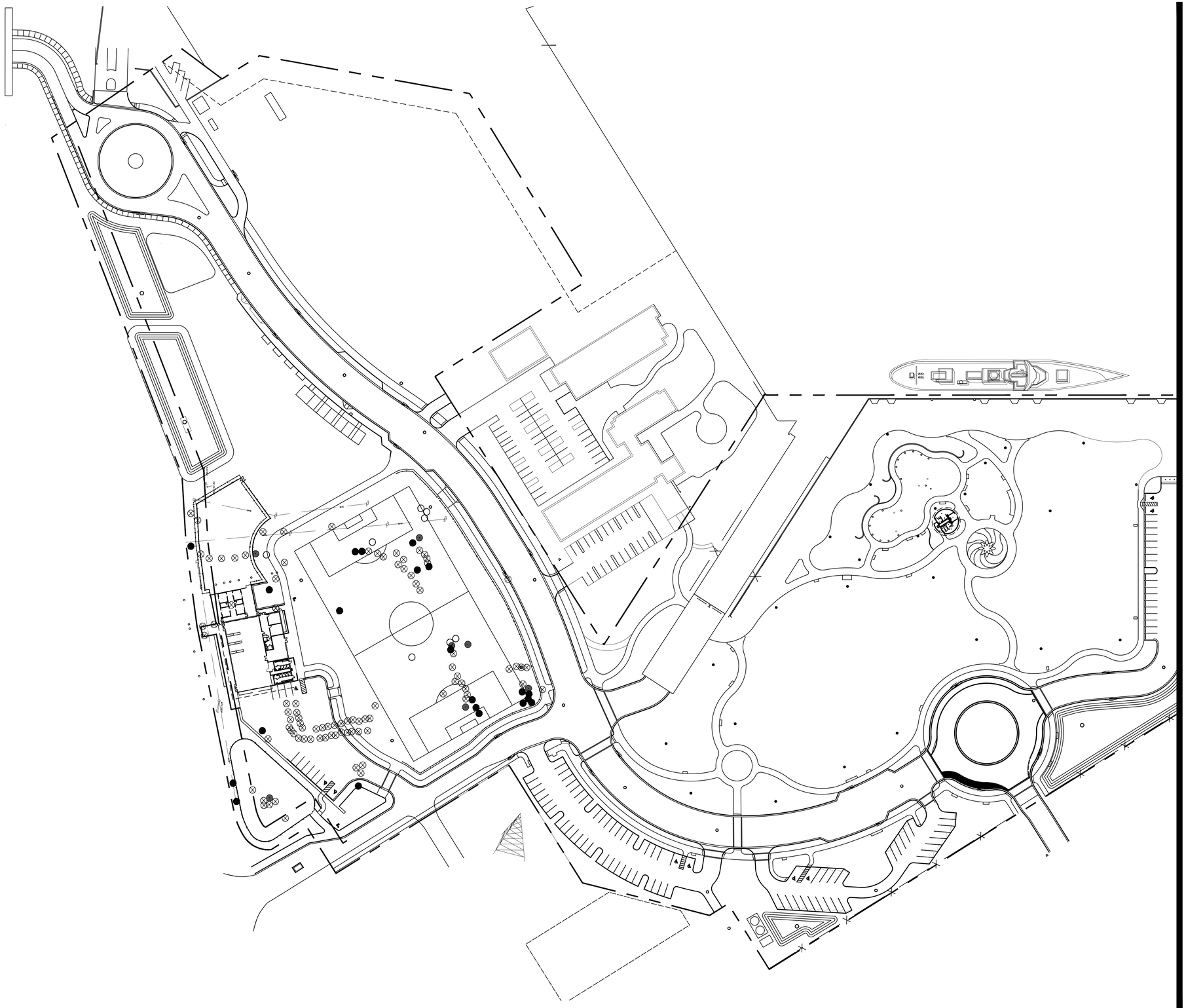
Sheet Number:

IR1.1.4

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\+Cds\Drawings\Arch\18070 IRRIGATION SHEET SET.dwg, 3/21/2019 10:42 PM, scale: 1"=0" = 1'=0", erica poole



1 EXISTING LANDSCAPE PLAN

SCALE: 1/64" = 1'-0"

GENERAL NOTES

1. MAHOGANY TREES ON SITE TO BE CUT DOWN FOR FUTURE USE BY LOCAL ARTISTS – DO NOT DEMOLISH TREE – CUT AND TOSS REQUIRED
2. ALL PALMS TO BE 4' TALL MINIMUM PER CODE
3. TREES TO BE RELOCATED TO BE REMOVED WITH SPUD AND MAINTAINED/WATERED DURING CONSTRUCTION AT A SAFE LOCATION.

LEGENDS:

TREES TO BE RELOCATED

TREES TO BE REMOVED

STORM REMOVED

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:43 PM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
BK	AA

Title:

EXISTING LANDSCAPE PLAN

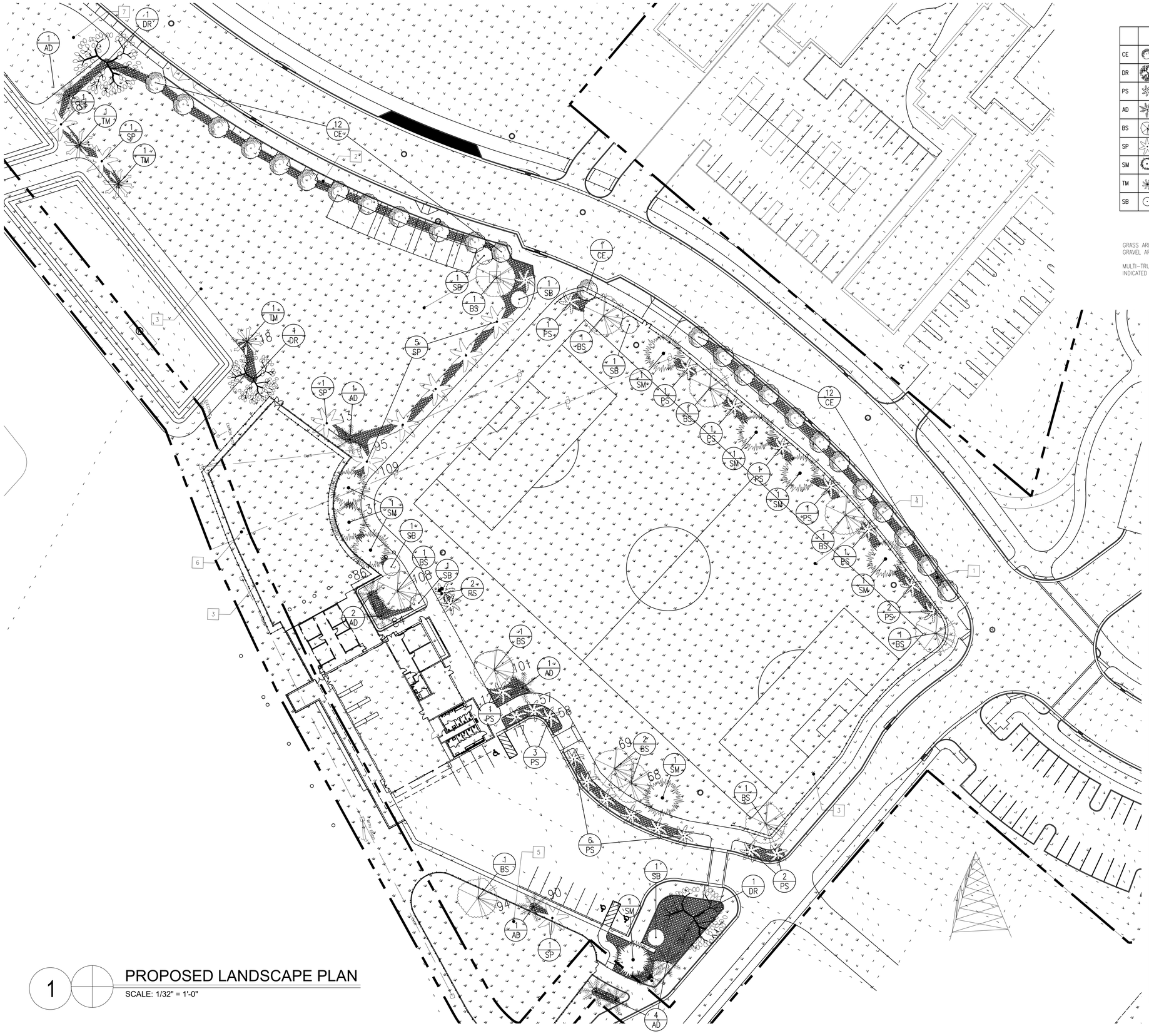
Sheet Number:

L1.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 – City of Key West – Truman Waterfront 1B\4-CDs\Drawings\Arch\18070 LANDSCAPE SHEET SET.dwg, 3/21/2019 10:43 PM, scale: 1"=1'-0", erica pace



		TREE SPECIES	# PROVIDED	MINIMUM SIZING
CE		CONOCARPUS ERECTUS– GREEN BUTTONWOOD	25 PROVIDED	EXISTING
DR		DELONIX REGIA – ROYAL POINCIANA	3 PROVIDED	65 GALLON – 3" CALIPER
PS		PSEUDOPHOENIX SARGENTII – BUCCANEER PALM	23 PROVIDED	8' TALL
AD		ADONIDIA – CHRISTMAS PALM	10 PROVIDED	8' TALL – (2) TRUNK
BS		BURSERA SIMARUBA – GUMBO LIMBO	11 PROVIDED	45 GALLON – 3" CALIPER
SP		SABAL PALMETTO – SABAL PALM	9 PROVIDED	8' TALL
SM		SWIETENIA MAHOGANI – MAHOGANY	9 PROVIDED	45 GALLON – 3" CALIPER
TM		THRINAX MORRISII – KEY THATCH PALM	3 PROVIDED	8' TALL
SB		SAVIA BAHAMENSIS – MAIDENBUSH (3 PER)	18 PROVIDED	7 GALLON

GRASS AREA – CHAMPIONSHIP BERMUDA = 138,890 SQ FT
GRAVEL AREA – TBD BY PUBLIC WORKS = 15,034 SQ FT

MULTI–TRUNK TREES TO BE A MINIMUM OF 3 TRUNKS AT 1 INCH EACH; HEIGHT INDICATED IN SCHEDULE

GENERAL NOTES

1. MAHOGANY TREES ON SITE TO BE CUT DOWN FOR FUTURE USE BY LOCAL ARTISTS – DO NOT DEMOLISH TREE – CUT AND TOSS REQUIRED
2. ALL PALMS TO BE 4' TALL MINIMUM PER CODE
3. TREES TO BE RELOCATED TO BE REMOVED WITH SPUD AND MAINTAINED/WATERED DURING CONSTRUCTION AT A SAFE LOCATION.
4. SEE IRRIGATION PLANS FOR IRRIGATION SYSTEM

1 PROPOSED LANDSCAPE PLAN
SCALE: 1/32" = 1'-0"

ARCHITECT:
K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting
Key Largo, FL
Key West, FL
Marathon, FL
URL: www.k2mdesign.com
PROF. REG. AA26001059
Building Relationships Based on Trust and Results
Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:
STRUCTURAL ENGINEER: Meridian Engineering LLC
CIVIL ENGINEER: Perez Engineering & Development
IRRIGATION: Blue Island Lighting & Irrigation Inc.

Submissions:
DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:43 PM

Drawing Size	Project #:
24x36	18070
Drawn By: BK	Checked By: AA

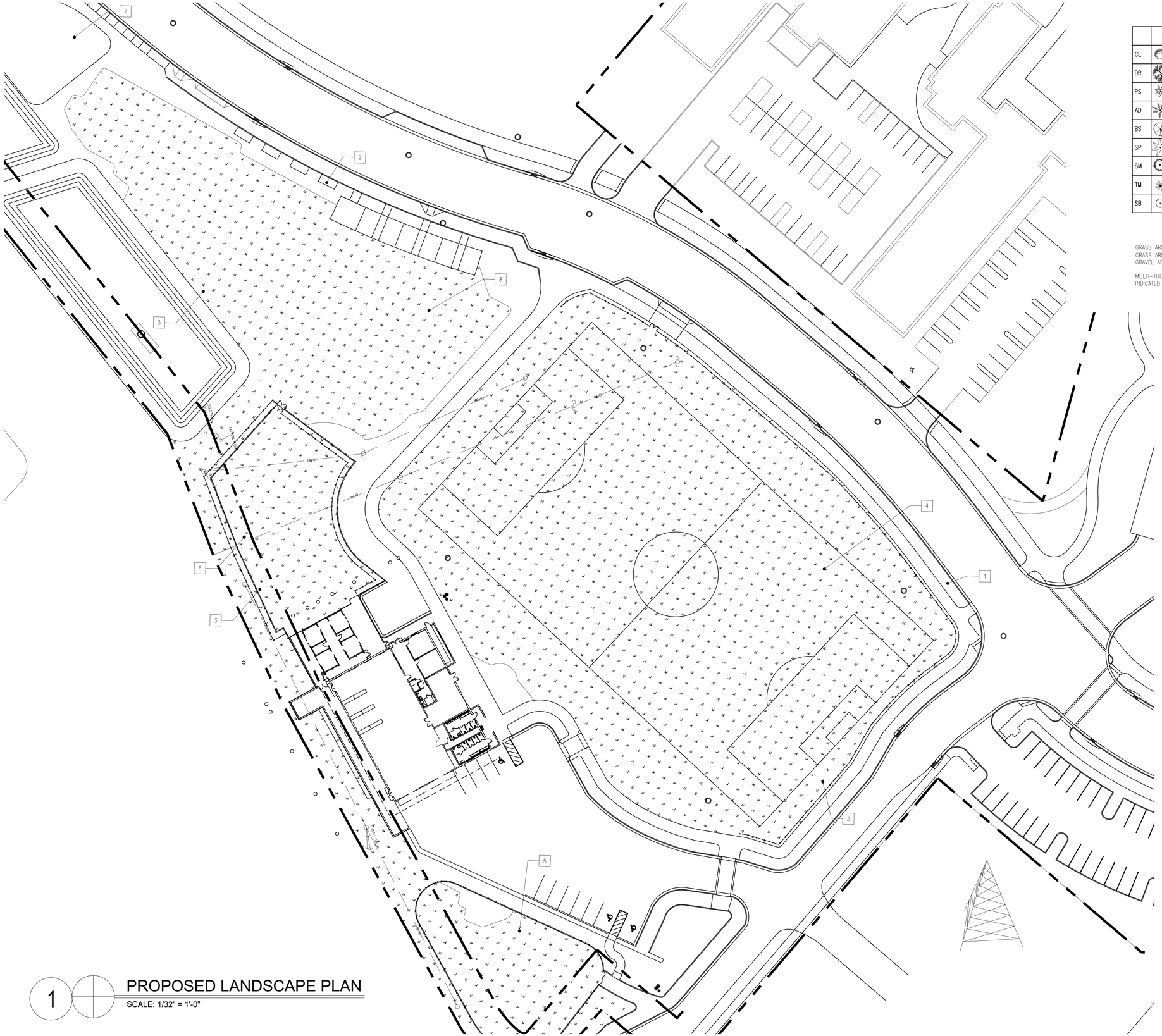
Title: PROPOSED LANDSCAPE PLAN

Sheet Number: L1.1.2

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 – City of Key West – Truman Waterfront 1B\4-CDs\Drawings\Arch\18070 LANDSCAPE SHEET SET.dwg, 3/21/2019 10:43 PM, scale: 1"=1'-0", erica poole



1 PROPOSED LANDSCAPE PLAN

SCALE: 1/32" = 1'-0"

		TREE SPECIES	# PROVIDED	MINIMUM SIZING
CE		CONOCARPUS ERECTUS– GREEN BUTTONWOOD	25 PROVIDED	EXISTING
DR		DELONIX REGIA – ROYAL POINCIANA	3 PROVIDED	65 GALLON – 3" CALIPER
PS		PSEUDOPHOENIX SARGENTII – BUCCANEER PALM	23 PROVIDED	8' TALL
AD		ADONIDIA – CHRISTMAS PALM	10 PROVIDED	8' TALL – (2) TRUNK
BS		BURSERA SIMARUBA – GUMBO LIMBO	11 PROVIDED	45 GALLON – 3" CALIPER
SP		SABAL PALMETTO – SABAL PALM	9 PROVIDED	8' TALL
SM		SWIETENIA MAHOGANI – MAHOGANY	9 PROVIDED	45 GALLON – 3" CALIPER
TM		THRINAX MORRISII – KEY THATCH PALM	3 PROVIDED	8' TALL
SB		SAVIA BAHAMENSIS – MAIDENBUSH (3 PER)	18 PROVIDED	7 GALLON

GRASS AREA – CHAMPIONSHIP BERMUDA = 47,599 SQ FT
GRASS AREA (FIELD) – SUPREME PASPALUM = 91,291 SQ FT
GRAVEL AREA – TBD BY PUBLIC WORKS = 15,034 SQ FT

MULTI–TRUNK TREES TO BE A MINIMUM OF 3 TRUNKS AT 1 INCH EACH; HEIGHT INDICATED IN SCHEDULE

GENERAL NOTES

1. MAHOGANY TREES ON SITE TO BE CUT DOWN FOR FUTURE USE BY LOCAL ARTISTS – DO NOT DEMOLISH TREE – CUT AND TOSS REQUIRED
2. ALL PALMS TO BE 4' TALL MINIMUM PER CODE
3. TREES TO BE RELOCATED TO BE REMOVED WITH SPUD AND MAINTAINED/WATERED DURING CONSTRUCTION AT A SAFE LOCATION.
4. SEE IRRIGATION PLANS FOR IRRIGATION SYSTEM
5. SEE APPENDIX FOR FRUIT TREE GROVE DRAWINGS
6. SOIL SECTION TO BE DETERMINED BY CONTRACTOR. FIELD RECOMMENDATION OF 6–8 INCHES OF 90/10 CANADIAN PEAT @ ROOTZONE. ADDITIONAL SOIL TESTING MAY BE REQUIRED TO DETERMINE OPTIMUM SOIL SECTION.
7. SUPREME PASPALUM TO BE BIG ROLL SOD, NETTING REMOVED.

CODED NOTES

X

1. GRAVEL (TYPICAL)
2. SPADE EDGE (TYPICAL)
3. PLACE AND FINE GRADE TOPSOIL TO MATCH EXISTING GRADES. MAINTAIN EXISTING DRAINAGE PATTERN. SEED WITH CHAMPIONSHIP BERMUDA GRASS TO ESTABLISH TURF LAWN @ ALL AREAS EXCEPT FIELD. FIELD TO RECIEVE SUPREME PASPALUM SOD.
4. SOCCER FIELD
5. DOG PARK
6. HORSE RUN
7. FRUIT TREE GROVE
8. GRASS FIELD

LEGEND

GRASS

GRAVEL

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B

CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST

1300 White Street, Key West, FL, 33040

PLOTTED: 3/27/2019 7:58 AM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
BK	AA

Title:

PROPOSED LANDSCAPE PLAN

Sheet Number:

L1.1.3

Date: March 22, 2019

©2018 by K2M Design, Inc.

ORIGINAL #	PLAN #	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION	DISPOSITION	REQUIRED MITIGATION	PROPOSED REPLACEMENT (AS REQUIRED)	NEW #
N	1	Swietenia Magohani	Mahogany	16' x 12' - 5' DBH	Poor	Remove	3.5" Caliper		
N1	2	Swietenia Magohani	Mahogany	24" DBH	Poor	Remove	15" Caliper		
AA4	3	Swietenia Magohani	Mahogany	35' x 40' - 16" DBH	Good	Relocate	N/A	Relocated on Site	3
AA6	4	Swietenia Magohani	Mahogany	16' X14' - M7" DBH	Poor	Remove	5.7" Caliper		
AA5	5	Swietenia Magohani	Mahogany	20'X14' - 11" DBH	Poor	Remove	8" Caliper		
AA8	6	Swietenia Magohani	Mahogany	30' x 20' - 14" DBH	Poor	Remove	10" Caliper		
AA2	7	Swietenia Magohani	Mahogany	30' x 40' - 8" DBH	Poor	Remove	6" Caliper		
AA3	8	Swietenia Magohani	Mahogany	16" DBH	Poor	Remove	10" Caliper		
L	9	Bursera Simaruba	Gumbo Limbo	20' x 20' - 10" DBH	Poor	Remove	7" Caliper		
K	10	Bursera Simaruba	Gumbo Limbo	20' x 20' - 12" DBH	Poor	Remove	7.9" Caliper		
11	11	Swietenia Magohani	Mahogany	40' x 30' - 18' DBH	Poor	Remove	13.6" Caliper		
BB	12	Cocos Nucifera	Coconut Palm	12'	Poor	Remove	1 Native - 4' Tall	Pseudophoenix Sargentii - Buccaneer Palm	12
H	13	Sabal Palmetto	Sabal Palm	12'	Good	Relocate	N/A	Relocated on Site	13
H2	14	Swietenia Magohani	Mahogany	1" DBH	Poor	Remove	.7" Caliper		
D	15	Swietenia Magohani	Mahogany	38" DBH	Poor	Remove	22.8" Caliper		
F	16	Bursera Simaruba	Gumbo Limbo	25" DBH	Poor	Remove	1.8" Caliper		
E	17	Sabal Palmetto	Sabal Palm	12'	Poor	Remove	1 Native - 4' Tall	Pseudophoenix Sargentii - Buccaneer Palm	17
C	18	Thrinax Morrisii	Key Thatch Palm	6' Overall Height	Good	Relocate	N/A	Relocated on Site	18
25	19	Swietenia Magohani	Mahogany	28' x 30' - 18" DBH	Poor	Remove	12" Caliper		
76	20	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
77	21	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
78	22	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
79	23	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
80	24	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
81	25	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
82	26	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
83	27	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
84	28	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
126	29	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
127	30	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
118	31	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
117	32	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
107	33	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
108	34	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
115	35	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
99	36	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
98	37	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
97	38	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
70	39	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
66	40	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
65	41	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
63	42	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
62	43	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
61	44	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
35	45	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
34	46	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
116	47	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
113	48	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
112	49	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
106	50	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
95	51	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
111	52	Conocarpus Erectus	Buttonwood	3'X2' Shrub	Not Regulated	Remove	N/A	N/A	
97A	53	Chrysobalanus Icaco	Coco Plum	2' Shrub	Not Regulated	Remove	N/A	N/A	
A	54	Bursera Simaruba	Gumbo Limbo	5' x 4' - 1' DBH	Poor	Remove	.6" Caliper		
29	55	Casuarina Spp.	Austrailian Pine	40' x 40' - 24" DBH	Invasive Species	Remove	N/A	N/A	
BB	56	Bursera Simaruba	Gumbo Limbo	1" DBH	Poor	Remove	.7" Caliper		
30	57	Cocos Nucifera	Coconut Palm	25' Overall Height	Good	**Remove**	1 Native - 4' Tall	Pseudophoenix Sargentii - Buccaneer Palm	57
26	58	Cocos Nucifera	Coconut Palm	15' Overall Height	Poor	Remove	1 Native - 4' Tall	Pseudophoenix Sargentii - Buccaneer Palm	58
27	59	Cocos Nucifera	Coconut Palm	20' Overall Height	Poor	Remove	1 Native - 4' Tall	Pseudophoenix Sargentii - Buccaneer Palm	59
125	60	Conocarpus Erectus	Buttonwood	3' x 2' Shrub	Not Regulated	Remove	N/A	N/A	
124	61	Chrysobalanus Icaco	Coco Plum	4" Shrub	Not Regulated	Remove	N/A	N/A	
124A	62	Chrysobalanus Icaco	Coco Plum	3' x 2' Shrub	Not Regulated	Remove	N/A	N/A	
123	63	Chrysobalanus Icaco	Coco Plum	2" Shrub	Not Regulated	Remove	N/A	N/A	
124B	64	Chrysobalanus Icaco	Coco Plum	3' x 2' Shrub	Not Regulated	Remove	N/A	N/A	
122	65	Conocarpus Erectus	Silver Buttonwood	2" Shrub	Not Regulated	Remove	N/A	N/A	
31	66	Bucida Buceras	Black Olive	12" DBH	Not Regulated	Remove	N/A	N/A	
MM	67	Chrysobalanus Icaco	Coco Plum	25" DBH	Poor	Remove	12.5" Caliper		
NN2	68	Bursera Simaruba	Gumbo Limbo	14' x 12' - 8' DBH	Good	Relocate	N/A	Relocated on Site	68
NN1	69	Bursera Simaruba	Gumbo Limbo	16' x 6' - 2' DBH	Good	Relocate	N/A	Relocated on Site	69
NN	70	Coccoloba Uvifera	Seagrape	25' x 30' - 24" DBH	Good	**Remove**	16" Caliper		70
LL5	71	Bursera Simaruba	Gumbo Limbo	11" DBH	Poor	Remove	7.7" Caliper		
LL4	72	Bursera Simaruba	Gumbo Limbo	2.5" DBH	Poor	Remove	1.7" Caliper		
LL3	73	Bursera Simaruba	Gumbo Limbo	3.5" DBH	Poor	Remove	2.4" Caliper		
KK	74	Bucida Buceras	Black Olive	24" DBH	Nuisance	Remove	N/A	N/A	
LL2	75	Bursera Simaruba	Gumbo Limbo	1" DBH	Poor	Remove	1" Caliper		
LL1	76	Bursera Simaruba	Gumbo Limbo	5.5" DBH	Poor	Remove	3.5" Caliper		
100	77	Bursera Simaruba	Gumbo Limbo	6' x 2' - 15" DBH	Poor	Remove	10" Caliper		
103	78	Bursera Simaruba	Gumbo Limbo	12' x 8' - 3" DBH	Good	**Remove**	2" Caliper		
V	79	Bursera Simaruba	Gumbo Limbo	12' x 15' - 8" DBH	Good	**Remove**	5.3" Caliper		
93	80	Bursera Simaruba	Gumbo Limbo	1" DBH	Good	Remove	1" Caliper		
U	81	Bursera Simaruba	Gumbo Limbo	14' x 12' - 8" DBH	Good	**Remove**	5.3" Caliper		
89	82	Coccoloba Uvifera	Seagrape	14' x 20' - 16" DBH	Good	**Remove**	10.6" Caliper		
P	83	Bursera Simaruba	Gumbo Limbo	12' x 8' - 5" DBH	Good	**Remove**	3.3" Caliper		
O	84	Sabal Palmetto	Sabal Palm	12' Overall Height	Poor	Remove	1 Native - 4' Tall	Adonidia - Christmas Palm	84
R	85	Bursera Simaruba	Gumbo Limbo	18' x 20' - 10" DBH	Poor	Remove	7.6" Caliper		
17B	86	Cocos Nucifera	Coconut Palm	20' Overall Height	Good	**Remove**	1 Native - 4' Tall	Adonidia - Christmas Palm	86
17A	87	Cocos Nucifera	Coconut Palm	20' Overall Height	Good	**Remove**	1 Native - 4' Tall	Adonidia - Christmas Palm	87
X	88	Coccoloba Uvifera	Seagrape	14" Clump	Poor	Remove	10.6" Caliper		
W	89	Bursera Simaruba	Gumbo Limbo	12' x 8' - 5" DBH	Poor	Remove	3.3" Caliper		
13	90	Cocos nucifera	Coconut Palm	20' Overall Height	Good	**Remove**	1 Native - 4' Tall	Adonidia - Christmas Palm	90
GG	91	Bucida Buceras	Black Olive	28" DBH	Nuisance	Remove	1.6" Caliper		
DD1	92	Bursera Simaruba	Gumbo Limbo	W x 20' - 7" DBH	Poor	Remove	4.6" Caliper		
EE1	93	Swietenia Magohani	Mahogany	18" x 8' - 6" DBH	Poor	Remove	40" Caliper		
FF	94	Bursera Simaruba	Gumbo Limbo	30' x 18' - 10" DBH	Good	Relocate	N/A	Relocated on Site	94
Y	95	Sabal Palmetto	Sabal Palm	6" Overall Height	Good	**Remove**	1 Native - 4' Tall	Adonidia - Christmas Palm	95
Z3	96	Bursera Simaruba	Gumbo Limbo	16' x 15' - 8" DBH	Poor	Remove	5.6" Caliper		
Z2	97	Bursera Simaruba	Gumbo Limbo	14' x 15' - 10" DBH	Poor	Remove	7.5" Caliper		
Z1	98	Bursera Simaruba	Gumbo Limbo	14' x 15' - 6" DBH	Poor	Remove	4.2" Caliper		
Z4	99	Bursera Simaruba	Gumbo Limbo	5' x 5' - 1.5" DBH	Poor	Remove	1" Caliper		
10	100	Swietenia Magohani	Mahogany	30' x 30' - 30" CAL	Good	**Remove**	27" Caliper		
FF	101	Bursera Simaruba	Gumbo Limbo	30' x 18' - 10" DBH	Good	Relocate	N/A	Relocated on Site	101
FF1	102	Conocarpus Erectus	Buttonwood	40" DBH	Poor	Remove	29" Caliper		
DD3	103	Bursera Simaruba	Gumbo Limbo	14' x 5' - 2" DBH	Poor	Remove	1.4" Caliper		
EE2	104	Swietenia Magohani	Mahogany	18' x 8' - 4" DBH	Poor	Remove	2.8" Caliper		
DD4	105	Bursera Simaruba	Gumbo Limbo	6' x 4' - 1.5" DBH	Poor	Remove	1" Caliper		
DD5	106	Bursera Simaruba	Gumbo Limbo	22' x 15' - 7" DBH	Poor	Remove	5.2" Caliper		
DD6	107	Bursera Simaruba	Gumbo Limbo	12' x 4' - 4" DBH	Poor	Remove	2.5" Caliper		
DD2	108	Bursera Simaruba	Gumbo Limbo	20' x 14' - 7" DBH	Good	Relocate	N/A	Relocated on Site	108
CC1	109	Sabal Palmetto	Sabal Palm	4' Overall Height	Good	Relocate	N/A	Relocated on Site	109
J	110	Pisidia Piscipula	Jamaican Dogwood	21" DBH	Poor	Remove	12.6" Caliper		

Disposition in **BOLD** indicates the tree was modified from relocate to remove. Reason is due to salvagability of tree not being possible (rooting/current condition)

STORM DAMAGED TREES ALREADY REMOVED FROM SITE

ORIGINAL #	EXISTING #	BOTANICAL NAME	COMMON NAME
12	A	Sabal Palmetto	Sabal Palm
AA7	B	Swietania Mahagani	Mahagony
I	C	Ficus Aurea	Strangler Fig
DD6.5	D	Bursera Simaruba	Gumbo Limbo
25	E	Bursera Simaruba	Gumbo Limbo
9	F	Phoenix Reclinata	Date Palm
7	G	Phoenix Reclinata	Date Palm
8	H	Casuarina Spp.	Austrailian Pine
102	J	Bursera Simaruba	Gumbo Limbo
101	K	Bursera Simaruba	Gumbo Limbo
16	L	Sabal Palmetto	Sabal Palm
114	M	Schinus Terebinthifolius	Brazilian Pepper
101A	N	Chrysobalanus Icaco	Coco Plum
15	P	Ficus Aurea	Strangler Fig
5	Q	Bursera Simaruba	Gumbo Limbo
MM1	R	Bursera Simaruba	Gumbo Limbo
94	S	Cocos Nucifera	Coconut Palm

GENERAL NOTES

1. MAHOGANY TREES ON SITE TO BE CUT DOWN FOR FUTURE USE BY LOCAL ARTISTS – DO NOT DEMOLISH TREE – CUT AND TOSS REQUIRED
2. ALL PALMS TO BE 4' TALL MINIMUM PER CODE
3. TREES TO BE RELOCATED TO BE REMOVED WITH SPUD AND MAINTAINED/WATERED DURING CONSTRUCTION AT A SAFE LOCATION.

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:43 PM

Drawing Size	Project #:
24x36	18070
Drawn By: BK	Checked By: AA

Title:
LANDSCAPE CHARTS

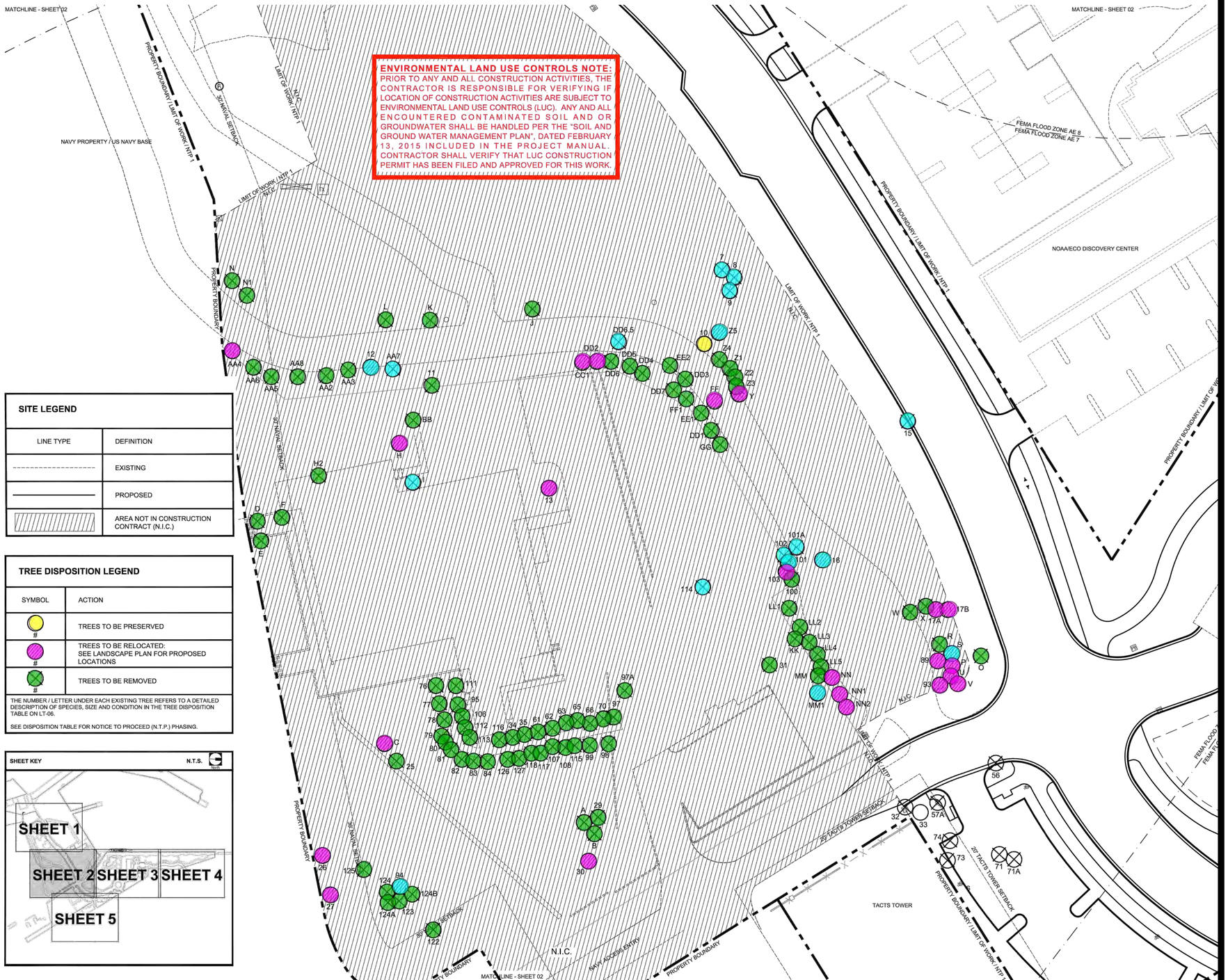
Sheet Number:
L2.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 – City of Key West – Truman Waterfront 1B\4–CDs\Drawings\Arch\18070 LANDSCAPE SHEET SET.dwg, 3/21/2019 10:43 PM, scale: 1'-0" = 1'-0", erica poole

ENVIRONMENTAL LAND USE CONTROLS NOTE:
PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE "SOIL AND GROUND WATER MANAGEMENT PLAN", DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.



SITE LEGEND

LINE TYPE	DEFINITION
	EXISTING
	PROPOSED
	AREA NOT IN CONSTRUCTION CONTRACT (N.I.C.)

TREE DISPOSITION LEGEND

SYMBOL	ACTION
#	TREES TO BE PRESERVED
#	TREES TO BE RELOCATED: SEE LANDSCAPE PLAN FOR PROPOSED LOCATIONS
#	TREES TO BE REMOVED

THE NUMBER / LETTER UNDER EACH EXISTING TREE REFERS TO A DETAILED DESCRIPTION OF SPECIES, SIZE AND CONDITION IN THE TREE DISPOSITION TABLE ON LT-06.

SEE DISPOSITION TABLE FOR NOTICE TO PROCEED (N.T.P.) PHASING.

SHEET KEY N.T.S.

1 PREVIOUS SITE DOCUMENTATION

SCALE: 1/64" = 1'-0"

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:43 PM

Drawing Size	Project #:
24x36	18070
Drawn By:	Checked By:
BK	AA

Title:
PRIOR LANDSCAPE DOCUMENTATION

Sheet Number:
L3.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CD\Drawings\Arch\18070 LANDSCAPE SHEET SET.dwg, 3/21/2019 10:43 PM, scale: 1'-0" = 1'-0", erica poole

#	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION	Disposition	Sheet	REQUIRED MITIGATION
1	*Cocos nucifera*	COCONUT PALM	15' OVERALL HEIGHT	CONTAMINATED SOIL	REMOVE	01	1.0 NATIVE PALM
2	*Cocos nucifera*	COCONUT PALM	15' OVERALL HEIGHT	CONTAMINATED SOIL	REMOVE	01	1.0 NATIVE PALM
3	*Cocos nucifera*	COCONUT PALM	15' OVERALL HEIGHT	CONTAMINATED SOIL	REMOVE	01	1.0 NATIVE PALM
4	*Bursera simaruba*	GUMBO LIMBO	15' X 15'; 10" CAL	CONTAMINATED SOIL	REMOVE	01	8.3 " CALIPER
5	*Bursera simaruba*	GUMBO LIMBO	15' X 12'; 8" CAL	CONTAMINATED SOIL	REMOVE	01	6.6 " CALIPER
6	*Hyophorbe lagenicaulis*	BOTTLE PALM	5' OVERALL HEIGHT	CONTAMINATED SOIL	REMOVE	01	N/A
7	*Phoenix reclinata*	DATE PALM	10' CLUSTER	NOT RELOCATABLE	REMOVE	02	1.0 NATIVE PALM
8	*Casuarina spp.*	AUSTRALIAN PINE	10' CLUSTER	INVASIVE SPECIES	REMOVE	02	N/A
9	*Phoenix reclinata*	DATE PALM	10' CLUSTER	NOT RELOCATABLE	REMOVE	02	1.0 NATIVE PALM
10	*Swietenia mahagoni*	MAHOGANY	30' x 30'; 30" CAL	GOOD	PRESERVE	02	N/A
11	*Swietenia mahagoni*	MAHOGANY	40' X 30'; 18" DBH	POOR	REMOVE	02	13.6 " CALIPER
12	*Sabal palmetto*	SABAL PALM	24' OVERALL HEIGHT	GOOD	**RELOCATE**	02	N/A
13	*Cocos nucifera*	COCONUT PALM	20' OVERALL HEIGHT	GOOD	**RELOCATE**	02	N/A
14	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
15	*Ficus aurea*	STRANGLER FIG	20' X 30'; 20" CAL	POOR	REMOVE	02	13.8 " CALIPER
16	*Sabal palmetto*	SABAL PALM	25' OVERALL HEIGHT	GOOD	**RELOCATE**	02	N/A
17A	*Cocos nucifera*	COCONUT PALM	20' OVERALL HEIGHT	GOOD	**RELOCATE**	02	N/A
17B	*Cocos nucifera*	COCONUT PALM	20' OVERALL HEIGHT	GOOD	**RELOCATE**	02	N/A
18	*Cocos nucifera*	COCONUT PALM	12' OVERALL HEIGHT	CONTAMINATED SOIL	REMOVE	03	1.0 NATIVE PALM
19	*Cocos nucifera*	COCONUT PALM	10' OVERALL HEIGHT	CONTAMINATED SOIL	REMOVE	03	1.0 NATIVE PALM
20	*Cocos nucifera*	COCONUT PALM	10' OVERALL HEIGHT	CONTAMINATED SOIL	REMOVE	03	1.0 NATIVE PALM
21	*Cocos nucifera*	COCONUT PALM	10' OVERALL HEIGHT	CONTAMINATED SOIL	REMOVE	03	1.0 NATIVE PALM
22	*Cocos nucifera*	COCONUT PALM	10' OVERALL HEIGHT	CONTAMINATED SOIL	REMOVE	03	1.0 NATIVE PALM
23	*Washingtonia robusta*	WASHINGTON PALM	24' OVERALL HEIGHT	INVASIVE SPECIES	REMOVE	04	1.0 NATIVE PALM
24	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
25	*Swietenia mahagoni*	MAHOGANY	28' X 30'; 18" DBH	POOR	REMOVE	02	12.0 " CALIPER
26	*Cocos nucifera*	COCONUT PALM	15' OVERALL HEIGHT	GOOD	**RELOCATE**	02	N/A
27	*Cocos nucifera*	COCONUT PALM	20' OVERALL HEIGHT	GOOD	**RELOCATE**	02	N/A
28	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
29	*Casuarina spp.*	AUSTRALIAN PINE	40' X 40'; 24" DBH	INVASIVE SPECIES	REMOVE	02	N/A
30	*Cocos nucifera*	COCONUT PALM	25' OVERALL HEIGHT	GOOD	**RELOCATE**	02	N/A
31	*Bucida buceras*	BLACK OLIVE	12" DBH	NOT REGULATED	REMOVE	02	N/A
32	*Coccoloba uvifera*	SEAGRAPE	28' X 40'; 36" DBH	POOR	REMOVE	02	23.4 " CALIPER
33	*Bursera simaruba*	GUMBO LIMBO	26' X 30'; 16" DBH	GOOD	PRESERVE	02	N/A
34	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
35	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
36	*Bursera simaruba*	GUMBO LIMBO	20' X 20'; 18" CAL	POOR	REMOVE	02	11.8 " CALIPER
37	*Cocos nucifera*	COCONUT PALM	20' OVERALL HEIGHT	CONTAMINATED SOIL	REMOVE	03	1.0 NATIVE PALM
38	*Coccoloba uvifera*	SEAGRAPE	25' X 35'; 36" CLUMP	GOOD	PRESERVE	05	N/A
39	*Albizia lebbeck*	WOMAN'S TONGUE	30' X 30'; 24" CAL	GOOD	PRESERVE	05	N/A
40	*Phoenix dactylifera 'Medjool'*	MEDJOOL DATE PALM	40' X 40'; 15" CLUMP	GOOD	PRESERVE	03	N/A
41	*Ficus aurea*	STRANGLER FIG	40' X 40'; 15" CLUMP	GOOD	PRESERVE	03	N/A
42	*Bursera simaruba*	GUMBO LIMBO	20' X 15'; 18" CAL	GOOD	**RELOCATE**	03	N/A
43	*Bursera simaruba*	GUMBO LIMBO	15' X 15'; 12" CAL	GOOD	**RELOCATE**	03	N/A
44	*Bursera simaruba*	GUMBO LIMBO	15' X 15'; 16" CAL	GOOD	**RELOCATE**	03	N/A
45	*Guapira discolor*	BLOLLY	15' X 15'; 8" CAL	POOR	REMOVE	03	5.3 " CALIPER
46	*Bursera simaruba*	GUMBO LIMBO	18' X 18'; 14" CAL	GOOD	**RELOCATE**	03	N/A
46A	*Ficus benjamina*	WEEPING FICUS	2" DBH	NOT REGULATED	REMOVE	05	N/A
46B	*Bursera simaruba*	GUMBO LIMBO	2" DBH	POOR	REMOVE	05	1.3 " CALIPER
46C	*Bursera simaruba*	GUMBO LIMBO	2" DBH	POOR	REMOVE	05	1.3 " CALIPER
46D	*Bursera simaruba*	GUMBO LIMBO	2" DBH	POOR	REMOVE	05	1.3 " CALIPER
46E	*Bursera simaruba*	GUMBO LIMBO	2" DBH	POOR	REMOVE	05	1.3 " CALIPER
46F	*Ficus benjamina*	WEEPING FICUS	2" DBH	NOT REGULATED	REMOVE	05	N/A
47	*Washingtonia robusta*	WASHINGTON PALM	30' OVERALL HEIGHT	INVASIVE SPECIES	REMOVE	03	1.0 NATIVE PALM
48	*Ficus aurea*	STRANGLER FIG	15' x 15'; 18" CLUMP	POOR	REMOVE	03	11.8 " CALIPER
49	*Cocos nucifera*	COCONUT PALM	35' OVERALL HEIGHT	CONTAMINATED SOIL	REMOVE	03	1.0 NATIVE PALM
50	*Washingtonia robusta*	WASHINGTON PALM	25' OVERALL HEIGHT	INVASIVE SPECIES	REMOVE	03	1.0 NATIVE PALM
51	*Washingtonia robusta*	WASHINGTON PALM	25' OVERALL HEIGHT	INVASIVE SPECIES	REMOVE	03	1.0 NATIVE PALM
52	*Washingtonia robusta*	WASHINGTON PALM	25' OVERALL HEIGHT	INVASIVE SPECIES	REMOVE	03	1.0 NATIVE PALM
53	*Bursera simaruba*	GUMBO LIMBO	20' X 20'; DBL 12" CAL	CONTAMINATED SOIL	REMOVE	03	8.7 " CALIPER
54	*Washingtonia robusta*	WASHINGTON PALM	25' OVERALL HEIGHT	INVASIVE SPECIES	REMOVE	03	1.0 NATIVE PALM
54A	*Thrinax morrisii*	KEY THATCH PALM	6' OVERALL HEIGHT	CONTAMINATED SOIL	REMOVE	03	1.0 NATIVE PALM
54B	*Thrinax morrisii*	KEY THATCH PALM	6' OVERALL HEIGHT	CONTAMINATED SOIL	REMOVE	03	1.0 NATIVE PALM
55	*Ficus aurea*	STRANGLER FIG	18' X 10" 8" DBH	POOR	REMOVE	03	5.3 " CALIPER
56	*Bursera simaruba*	GUMBO LIMBO	2" DBH	POOR	REMOVE	02	1.3 " CALIPER
57	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
57A	*Cordia sebestena*	ORANGE GEIGER TREE	4" DBH	POOR	REMOVE	02	2.6 " CALIPER
58	*Bursera simaruba*	GUMBO LIMBO	14' X 12" 8" DBH	POOR	REMOVE	02	6.0 " CALIPER

#	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION	Disposition	Sheet	REQUIRED MITIGATION
59	*Bursera simaruba*	GUMBO LIMBO	10' X 12'; 5" DBH	POOR	REMOVE	02	3.4 " CALIPER
60	*Sabal palmetto*	SABAL PALM	12"	GOOD	**RELOCATE**	03	N/A
61	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
62	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
63	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
64	*Bursera simaruba*	GUMBO LIMBO	15' x 15 MULTI-TRUNK'; 16" DBH	POOR	REMOVE	05	10.6 " CALIPER
65	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
66	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
67	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
68	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
69	*Ficus aurea*	STRANGLER FIG	12" DBH	POOR	REMOVE	03	7.9 " CALIPER
70	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
71	*Coccoloba uvifera*	SEAGRAPE	8" DBH	POOR	REMOVE	02	5.3 " CALIPER
71A	*Bursera simaruba*	GUMBO LIMBO	2" DBH	POOR	REMOVE	02	1.3 " CALIPER
72	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
73	*Coccoloba uvifera*	SEAGRAPE	4" DBH	POOR	REMOVE	02	2.6 " CALIPER
74	*Coccoloba uvifera*	SEAGRAPE	8" DBH	POOR	REMOVE	02	4.8 " CALIPER
75	*Washingtonia robusta*	WASHINGTON PALM	12"	INVASIVE SPECIES	REMOVE	04	1.0 NATIVE PALM
76	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
77	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
78	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
79	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
80	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
81	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
82	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
83	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
84	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
85	*Cocos nucifera*	COCONUT PALM	6"	CONTAMINATED SOIL	REMOVE	03	1.0 NATIVE PALM
86	*Cocos nucifera*	COCONUT PALM	3"	CONTAMINATED SOIL	REMOVE	03	1.0 NATIVE PALM
87	*Cocos nucifera*	COCONUT PALM	4"	CONTAMINATED SOIL	REMOVE	03	1.0 NATIVE PALM
88	*Cocos nucifera*	COCONUT PALM	8"	CONTAMINATED SOIL	REMOVE	03	1.0 NATIVE PALM
89	*Coccoloba uvifera*	SEAGRAPE	14' X 20'; 16" DBH	GOOD	**RELOCATE**	02	N/A
90	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
91	*Bursera simaruba*	GUMBO LIMBO	4" DBH	CONTAMINATED SOIL	REMOVE	03	2.9 " CALIPER
92	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
93	*Bursera simaruba*	GUMBO LIMBO	1" DBH	GOOD	**RELOCATE**	02	N/A
94	*Cocos nucifera*	COCONUT PALM	12"	GOOD	**RELOCATE**	02	N/A
95	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
96	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
97	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
97A	*Chrysobalanus icaco*	COCOPLUM	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
98	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
99	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
100	*Bursera simaruba*	GUMBO LIMBO	6' X 2'; 1.5" DBH	POOR	REMOVE	02	1.0 " CALIPER
101	*Bursera simaruba*	GUMBO LIMBO	20' X 25'; 10" DBH	GOOD	**RELOCATE**	02	N/A
101A	*Chrysobalanus icaco*	COCOPLUM	15' X 10" 8" DBH	POOR	REMOVE	02	5.8 " CALIPER
102	*Bursera simaruba*	GUMBO LIMBO	18' X 12'; 6" DBH	POOR	REMOVE	02	3.9 " CALIPER
103	*Bursera simaruba*	GUMBO LIMBO	12' X 8'; 3" DBH	GOOD	**RELOCATE**	02	N/A
104	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
105	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
106	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
107	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
108	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
109	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
110	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
111	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
112	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
113	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
114	*Schinus terebinthifolius*	BRAZILIAN PEPPER	SHRUB	INVASIVE SPECIES	REMOVE	02	N/A
115	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
116	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
117	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
118	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
119	*Washingtonia robusta*	WASHINGTON PALM	16"	INVASIVE SPECIES	REMOVE	04	1.0 NATIVE PALM
120	*Washingtonia robusta*	WASHINGTON PALM	16"	INVASIVE SPECIES	REMOVE	04	1.0 NATIVE PALM
121	NUMBER NOT USED - LEFT BLANK INTENTIONALLY						
122	*Conocarpus erectus var. sericeus*	SILVER BUTTONWOOD	2" SHRUB	NOT REGULATED	REMOVE	02	N/A
123	*Chrysobalanus icaco*	COCOPLUM	2" SHRUB	NOT REGULATED	REMOVE	02	N/A

#	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION	Disposition	Sheet	REQUIRED MITIGATION
124	*Chrysobalanus icaco*	COCOPLUM	4" SHRUB	NOT REGULATED	REMOVE	02	N/A
124A	*Chrysobalanus icaco*	COCOPLUM	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
124B	*Chrysobalanus icaco*	COCOPLUM	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
125	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
126	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
127	*Conocarpus erectus*	BUTTONWOOD	3' X 2' SHRUB	NOT REGULATED	REMOVE	02	N/A
A	*Bursera simaruba*	GUMBO LIMBO	5' X 4'; 1" DBH	POOR	REMOVE	02	0.6 " CALIPER
AA2	*Swietenia mahagoni*	MAHOGANY	30' X 40'; 8" DBH	POOR	REMOVE	02	6.0 " CALIPER
AA3	*Swietenia mahagoni*	MAHOGANY	16" DBH	POOR	REMOVE	02	10.0 " CALIPER
AA4	*Swietenia mahagoni*	MAHOGANY	35' X 40'; 16" DBH	GOOD	**RELOCATE**	02	N/A
AA5	*Swietenia mahagoni*	MAHOGANY	20' X 14'; 11" DBH	POOR	REMOVE	02	8.0 " CALIPER
AA6	*Swietenia mahagoni*	MAHOGANY	16' X 14';M 7" DBH	POOR	REMOVE	02	4.7 " CALIPER
AA7	*Swietenia mahagoni*	MAHOGANY	30' X 20'; 14" DBH	POOR	REMOVE	02	10.0 " CALIPER
AA8	*Swietenia mahagoni*	MAHOGANY	30' X 25'; 16" DBH	POOR	REMOVE	02	12.5 " CALIPER
B	*Bursera simaruba*	GUMBO LIMBO	1" DBH	POOR	REMOVE	02	0.7 " CALIPER
BB	*Cocos nucifera*	COCONUT PALM	12"	POOR	REMOVE	02	1.0 NATIVE PALM
C	*Thrinax morrisii*	KEY THATCH PALM	6' OVERALL HEIGHT	GOOD	**RELOCATE**	02	N/A
CC1	*Sabal palmetto*	SABAL PALM	4' OVERALL HEIGHT	GOOD	**RELOCATE**	02	N/A
D	*Swietenia mahagoni*	MAHOGANY	38" DBH	POOR	REMOVE	02	22.8 " CALIPER
DD1	*Bursera simaruba*	GUMBO LIMBO	20' X 20'; 7" DBH	POOR	REMOVE	02	4.6 " CALIPER
DD2	*Bursera simaruba*	GUMBO LIMBO	20' X 14'; 7" DBH	GOOD	**RELOCATE**	02	N/A
DD3	*Bursera simaruba*	GUMBO LIMBO	14' X 5'; 2" DBH	POOR	REMOVE	02	1.4 " CALIPER
DD4	*Bursera simaruba*	GUMBO LIMBO	6' X 4'; 1.5" DBH	POOR	REMOVE	02	1.0 " CALIPER
DD5	*Bursera simaruba*	GUMBO LIMBO	22' X 15'; 7" DBH	POOR	REMOVE	02	5.2 " CALIPER
DD6	*Bursera simaruba*	GUMBO LIMBO	12' X 4'; 4" DBH	POOR	REMOVE	02	2.5 " CALIPER
DD6.5	*Bursera simaruba*	GUMBO LIMBO	14' X 6'; 4" DBH	POOR	REMOVE	02	2.6 " CALIPER
DD7	*Bursera simaruba*	GUMBO LIMBO	6' X 3'; 1" DBH	POOR	REMOVE	02	0.7 " CALIPER
E	*Sabal palmetto*	SABAL PALM	12"	POOR	REMOVE	02	1.0 NATIVE PALM
EE1	*Swietenia mahagoni*	MAHOGANY	18' X 8'; 6" DBH	POOR	REMOVE	02	4.0 " CALIPER
EE2	*Swietenia mahagoni*	MAHOGANY	18' X 8'; 4" DBH	POOR	REMOVE	02	2.8 " CALIPER
F	*Bursera simaruba*	GUMBO LIMBO	2.5" DBH	POOR	REMOVE	02	1.8 " CALIPER
FF	*Bursera simaruba*	GUMBO LIMBO	30' X 18'; 10" DBH	GOOD	**RELOCATE**	02	N/A
FF1	*Conocarpus erectus*	BUTTONWOOD	40" DBH	POOR	REMOVE	02	29.0 " CALIPER
GG	*Bucida buceras*	BLACK OLIVE	28" DBH	NUISANCE	REMOVE	02	1.6 " CALIPER
H	*Sabal palmetto*	SABAL PALM	12' OVERALL HEIGHT	GOOD	**RELOCATE**	02	N/A
H2	*Swietenia mahagoni*	MAHOGANY	1" DBH	POOR	REMOVE	02	0.7 " CALIPER
I	*Ficus aurea*	STRANGLER FIG	15" DBH	POOR	REMOVE	02	9.0 " CALIPER
J	*Pisidia piscipula*	JAMAICAN DOGWOOD	21" DBH	POOR	REMOVE	02	12.6 " CALIPER
K	*Bursera simaruba*	GUMBO LIMBO	20' X 20'; 12 DBH	POOR	REMOVE	02	7.9 " CALIPER
KK	*Bucida buceras*	BLACK OLIVE	24" DBH	NUISANCE	REMOVE	02	N/A
L	*Bursera simaruba*	GUMBO LIMBO	20' X 20'; 10" DBH	POOR	REMOVE	02	7.0 " CALIPER
LL1	*Bursera simaruba*	GUMBO LIMBO	5.5" DBH	POOR	REMOVE	02	3.4 " CALIPER
LL2	*Bursera simaruba*	GUMBO LIMBO	1" DBH	POOR	REMOVE	02	1.0 " CALIPER
LL3	*Bursera simaruba*	GUMBO LIMBO	3.5" DBH	POOR	REMOVE	02	2.4 " CALIPER
LL4	*Bursera simaruba*	GUMBO LIMBO	2.5" DBH	POOR	REMOVE	02	1.7 " CALIPER
LL5	*Bursera simaruba*	GUMBO LIMBO	11" DBH	POOR	REMOVE	02	7.7 " CALIPER
MM	*Chrysobalanus icaco*	COCOPLUM	25" DBH	POOR	REMOVE	02	12.5 " CALIPER
MM1	*Bursera simaruba*	GUMBO LIMBO	20' X 8'; 4" DBH	GOOD	**RELOCATE**	02	N/A
N	*Swietenia mahagoni*	MAHOGANY	16' X 12'; 5" DBH	POOR	REMOVE	02	3.5 " CALIPER
N1	*Swietenia mahagoni*	MAHOGANY	24" DBH	POOR	REMOVE	02	15.0 " CALIPER
NN	*Coccoloba uvifera*	SEAGRAPE	25' X 30'; 24" DBH	GOOD	**RELOCATE**	02	N/A
NN1	*Bursera simaruba*	GUMBO LIMBO	16' X 6'; 2" DBH	GOOD	**RELOCATE**	02	N/A
NN2	*Bursera simaruba*	GUMBO LIMBO	14' X 12" 8" DBH	GOOD	**RELOCATE**	02	N/A
O	*Sabal palmetto*	SABAL PALM	12' OVERALL HEIGHT	POOR	REMOVE	02	1.0 NATIVE PALM
P	*Bursera simaruba*	GUMBO LIMBO	12' X 8'; 5" DBH	GOOD	**RELOCATE**	02	N/A
R	*Bursera simaruba*	GUMBO LIMBO	18' X 20'; 10" DBH	POOR	REMOVE	02	7.6 " CALIPER
S	*Bursera simaruba*	GUMBO LIMBO	12' X 5'; 3" DBH	GOOD	**RELOCATE**	02	N/A
U	*Bursera simaruba*	GUMBO LIMBO	14' X 12" 8" DBH	GOOD	**RELOCATE**	02	N/A
V	*Bursera simaruba*	GUMBO LIMBO	14' X 15'; 8" DBH	GOOD	**RELOCATE**	02	N/A
W	*Bursera simaruba*	GUMBO LIMBO	12' X 8'; 5" DBH	POOR	REMOVE	02	3.3 " CALIPER
X	*Coccoloba uvifera*	SEAGRAPE	14" CLUMP	POOR	REMOVE	02	10.6 " CALIPER
Y	*Sabal palmetto*	SABAL PALM	6' OVERALL HEIGHT	GOOD	**RELOCATE**	02	N/A
Z1	*Bursera simaruba*	GUMBO LIMBO	14' X 15'; 6" DBH	POOR	REMOVE	02	4.2 " CALIPER
Z2	*Bursera simaruba*	GUMBO LIMBO	14' X 15'; 10" DBH	POOR	REMOVE	02	7.5 " CALIPER
Z3	*Bursera simaruba*	GUMBO LIMBO	16' X 15'; 8" DBH	POOR	REMOVE	02	5.6 " CALIPER
Z4	*Bursera simaruba*	GUMBO LIMBO	5' X 5'; 1.5" DBH	POOR	REMOVE	02	1.0 " CALIPER
Z5	*Bursera simaruba*	GUMBO LIMBO	10' X 8'; 2" DBH	GOOD	**RELOCATE**	02	N/A
			Mitigation Native Palms Required			30	
			Mitigation Inches of Canopy Caliper Required			441.90	

COLOR CODING LEGEND

(orange)	NTP1
(green)	NTP2
(red)	NTP3
(grey)	FUTURE PHASE/N.I.C.

1 PREVIOUS SITE DOCUMENTATION

SCALE: 1/64" = 1'-0"

J:\2018\18070 - City of Key West - Truman Waterfront 1B\4-CDs\Drawings\Arch\18070 LANDSCAPE SHEET SET.dwg, 3/21/2019 10:43 PM, scale: 1'-0" = 1'-0", erica poole

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:43 PM

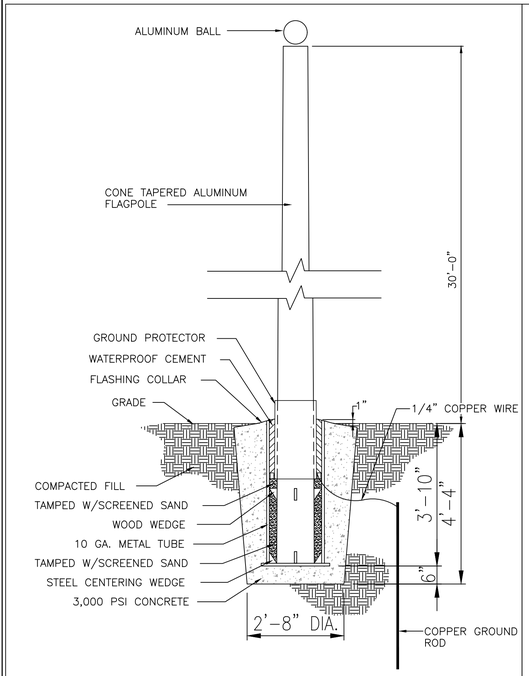
Drawing Size	Project #:
24x36	18070
Drawn By: BK	Checked By: AA

Title:
PRIOR LANDSCAPE DOCUMENTATION

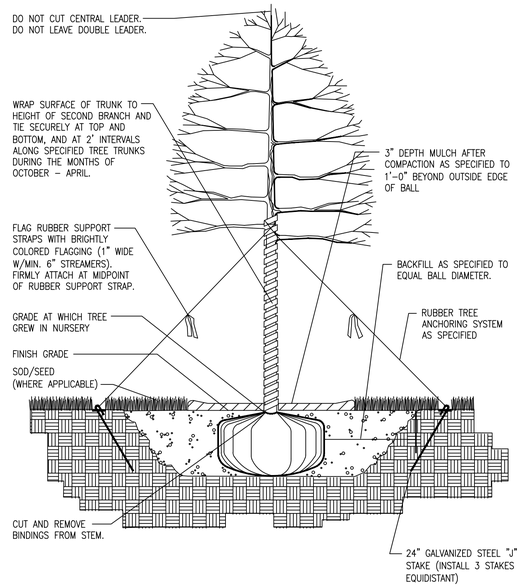
Sheet Number:
L3.1.2

Date: March 22, 2019

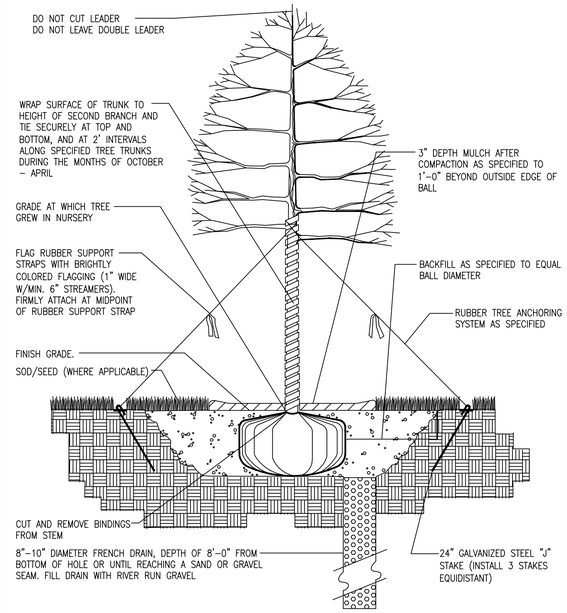
©2018 by K2M Design, Inc.



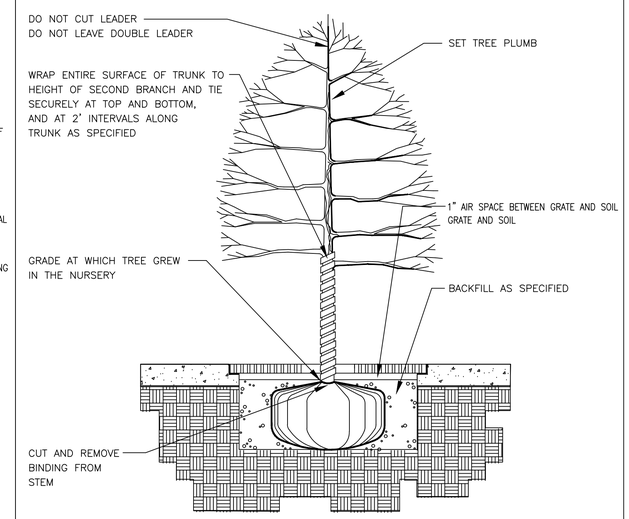
1 / L511 TYPICAL FLAGPOLE DETAIL
3/4"=1'-0"



2 / L511 TYPICAL TREE PLANTING SECTION
3/4"=1'-0"

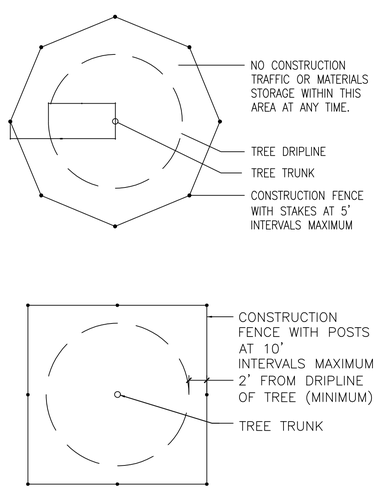


3 / L511 TYPICAL TREE PLANTING SECTION
3/4"=1'-0"

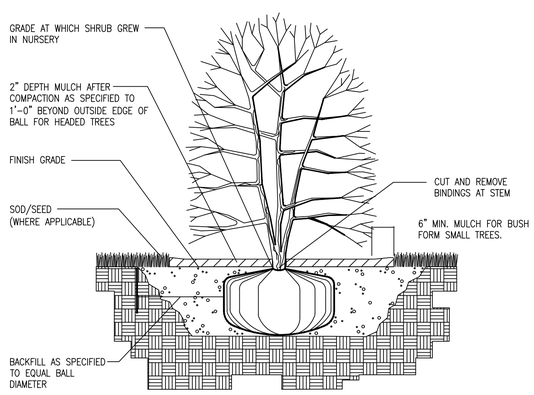


4 / L511 TREE GRATE PLANTING
3/4"=1'-0"

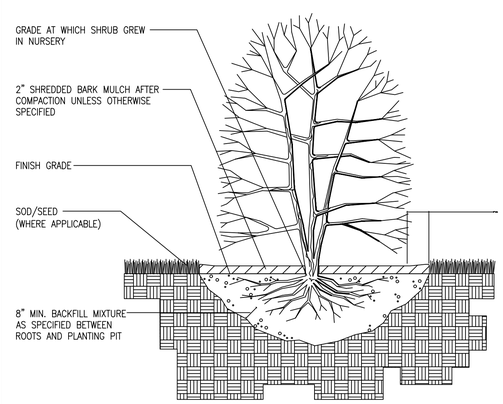
REFERENCE SPECIFICATION SECTION
02231 TREE PROTECTION AND TRIMMING



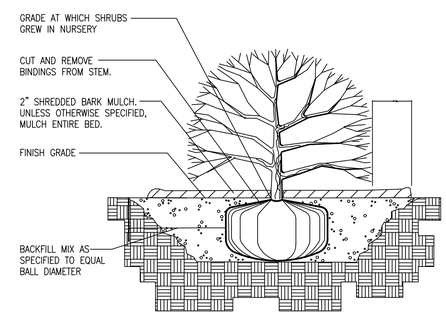
5 / L511 TYPICAL TREE PROTECTION DETAIL
3/4"=1'-0"



6 / L511 TYPICAL SMALL TREE PLANTING DETAIL
3/4"=1'-0"



7 / L511 TYPICAL SHRUB/SMALL TREE PLANTING DETAIL (BARE ROOT)
3/4"=1'-0"



8 / L511 B&B OR CONTAINER SHRUB PLANTING SECTION
3/4"=1'-0"

ARCHITECT:
K2M DESIGN
Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting
Key Largo, FL
Key West, FL
Marathon, FL
URL: www.k2mdesign.com
PROF. REG. AA26001059
Building Relationships Based on Trust and Results
Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:
STRUCTURAL ENGINEER: Meridian Engineering LLC
CIVIL ENGINEER: Perez Engineering & Development
IRRIGATION: Blue Island Lighting & Irrigation Inc.

Submissions:
DATE: PHASE
2019.03.22 - ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST WATERFRONT PARK
CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:43 PM

Drawing Size	Project #:
24x36	18070
Drawn By: BK	Checked By: AA

Title: LANDSCAPE/SITE DETAILS

Sheet Number: L5.1.1

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\K-CD\Drawings\Arch\18070 LANDSCAPE SHEET SET.dwg, 3/21/2019 10:43 PM, scale: 1'-0" = 1'-0", erica poole

GRADING & DRAINAGE NOTES:

1. ALL EXCAVATED AREAS TO BE SEEDED OR SODDED AFTER FINAL GRADING UNLESS OTHERWISE NOTED. SEE LANDSCAPE PLAN AND/OR EROSION CONTROL PLAN FOR DIRECTIONA ND VERIFICATION

2. PROVIDE POSITIVE DRAINAGE IN ALL PAVED AREAS WITH OUT PONDING WATER. THE PAVING CONTRACTOR SHALL TEST ALL PAVED AREAS FOR BIRD BATH CONDITIONS BY FLOODING THE ENTIRE AREA WITH WATER AND MARKING THE POND AREA PRIOR TO THE INSTALLATION OF THE TOPPING COURSE. CORRECTION SHALL BE MADE IF NECESSARY.

3. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND ELEVATIONS IN THE FIELD PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FIELD DIMENSIONS AND ELEVATIONS DURING THE ENTIRE CONSTRUCTION SCHEDULE. IF ANY DISCREPANCIES ARE FOUND IN THESE ENGINEERING PLANS, LANDSCAPE PLANS, OR SURVEY PLANSFROM ACTUAL FIELD CONDITIONS, THE CONTRACTOR SHALL CONTACT THE A/E IMMEDIATLY

4. ALL CONTRACTOR(S) BUT NOT LIMITED TO THE EXCAVATING CONTRACTOR(S) MUST TAKE PARTICULAR CARE WHEN EXCAVATING IN AND AROUND EXISTING UTILITY LINES AND EQUIPTMENT. ACTUAL FIELD LOCATION OF ALL EXISTING UTILITIES ARE THE CONTRACTORS RESPONSIBILITY AND MUST BE LOCATED EITHER BY THE REPRESENTATIVE OF THE UTILITY COMPANY OR BY A PRIVATE UNDERGROUND UTILITY LOCATION COMPANY PRIOR TO THE START OF EXCAVATING. VERIFY MINIMUM COVERAGE REQUIREMENTS BY THE UTILITY COMPANY OR CONTRACTOR(S) SO AS NOT TO CAUSE DAMAGE.

5. IT IS THE CONTRACTORS RESPONSIBILITY TO NOTIFY ALL THE UTILITY COMPANIES AND DEPARTMENTS 72 HOURS BEFORE COMMENCING CONSTRUCTION ACTIVITIES TO VERIFY AND UTILITIES THAT MAY BE PRESENT ON THE SITE. ALL VERIFICATIONS, LOCATIONS, SIZE AND DEPTHS SHALL BE MADE BY THE APPROPRIATE UTILITY COMPANIES OR DEPARTMENTS. WHEN EXCAVATING AROUND OR OVER EXISTING UTILITIES, THE CONTRACTOR MUST NOTIFY THE UTILITY COMPANY OR DEPARTMENT SO A REPRESENTATIVE OF THE UTILITY CAN BE PRESENT DURING THE EXCAVATING TO INSTRUCT AND OBSERVE THE EXCAVATION.

6. TRENCHES FOR ALL UTILITIES SHALL BE BACKFILLED COMPLETELY WITH APPROVED ENGINEERED GRANULAR MATERIAL SUITABLE TO THE A/E. SEE THE APPROPRIATE DETAILS AND SPECIFICATIONS FOR THE APPROVED MATERIALS.

7. ALL PROPOSED SPOT ELEVATIONS ARE THE FINAL TOP OF PAVEMENT, TOP OF CURB OR FINAL GRADE ELEVATION. TO DETERMINE THE SUBGRADE ELEVATION REQUIRED BELOW, SEE APPROPRIATE DETAIL.

8. HEAVY CONSTRUCTION EQUIPTMENT AND TRAFFIC MAY CREATE PUMPING AND GENERAL DETERIORATION OF THE SHALLOWER SOILS IF EXCESS SURFACE WATER IS PRESENT. PROPER PRECAUCTIONARY STEPS MUST BE TAKEN DURING THE ENTIRE CONSTRUCTION SCHEDULE TO ALLEVIATE SUCH DAMAGE.

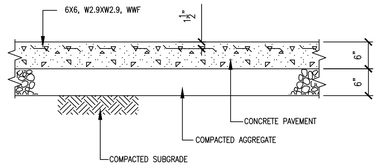
9. ALL CONSTRUCTION METHODS AND MATERIALS MUST CONFORM TO CURRENT STANDARDS AND SPECIFICATIONS OF THE FEDERAL, STATE, COUNTY, CITY, OR LOCAL REQUIREMENTS, WHICHEVER HAS JURISDICTION.

10. EXISTING PAVEMENTS, SIDEWALKS, CURBS, DRIVEWAYS, ELECTRICAL TRANSFORMERSAND PADS, DITCHES, DRAINAGE PIPES AND STRUCTURES, FENCES, LAWNS, TREES, BUSHES, MAILBOXES, SIGNS, POWER POLES, ETC.. TO REMAIN AND BE PROTECTED FROM DAMAGE BY THE CONTRACTOR. ANY DAMAGE DURING CONSTRUCTION SHALL BE RESTORED, RECONSTRUCTED OR REPLACED BY THE CONTRACTOR AT HIS EXPENSE. ALL DAMAGES SHALL BE RESTORED OR REPLACED TO ATLEAST THEIR ORIGINAL CONDITION OR AS REQUIRED OR DICTATED BY FEDERAL, STATE, COUNTY, CITY, OR LOCAL AGENCIES.

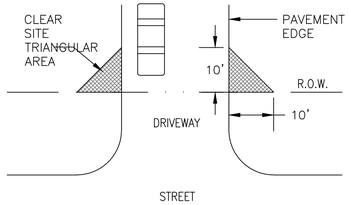
11. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN ALL FEDERAL, STATE, COUNTY, CITY, OR LOCAL PERMITS FOR ANY AND ALL WORK REQUIRED UNLESS OTHERWISE NOTED. THE CONTRACTOR IS RESPONSIBLE TO PAY FOR ALL REQUIRED PERMITS BY ANY OR ALL AGENCIES MENTIONED ABOVE UNLESS OTHERWISE NOTED IN THE CONTRACT OR SPECIFICATION.

13. THE CONTRACTRO SHALL BE RESPONSIBLE TO PROVIDE AT HIS EXPENSE ALL AUTOMOBILE AND PEDESTRIAN TRAFFIC CONTROL DEVICES REQUIRED BY FEDERAL, STATE, COUNTY, CITY, OR LOCAL AGENCIES.

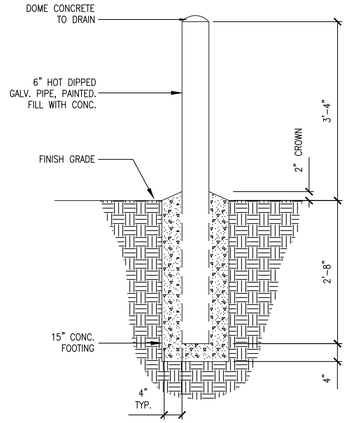
14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INSPECT EACH DAY AND REMOVE ALL MUD, DIRT, GRAVEL, AND LOOSE MATERIALS TRACTED, DUMPED, SPILLED OR WIND BLOWN FROM THE SITE ONTO OTHER SITES, RIGHT OF WAYS, PUBLIC OR PRIVATE, STREETS OR ROADS, DRIVEWAYS, YARDS, OR SIDEWALKS. THE CONTRACTOR MUST CLEAN OR PICK UP DAILY IF NECESSARY. THE CONTRACTOR SHALL REDUCE THE AIRBORNE DUST DURING THE ENTIRE CONSTRUCTION SCHEDULE. WATER MAY BE USED AS A REDUCER.



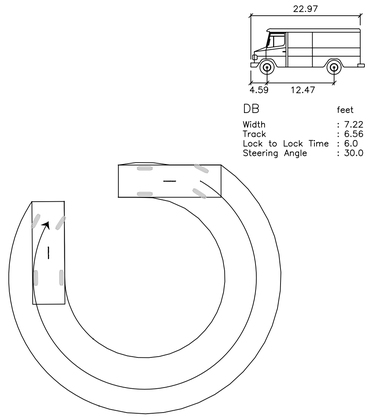
1 / L512 **DUMPSTER PAD DETAIL (IF APPLICABLE)**
3/4"=1'-0"



2 / L512 **CLEAR SIGHT TRIANGLE DETAIL**
NTS



3 / L512 **TYPICAL BOLLARD DETAIL**
NTS



4 / L512 **DELIVERY TRUCK TURN RADIUS DETAIL**
NTS

ARCHITECT:

K2M DESIGN

Architecture, Engineering, Interior Design, Asset Management, Specialty Consulting

Key Largo, FL
Key West, FL
Marathon, FL

URL: www.k2mdesign.com
PROF. REG. AA26001059

Building Relationships
Based on Trust and Results

Cleveland | Columbus | Indianapolis | Key Largo | Key West | Marathon | Charlotte | Baltimore | Bentonville

Seal:

Consultants:

STRUCTURAL ENGINEER:
Meridian Engineering LLC

CIVIL ENGINEER:
Perez Engineering & Development

IRRIGATION:
Blue Island Lighting & Irrigation Inc.

Submissions:

DATE:	PHASE
2019.03.22	ISSUED BID SET

TRUMAN WATERFRONT 1B
CITY OF KEY WEST
WATERFRONT PARK

CITY OF KEY WEST
1300 White Street, Key West, FL, 33040

PLOTTED: 3/21/2019 10:43 PM

Drawing Size	Project #:
24x36	18070
Drawn By: BK	Checked By: AA

Title:
LANDSCAPE/SITE DETAILS

Sheet Number:
L5.1.2

Date: March 22, 2019

©2018 by K2M Design, Inc.

J:\2018\18070 - City of Key West - Truman Waterfront 1B\K-CDs\Drawings\Arch\18070 LANDSCAPE SHEET SET.dwg, 3/21/2019 10:43 PM, scale: 1'-0" = 1'-0", arico paola

APPENDICIES

SITE SURVEY

LOCATION MAP – NTS

N

GRAPHIC SCALE

30 0 15 30

(IN FEET)
1 inch = 30 ft.
(INTENDED DISPLAY SCALE)

TOPOGRAPHIC SURVEY A PART OF THE TRUMAN WATERFRONT KEY WEST, FLORIDA

ELEVATIONS SHOWN HEREON ARE ON NATIONAL GEODETIC VERTICAL DATUM 1929

SURVEYORS NOTES:

1. The survey date is 04/13/18.
2. This is NOT a Boundary Survey.
3. This is a Topographic Survey, as defined in Chapter 5J–17.050(10)(a)–(k) of the Florida Administrative Code.
4. This survey map and report or the copies thereof are not valid without the signature and the original raised seal of a Florida licensed surveyor and mapper.
5. Elevations shown hereon were established using a Real Time Global Positioning System (RTK GPS) and referenced to National Geodetic Vertical Datum of 1929 (NGVD 29). Said elevations were established by National Geodetic Survey (NGS) benchmark "14.324" having a published elevation of 14.32' (NGVD 29). Conversion to North American Vertical Datum of 1988 (NAVD 88) is as follows (NGVD 29) – 1.34' = NAVD 88 (Per NGS Benchmark PIDAA0008)
6. The coordinates shown hereon are referenced to the Florida State Plane Coordinate System, East Zone, North American Datum of 1983, 2011 adjustment (NAD83/2011), as established using Real–Time Kinematic Global Positioning System (RTK GPS) survey methods. The corrected positions computed were verified through a redundancy of measurements to meet or exceed closure for Rural: Linear 1 foot in 5,000 feet. All distances shown hereon are in U.S. Survey Feet.
7. Aerial imagery shown hereon was obtained from the Land Boundary Information System (LABINS) dated 2015 and is shown for informational purposes only.
8. The Subject property is entirely in Flood Zone AE (EL 7 feet) according to Flood Insurance Rate Map 12087C–1516K, Community No. 125129, Dated 02–18–2005.

LEGEND:

- WOOD UTILITY POLE
- CONCRETE UTILITY POLE
- GUY WIRE/ANCHOR
- FIRE HYDRANT
- METAL LIGHT POLE

CONC	=	CONCRETE
CLF	=	CHAINLINK FENCE
OHW	=	OVERHEAD WIRE
WDF	=	WOOD FENCE
ROL	=	ROOF OVERHANG LINE
TYP	=	TYPICAL

NOTE: FOUNDATIONS BENEATH THE SURFACE ARE NOT SHOWN. MEASURED DIMENSIONS EQUAL PLATTED OR DESCRIBED DIMENSIONS UNLESS INDICATED OTHERWISE.
THE FOLLOWING IS A LIST OF ABBREVIATIONS THAT MAY BE FOUND ON THIS SHEET.

BFP = BACK–FLOW PREVENTER
BO = BLOW OUT
BOL = BOLLARD
C = CALCULATED
C&G = 2' CONCRETE CURB & GUTTER
CB = CONCRETE BLOCK
CBW = CONCRETE BLOCK WALL
CBRW = CONCRETE BLOCK RETAINING WALL
CC = CONCRETE CURB
CI = CURB INLET
CL = CENTERLINE
CLF = CHAINLINK FENCE
CM = CONCRETE MONUMENT
CONC = CONCRETE
C/S = CONCRETE SLAB
CVRD = COVERED
D = DEED
DELTA = DELTA ANGLE
DEASE = DRAINAGE EASEMENT
DM = DRAINAGE MANHOLE
EB = ELECTRIC BOX
EL = ELEVATION
ELEV = ELEVATED
EM = ELECTRIC METER
ENCL = ENCLOSED
FPC = FIBER PIPE CUT–OFF
FFE = FINISHED FLOOR ELEVATION
FH = FIRE HYDRANT
FI = FENCE INSIDE
FND = FOUND
FO = FENCE OUTSIDE
FOL = FENCE ON LINE
GB = GRADE BREAK
GI = GRATE INLET
GL = GROUND LEVEL
HB = HOSE BIB
HW = HOSE WB
IP = IRON PIPE
IR = IRON ROD
L = ARC LENGTH
LE = LOWER ENCLOSURE
LP = LIGHT POLE
MB = MAILBOX
M = MEASURED
MB = MAILBOX
MHWL = MEAN HIGH WATER LINE
MTLF = METAL FENCE
NAVD = NORTH AMERICAN VERTICAL DATUM (1988)
NGVD = NATIONAL GEODETIC VERTICAL DATUM (1929)
NTS = NOT TO SCALE
OHW = OVERHEAD WIRES
P = PLAT
P&M = PLAT & MEASURED
PC = POINT OF CURVE
POC = POINT OF COMPOUND CURVE
PRC = POINT OF REVERSE CURVE
PT = POINT OF TANGENT
PV = PIPE VALVE
PK = PARKER KALON NAIL
PM = PARKING METER
POB = POINT OF BEGINNING
POC = POINT OF COMMENCEMENT
PRC = POINT OF REVERSE CURVE
PRM = PERMANENT REFERENCE MONUMENT
PT = POINT OF TANGENT
PV = PIPE VALVE
ROL = ROOF OVERHANG LINE
ROWL = RIGHT OF WAY LINE
R/W = RIGHT OF WAY
SCO = SANITARY CLEAN–OUT
SMH = SANITARY MANHOLE
SPV = SPRINKLER CONTROL VALVE
SV = SEWER VALVE
TB = TELEPHONE BOX
TBM = TIDAL BENCHMARK
TMH = TELEPHONE MANHOLE
TOB = TOP OF BANK
TOS = TOE OF SLOPE
TS = TRAFFIC SIGN
TYP = TYPICAL
UEASE = UTILITY EASEMENT
UPC = CONCRETE UTILITY POLE
UPM = METAL UTILITY POLE
UPW = WOOD UTILITY POLE
VB = VIDEO BOX
WD = WOOD DECK
WF = WOOD FENCE
WL = WOOD LANDING
WM = WATER METER
WRACK LINE = LINE OF DEBRIS ON SHORE
WV = WATER VALVE

REVISION 07–30–2018: CORRECT FFE ELEVATION TO NGVD29

CERTIFIED TO –
CITY OF KEY WEST
K2M Design, Inc.

NOTE: THIS SURVEY WAS PERFORMED FOR THE SOLE AND EXCLUSIVE BENEFIT OF THE PARTIES LISTED HEREIN AND SHALL NOT BE RELIED UPON BY ANY OTHER ENTITY OR INDIVIDUAL WHOMSOEVER. LIKEWISE, ANY REUSE OF THIS SURVEY FOR ANY PURPOSE OTHER THAN WHICH WAS ORIGINALLY INTENDED, WITHOUT THE WRITTEN PERMISSION OF THE UNDERSIGNED SURVEYOR & MAPPER, WILL BE DONE SO AT THE RISK OF THE REUSING PARTY AND WITHOUT ANY LIABILITY TO THE UNDERSIGNED SURVEYOR & MAPPER.
LEGAL DESCRIPTIONS HAVE BEEN FURNISHED BY THE CLIENT OR HIS/HER REPRESENTATIVE. PUBLIC RECORDS HAVE NOT BEEN RESEARCHED BY THE SURVEYOR TO DETERMINE THE ACCURACY OF THESE DESCRIPTIONS NOR HAVE ADJOINING PROPERTIES BEEN RESEARCHED TO DETERMINE OVERLAPS OR HIATUS. THIS SURVEY DOES NOT PURPORT TO SHOW OWNERSHIP OF WALLS OR FENCES ALONG PROPERTY LINES. ADDITIONS OR DELETIONS TO THIS SURVEY MAP BY OTHER THAN THE SIGNING PARTY OR PARTIES IS PROHIBITED WITHOUT WRITTEN CONSENT OF THE SIGNING PARTY OR PARTIES.

SCALE:	1"=30'
FIELD WORK DATE	04/13/18
REVISION DATE	07/30/18
SHEET	1 OF 1
DRAWN BY:	KB
CHECKED BY:	RER
INVOICE #:	18041001

I HEREBY CERTIFY THAT THIS SURVEY WAS MADE UNDER MY RESPONSIBLE CHARGE AND MEETS THE STANDARDS OF PRACTICE AS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 5J–17, FLORIDA ADMINISTRATIVE CODE, PURSUANT TO SECTION 472.027, FLORIDA STATUTES. THIS SURVEY, WHEN SCHEDULE B HAS BEEN PROVIDED MEETS THE PROVISIONS OF FLORIDA ENDORSEMENT FORM 9, SUBPARAGRAPH 1(B) 1(SETBACKS), 1(B)3(ENCROACHMENTS), & 1(B)4(EASEMENTS), SCHEDULE "B" HAS NOT BEEN PROVIDED.

SIGNED _____
ROBERT E. REECE, PSM 5632, PROFESSIONAL SURVEYOR AND MAPPER

NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA SURVEYOR AND MAPPER

REECE & ASSOCIATES
PROFESSIONAL SURVEYOR AND MAPPER, LB 7846
127 INDUSTRIAL ROAD, BIG PINE KEY, FL 33043
OFFICE (305) 872 – 1348
FAX (305) 872 – 5622

GEOTECHNICAL REPORT

REPORT OF
GEOTECHNICAL EXPLORATION

TRUMAN WATERFRONT PARK
CITY OF KEY WEST WATERFRONT PARK
KEY WEST, FLORIDA

FOR

K2M DESIGN, INC.
1150 VIRGINIA STREET
KEY WEST, FLORIDA 33040

PREPARED BY

NUTTING ENGINEERS OF FLORIDA, INC.
2051 NW 112TH AVE, SUITE 126
MIAMI, FLORIDA33172

PROJECT No. 2068.5

APRIL 2018

Nutting Engineers
of Florida Inc. | Established 1967
Your Project is Our Commitment

Geotechnical & Construction Materials
Engineering, Testing & Inspection
Environmental Services

Offices throughout the state of Florida

www.nuttingengineers.com info@nuttingengineers.com

Nutting Engineers
of Florida Inc. | Established 1967
Your Project is Our Commitment

2051 N.W. 112th Avenue, Suite 126
Miami, Florida 33172
305-557-3083
Toll Free: 877-NUTTING (688-8464)
Fax: 305-824-8827
Broward 954-941-8700
Palm Beach 561-736-4900
St. Lucie 772-408-1050
www.nuttingengineers.com

Geotechnical and Construction Materials | Engineering, Testing and Inspections | Environmental Services

April 25, 2018

Ms. Erica Poole
K2M Design, Inc.
1150 Virginia Street
Key West, Florida 33040
Phone: (305) 307-5840
Email: epoole@k2mdesign.com

Subject: Report of Geotechnical Exploration
Truman Waterfront Park
City of Key West Waterfront Park
Key West, Florida

Dear Ms. Poole:

Nutting Engineers of Florida, Inc. has performed a geotechnical exploration for the above proposed construction in Key West, Florida. The purpose of this exploration was to obtain information concerning the site and subsurface conditions at specific locations in order to provide site preparation and foundation design recommendations for support of the proposed construction. This report presents our findings and recommendations.

PROJECT INFORMATION

Per our conversation on January 9, 2018 and review of the plan provided, we understand that plans for this project include the partial demolition of the existing gym building and subsequently constructing an approximately 8,169 square foot building and an approximately 1,088 square foot horse stable, construction of a new parking area, and the installation of post lights at the referenced site.

Based on current site elevations, we estimate that less than one foot of fill may be required to bring the site up to construction grade; however, the final construction elevation shall be determined by a professional architect, civil engineer, or other qualified party.

NE should be notified in writing by the client of any changes in the proposed construction along with a request to amend our foundation analysis and/or recommendations within this report as appropriate.

GENERAL SUBSURFACE CONDITIONS

Subsurface Soil Exploration

The exploration of subsurface conditions included site observation, review of available data such as the Soil Survey of Monroe County andfour (4) Standard Penetration Test boring (ASTM D-1586). The Standard Penetration Test boringswere performed toa depth of 30feet below the existing ground surface. The individual test boring reportsare presented in the Appendix of this report. The borings were established using approximate methods, namely a measuring wheel and available surface controls.

Soil Survey Maps

A review of the Soil Survey for MonroeCounty indicates that at the time the survey was conducted, the soils at the site were described as Urban land complex. This map unit is in constructed upland areas adjacent to areas of water throughout the keys. Individual areas are subject to rare flooding from hurricanes and other tropical storms. Elevations vary, depending on the thickness of the fill material, but they are dominantly +3 National Geodetic Vertical Datum (NGVD) of 1929. The Udorthents dominantly consist of crushed oolitic limestone or coral bedrock that has been spread over the original soil material. They commonly are about 32 inches of extremely gravelly sand underlain by about 40 inches of marl. The marl is underlain by coral bedrock. Other areas of soils are underlain by muck and other soil material. Houses and other urban structures cover up to 40 percent of most areas of the Udorthents; however, the natural soils can still be observed. We note that the maximum depth of the soil survey was approximately six feet.

Test Boring Results

In general, the test borings recordedsoft to medium hard limestone fragments and varying amountsof sand to depths of two to four feetbelow existing grade followed by very soft to soft silt to depths of approximately four to six feet. Beneath this, the borings encountered medium to very dense sand with trace limestone fragments to a depth of approximately thirteen feet underlain bysoft to medium hard limestone with varying amounts of sand to thirty feet, the maximum depth explored. A detailed description of the soil profile is presented in the test boring records provided in the Appendix.

Groundwater Information

The groundwater level was encountered at adepth of approximately five to six feet below the existing ground surface.

The immediate depth to groundwater measurements presented in this report may not provide a reliable indication of stabilized or long term depth to groundwater at this site.Water table elevations can vary dramatically with time through rainfall, droughts,

storm events, flood control activities, nearby surface water bodies, tidal activity, pumping and many other factors. For these reasons, this immediate depth to water data should not be relied upon alone for project design considerations.

ANALYSIS AND RECOMMENDATIONS

The test borings performed for this project revealed very soft to soft compressible silt at depths ranging from about two to six feet below the existing ground surface, with the natural limestone formation below this depth. Construction of the proposed structures over the existing profile would result in excessive settlements. Therefore, in order to support the structures using a shallow foundation system we recommend that the silt be excavated and removed from the building areas and replaced with well compacted structural fill. We note that the silt was predominantly encountered in borings B-1 and B-2 and therefore may not be uniform throughout the proposed building area. We recommend that test pits should be performed to better delineate the limits of the required excavation operations, especially as it relates to the existing building.

Once the compressible silt is removed and replaced as stated in this report, the proposed structures may be designed using an allowable soil bearing pressure of 2,500 pounds per square foot.

In accordance with Monroe County Ordinances, specifically section 122- Floodplain Management, if the buildings are located within an area covered by this Ordinance, deep foundation systems will be required. We were not provided information concerning whether this Ordinance applies to the proposed buildings. Therefore, we should be informed to provide additional input if this portion of the Code applies.

We recommend a minimum width of 16 inches for continuous footings and 24 inches for individual footings, even though the soil bearing pressure may not be fully developed in all cases. We recommend that the bottom of footings be at least 12 inches below the lowest adjacent finished grade. The foundations should be constructed in accordance with the local building codes and good standard practice. This may include installing 16-inch diameter augercast piles to at least three feet into the natural limestone formation as stated in Monroe County Ordinances. If these piles are required, the natural limestone formation was encountered at depths of about six feet therefore, the piles will need to have a tip depth of approximately nine feet below existing ground surface.

Foundation Settlement

Shallow foundations designed, supported, and constructed in accordance with the recommendations of this report are estimated to sustain a maximum total settlement of less than approximately one inch. Differential settlement between adjacent foundations should be approximately one-half of the total settlement. Distortions that occur along the wall footings due to differential settlement should not be more than 1 in 500.

Floor Slab

It is our opinion that the floor slab system may be constructed as a slab on grade. We recommend that the procedures described under the "Site Preparation" section of this report be used to prepare the floor slab subgrades. We recommend that a vapor barrier be placed between the soil and concrete.

Site Preparation

The surficial organic soils, debris from the clearing operations, and any unsuitable soils as determined by the Geotechnical Engineer will need to be completely removed within the construction area (footing area) and to a lateral distance of at least 2 feet beyond the footprint limits, where practical.

A Nutting Engineer's representative **must be** present to observe that the excavation operations are performed as we have discussed herein. Otherwise Nutting Engineers shall bear no liability for acceptance of work or resulting foundation performance and consequences.

We note that demucking operations are contractor dependent and that the total amount of material removed may depend on the operator's ability to effectively remove the soils without over-excavation. It will be very important that we monitor these operations in order to ensure that the operator does not over excavate. This will save on costs and avoid the potential for confusion. Also, the excavation will need to be performed so that it does not influence the existing building.

Once the construction area has been cleared, and upon approval by the geotechnical engineer, within the new building areas and five feet beyond the footing limits the organic silt soils should be demucked and removed from the site. Based on the test borings, we anticipate these soils will be encountered at depths beginning at approximately two to four feet and terminating at depths of around six to seven feet. The clean soils above this stratum can be stockpiled and used as backfill.

The level of the water table at the time of the site observation was approximately five to six feet below the existing ground surface. Therefore, we anticipate that the excavation may fall below the water table. We note that the water table will fluctuate due rainfall and other factors. Based on the depth of the unsuitable soils it is anticipated that dewatering operations may not be performed and the recommendations provided below reflect that condition. If dewatering is needed, our office should be notified in order to evaluate our recommendations and determine if alternative recommendations should be provided. We note that the water table should be at least two feet below the bottom of excavation during any compaction operations.

If dewatering is not performed, once the unsuitable soils have been removed, fill placed below the natural groundwater level shall consist of clean sand and limestone having a

Limerock Bearing Ratio (LBR) of at least 40. The fill material shall have no more than 10 percent passing the No. 200 sieve, with a maximum particle size of 3 inches. The fill may be placed in a loose state until reaching no more than two feet above the natural groundwater level. Once the site is two feet above the water table the soils should be compacted with at least ten passes of a small self propelled double drum vibratory roller with a minimum dynamic force of 5 tons. Also, the surface should be compacted until a density equivalent to at least 98 percent of the modified Proctor maximum dry density (ASTM D-1557) is achieved to a depth of at least 12 inches below the compacted surface.

Fill then placed above the proof rolled surface, and is at least two feet above the water table, may then consist of clean granular soils, free of debris and organics, and shall have no more than 10 percent passing the No. 200 sieve, with a maximum particle size of 3 inches.

The fill should be placed in lifts not exceeding 12 inches in loose thickness when using the vibratory compaction equipment described previously. Each lift should be thoroughly compacted until densities equivalent to at least 98 percent of the modified Proctor maximum dry density are uniformly obtained.

The fill should have ASTM designation (D-2487) of GP, GW, SP, or SW, with a maximum particle size of no more than 3 inches or as otherwise approved by Nutting Engineers.

When the demucking has been completed, the bottom of foundation excavations should be compacted after excavation to develop a minimum density requirement of 98 percent of the maximum modified Proctor dry density, for a minimum depth of two (2) feet below the bottom of the footing depth, as determined by field density compaction tests. The floor slab area should also be compacted in the same manner.

GENERAL INFORMATION

Our client for this geotechnical evaluation was:

K2M Design, Inc.
1150 Virginia Street
Key West, Florida 33040

The contents of this report are for the exclusive use of the client, the client's design & construction team and governmental authorities for this specific project exclusively. Information conveyed in this report shall not be used or relied upon by other parties or for other projects without the expressed written consent of NUTTING ENGINEERS OF FLORIDA, INC.

This report discusses geotechnical considerations for this site based upon observed conditions and our understanding of proposed construction for foundation support. Environmental issues including (but not limited to), soil and/or groundwater contamination are beyond our scope of service for this project.

If conditions are encountered which are not consistent with the findings presented in this report, or if proposed construction is moved from the location investigated, this office shall be notified immediately so that the condition or change can be evaluated and appropriate action taken.

Excavations of five feet or more in depth should be sloped or shored in accordance with OSHA and State of Florida requirements.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein, have been presented after being prepared in accordance with general accepted professional practice in the field of foundation engineering, soil mechanics and engineering geology. No other warranties are implied or expressed.

We appreciate the opportunity to be of service on this project. If we can be of any further assistance, or if you need additional information, please contact us at your convenience.

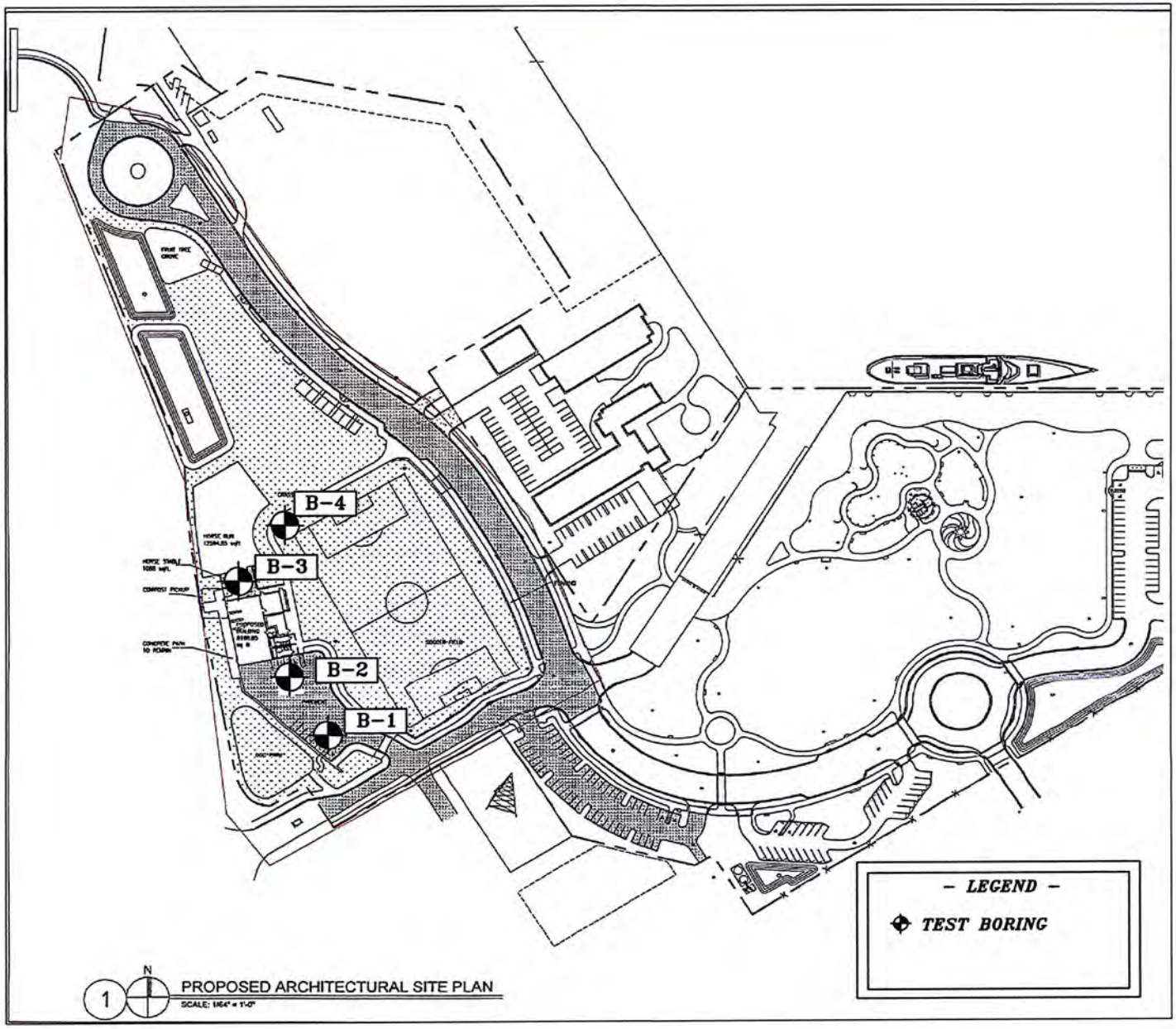
Sincerely,
NUTTING ENGINEERS OF FLORIDA, INC.

Richard Wohlfarth 4/25/18

Adrian Ramirez
Engineering Intern

Richard C. Wohlfarth, P.E #50858
Director of Engineering

Attachments: Boring Location Plan
Test Boring Reports
Soil Classification Criteria
Limitations of Liability



NUTTING ENGINEERS OF FLORIDA, INC.
ESTABLISHED 1967

TRUMAN WATERFRONT PARK
CITY OF KEY WEST WATERFRONT PARK
KEY WEST, FLORIDA

APPROXIMATE TEST LOCATIONS

NOT TO SCALE

FIGURE 1

Nutting Engineer of Florida, Inc.
1310 Neptune Drive
Boynton Beach, FL 33426
Telephone: 561.736.4900
Fax: 561.737.9975

BORING NUMBER B-1

PROJECT NUMBER 2068.5

CLIENT K2M Design, Inc.

PROJECT NAME Truman Waterfront Park

PROJECT LOCATION City of Key West Waterfront Park, FL

DATE STARTED 4/9/18 COMPLETED 4/9/18

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY Dancor CHECKED BY A. Ramirez

∇ AT TIME OF DRILLING 5.5 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value
0		Dk. brown fine SAND, trace roots			
		Lt. brown LIMESTONE FRAGMENTS	SS 1	14-22-18-12	40
		Lt. brown fine SAND, trace limestone fragments	SS 2	7-7-6-2	13
5		Lt. gray SILT ∇	SS 3	1-WOH-1-WOH	
		Lt. brown fine SAND, trace limestone	SS 4	37-22-18-21	40
10			SS 5	15-16-18-20	34
15		Lt. brown LIMESTONE and fine SAND	SS 6	9-26-26-25	52
20		Lt. brown LIMESTONE	SS 7	20-20-18-20	38
25			SS 8	25-27-22-29	49
30			SS 9	15-13-12-14	25
		Bottom of hole at 30.0 feet.			

▲ SPT N VALUE ▲ (10, 20, 30, 40)

PL MC LL (20, 40, 60, 80)

□ FINES CONTENT (%) □ (20, 40, 60, 80)

TEST NUTTING BOREHOLE 2-2068.5 K2M DESIGN, INC. - TRUMAN WATERFRONT PARK.GPJ GINT US.GDT 4/13/18

Nutting Engineer of Florida, Inc.
1310 Neptune Drive
Boynton Beach, FL 33426
Telephone: 561.736.4900
Fax: 561.737.9975

BORING NUMBER B-2

PROJECT NUMBER 2068.5

CLIENT K2M Design, Inc.

PROJECT NAME Truman Waterfront Park

PROJECT LOCATION City of Key West Waterfront Park, FL

DATE STARTED 4/9/18 COMPLETED 4/9/18

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY Dancor CHECKED BY A. Ramirez

∇ AT TIME OF DRILLING 5.3 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value
0		Lt. brown LIMESTONE FRAGMENTS	SS 1	12-30-8-4	38
		Lt. brown fine SILTY SAND			
		Lt. brown SILT	SS 2	3-4-2-9	6
5		Lt. brown fine SAND, trace limestone fragments ∇	SS 3	4-5-4-4	9
			SS 4	1-2-14-22	16
		Lt. brown fine SAND, trace limestone	SS 5	25-40-50/3"	100+
10					
		Lt. brown LIMESTONE	SS 6	22-27-24-26	51
15					
			SS 7	25-24-18-26	42
20					
			SS 8	23-26-23-26	49
25					
			SS 9	6-4-4-5	8
30		Bottom of hole at 30.0 feet.			

▲ SPT N VALUE ▲ (10, 20, 30, 40)

PL MC LL (20, 40, 60, 80)

□ FINES CONTENT (%) □ (20, 40, 60, 80)

TEST NUTTING BOREHOLE 2-2068.5 K2M DESIGN, INC. - TRUMAN WATERFRONT PARK.GPJ GINT US.GDT 4/13/18

Nutting Engineer of Florida, Inc.
1310 Neptune Drive
Boynton Beach, FL 33426
Telephone: 561.736.4900
Fax: 561.737.9975

BORING NUMBER B-3

PROJECT NUMBER 2068.5

CLIENT K2M Design, Inc.

PROJECT NAME Truman Waterfront Park

PROJECT LOCATION City of Key West Waterfront Park, FL

DATE STARTED 4/9/18 COMPLETED 4/9/18

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

GROUND WATER LEVELS:

LOGGED BY Dancor CHECKED BY A. Ramirez

∇ AT TIME OF DRILLING 5.8 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value
0		Dk. brown fine SAND, trace roots			
		Lt. brown LIMESTONE FRAGMENTS	SS 1	11-21-13-6	34
			SS 2	3-4-3-3	7
5		Gray fine SAND and LIMESTONE FRAGMENTS ∇	SS 3	1-1-1-1	2
		Brown fine SAND and LIMESTONE FRAGMENTS	SS 4	3-7-14-21	21
		Lt. brown fine SAND, trace limestone	SS 5	20-28-50/5"	100+
10					
		Lt. brown LIMESTONE	SS 6	8-18-50/5"	100+
15					
20			SS 7	8-17-28-30	45
		Lt. brown LIMESTONE and fine SAND	SS 8	18-17-20-17	37
25					
		Lt. brown fine SAND and LIMESTONE	SS 9	10-9-12-8	21
30		Bottom of hole at 30.0 feet.			

▲ SPT N VALUE ▲ 10 20 30 40

PL MC LL 20 40 60 80

□ FINES CONTENT (%) □ 20 40 60 80

TEST NUTTING BOREHOLE 2-2068.5 K2M DESIGN, INC. - TRUMAN WATERFRONT PARK.GPJ GINT US.GDT 4/13/18

Nutting Engineer of Florida, Inc.
1310 Neptune Drive
Boynton Beach, FL 33426
Telephone: 561.736.4900
Fax: 561.737.9975

BORING NUMBER B-4

PROJECT NUMBER 2068.5

CLIENT K2M Design, Inc.

PROJECT NAME Truman Waterfront Park

PROJECT LOCATION City of Key West Waterfront Park, FL

DATE STARTED 4/9/18 COMPLETED 4/9/18

SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring

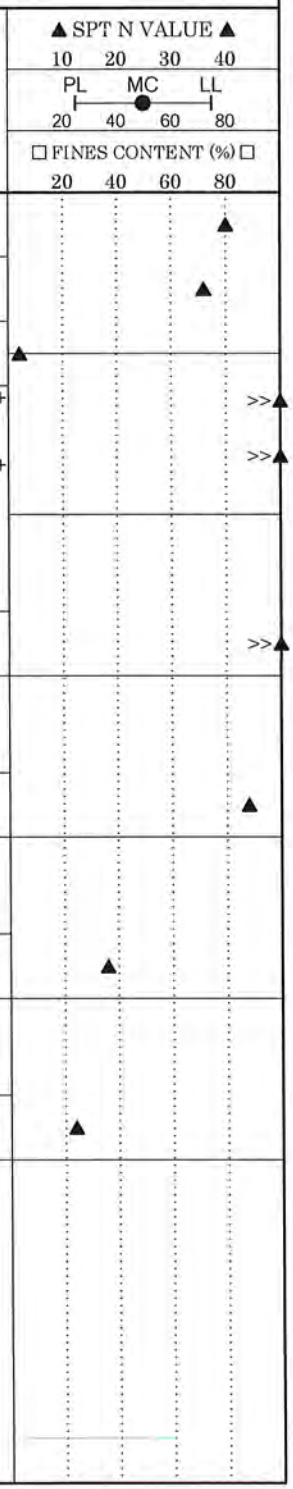
GROUND WATER LEVELS:

LOGGED BY Dancor CHECKED BY A. Ramirez

∇ AT TIME OF DRILLING 5.0 ft

APPROXIMATE LOCATION OF BORING As located on site plan

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value
0		Dk. brown fine SAND, trace roots			
		Lt. brown LIMESTONE FRAGMENTS	SS 1	19-28-12-8	40
			SS 2	12-13-23-9	36
5		∇ Gray fine SAND and LIMESTONE	SS 3	1-1-1-7	2
		Lt. brown fine SAND and LIMESTONE	SS 4	45-50/5"	100+
		Lt. brown fine SAND, trace limestone	SS 5	50/4"	100+
10					
		Lt. brown LIMESTONE	SS 6	10-12-39-30	51
15					
		Lt. brown LIMESTONE and fine SAND	SS 7	24-25-19-21	44
20					
		Lt. brown fine SAND and LIMESTONE	SS 8	9-10-8-7	18
25					
		Lt. brown LIMESTONE and fine SAND	SS 9	8-7-5-7	12
30		Bottom of hole at 30.0 feet.			



TEST NUTTING BOREHOLE 2-2068.5 K2M DESIGN, INC. - TRUMAN WATERFRONT PARK.GPJ GINT US.GDT 4/13/18

SOIL AND ROCK CLASSIFICATION CRITERIA

SAND/SILT

N-VALUE (bpf)	RELATIVE DENSITY
0 – 4	Very Loose
5 – 10	Loose
11 – 29	Medium
30 – 49	Dense
>50	Very dense
100	Refusal

CLAY/SILTY CLAY

N-VALUE (bpf)	UNCONFINED COMP. STRENGTH (tsf)	CONSISTENCY
<2	<0.25	v. Soft
2 – 4	0.25 – 0.50	Soft
5 – 8	0.50 – 1.00	Medium
9 – 15	1.00 – 2.00	Soft
16 – 30	2.00 – 4.00	v. Stiff
>30	>4.00	Hard

ROCK

N-VALUE (bpf)	RELATIVE HARDNESS	ROCK CHARACTERISTICS
N≥ 100	Hard to v. hard	Local rock formations vary in hardness from soft to very hard within short vertical and horizontal distances and often contain vertical solution holes of 3 to 36 inch diameter to varying depths and horizontal solution features. Rock may be brittle to split spoon impact, but more resistant to excavation.
25≤ N ≤ 100	Medium hard to hard	
5≤ N ≤ 25	Soft to medium hard	

PARTICLE SIZE

Boulder	>12 in.
Cobble	3 to 12 in.
Gravel	4.76 mm to 3 in.
Sand	0.074 mm to 4.76 mm
Silt	0.005 mm to 0.074 mm
Clay	<0.005 mm

DESCRIPTION MODIFIERS

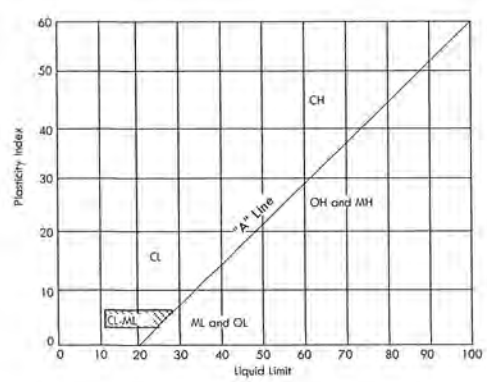
0 – 5%	Slight trace
6 – 10%	Trace
11 – 20%	Little
21 – 35%	Some
>35%	And

Major Divisions			Group Symbols	Typical names
Coarse-grained soils (More than half of material is *larger* than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gavels, gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines
		Gravels with fines (Appreciable amount of fines)	GW* d / u	Silty gravels, gravel-sand-silt mixtures
			GC	Clayey gravels, gravel-sand-clay mixtures
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines
			SP	Poorly graded sands, gravelly sands, little or no fines
		Sands with fines (Appreciable amount of fines)	SM* d / u	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures
Fine-grained soils (More than half of material is *smaller* than No. 200 sieve size)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy, clays, silty clays, lean clays
			OL	Organic silts and organic silty clays of low plasticity
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
			CH	Inorganic clays or high plasticity, fat clays
			OH	Organic clays of medium to high plasticity, organic silts
	Highly organic soils		PT	Peat and other highly organic soils

Laboratory classification criteria

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:
Less than five percent.....GW, GP, SW, SP
More than 12 percent.....GM, GC, SM, SC
5 to 12 percent.....*Borderline* cases requiring dual systems**

$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_z = \frac{(D_{30})^2}{D_{10} x D_{60}}$ *between* 1 and 3	
Not meeting all gradation requirements for GW	
Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols.
Atterberg limits above "A" line with P.I. greater than 7	
$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_z = \frac{(D_{30})^2}{D_{10} x D_{60}}$ *between* 1 and 3	
Not meeting all gradation requirements for SW	
Atterberg limits below "A" line or P.I. less than 4	Limits plotting in hatched zone with P.I. between 4 and 7 are *borderline* cases requiring use of dual system.
Atterberg limits above "A" line with P.I. more than 7	



Plasticity Chart

Nutting Engineers of Florida Inc. | Established 1967
Your Project is Our Commitment

LIMITATIONS OF LIABLILITY

WARRANTY

We warranty that the services performed by Nutting Engineers of Florida, Inc. are conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession in our area currently practicing under similar conditions at the time our services were performed. ***No other warranties, expressed or implied, are made***. While the services of Nutting Engineers of Florida, Inc. are a valuable and integral part of the design and construction teams, we do not warrant, guarantee or insure the quality, completeness, or satisfactory performance of designs, construction plans, specifications we have not prepared, nor the ultimate performance of building site materials or assembly/construction.

SUBSURFACE EXPLORATION

Subsurface exploration is normally accomplished by test borings; test pits are sometimes employed. The method of determining the boring location and the surface elevation at the boring is noted in the report. This information is represented in the soil boring logs and/or a drawing. The location and elevation of the borings should be considered accurate only to the degree inherent with the method used and may be approximate.

The soil boring log includes sampling information, description of the materials recovered, approximate depths of boundaries between soil and rock strata as encountered and immediate depth to water data. The log represents conditions recorded specifically at the location where and when the boring was made. Site conditions may vary through time as will subsurface conditions. The boundaries between different soil strata as encountered are indicated at specific depths; however, these depths are in fact approximate and dependent upon the frequency of sampling, nature and consistency of the respective strata. Substantial variation between soil borings may commonly exist in subsurface conditions. Water level readings are made at the time and under conditions stated on the boring logs. Water levels change with time, precipitation, canal level, local well drawdown and other factors. Water level data provided on soil boring logs shall not be relied upon for groundwater based design or construction considerations.

LABORATORY AND FIELD TESTS

Tests are performed in *general* accordance with specific ASTM Standards unless otherwise indicated. All criteria included in a given ASTM Standard are not always required and performed. Each test boring report indicates the measurements and data developed at each specific test location.

ANALYSIS AND RECOMMENDATIONS

The geotechnical report is prepared primarily to aid in the design of site work and structural foundations. Although the information in the report is expected to be sufficient for these purposes, it shall not be utilized to determine the cost of construction nor to stand alone as a construction specification. Contractors shall verify subsurface conditions as may be appropriate prior to undertaking subsurface work.

Report recommendations are based primarily on data from test borings made at the locations shown on the test boring reports. Soil variations commonly exist between boring locations. Such variations may not become evident until construction. Test pits sometimes provide valuable supplemental information that derived from soil borings. If variations are then noted, the geotechnical engineer shall be contacted in writing immediately so that field conditions can be examined and recommendations revised if necessary.

The geotechnical report states our understanding as to the location, dimensions and structural features proposed for the site. ***Any significant changes of the site improvements or site conditions must be communicated in writing to the geotechnical engineer immediately*** so that the geotechnical analysis, conclusions, and recommendations can be reviewed and appropriately adjusted as necessary.

CONSTRUCTION OBSERVATION

Construction observation and testing is an important element of geotechnical services. The geotechnical engineer's field representative (G.E.F.R.) is the "owner's representative" observing the work of the contractor, performing tests and reporting data from such tests and observations. ***The geotechnical engineer's field representative does not direct the contractor's construction means, methods, operations or personnel.*** The G.E.F.R. does not interfere with the relationship between the owner and the contractor and, except as an observer, does not become a substitute owner on site. The G.E.F.R. is responsible for his/her safety, but has no responsibility for the safety of other personnel at the site. The G.E.F.R. is an important member of a team whose responsibility is to observe and test the work being done and report to the owner whether that work is being carried out in general conformance with the plans and specifications. The enclosed report may be relied upon solely by the named client.

SOIL AND GROUNDWATER MANAGEMENT PLAN

Revised Soil and Groundwater Management Plan (Revision 2) Truman Waterfront Park Key West, Florida

E Sciences Project Number 7-0070-002
February 13, 2015

E Sciences

ENGINEERING
ENVIRONMENTAL
ECOLOGICAL

Prepared for:

Bermello Ajamil & Partners, Inc.
2601 South Bayshore Drive 10th Floor
Miami, Florida 33133

City of Key West
3132 Flagler Avenue
Key West, FL 33040

224 SE 9th Street • Fort Lauderdale, FL 33316 • Tel 954-484-8500 • Fax 954-484-5146 • www.esciencesinc.com

ENGINEERING
ENVIRONMENTAL
ECOLOGICAL

February 13, 2015

Mr. Randy P. Hollingworth
Bermello, Ajamil & Partners, Inc.
2601 South Bayshore Drive, 10th Floor
Miami, FL 33133

Subject: Revised Soil and Groundwater Management Plan – Revision 2
Truman Waterfront Park
Key West, Florida
E Sciences Project Number 7-0070-002

Dear Mr. Hollingworth:

E Sciences, Incorporated (E Sciences) is pleased to submit the enclosed Soil and Groundwater Management Plan (SMP/GMP) for the above referenced site. This SMP/GMP was developed to provide procedures and precautions to be implemented for the management of impacted soil and groundwater during construction activities associated with the development of a 23-acre park referred to as Truman Waterfront Park located on the westernmost area of Key West within the Truman Annex Naval Complex.

We appreciate the opportunity to perform these services for you and the City of Key West. Please contact us at (954) 484-8500 if you have questions regarding this information.

Sincerely,
E SCIENCES, INCORPORATED

Maria Paituvi, P.E.
Senior Engineer

Nadia G. Locke, P.E.
Associate

E Sciences, INCORPORATED
224 SE 9th Street • Fort Lauderdale, FL 33316
ph 954-484-8500 fax 954-484-5146
www.esciencesinc.com

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 BACKGROUND INFORMATION 2

2.1 Truman Annex DRMO Waste Storage Area (Parcel C) 2

2.2 City-Owned Parcel K 4

2.3 Parcel E 5

2.3.1 Parcel E1 6

2.3.2 Parcel E2 6

2.3.3 Parcel E3 8

3.0 SOIL MANAGEMENT PLAN 10

3.1 Health and Safety Plan 12

3.2 Dust and Sediment Control 13

3.3 Soil Stockpile Management 14

3.4 Soil Characterization 14

3.5 Equipment Decontamination 14

3.6 Soil Reuse 16

3.7 Waste Disposal 16

3.8 Disposal Documentation 16

3.9 Tree Removal and Relocation 16

3.10 Pre-Construction Meeting 17

4.0 GROUNDWATER MANAGEMENT PLAN 18

4.1 Extent of Groundwater Impacts 18

4.2 Groundwater Management Provisions 18

4.3 Groundwater Monitoring Wells 19

5.0 SMP/GMP IMPLEMENTATION AND SUPERVISION 20

6.0 RECORD KEEPING AND NOTIFICATIONS 21

7.0 REFERENCES 22

FIGURES

1 Location Map
2 Aerial Photograph
3 Parcel Reference Map
4 Proposed Development Plan, September 2014
5 SMP/GMP Reference Map

APPENDICES

A Communication Records
B Site Rehabilitation Completion Order for Parcel E1 dated August 2001
C Select Construction Plan Set Sheets for East Quay dated 1986
D FDEP Chapter 62-713 F.A.C., Tables A & B
E Truman Waterfront LUC Area Construction Permit

1.0 INTRODUCTION

The City of Key West Naval Properties Local Redevelopment Agency (LRA) has been engaged in the acquisition, planning and permitting of the redevelopment of a portion of the former US Navy Truman Waterfront base since 1995 as allowed by the Federal Government's Base Realignment and Closure (BRAC) process. The LRA is seeking to develop a portion of surplus Navy property known as the Truman Waterfront Upland Parcels, located in Key West, Monroe County, Florida. The overall project consists of designing and implementing a thematically integrated waterfront park consistent with the character of a surrounding historic community and is named the Truman Waterfront Park. E Sciences was engaged by Bermello, Ajamil & Partners, Inc. (B&A) to prepare a Soil and Groundwater Management Plan (SMP/GMP) for the Truman Waterfront Park Project (the Site).

The Site is located at the westernmost end of Key West within the Truman Annex Naval Complex. The Site encompasses multiple properties over an approximate 23-acre area adjacent to the Florida Bay waters. The Site includes Parcel C, Parcel K and Parcel E. The soil and groundwater on these parcels have historically been impacted by former Navy activities. The Navy has undertaken remedial activities in order to achieve cleanup to allow the construction of a recreational park and the unrestricted use of the park by the public. The presence of residual impacted soils will be capped to prevent exposure to the public. The soil and groundwater management provisions presented herein have been developed to provide management protocols specifically for construction activities that might require direct exposure, handling and disposal of residual subsurface impacted soil based during excavation. Additional information regarding the history and status of the assessment and remediation activities conducted at these properties is provided in Section 2.0. The Site location is depicted in **Figure 1**. **Figure 2** provides aerial coverage for the Site.

The provisions provided within this SMP/GMP are based on the review of the current information and reports available and cited herein. The provisions may be modified based on results of future assessment or testing conducted within the subject properties that may occur prior to or during the proposed development activities or based on historical assessment information that may be discovered or provided at later time. It is also noteworthy that the environmental conditions and restrictions are based on proposed deed modifications pending concurrence and approval from the Florida Department of Environmental Protection (FDEP).

2.0 BACKGROUND INFORMATION

The following sections provide a summary of impacts and the regulatory closure status for the following properties within the Site limits:

- City-owned portion of Parcel K: herein referred to as Parcel K.
- Parcel C: herein referred to as the Former Defense Reutilization and Marketing Office Waste Storage Area (DRMO) Parcel.
- Parcel E: subdivided into Parcel E1 (north portion) and Parcel E2 (south portion) and Parcel E3 (strip of land beneath the pavement directly adjacent to waterfront).

The above-referenced parcels have been, or are currently being, addressed for historical impacts under the Department of Navy, Naval Facilities Engineering Command (NAVFAC) BRAC Program. The impacts within these parcels have been addressed to the necessary standards to permit the construction of the proposed waterfront park and the recreational use by the public. The documented soil impacts has been addressed by means of excavation and offsite disposal or the installation of an engineering control that prevents direct exposure to the impacted soil, which will be preserved as part of the park development. The location of these parcels is depicted on **Figure 3**. The following sections present a cursory summary of the history of on those parcels, regulatory status and impacts.

Based on the extensive and complex environmental history of the Site, our understanding of the environmental conditions and restrictions for each parcel was provided to the FDEP and the Navy for concurrence. Correspondence regarding FDEP and Navy concurrence is provided in **Appendix A**.

For the purposes of this SMP/GMP, the soil layer extending from zero to two feet below land surface (bls) is referred to as surface soil and subsurface soil extends below two feet bls. An engineering control may consist of different configurations that prevent the exposure to impacted soil. Engineering controls include but are not limited to the following:

- A two-foot layer of non-impacted soil.
- A concrete or asphalt cover.
- Synthetic liners.

The following sections provide brief background information for each parcel.

2.1 Truman Annex DRMO Waste Storage Area (Parcel C)

The DRMO Parcel is approximately 6.25 acres of land located at the southeastern corner of the Site. The former use of this parcel included storage and use of fuels, oils and metals. The latest regulatory and assessment information for this parcel is documented in a *Site Rehabilitation Completion Report* (SRCR) dated December 2010 prepared by CH2M HILL. This parcel underwent numerous remediation activities

between 1998 and 2010. Excavation and disposal of impacted soil were implemented in order to meet the Soil Cleanup Target Levels (SCTL) defined under FDEP Chapter 62-777, Florida Administrative Code (F.A.C.) and achieve unrestricted land use criteria. Based on review of deed documentation provided by the City of Key West (the City), soil restrictions are in effect for this property and land use is currently restricted to non-residential.

Based on information provided in the 2010 SRCR, the soil impacts at the DRMO Parcel have been remediated to meet SCTLs and it is suitable for unrestricted land use. Therefore, the report recommended that the current Land Use Controls (LUC) tied to the property deed be revoked.

A *BRAC Five Year Review of Six BRAC Environmental Sites for Naval Air Station Key West* report dated April 2014 includes additional information regarding the DRMO Parcel. According to this document, parameters of concern included inorganics (lead, antimony, iron, arsenic, manganese), semi-volatile organic compounds (SVOC) (benzo[a]pyrene, benzo(b)fluoranthene, dibenzo[a,h]anthracene, and indeno(1,2,3-cd)pyrene) and polychlorinated biphenyls (PCBs).

Based on information disclosed during a teleconference held on April 14, 2014 (attended by BRAC, FDEP Federal Programs Section Bureau of Waste Cleanup and Naval Air Station Key West representatives), FDEP's review revealed a concern regarding historic iron levels in the soil and FDEP requested additional monitoring to determine that iron has not leached into the groundwater. The results of a recent groundwater sampling event revealed no groundwater contamination impacts. Other information disclosed during this teleconference indicates that FDEP is receptive to approval of the removal of the LUCs associated with the soil at this parcel. Therefore, this SMP is based on the assumption that no surface or subsurface soil impacts remain on the DRMO parcel. The GMP is based upon the absence of groundwater impacts. Overall, it is presumed that FDEP will issue a Site Rehabilitation Completion Order (SRCO) for the parcel and this will allow unrestricted groundwater and land use. A copy of the draft minutes from the April 14, 2014 teleconference provided to us is included in **Appendix A**.

We understand that the Navy will revise the deed for the DRMO Parcel and it will allow unrestricted land and groundwater use.

2.2 City-Owned Parcel K

City-owned Parcel K is located on the Truman Annex waterfront. It historically housed multiple buildings associated with metal shops, repair shops, a lumber shed, boat and boiler shops and a foundry. The buildings were removed from this property in 1982. The storage and use of metals, solvents, fuels, acids and oil were considered potential sources of impacts at this location. The latest environmental report available for this parcel is the SRCR dated April 2014. Additional historical information on the current status for this parcel was also contained in the April 2014 BRAC 5 Year Review document. Based on review of deed documentation provided by the City, soil restrictions are in effect for this parcel and it is currently restricted to non-residential use. There are currently no groundwater use restrictions on this parcel.

Parameters of concern historically documented above FDEP SCTLs include PCBs, lead and polycyclic aromatic hydrocarbons (PAH) affecting the surface and subsurface soil. Source removal efforts were implemented between January 2012 and February 2012 in order to meet site-specific recreational use SCTLs at this parcel. The surface soil at this parcel currently meets site-specific Direct Exposure Recreational SCTLs, which allows the construction and use of the park.

The 2014 SRCR recommended that the deed restriction be revised to allow for recreational use of the parcel while maintaining the restriction on residential land use. In correspondence dated June 4, 2014, FDEP stated that the SRCR was suitable for its intent and approved as final. The FDEP would issue a SRCO upon demonstration that the deed has been revised according to the SRCR. Based on information disclosed during a teleconference held on April 14, 2014 (attended by BRAC, FDEP Federal Programs Section Bureau of Waste Cleanup and Naval Air Station Key West representatives), FDEP and BRAC are coordinating the completion of the SRCO and deed modifications.

The following table presents the SCTLs implemented for site rehabilitation. Please note that site-specific recreational SCTLs are above direct exposure residential SCTLs and therefore, those soils shall be considered impacted for the purposes of this SMP.

TABLE 1-1
Soil Cleanup Target Levels
Parcel K, NAS Key West

	Lead (mg/kg)	PCBs (mg/kg)	PAHs (mg/kg)
Residential Adult and Child	400	0.5[b]	0.1[b]
Recreational Youth[a]	400	1.29[b]	0.35[b]
Industrial Worker	1,400	2.6[b]	0.7[b]
Leachability[c]	400	17	8[d]

All values are in milligrams per kilogram (mg/kg) units.
[a] Exposure Factors were obtained from FDEP, RBCA Guidance, and recreational SCTL was calculated using assumptions provided in Appendix B.
[b] When both PCBs and PAHs were collocated, cumulative risk from both PCBs and PAHs together was aimed to be 1E-6, which is equivalent to using the apportioned target SCTL value.
[C] Selected LGW SCTL values are based on protection of groundwater to potable quality, although the area groundwater is likely in contact with saline water in the adjacent bay.
[d] Individual PAHs have LGW SCTLs ranging from 0.7 mg/kg to 77 mg/kg (see Appendix A, Table A-4).

Source: Site Rehabilitation Completion Report, Soil Removal Actions at the City-Owned Portion of Parcel K Revision No. 02 dated April 2014 and prepared by CH2M HILL.

We understand that the Navy will revise the deed for Parcel K and it will allow unrestricted recreational land use and groundwater use.

2.3 Parcel E

Based on review of deed documentation provided by the City, the current LUCs enforced on Parcel E include non-residential land use provisions and groundwater use restrictions. The requirement for engineering controls exists but is limited to a delineated area on the former location of Building 136.

Based on assessment information and the current environmental status of distinct areas within Parcel E, this SMP addresses the following sub-parcel areas independently:

- Parcel E1: also referred to as the former Building 189 site.
- Parcel E2: formerly occupied by Building 136, Building 102 and Building 104 and currently occupied by Building 103
- Parcel E3: also referred to as East Quay.

It is our understanding that the FDEP understands that the above sub-parcels present individual environmental conditions independent of the current LUC provisions. Please refer to **Figure 3** for the location of each sub-parcel. The following sections include background information and environmental conditions pertinent to each sub-parcel.

2.3.1 Parcel E1

Parcel E1 was formerly occupied by Building 189. The latest regulatory documentation available for review is the Site Rehabilitation Completion Order (SRCO) issued by FDEP for this parcel on August 7, 2001. A copy of the SRCO is included in **Appendix B**. Therefore, no groundwater or soil impacts associated with this sub-parcel of Parcel E are considered a concern for the proposed site development and land use as a park. The SMP is based upon the assumption that the Navy will revise the deed and land use restrictions will be removed for this parcel.

2.3.2 Parcel E2

Parcel E2 was formerly occupied by Building 136, Building 102 and Building 104. Building 103 remains on the property. The approximate location of these buildings is depicted on **Figure 3**. Based on the environmental impacts in different areas within Parcel E2, we have provided discussions for two functional areas: the area including Building 102, 103 and 104 and the area including Building 136.

Buildings 102, 103 and 104

Buildings 102 (Former Torpedo Overhaul and Storehouse) and 104 (Former Battery Overhaul and Storage) have been removed. Knowledge of the operations in these buildings is limited to naval submarine support activities. Hazardous materials, specifically volatile organic compounds (VOCs), SVOCs, and inorganics are likely to have been used in these buildings. The latest environmental document available for this parcel regarding soil impacts is a *Proposed Plan for Soil Remedy* dated September 19, 1999. Previous remedial action efforts at Buildings 102 and 104 included the excavation of two separate areas of impacted soil to a depth of two feet bls. Based on review of the reports cited herein, SVOCs (specifically Benzo (a) pyrene constituents) remain above FDEP SCTLs in the subsurface soil.

Building 103 (Former Central Power Plant) is still standing but is out of service. Knowledge of the operations in this building is limited to naval submarine support activities. Documented parameters of concern include SVOCs and PCBs. Removal of impacted soil in the vicinity of Building 103 conducted prior to 1999 was impeded by building foundations and concrete transformer casements in the ground. Therefore, it is concluded that subsurface soil impacts remain within this area.

Most recent information regarding remedial efforts associated with the presence of petroleum free product in the groundwater near Building 102 and Building 103 was provided in a report titled *Annual Status Report Petroleum Recovery Program* December 2005 to December 2006 and *Monthly Status Report January 2007 for Trumbo Point Fuel Farm and Truman Annex Buildings 102 and 10*3 prepared by CH2M HILL. The presence of free product in the groundwater within the area of Building 102 and Building 103 was addressed by implementation of active and passive free product recovery. However, groundwater

analytical data was not available for review to evaluate the potential presence of residual groundwater petroleum impacts in this area.

Based on information provided above, the surface soil within this area of Parcel E2 has been remediated to meet Direct Exposure Residential SCTLs and therefore meets recreational use criteria. Impacts remain above FDEP SCTLs in the subsurface soil. Therefore, an engineering control shall be implemented on this area of Parcel E and subsurface soil shall be considered as impacted soil during construction activities.

Groundwater impacts are presumed within this area of Parcel E2, therefore groundwater use restrictions and groundwater management provisions are applicable for this area.

Building 136

Building 136 served as a naval docking and support facility for more than a century. Building 136 (Shipfitters and, prior to 1951, the Plate and Mold Shop) was demolished and the debris was buried in and around the building's footprint in the 1980s, but the debris was later removed for off-site disposal. Lead, metals, solvents, and oils from building operations and demolition debris buried on site were considered potential soil parameters of concern. The latest regulatory environmental document available for this area is provided in a *Proposed Plan for Soil Remedy* dated September 19, 1999. Additional historical information was also identified in the April 2014 BRAC 5 Year Review document and the 2010 SRCR for the DRMO parcel.

Remedial efforts consisting of soil removal were implemented in this area in 1999 and 2007. COCs for this area included SVOCs, arsenic and iron. During the 1999 source removal, due to impacts remaining below the surface in the vicinity of building 136, an engineering control was implemented in order to address the residual arsenic soil impacts below two feet bls. This engineering control was incorporated into the deed restriction for Parcel E and was limited to a delineated area. Additional remedial efforts conducted in 2007, after the deed restriction was executed, removed the additional arsenic impacted soil near Building 136 to a depth of two feet bls.

No reports documenting the presence of groundwater impacts were identified or provided during the development of this document. Therefore, groundwater analytical data was not available for review to evaluate the potential presence of groundwater petroleum impacts in this area.

Based on information reviewed, no surface soil impacts are present within this area. However, we could not ascertain the presence or absence of subsurface soil impacts within this area of Parcel E2. Therefore, the subsurface soil will be considered impacted for the purposes of this SMP and an engineering control shall be implemented on this area of Parcel E. Groundwater use restrictions are in effect on this parcel

based on the current deed conditions. Groundwater restriction and management provisions will be applicable to this area of Parcel E2.

We understand that the deed will continue to have soil and groundwater land use restrictions for Parcel E2.

2.3.3 Parcel E3

Parcel E3 consists of fill soil beneath the concrete slab of the "East Quay". According to information provided by BRAC, in 1988 earthwork was conducted in this parcel to tie the seawall into the deadmen that anchor the wall. During these construction efforts, a Navy fuel line was identified in the work area. Several thousand cubic yards of petroleum-impacted soil were removed off-site as part of this construction activity. However, no documentation related to these activities has been located for review at this time. Construction plans and cross sections for this parcel dated 1986 depict the presence of diesel oil lines, tanks, an oil-water separator and other utilities. Boring logs included within the plan sheets, document the presence of petroleum product odors identified "above limestone" in the subsurface. Copies of select pages of the plan set identifying these features are provided in **Appendix C**.

Based on this limited information available and based on recommendations by BRAC, this parcel is considered to have surface and subsurface soil impacts. Groundwater use restrictions are in effect on this parcel based on the current deed conditions.

We understand that the deed will continue to have soil and groundwater land use restrictions for Parcel E3. The requirements and measures contained within this SMP/GMP regarding Parcel E3 are subject to change based on additional assessment or review of additional documentation that may be conducted at a later time.

The following table summarizes the current impacts and proposed restrictions for each parcel. The proposed restrictions are based on most recent groundwater assessment results conducted by the Navy and are subject to approval by FDEP.

Table 2.1 Summary of Existing Environmental Conditions

		Former DRMO	Parcel K	Parcel E1	Parcel E2	Parcel E3
Surface Soil	Above FDEP SCTLs		✓			✓
	Meets FDEP Residential Exposure SCTLs	✓		✓	✓	
	Meet Site-Specific Recreational SCTLs[1]		✓			
Subsurface Soil	Above FDEP SCTLs		✓		✓	✓
	Meets FDEP Residential Exposure SCTLs	✓		✓		
	Meets Site Specific Recreational SCTLs		✓			
Groundwater	Impacts Present or Presumed				✓	✓
	No Impacts	✓	✓	✓		
Restrictions	Engineering Control to prevent exposure to subsurface soil to be maintained				✓	✓
	Surface Soil to be replaced with clean fill or an engineering control to be installed over existing surface soil					✓
	Recreational Use Allowed for Surface Soil	✓	✓	✓	✓	
	Groundwater Use Restriction				✓	✓

SCTL =Soil Cleanup Target Levels defined under Florida Department of Environmental Protection (FDEP) Chapter 62-777, Florida Administrative Code (F.A.C.)

[1]Site-specific Recreational SCTL values area above the FDEP Direct Exposure Residential SCTLs (dependent on the parameter). Therefore, for the purposes of this SMP, Recreational soils are considered to be above FDEP SCTLs based on Direct Exposure Residential criteria.

3.0 SOIL MANAGEMENT PLAN

The following SMP has been developed to isolate the areas within the parcels where previous assessment activities identified soils with impacts above the Residential, Recreational and Industrial Direct Exposure SCTLs and to provide protocols and precautions that will be implemented for the management of soil excavated within the SMP area during design and construction activities for the Site. The proposed development plan is depicted on **Figure 4**.

The documented impacts within the subject parcels have been or will be addressed as follows in order to meet the regulatory requirements to construct the proposed park for the safe use of the public:

- Excavation and offsite disposal;
- Implementation of engineering controls to prevent direct exposure to subsurface impacted soil. This approach is widely implemented in similar conditions as it provides an effective barrier for the protection of the human health and the environment.

Soil impact information provided herein is based on information provided and contained within the documents referenced in Section 2.0. Table 3.1 below summarizes the soil impacts documented for each individual parcel. The areas and soil layers affected by impacts depicted on **Figure 5** are referred to as SMP areas as described herein.

Soil excavation and regulatory documentation within soil impact areas shall be conducted in accordance with FDEP Chapter 62-780.500(5) as it pertains to soil removal, treatment, and disposal.

Table 3.1
Soil Impacts and SMP Summary

Site	Depth Interval	Impacts	SMP Provisions
DRMO	No Impacts	• No Impacts	•No import of soil from other parcels. •No re-use of soil beyond parcel boundaries.
Parcel K	Surface Soil	• Meets site-specific Recreational SCTLs •Above FDEP Residential SCTLs	•No re-use of soil beyond parcel boundaries. •Subject to SMP provisions.
	Subsurface Soil	• Meets site-specific Recreational SCTLs •Above Residential FDEP SCTLs	•No re-use of subsurface soil beyond parcel boundaries. •Subject to SMP provisions described in Section 3.0.
Parcel E1	No Impacts	•No Impacts	•No import of soil from other parcels. •No re-use of soil beyond parcel boundaries.
Parcel E2	Surface Soil	•No Impacts	•No import of soil from other parcels. •No re-use of soil beyond parcel boundaries.
	Subsurface Soil	•Above FDEP Residential SCTLs	•Subsurface soil excavated shall not be used above 2 feet bls within the parcel boundaries unless covered with an engineering control. •No re-use of soil beyond parcel boundaries. •If excavated, upper two feet must be replaced with a minimum of two feet of non-impacted soil or alternative engineering control. • Subject to SMP provisions described in Section 3.0.
Parcel E3	Surface Soil (Beneath concrete)	•Above FDEP Residential SCTLs	•Soil must be excavated or covered with appropriate engineering controls. •No re-use of soil beyond parcel boundaries. • Subject to SMP provisions described in Section 3.0.
	Subsurface Soil	•Above FDEP Residential SCTLs	•Soil must be covered with appropriate engineering controls. •No re-use of subsurface soil beyond parcel boundaries. • Subject to SMP provisions described in Section 3.0.

Remediation efforts in Parcel K were targeted to meet site specific Recreational SCTLs. The Recreational SCTLs are equal or above Residential Direct Exposure SCTLs and therefore, soil excavated from those areas is to be handled as impacted soil.

In the event that soil staining/discoloration or odor is identified during construction, work in the affected area shall cease and onsite personnel shall notify the project manager in order to document the findings and evaluate the potential soil management provisions and proper course of action. In the event that buried debris is encountered during construction activities, work in the affected are shall cease and the project manager must be notified to document the findings and evaluate the proper course of action. Additional information regarding notifications is provided in Section 5.0.

3.1 Health and Safety Plan

The proposed development will be conducted in areas subject to soil and groundwater restrictions due to the presence of parameters of concern. As such, the construction activities in those areas must be implemented by personnel who meet the necessary safety training requirements. These requirements include, but are not limited to training for workers who will come in direct contact with contaminated media as outlined in the Occupational Safety and Health Administration (OSHA) Standard 1910.120(e). While general requirements from this standard are outlined below the contractor shall ensure full compliance with OSHA requirements:

- General site workers (such as equipment operators, general laborers and supervisory personnel) engaged in hazardous substance removal or other activities which expose or potentially expose workers to hazardous substances and health hazards shall receive a minimum of 40 hours of instruction off the site, and a minimum of three days actual field experience under the direct supervision of a trained experienced supervisor.
- Workers on site only occasionally for a specific limited task (such as, but not limited to, land surveying, or geophysical surveying) and who are unlikely to be exposed over permissible exposure limits and published exposure limits shall receive a minimum of 24 hours of instruction off the site, and the minimum of one day actual field experience under the direct supervision of a trained, experienced supervisor.
- On-site management and supervisors who supervise employees engaged in, hazardous waste operations shall receive 40 hours initial training, and three days of supervised field experience and at least eight additional hours of specialized training at the time of job assignment on such topics as, but not limited to, the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring procedure and techniques.

Prior to implementing construction activities at the Site, the contractor shall develop a site-specific Health and Safety Plan (HASP) for workers directly exposed to soil and groundwater at the Site. The HASP shall describe the known or presumed existing site conditions that may affect worker or public health and safety; the activities that will be taking place within the SMP/GMP affected areas; health and safety requirements; appropriate levels of personal protection required and the criteria for such protection; hygiene; decontamination procedures; training requirements and contingency planning in terms of communication, emergency equipment and emergency planning, as well as any appropriate monitoring or inspection requirements.

Minimum requirements to be included in the HASP include, but are not limited to:

- Description of the specific work areas and impacts associated with the proposed construction activity.
- List of key personnel responsible for site safety, response operations and protection of public health.
- Procedures to control site access.
- Specific description of levels of protection to be worn by personnel in the work area.
- Description of decontamination procedures for personnel and equipment
- Establishment of site specific emergency procedures, including route to nearest medical facility and emergency care for on-site injuries

The contractor shall be responsible for preparing and implementing the HASP in accordance with OSHA 1910(b). In the event that previously unknown conditions are discovered during the course of the construction activities, the contractor shall update and modify the HASP provisions accordingly.

FDEP has compiled templates and guidance for the preparation of HASP for similar cleanup sites. This information can be accessed at the following link:
http://www.dep.state.fl.us/waste/categories/pcp/pages/safety.htm

3.2 Dust and Sediment Control

Dust and sediment control measures shall be implemented in compliance with all applicable laws and regulations. During excavation of impacted soil, all exposed soil surfaces within the SMP area (refer to **Figure 5**) shall be kept visibly moist by water spray, or covered with continuous heavy-duty plastic sheeting or other covering to minimize emissions of particulates into the atmosphere. Soil shall not be inundated to the degree that may cause soil migration.

Vehicular access in the SMP area should be controlled and vehicles sprayed prior to exiting the Site as necessary to keep soil onsite and prevent off-site tracking of impacted soil. Parking areas, staging areas, and traffic pathways on the Site shall be cleaned as necessary to control dust emissions. Adjacent public streets shall also be cleaned immediately when soil material from the Site is visible. Soil loaded into

transport vehicles for off-site disposal shall be covered with tarps or other covering to minimize emissions into the atmosphere. The cover shall be in good condition, joined at the seams, and securely anchored.

All soil stockpiles and uncovered soils in the SMP areas shall be managed by appropriate erosion and sediment best management practices (BMPs) in accordance with the project's Erosion Control Plan (ECP) and Stormwater Pollution Prevention Plan (SWPPP). The ECP may be integral to the SWPPP and shall be developed and implemented by the contractor.

3.3 Soil Stockpile Management

Excavated soil from the SMP areas where FDEP SCTL exceedances are known shall be segregated and stockpiled separately from clean soil and placed on top of heavy-duty plastic sheeting. The excavated soil within the subject SMP area shall be stockpiled in a designated area and shall be maintained according to the ECP, applicable regulations and best management practices. A stockpile management system shall be developed prior to earthwork. The origin of the soil in each stockpile shall be documented and the stockpile tracked during relocation and disposal. Each stockpile shall be categorized and numbered. Wherever practical, excavated soil will be stockpiled in areas with improved asphalt or concrete surface and not adjacent to drainage features and water bodies. Soil stockpiles shall be covered with impervious material adequate to prevent soil transport by wind or rainwater runoff. Covers shall be maintained in good condition and inspected daily. When not covered, soil stockpile surfaces shall be kept visibly moist by water spray, as necessary.

3.4 Soil Characterization

Soil with FDEP SCTL exceedances excavated from the SMP areas shall be properly sampled by qualified staff according to the frequency required by the pre-designated disposal facility. As a minimum, sampling frequency shall be conducted as presented in Table A of FDEP Chapter 62-713 F.A.C. Sampling will be conducted for disposal characterization prior to off-site disposal or the future re-use within the Site in accordance with FDEP Standard Operating Procedures (SOP) FS 5000 Waste Sampling per FDEP Chapter 62-160, as appropriate. The qualified staff will report items out of the ordinary and will contact FDEP and the disposal facility, if necessary, to determine the need for additional testing. Soil samples will be analyzed for the presence of the parameters of concern to be determined by the selected disposal facility. Please see **Appendix D** for a copy of an excerpt of the referenced regulatory rule.

3.5 Equipment Decontamination

The contractor must designate a temporary decontamination area within each SMP area. After completing surface and subsurface earthwork, the contractor shall decontaminate the equipment and vehicles that have come in contact with impacted soil by washing off the equipment and excavator buckets with a neutral

surfactant and water mix followed by a water rinse. Decontamination shall be performed when vehicles and equipment are being transferred from one SMP area to another.

3.6 Soil Reuse

Soil re-use is an option under certain circumstances. Soil re-use is defined as the excavation of soil from one location and placement of soil for use as fill in another location within a respective parcel. All soil must remain within the site boundaries, even during re-use activities. Additionally soil excavated within a respective SMP parcel may be reused within that parcel provided that impacted soils are managed as such, and in a manner consistent with the engineering control restrictions applicable to the parcel. Table 3.1 specifically states the SMP provisions that must be followed in each case. Soil for backfill may be imported from off-site sources if soil shortages occur. The contractor will certify and provide supporting documentation that any imported soil is not contaminated prior to arriving onsite.

3.7 Waste Disposal

Soil that is excavated from the SMP area exhibiting parameter concentrations above SCTLs based on analytical results (see Section 3.4) that is not being re-used and requires off-site disposal shall be kept in distinct stockpiles and in accordance with Section 3.3 pending characterization and disposal. Impacted soil will be transported to a FDEP-approved solid waste disposal or treatment facility.

Appropriate vehicles and operating procedures will be used to prevent spillage and leakage of materials from occurring at the Site and en-route to the disposal facility. Trucks shall be securely covered prior to leaving the Site. If materials resulting from leakage or tracking are observed along the adjacent roadways, they shall immediately be cleaned and procedures modified as necessary to prevent recurrence.

3.8 Disposal Documentation

A manifest system shall be used so that impacted soils can be tracked from generation (excavation location, stockpile) to ultimate disposal. The manifests shall comply with all provisions of the appropriate transportation and disposal regulations.

The City will be considered the generator of these wastes. The Contractor shall coordinate manifest signatures with appropriate City personnel.

3.9 Tree Removal and Relocation

Tree removal and relocation may be included as part of the development scope for the Site. Trees shall not be relocated from an impacted parcel to an unrestricted parcel. In the event that tree removal is required within Parcel K and Parcel E, the affected trees will be removed from the root ball as practicable; the roots will be washed off as practical to remove soil within the root area, chipped for use as mulch or off-site disposal. Soil washing shall occur in a designated area and in a manner so as to contain the spread of impacted soil on the ground.

3.10 Pre-Construction Meeting

Prior to initiation of construction activities, a qualified staff member shall conduct a pre-construction meeting with the contractor to identify the area within the Site that was identified as the SMP area and discuss health and safety protocols and other items pertinent to soil management. Visual markers shall be placed to delineate the SMP areas prior to any site work.

4.0 GROUNDWATER MANAGEMENT PLAN

The following GMP has been developed to reduce disturbance and migration of groundwater impacts during construction activities at the Site.

4.1 Extent of Groundwater Impacts

The following information regarding groundwater impacts is based on the information summarized in Section 2.0:

- No groundwater impacts are present within the DRMO Parcel.
- No groundwater impacts are present within Parcel K.
- The presence of petroleum has been documented in Parcels E2 and E3. Groundwater restrictions are applicable to these sub-parcels.
- Groundwater impacts in Parcel E1 have been addressed to meet regulatory criteria and therefore no groundwater restrictions are deemed necessary within this sub-parcel.

Therefore, the GMP provisions are applicable to Parcel E2 and E3 only. The parameters of concern in these areas include petroleum product previously identified in the building 102 and 104 and East Quay areas. Parameters of concern for the building 136 area have not been determined based on the lack of assessment data. However, soil impacts in the area of building 136 included SVOCs, iron and arsenic. Therefore, groundwater parameters of concern for Parcel E2 include SVOC, iron, arsenic and petroleum constituents.

4.2 Groundwater Management Provisions

The following provisions apply to the GMP area:

- The contractor shall obtain all necessary dewatering permits for the project. Dewatering permits as required must be approved by FDEP and the South Florida Water Management District. In addition, a Generic Permit for Discharges from Petroleum Contaminated Sites under Chapter 62-621.300, F.A.C. must be secured by the construction contractor and approved by FDEP prior to dewatering activities in areas with impacted groundwater or areas within 500 feet of known or presumed impacted groundwater. The permit conditions must be enforced. Additional permit conditions may be required based on parameters of concern identified within the GMP.
- Groundwater may not be discharged to a storm drain or sanitary sewer unless in compliance with an approved discharge permit. Discharge into the City Waste Water Treatment Plant will need to meet influent standards and will require prior approval from the City.

- The discharge must be free of floating solids, visible foam, turbidity, or visible oil and must not create nuisances to surface waters.
- If groundwater is extracted, it must be contained, characterized and treated (if required) prior to discharge to a permitted discharge point or disposed off-site.
- Records of groundwater testing and disposal documentation shall be kept on file.
- Groundwater monitoring as required by the Dewatering Permit conditions shall be implemented.
- Groundwater shall not be used for irrigation purposes.
- No water supply wells shall be used onsite.
- Daily logs documenting dewatering activities shall be kept on file.

Please note that additional and specific requirements will be dictated by the permitting agency upon issuing the dewatering permit for the specific proposed dewatering areas.

Also note that dewatering activities conducted within the remaining parcels may affect the migration of the groundwater impacts from Parcels E2 and E3. Therefore, it is possible that depending on the extent of the dewatering conducted within other parcel areas adjacent to Parcel E2 and E3, dewatering restrictions and conditions may be required. It will be incumbent on the contractor to demonstrate that dewatering will not cause migration of impacted groundwater into un-impacted areas.

4.3 Groundwater Monitoring Wells

Existing monitoring wells must be protected from damage or replaced if damaged or removed during construction. Preconstruction and post-construction surveys of existing monitoring wells shall be conducted. The contractor shall be responsible to replace damaged monitoring wells.

5.0 SMP/GMP IMPLEMENTATION AND SUPERVISION

Prior to commencing work within the Site, the contractor shall complete and certify the Truman Waterfront LUC Area Construction Permit for submittal to the Navy for approval. The permit application shall also be submitted to FDEP for review and concurrence. The permit application form is included in **Appendix E**. This permit includes a certification that the permitee will obtain a copy of this SMP/GMP document and implement the protocols and measure described herein.

An environmental professional will be designated by the City of Key West to observe and document the construction activities as they relate to the proper soil and groundwater management and compliance with this SMP/GMP. This designated professional will conduct periodic site visits and document activities, as well as report back to the City regarding additional management measures required or improper techniques observed. This observation will be conducted on behalf of the City and does not exempt the contractor for responsibility to implement and enforce the SMP and GMP provision, nor does it substitute or exclude the notification and record keeping requirements set forth in Section 6.0 of this document.

Please note that the City will not be responsible for enforcement and implementation of the HASP.

6.0 RECORD KEEPING AND NOTIFICATIONS

Based on the presence of impacts at the Site, site contractor personnel shall document the soil and groundwater disposal practices, soil re-use activities as well as document health and safety protocols and routine briefings. The following records shall be kept on file for submittal to the City, the Navy and FDEP upon completion of development or as requested during construction activities:

- Manifests for disposal of impacted soil or groundwater.
- Laboratory analytical reports for soil and groundwater testing performed during development.
- Documentation regarding clean fill brought to the Site during development.
- Records of damaged monitoring wells and well replacement activities, if applicable.
- Daily logs of soil removed from the Site for off-site disposal.
- Documentation of stockpile tracking.
- Records of communication regarding unforeseen environmental conditions encountered.
- Records of discovery of soil staining or discoloration, or odor. This information will include descriptions of the observations, locations, notifications, as well as course of action implemented.

Questions regarding environmental conditions or discovery of potential environmental conditions not included here can be addressed to the Mr. James Bouquet with the City of Key West at (305) 809-3962 and jbouquet@cityofkeywest-fl.gov.

7.0 REFERENCES

CH2M HILL, *Annual Status Report Petroleum Recovery Program December 2005 to December 2006 Monthly Status Report January 2007 for Trumbo Point Fuel Farm and Truman Annex Buildings 102 and 103,* May 2007

CH2M HILL, *Site Rehabilitation Completion Report Soil Removal Actions at the City-Owned Portion of Parcel K, Naval Air Station Key West, Key West, Florida,* April 2014

FDEP, *correspondence regarding approval of Site Rehabilitation Completion Report Soil Removal Actions at the City-Owned Portion of Parcel K,* June 4, 2014

TetraTech*, BRAC Five Year Review for Six BRAC Environmental Sites Naval Air Station Key West,* April 2014

CH2M HILL, *Site Rehabilitation Completion Report Former Defense Reutilization and Marketing Office Truman Annex, Naval Air Station Key West, Key West, Florida,* December 2010

Naval Facilities Engineering Southern Division Command, *Finding of Suitability to Transfer Truman Annex Parcels*, Naval Air Facility, Key West, Florida,

Draft Teleconference Notes (version 2), meeting held by FDEP, BRAC, NAVFAC and NAS, April 14, 2014

Proposed Plan for Soil Remedy at Truman Annex Buildings 102 And 104 Naval Air Station, September 19, 1999

Proposed Plan for Soil Remedy at Truman Annex Buildings 103 Naval Air Station, September 19, 1999

Proposed Plan for Soil Remedy at Truman Annex Buildings 136 Naval Air Station, September 19, 1999

FDEP*, Site Rehabilitation Completion Order*, Building 189, *Naval Air Station Key West, Key West, Florida,* August 7, 2001

County of Monroe, *Quitclaim Deed, December 3, 2002*

FIGURES

Background Source: ESRI Street Map

Legend

Project Location

0 300 600 1,200 1,800 2,400 Feet

E Sciences, Incorporated
FL Engineering Lic. #8691
224 SE 9th Street
Ft. Lauderdale, Florida 33316
www.esciencesinc.com
Phone: 954-484-8500
Fax: 954-484-5146

Truman Waterfront Park

Section 6, Township 68S, Range 25E
Key West, Monroe County, Florida

Location Map

FIGURE 1

DRAWN BY: TV	CHECKED BY: MP	PROJECT NUMBER: 7-0070-002	SCALE: 1 "=1,000 '	DATE: 8/28/2014

P:\Projects\7-0000-0099\7-0070-002\4_figures and drawings\GIS\1. Location Map.mxd

E Sciences, Incorporated
FL Engineering Lic. #8691
224 SE 9th Street
Ft. Lauderdale, Florida 33316
www.esciencesinc.com
Phone: 954-484-8500
Fax: 954-484-5146

Truman Waterfront Park

Section 6, Township 68S, Range 25E
Key West, Monroe County, Florida

Aerial Photograph

FIGURE
2

DRAWN BY: TV	CHECKED BY: MP	PROJECT NUMBER: 7-0070-002	SCALE: 1 "=350 '	DATE: 8/28/2014

P:\Projects\7-0000-0099\7-0070-002\4_figures and drawings\GIS\2. Aerial Photograph.mxd

Legend

Project Location Former building locations are approximate based on historical documents.

E Sciences, Incorporated
FL Engineering Lic. #8691
224 SE 9th Street
Ft. Lauderdale, Florida 33316
www.esciencesinc.com
Phone: 954-484-8500
Fax: 954-484-5146

Truman Waterfront Park

Section 6, Township 68S, Range 25E
Key West, Monroe County, Florida

Parcel Reference Map

FIGURE 3

DRAWN BY: LG	CHECKED BY: MP	PROJECT NUMBER: 7-0070-002	SCALE: 1 "=350 '	DATE: 10/23/2014

O:\Projects\7-0000-0099\7-0070-0024_figures and drawings\GIS\Parcel Reference Map.mxd

P:\Projects\7-0000-0099\7-0070-002\4_figures and drawings\GIS\Proposed Development Plan September 2014.mxd

E Sciences, Incorporated
FL Engineering Lic. #8691
224 S.E. 9th Street
Fort Lauderdale, FL 33316
www.esciencesinc.com
Phone: 954-484-8500
Fax: 954-484-5146

Truman Waterfront Park

Section 6, Township 68S, Racnge 25E
Key West, Monroe County, Florida

Proposed Development Plan September 2014

FIGURE 4

DRAWN BY: LG	CHECKED BY:	PROJECT NUMBER: 7-0070-002	SCALE: NTS	DATE: 10/8/2014

Soil and Groundwater Impacts and SMP/GMP Summary		
Impacts		**Provisions**
No Impacts	• No Impacts	•No import of soil from other parcels. •No re-use of soil beyond parcel boundaries.
Surface Soil	• Meets site-specific Recreational SCTLs •Above FDEP SCTLs	•No re-use of soil beyond parcel boundaries. •Subject to SMP provisions presented in Section 3.0 of Soil and Groundwater Management Plan dated February 6, 2015..
Subsurface Soil	•Above FDEP SCTLs	•No re-use of soil beyond parcel boundaries •Subject to SMP provisions presented in Section 3.0 of Soil and Groundwater Management Plan dated February 6, 2015..
Surface Soil	•No Impacts	•No import of soil from other parcels. •No re-use of soil beyond parcel boundaries.
Subsurface Soil	•Above FDEP SCTLs	•Subsurface soil excavated shall not be used above 2 feet bls within the parcel boundaries unless covered with an engineering control. •No re-use of soil beyond parcel boundaries. •If excavated, upper two feet must be replaced with a minimum of two feet of non-impacted soil or alternative engineering control. •Subject to SMP provisions presented in Section 3.0 of Soil and Groundwater Management Plan dated February 6, 2015.
Groundwater	•Groundwater Impacts documented.	•Subject to GMP provisions presented in Section 4.0 of Soil and Groundwater Management Plan dated February 6, 2015.
Surface Soil	•Above FDEP SCTLs	•Soil must be excavated or covered with appropriate engineering controls. •No re-use of soil beyond parcel boundaries. •Subject to SMP provisions presented in Section 3.0 of Soil and Groundwater Management Plan dated February 6, 2015..
Subsurface Soil	•Above FDEP SCTLs	•Soil must be excavated or covered with appropriate engineering controls. •No re-use of soil beyond parcel boundaries. •Subject to SMP provisions presented in Section 3.0 of Soil and Groundwater Management Plan dated February 6, 2015.
Groundwater	•Groundwater Impacts documented.	•Subject to GMP provisions presented in Section 4.0 of Soil and Groundwater Management Plan dated February 6, 2015.

Note: Refer to the SMP/GMP text for additional information.

E Sciences, Incorporated
FL Engineering Lic. #8691
224 SE 9th Street
Ft. Lauderdale, Florida 33316
www.esciencesinc.com
Phone: 954-484-8500
Fax: 954-484-5146

Truman Waterfront Park

Section 6, Township 68S, Range 25E
Key West, Monroe County, Florida

SMP and GMP Reference Map

FIGURE 5

DRAWN BY: LG	CHECKED BY: MP	PROJECT NUMBER: 7-0070-002	SCALE: 1 "=350 '	DATE: 2/6/2015

P:\Projects\7-0000-0099\7-0070-0024_figures and drawings\GIS\SMP Reference Map.mxd

APPENDIX A

From:	James Bouquet
To:	Barney, David A CIV NAVFACHQ, BRAC PMO
Cc:	dcraig@keywestcity.com; dbradsha@keywestcity.com; rhollingworth@bermelloajamil.com; Nadia Locke; Amy.Twitty@CH2M.com; Vaught,Tracie (Tracie.Vaught@dep.state.fl.us); Fielding, Thuane B CIV NAVFAC HQ, BRAC PMO; aperez@perezeng.com; Gary Volenec
Subject:	RE: Truman Waterfront Parcel Restrictions
Date:	Tuesday, October 07, 2014 11:32:43 AM

David:

Yes, the existing survey does indicate a "gas line" running under the pier. Our original intent was to remove all of the concrete pavement and replace with new patterned concrete and landscaping. Based on your email , the Navy will now require that soil along the quay not covered with pavement will be under a 2 foot cap (or geomembrane layer) similar to sub-parcel E2, correct?

Are there asbuilts or information available that indicate the extent of soil removal and clean backfill replacement? Again, our plans for this area are primarily surficial and the knowledge that several feet of clean soil existing at the surface would be important from a design, soil management plan and ultimately cost perspective.

Jim

-----Original Message-----
From: Barney, David A CIV NAVFACHQ, BRAC PMO
[mailto:david.a.barney@navy.mil]
Sent: Tuesday, October 07, 2014 11:10 AM
To: James Bouquet
Cc: dcraig@keywestcity.com; dbradsha@keywestcity.com; rhollingworth@bermelloajamil.com; nlocke@esciencesinc.com; Amy.Twitty@CH2M.com; Vaught,Tracie (Tracie.Vaught@dep.state.fl.us); Fielding, Thuane B CIV NAVFAC HQ, BRAC PMO
Subject: RE: Truman Waterfront Parcel Restrictions

Jim,

As I currently understand the circumstances of the Truman Waterfront Parcel Restrictions, the Navy generally agrees with the summary provided below for sub-parcels E1 and E2. However, regarding sub-parcel E3 (the pier) after further discussions it is my understanding that circa 1988, the East Seawall (the pier) was expanded seaward. A significant amount of earthwork was required to tie the new seawall into existing deadmen that anchor the wall. The long tie-rods were replaced during which work a Navy fuel line was identified in the work area. Several thousand cubic yards of petroleum contaminated soil were removed and taken off site as part of this construction activity. However, at this time, the Navy and FDEP have not been able to locate any reports describing the petroleum contaminated soil removal (nature and extent, potential impact to groundwater) or any analytical information on the new fill brought in for the expansion of the seawall. Until such information can be obtained, and concurrence provided to eliminate necessary land use controls, we recommend including appropriate handling of the soil and groundwater at sub-Parcel E3 in your soil management plan.

r/

David Barney
BRAC Environmental Coordinator
Naval Facilities Engineering Command
BRAC Program Management Office East
571 Shea Memorial Drive
South Weymouth, MA 02190

Phone: 617-753-4656
US Mail Address: PO Box 169
Email: david.a.barney@navy.mil

-----Original Message-----
From: James Bouquet [mailto:jbouquet@cityofkeywest-fl.gov]
Sent: Tuesday, September 30, 2014 3:44 PM
To: Barney, David A CIV NAVFACHQ, BRAC PMO
Cc: dcraig@keywestcity.com; dbradsha@keywestcity.com; rhollingworth@bermelloajamil.com; nlocke@esciencesinc.com
Subject: RE: Truman Waterfront Parcel Restrictions

Thanks David and I look forward to working with you.

Let me know what the City or our consulting team can do to expedite the process.

Jim

-----Original Message-----
From: Barney, David A CIV NAVFACHQ, BRAC PMO
[mailto:david.a.barney@navy.mil]
Sent: Tuesday, September 30, 2014 3:36 PM
To: James Bouquet
Subject: RE: Truman Waterfront Parcel Restrictions

Hi Jim,

I am working with one of our Real Estate Specialist (Stephanie Zamorski) on the survey/legal description concerns. I am also working with Amy to better understand the LUC descriptions and what needs to be communicated to, and received from, FDEP to follow up on the bullet points from the initial email from Maria Paituvi below.

r/

David Barney
BRAC Environmental Coordinator
Naval Facilities Engineering Command
BRAC Program Management Office East
571 Shea Memorial Drive
South Weymouth, MA 02190

Phone: 617-753-4656
US Mail Address: PO Box 169
Email: david.a.barney@navy.mil

-----Original Message-----
From: James Bouquet [mailto:jbouquet@cityofkeywest-fl.gov]
Sent: Tuesday, September 30, 2014 2:58 PM
To: Barney, David A CIV NAVFACHQ, BRAC PMO
Subject: FW: Truman Waterfront Parcel Restrictions

David B

Should have directed this to you.

I will be asked why/when was it determined that the City was responsible for surveying/legal descriptions of the environmental parcels? I can see the City preparing descriptions for utility easements effected by the proposed project, but not sure how that relates to the Navy's environmental work?

Jim

-----Original Message-----
From: Criswell, David CIV NAVFAC HQ, BRAC PMO [mailto:david.criswell@navy.mil]
Sent: Tuesday, September 30, 2014 9:35 AM
To: James Bouquet; Barney, David A CIV NAVFACHQ, BRAC PMO
Cc: nlocke@esciencesinc.com; Amy.Twitty@ch2m.com; rhollingworth@bermelloajamil.com; dbradsha@keywestcity.com; dcraig@keywestcity.com; James K. Scholl; mpaituvi@esciencesinc.com; Preston, Gregory C CIV NAVFACHQ, BRAC PMO; tracie.vaught@dep.state.fl.us; Zamorski, Stephanie CIV NAVFACHQ, BRAC PMO
Subject: RE: Truman Waterfront Parcel Restrictions

Jim,

Thank you for reaching out to the "New Dave". One thing I wanted to remind the City of is the need for a survey for each parcel on which the Navy will be releasing the restrictions. Most pressing is the release of restrictions for Parcel K. The Navy needs a survey specific to the Parcel where we are releasing the restrictions. Similar surveys will be needed for the DRMO Parcel and the Parcel E subparcels. Please work with Dave Barney and Amy Twitty to coordinate the requirements.

It has been a pleasure to work with you all and I look forward to visiting Key West again to see the new park!

David Criswell

-----Original Message-----
From: James Bouquet [mailto:jbouquet@cityofkeywest-fl.gov]
Sent: Tuesday, September 30, 2014 8:17 AM

To: Barney, David A CIV NAVFACHQ, BRAC PMO
Cc: nlocke@esciencesinc.com; Amy.Twitty@ch2m.com; rhollingworth@bermelloajamil.com; dbradsha@keywestcity.com; dcraig@keywestcity.com; James K. Scholl; mpaituvi@esciencesinc.com; Criswell, David CIV NAVFAC HQ, BRAC PMO; Preston, Gregory C CIV NAVFACHQ, BRAC PMO; tracie.vaught@dep.state.fl.us
Subject: FW: Truman Waterfront Parcel Restrictions

David:

My name is Jim Bouquet and I am the City of Key West Project Manager for the Truman Waterfront Park Project. As David Criswell is retiring, I am forwarding you this email chain regarding preparation of a draft Soil Management Plan/Groundwater Management Plan to support construction of the proposed park.

As indicated below, Nadia Locke of E-Sciences (the project's environmental consultant) has requested the Navy's conformation of the proposed land use controls (LUCs) for the Truman site, specially as related to the proposed Parcel E subdivisions. Our understanding of these LUCs are based on a presentation by the Navy at the July RAB meeting held in Key West and subsequent discussions with the Navy's consultant CH2M Hill (Amy Twitty). Note that FDEP (Tracie Vaught) has concurred with the proposed LUCs.

We would like to submit a draft Soil Management /Groundwater Management Plan to both the Navy and FDEP during October for review and comment. To meet this schedule, your timely feedback to this email will be appreciated. As you are aware, this Plan and agreement on the LUCs are critical to revising/amending the existing deed for the Site, which will be required prior to commencing construction planned for early Summer 2016.

Feel free to contact and discuss directly with Nadia and her team.

It is our understanding that the BRAC Program Management Office (Greg Preston) will be taking the lead in revising the existing deed. Please let me know if you require additional information from the City to expedite this process.

Thanks and please contact me with any questions.

Jim Bouquet, P.E.

305.809.3962

From: Vaught,Tracie [mailto:Tracie.Vaught@dep.state.fl.us <mailto:Tracie.Vaught@dep.state.fl.us>]
Sent: Tuesday, September 23, 2014 1:55 PM
To: Criswell, David CIV NAVFAC HQ, BRAC PMO; Amy.Twitty@CH2M.com <mailto:Amy.Twitty@CH2M.com> ; James Bouquet; Randy Hollingworth; nlocke@esciencesinc.com <mailto:nlocke@esciencesinc.com>
Cc: Barney, David A CIV NAVFACHQ, BRAC PMO
Subject: RE: Truman Waterfront Parcel Restrictions

The descriptions provided below are correct. I would like to emphasize that the groundwater does have a land use control which will require the groundwater to be handled accordingly if it is impacted in any way during the construction of the Truman Annex Park. The only documents that have been provided with official DEP approval are documents that you already have in your possession.

Respectfully,

Tracie L. Vaught

Bob Martinez Center

2600 Blairstone Road

Mail Station 4535

Tallahassee, Florida, 32399

Tracie.vaught@dep.state.fl.us <mailto:Tracie.vaught@dep.state.fl.us>

Office number (850) 245-8998

-----Original Message-----

From: Criswell, David CIV NAVFAC HQ, BRAC PMO [mailto:david.criswell@navy.mil <mailto:david.criswell@navy.mil>]
Sent: Tuesday, September 23, 2014 1:04 PM
To: Vaught,Tracie
Subject: FW: Truman Waterfront Parcel Restrictions

-----Original Message-----

From: Maria Paituvi [mailto:mpaituvi@esciencesinc.com <mailto:mpaituvi@esciencesinc.com>]

Sent: Tuesday, September 23, 2014 11:05 AM

To: Criswell, David CIV NAVFAC HQ, BRAC PMO; Amy.Twitty@CH2M.com <mailto:Amy.Twitty@CH2M.com>

Cc: Nadia Locke; jbouquet@keywestcity.com <mailto:jbouquet@keywestcity.com> ; Randy Hollingworth (RHollingworth@bermelloajamil.com <mailto:RHollingworth@bermelloajamil.com>)

Subject: Truman Waterfront Parcel Restrictions

Good afternoon David and Amy,

Thank you for providing us with so much information to assist us with preparing the soil management plan for the Truman Waterfront Project. We have reviewed the extensive documentation you have provided. We feel as though we have a good handle on Parcel K and the DRMO parcel. As you already know, Parcel E is the challenging part. We believe that we are at a point where we could use your assistance once again by reviewing our understanding and providing confirmation or clarification.

Based on documents provided and additional information provided by the City, this

is our current understanding of the existing and proposed restrictions on Parcel E for your review and confirmation:

. The parcel was subdivided into Parcels E1, E2 and E3 in order to separate areas with different types of restrictions in order to facilitate the development of the proposed park.

o Parcel E1: This site (Building 189) received an SRCO and therefore can be considered as a clean site (soil and groundwater) for the purpose of development. No soil or groundwater management provision will required for this site during construction of the proposed park and there will be no land use controls.

o Parcel E2: This site includes former Buildings 102, 103, 104 and 136. Historical soil impacts above 2 feet have been addressed to residential standards. Soil impacts remain below 2 feet. Therefore, soil management provisions will address the presence of impacted soil below 2 feet by maintaining the existing engineering control of two feet of clean fill across Parcel E2. Groundwater use restrictions will remain in place but there will be no land use restrictions that will prevent use of this parcel as a recreational park and playground as long as the engineering control remains in pla

o Parcel E3: No soil or groundwater impacts are present. Therefore, no soil or groundwater management restrictions will be required.

. We understand that FDEP was engaged in the discussions during a meeting that occurred in July 2014 where it was agreed by all parties that the Navy and City would employ different land use controls of those subparcels separately and that FDEP concurs in concept with the information presented above. We further understand that the development and use the proposed park is allowable and that there will be no land use restrictions to prevent this type of land use. Are there meeting minutes or any other type of documentation confirming FDEP's concurrence?

. It is the City's understanding that BRAC will be revising the deeds for Parcel E2 and Parcel K to allow for recreational use, and the deeds for Parcels E1, E3 and the DRMO parcel to remove all land use restrictions.

We understand that the history and regulatory interaction for this site is complex and we appreciate your cooperation and insight as we try to develop the soil management plan and convey this information in the most efficient and clear manner.

Please don't hesitate to call us to discuss.

Thank you,

Maria Paituvi, P.E.

Senior Engineer

Description: Description: C:\Users\mpaituvi\AppData\Roaming\Microsoft\Signatures\image001.jpg

224 SE 9th Street

Fort Lauderdale, FL 33316

954/484-8500 Telephone

954/484-5146 Fax

305/984-9162Cell

mpaituvi@esciencesinc.com <mailto:mpaituvi@esciencesinc.com>
<mailto:mpaituvi@esciencesinc.com <mailto:mpaituvi@esciencesinc.com> >

www.esciencesinc.com <http://www.esciencesinc.com>
<http://www.esciencesinc.com/ <http://www.esciencesinc.com/> >

Orlando - Fort Lauderdale - Miami - DeLand

Miami-Dade County CBE, SFWMD SBE

Image removed by sender. <http://survey.dep.state.fl.us/?refemail=Tracie.Vaught@dep.state.fl.us>

Total Control Panel Login

To: nlocke@esciencesinc.com Remove this sender from my allow list

From: jbouquet@cityofkeywest-fl.gov

You received this message because the sender is on your allow list.

Maria Paituvi

From: Amy.Twitty@CH2M.com
Sent: Tuesday, September 09, 2014 4:13 PM
To: Maria Paituvi; Nadia Locke
Cc: jbouquet@keywestcity.com; david.criswell@navy.mil; art.sanford.ctr@navy.mil
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents
Attachments: D Scale drawing Pages from Project Completion Rpt_DRMO.pdf; Figure 2-7 EC-G from Project Completion Rpt_DRMO-2.pdf

Maria – Regarding your first bullet below, please refer to Figure 8 (Summary of Risk-Based Corrective Action Analysis Technical Memorandum) which shows the residual BEQ concentrations from 2 to 4 feet bls. We compared those BEQ results to leachability criteria (8 mg/kg) and all were below; therefore, no removal actions were necessary based on BEQs. However, some results exceeded residential (0.1 mg/kg), recreational (0.35 mg/kg), and industrial (0.7 mg/kg) criteria for BEQs (although it appears some of our color coding is incorrect for some samples). Thus, in the event that subsurface soil >2 ft bls is excavated and brought to the surface, direct exposure to these soils could become an issue and would need to be managed accordingly.

Regarding the second bullet, I have a copy of a 2006 Tech Memo Former DRMO Site. I have uploaded it to the same ftp site as before:

https://transfer.ch2m.com

Then find the "pub" folder and then the "KeyWestDocs" folder. I'm not sure if this full link will work but you can try it (I am an internal client so I can't test it):

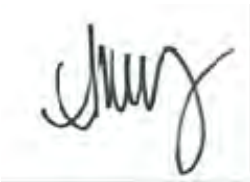
https://transfer.ch2m.com/pub/KeyWestDocs

Please note this week's user ID and Password is:
Username = **ext\Innovation**
Password = **ehulem45**

And yes, iron is the only gw COC.

For your third bullet, this one is a little trickier! I have some free product recovery reports that include Parcel E that I will look for. At a minimum, the portion of Parcel E associated with Building 189 received a Site Rehabilitation Completion Order from FDEP and should remove LUCs from Building 189 and north (not sure there was ever anything to the north anyway). The arsenic left in soil near Building 136 was removed during the DRMO excavation activities (you have that completion report). See figures attached regarding the Engineering Control area G (EC-G) that was removed to 2 ft. The SI (1998) and SSI (1999) reports show some of the soil maps from Parcel E. You also have these reports.

More to follow…



From: Maria Paituvi [mailto:mpaituvi@esciencesinc.com]
Sent: Monday, September 08, 2014 9:49 AM
To: Twitty, Amy/NVR; Nadia Locke
Cc: jbouquet@keywestcity.com
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

Hello Amy,
Thank you for all the files. We are trying to sort through the directly relevant information as it is available in order to prepare the Soil and Groundwater Management Plan for the development of the Truman Waterfront Park. That is why we requested information and documents associated with soil and groundwater delineation for DRMO, Parcel K and Parcel E as they would assist us greatly of depicting an accurate description of the site conditions and allow us to develop the appropriate management measures accordingly. Based on the information reviewed, we have the following understanding:

- Parcel K meets Recreational standards above 2 ft bls and there is no residual contamination above Residential standards below 2 ft. Therefore, we can draft the soil management plan under the provision that only soil above 2 ft is impacted above residential standards. We understand that this site was subject a Risk Based Corrective Action as documented on the Summary of Risk-Based Corrective Action Analysis Technical Memorandum prepared by CH2M Hill dated August 13, 2010. The groundwater is not impacted and there will be no groundwater controls necessary on Parcel K.
- For the DRMO, excavation efforts addressed the surface and subsurface soil impacts and the site meets residential standards. Historical assessment was based on risk characterization and assessment documented in Decision Document for Ten Base Realignment and Closure (BRAC) Sites by TetraTech dated April 2002 and Technical Memorandum – Former DRMO Site prepared by CH2M Hill dated 2007. Could we request a copy of the 2007 CH2M Hill document? We understand that besides the iron, there are no issues related to groundwater and it is anticipated that once this is resolved there will be no LUCs on groundwater.
- We are still trying to locate updated information regarding the groundwater contamination in Parcel E and the delineated soil impacts there. I understand the that entire site is restricted for non-residential use. Are we to assume that all soil at the Site is impacted above residential standards or are there delineation areas available? Based on Decision Document for Ten Base Realignment and Closure (BRAC) Sites by TetraTech dated April 2002, soil impacts at Building 102, 103 and 104 had been addressed and no further action was supported by a residual risk assessment performed for those sites. Arsenic soil contamination remained at the Building 136 site and engineering controls were implemented there. Are there maps that depict where contaminated soil was removed and contaminated soil remains? We could not locate documents regarding groundwater assessment and remediation. Are there maps that depict the groundwater or free product plumes delineations?

If you could confirm the information above and provide any additional clarification and documentation (specially on Parcel E) it will be greatly appreciated.
I am always available to talk, so don't hesitate to call me if you want to discuss any of this information.
Thank you,

Maria Paituvi, P.E.
Senior Engineer

ESciences
ENGINEERING
ENVIRONMENTAL
ECOLOGICAL

224 SE 9th Street
Fort Lauderdale, FL 33316
954/484-8500 Telephone
954/484-5146 Fax
305/984-9162Cell
mpaituvi@esciencesinc.com
www.esciencesinc.com
Orlando - Fort Lauderdale – Miami – DeLand

Miami-Dade County CBE, SFWMD SBE

From: Amy.Twitty@CH2M.com [mailto:Amy.Twitty@CH2M.com]
Sent: Friday, August 29, 2014 11:42 AM
To: Maria Paituvi; Nadia Locke
Cc: jbouquet@keywestcity.com
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

Also note in the 2010 DRMO SRCR Section 2 describes the final excavation to remove soil contamination from 2 to 3 feet to meet residential (not recreational) criteria.

From: Maria Paituvi [mailto:mpaituvi@esciencesinc.com]
Sent: Tuesday, August 26, 2014 9:04 PM
To: Twitty, Amy/NVR; Nadia Locke
Cc: jbouquet@keywestcity.com
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

Hello Amy,

Thank you for providing us with all the valuable information and documents for this project. At this time we have a few more specific questions that I was hoping you might be able to assist us with. The information listed below would assist us better prepare the soil management plan:

- Groundwater impacts have been documented in Building 102, 103 and 104 in Parcel E. The latest groundwater data we have located was included in Free Product Recovery Program Summary Continued Compliance Monitoring – 4th Additional Quarter (March 2005 – May 2005) Compliance Monitoring Results Trumbo Point Fuel Farm, USGC and Navy Piers and Truman Annex Building 103 prepared by CH2M HILL. This document included a figure depicting Free Product Areas but no groundwater contamination plume areas were identified. To your knowledge, is there later data available?
- The DRMO site has a lot of history. Overall it appears that only the top 2 feet of surface soil have been addressed in order to pursue the LUC for recreational use. Do you know if there are soil delineation

maps available for the soil contamination below 2 feet? The SRCR dated December 2010 includes excavation maps and extensive background information but it would help us greatly to identify the specific areas where soil impacts remain below 2 ft bls.

- Regarding Parcel K, the SRCR dated April 2014 stated that impacted surface and subsurface soil was removed from the site and the site has been addressed to Recreational standards. For this site, it would also be helpful to locate any available delineation maps for the impacts remaining on the site below the excavation depth.

We would really appreciate any help and assistance you might be able to provide. The files are both numerous and extensive so any insight you can provide to locate the above information would be greatly appreciated. The information provided above is based on our cursory review of the files available.

Please contact me with any questions or comments.

Thank you,

Maria Paituvi, P.E.
Project Engineer

ESciences ENGINEERING ENVIRONMENTAL ECOLOGICAL

224 SE 9th Street
Fort Lauderdale, FL 33316
954/484-8500 Telephone
954/484-5146 Fax
305/984-9162Cell
mpaituvi@esciencesinc.com
www.esciencesinc.com
Orlando - Fort Lauderdale – Miami – DeLand
Miami-Dade County CBE, SFWMD SBE

From: Amy.Twitty@CH2M.com [Amy.Twitty@CH2M.com]
Sent: Monday, August 25, 2014 11:59 AM
To: Maria Paituvi; Nadia Locke
Cc: jbouquet@keywestcity.com
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

Glad to hear it. Sorry for the confusion.

From: Maria Paituvi [mailto:mpaituvi@esciencesinc.com]
Sent: Monday, August 25, 2014 10:58 AM
To: Twitty, Amy/NVR; Nadia Locke
Cc: jbouquet@keywestcity.com
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

Thanks Amy,
We were able to locate and download the documents under the link provided.
Regards,

Maria Paituvi, P.E.
Project Engineer

ESciences ENGINEERING ENVIRONMENTAL ECOLOGICAL

224 SE 9th Street
Fort Lauderdale, FL 33316
954/484-8500 Telephone
954/484-5146 Fax
305/984-9162Cell
mpaituvi@esciencesinc.com
www.esciencesinc.com
Orlando - Fort Lauderdale – Miami – DeLand

Miami-Dade County CBE, SFWMD SBE

From: Amy.Twitty@CH2M.com [mailto:Amy.Twitty@CH2M.com]
Sent: Monday, August 25, 2014 10:03 AM
To: Nadia Locke
Cc: Maria Paituvi; jbouquet@keywestcity.com
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

Sorry about that. Many computer issues for me last week. Try this:

https://transfer.ch2m.com

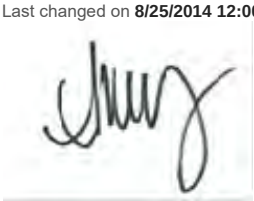
Then find the "pub" folder and then the "KeyWestDocs" folder. I'm not sure if this full link will work but you can try it (I am an internal client so I can't test it):

https://transfer.ch2m.com/pub/KeyWestDocs

Please note this week's user ID and Password below"

Public READ ONLY Password
Username = **ext\Innovation**
Password = **osiwox77**

Last changed on **8/25/2014 12:00:06 AM**, MT



From: Nadia Locke [mailto:nlocke@esciencesinc.com]
Sent: Monday, August 25, 2014 6:09 AM
To: Twitty, Amy/NVR
Cc: Maria Paituvi
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

Hi Amy. I don't recall hearing back. Can you please send the updated link when you have a moment? Thank you!

Nadia

Nadia G. Locke, P.E., LEED AP ND
Associate

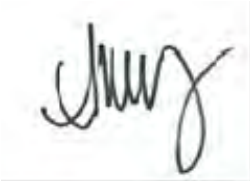
ESciences ENGINEERING ENVIRONMENTAL ECOLOGICAL

Miami-Dade County CBE, SFWMD SBE
224 SE 9th Street
Fort Lauderdale, FL 33316 MAP
954/484-8500 Telephone
954/484-5146 Fax
954/937-9678 Cell
nlocke@esciencesinc.com

www.esciencesinc.com
Orlando — Fort Lauderdale— Miami — DeLand

From: Amy.Twitty@CH2M.com [mailto:Amy.Twitty@CH2M.com]
Sent: Thursday, August 21, 2014 3:08 PM
To: jbouquet@keywestcity.com; Nadia Locke
Cc: Maria Paituvi; Justin Freedman
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

Sorry. I will send another link.



From: James Bouquet [mailto:jbouquet@keywestcity.com]
Sent: Thursday, August 21, 2014 2:06 PM
To: Nadia Locke; Twitty, Amy/NVR
Cc: Maria Paituvi; Justin Freedman
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

Me neither

From: Nadia Locke [mailto:nlocke@esciencesinc.com]
Sent: Thursday, August 21, 2014 2:41 PM
To: Amy.Twitty@CH2M.com; jbouquet@keywestcity.com
Cc: Maria Paituvi; Justin Freedman
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

Hello Amy

Please see my screenshot below. My computer is indicating that it cannot find the filepath to the public website. Can you please check and resend it? Thanks for your help!

Nadia

Nadia G. Locke, P.E., LEED AP ND
Associate

RE: Truman Waterfront Park-Soil Management Plan - Request for Documents - Message (HTML)

File | Message | Adobe PDF

Ignore | Junk | Delete | Reply | Reply All | Forward | Meeting | More | To Manager | Done | Create New | Team E-mail | Reply & Delete | Move | Rules | OneNote | Actions | Mark Unread | Categorize | Follow Up | Translate | Find | Related | Select

Delete | Respond | Quick Steps | Move | Tags | Editing

You forwarded this message on 8/20/2014 4:04 PM.

From: Amy.Twitty@CH2M.com
To: jbouquet@keywestcity.com
Cc: Nadia Locke; david.criswell@navy.mil; Tracie.Vaught@dep.state.fl.us; dcraig@keywestcity.com; RHollingworth@bermelloajamil.com
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

- 1998 Site Inspection Report for Nine BRAC Parcels
- 1999 Supplemental Site Inspection Report for BRAC Parcels
- 1999 Project Completion Report for BRAC Parcels Fast Track Soil Removals
- 2002 Decision Document for Ten BRAC Sites
- 2007 Project Completion Report for Excavation of PCB and Lead-contaminated Soil at the Former Defense Reutilization and Marketing Office

I'll continue to search and upload documents when I can. Link and this week's username and password below:

CH2M HILL Public FTPS Site

\\able\ftp\pub\KeyWestDocs

Public READ ONLY Password
Username = **ext\innovation**
Password = **agokal41**

Please note the password changes every Sunday at midnight, MT

Microsoft Outlook

Cannot find file '\\able\ftp\pub\KeyWestDocs'. Verify the path or Internet address is correct.

OK

Click on a photo to see social network updates and email messages from this person.

ESciences
ENGINEERING
ENVIRONMENTAL
ECOLOGICAL

Miami-Dade County CBE, SFWMD SBE
224 SE 9th Street
Fort Lauderdale, FL 33316 MAP
954/484-8500 Telephone
954/484-5146 Fax
954/937-9678 Cell
nlocke@esciencesinc.com

www.esciencesinc.com

From: Amy.Twitty@CH2M.com [mailto:Amy.Twitty@CH2M.com]
Sent: Monday, August 18, 2014 4:35 PM
To: jbouquet@keywestcity.com
Cc: Nadia Locke; david.criswell@navy.mil; Tracie.Vaught@dep.state.fl.us; dcraig@keywestcity.com; RHollingworth@bermelloajamil.com
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

I have placed a few reports on our public ftp site. These include:

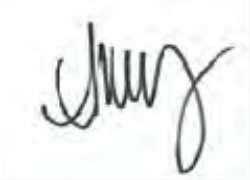
- 1998 Site Inspection Report for Nine BRAC Parcels
- 1999 Supplemental Site Inspection Report for BRAC Parcels
- 1999 Project Completion Report for BRAC Parcels Fast Track Soil Removals
- 2002 Decision Document for Ten BRAC Sites
- 2007 Project Completion Report for Excavation of PCB and Lead-contaminated Soil at the Former Defense Reutilization and Marketing Office

I'll continue to search and upload documents when I can. Link and this week's username and password below:

CH2M HILL Public FTPS Site

\\able\ftp\pub\KeyWestDocs

Public READ ONLY Password
Username = **ext\Innovation**
Password = **agokal41**
Please note the password changes every Sunday at midnight, MT.



From: James Bouquet [mailto:jbouquet@keywestcity.com]
Sent: Monday, August 18, 2014 12:38 PM
To: Twitty, Amy/NVR
Cc: Nadia Locke; Criswell, David CIV NAVFAC HQ, BRAC PMO; Tracie.Vaught@dep.state.fl.us; Don Craig; Randy Hollingworth
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

Amy – cover sheets of documents sent to Nadia

From: Nadia Locke [mailto:nlocke@esciencesinc.com]
Sent: Monday, August 18, 2014 1:15 PM
To: James Bouquet
Cc: Amy.Twitty@ch2m.com; Criswell, David CIV NAVFAC HQ, BRAC PMO; Tracie.Vaught@dep.state.fl.us; Don Craig; Randy Hollingworth
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

Thank you for sending over the documents in the two emails, Jim. We only had the document named DRMO LUC Areas from Deed.pdf. The others documents are new to us. The previous document request we sent Fridays still relevant, as we do not know what documents may exist that we do not have. So, thank you for forwarding the request to Amy prior to me responding. I was in meetings.

Nadia

Nadia G. Locke, P.E., LEED AP ND
Associate

ESciences
ENGINEERING
ENVIRONMENTAL
ECOLOGICAL

Miami-Dade County CBE, SFWMD SBE
224 SE 9th Street
Fort Lauderdale, FL 33316 MAP
954/484-8500 Telephone
954/484-5146 Fax
954/937-9678 Cell
nlocke@esciencesinc.com

www.esciencesinc.com
Orlando — Fort Lauderdale— Miami — DeLand

From: James Bouquet [mailto:jbouquet@keywestcity.com]
Sent: Monday, August 18, 2014 9:22 AM
To: Nadia Locke
Cc: Amy.Twitty@ch2m.com; Criswell, David CIV NAVFAC HQ, BRAC PMO; Tracie.Vaught@dep.state.fl.us; Don Craig; Randy Hollingworth
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

2 of 2

From: James Bouquet [mailto:jbouquet@keywestcity.com]
Sent: Monday, August 18, 2014 9:20 AM
To: 'Nadia Locke'
Cc: 'Amy.Twitty@CH2M.com'; 'Criswell, David CIV NAVFAC HQ, BRAC PMO'; 'Tracie.Vaught@dep.state.fl.us'; Don Craig; 'Randy Hollingworth'
Subject: RE: Truman Waterfront Park-Soil Management Plan - Request for Documents

Nadia:

Before forwarding your request to Amy, I just want to confirm you are in receipt of the attached documents.

This is email 1 of 2

Jim

From: Nadia Locke [mailto:nlocke@esciencesinc.com]
Sent: Friday, August 15, 2014 2:34 PM
To: dcraig@keywestcity.com; jbouquet@keywestcity.com
Cc: Randy Hollingworth; Justin Freedman; Maria Paituvi
Subject: Truman Waterfront Park-Soil Management Plan - Request for Documents

Good afternoon and thank you for the opportunity to discuss the City's needs and obligations regarding the environmental and land use control issues at the Site. We are looking forward to developing the soil management plan as we understand the that it is part of the critical path for the project. We are in receipt of some items based upon what has been provided to us by the City and the information we have downloaded from regulatory databases, but our records are by no means complete. We therefore request the following information be provided to as soon as practical:

- DRMO/Parcel C-The latest information we have is the Site Rehabilitation Completion Report dated December 2010. Please provide any additional assessment reports or communications with the agencies confirming their acceptance of the recommendations, if they exist. Also, please provide us with the data of the groundwater analysis (site plan and lab reports) as soon as that is received so that we can incorporate that information into the management plan without waiting on the final report if possible.
- Parcel E-We have no documentation associated with the assessment, remediation or regulatory communication on this property. Please provide us with assessment and remediation reports documenting the soil and groundwater quality at Parcels E1, E2 and E3. Also, please provide any regulatory communications relative to these documents or that may be relevant to the project.

Thank you and we look forward to a successful project.

Nadia

Nadia G. Locke, P.E., LEED AP ND
Associate

ENGINEERING
ENVIRONMENTAL
ECOLOGICAL

Miami-Dade County CBE, SFWMD SBE
224 SE 9th Street
Fort Lauderdale, FL 33316 MAP
954/484-8500 Telephone
954/484-5146 Fax
954/937-9678 Cell
nlocke@esciencesinc.com

www.esciencesinc.com
Orlando — Fort Lauderdale— Miami — DeLand

Total Control Panel Login

To: mpaituvi@esciencesinc.com Remove this sender from my allow list

From: amy.twitty@ch2m.com

You received this message because the sender is on your allow list.

APPENDIX B

N7846-3.1 .006

0001

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

RECEIVED 8-13-01

August 7, 2001

Q A Record

Mr. Byas Glover
Code 18410
Southern Division
Naval Facilities Engineering Command
Post Office Box 190010
North Charleston, South Carolina 29419-9010

RE: Groundwater Monitoring Report, Building 189 Pipeline Site, Naval Air Station (NAS) Key West, Key West, Florida

Dear Mr. Glover:

I have completed the technical review of the Groundwater Monitoring Report and No Further Action Proposal for the Building 189 Pipeline Site, NAS Key West dated June 2001 (received by Electronic Mail June 26, 2001). Based upon my review, the enclosed Site Rehabilitation Completion Order was signed by Mr. Douglas A. Jones, Chief, Bureau of Waste Cleanup. The No Further Action Proposal was incorporated by reference in the Site Rehabilitation Completion Order.

If I can be of any further assistance with this matter, please contact me at (850) 921-9989.

Sincerely,

Joseph F. Fugitt

Joseph F. Fugitt, P.G.
Remedial Project Manager

cc: Robert Courtright, NAS Key West
Chuck Bryan, Tetra Tech NUS, Aiken, South Carolina

TJB JJC ESN ESW

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

August 6, 2001

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Mr. Byas Glover
Code 18410
Southern Division
Naval Facilities Engineering Command
Post Office Box 190010
North Charleston, South Carolina 29419-9010

Subject: Site Rehabilitation Completion Order
Building 189 Pipeline Site
Naval Air Station Key West
Key West, Monroe County

Dear Mr. Glover:

The Bureau of Waste Cleanup has reviewed the Groundwater Monitoring Report and No Further Action Proposal (NFAP) dated June 2001 (received June 26, 2001), submitted for the petroleum product discharge discovered at this site. Documentation submitted with the NFAP confirms that criteria set forth in Rule 62-770.680(1), Florida Administrative Code (F.A.C.), have been met. The NFAP is hereby incorporated by reference in this Site Rehabilitation Completion Order (Order). Therefore, you are released from any further obligation to conduct site rehabilitation at the site for petroleum product contamination, except as set forth below.

(1) In the event concentrations of petroleum products' contaminants of concern increase above the levels approved in this Order, or if a subsequent discharge of petroleum or petroleum product occurs at the site, the Department of Environmental Protection (Department) may require site rehabilitation to reduce concentrations of petroleum products' contaminants of concern to the levels approved in the NFAP or otherwise allowed by Chapter 62-770, F.A.C.

(2) Additionally, you are required to properly abandon all monitoring wells, except compliance wells required by Chapter 62-761, F.A.C., for release detection, within 60 days of receipt of this Order. The monitoring wells must be abandoned in accordance with the requirements of Rule 62-532.500(4), F.A.C.

Legal Issues

The Department's Order shall become final unless a timely petition for an administrative proceeding (hearing) is filed under Sections 120.569 and 120.57, Florida Statutes (F.S.), within 21 days of receipt of this Order. The procedures for petitioning for a hearing are set forth below.

Persons affected by this Order have the following options:

If you choose to accept the above decision by the Department about the No Further Action Proposal you do not have to do anything. This Order is final and effective as of the date on the top of the first page of this Order.

If you disagree with the decision, you may do one of the following:

(1) File a petition for administrative hearing with the Department's Office of General Counsel within 21 days of receipt of this Order; or

(2) File a request for an extension of time to file a petition for hearing with the Department's Office of General Counsel within 21 days of receipt of this Order. Such a request should be made if you wish to meet with the Department in an attempt to informally resolve any disputes without first filing a petition for hearing.

Please be advised that mediation of this decision pursuant to Section 120.573, F.S., is not available.

How to Request an Extension of Time to File a Petition for Hearing

For good cause shown, pursuant to Rule 62-110.106(4), F.A.C., the Department may grant a request for an extension of time to file a petition for hearing. Such a request must be filed (received) in the Department's Office of General Counsel at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, within 21 days of receipt of this Order. Petitioner, if different from Southern Division of Naval Facilities Engineering Command, shall mail a copy of the request to Southern Division of Naval Facilities Engineering Command at the time of filing. Timely filing a request for an extension of time tolls the time period within which a petition for administrative hearing must be made.

How to File a Petition for Administrative Hearing

A person whose substantial interests are affected by this Order may petition for an administrative hearing under Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed (received) in the Department's Office of General Counsel at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000,

within 21 days of receipt of this Order. Petitioner, if different from Southern Division of Naval Facilities Engineering Command, shall mail a copy of the petition to Southern Division of Naval Facilities Engineering Command at the time of filing. Failure to file a petition within this time period shall waive the right of anyone who may request an administrative hearing under Sections 120.569 and 120.57, F.S.

Pursuant to Section 120.54(5)(b)4.a., F.S. (1998, Supp.), and Rule 28-106.201, F.A.C., a petition for administrative hearing shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the name, address, and telephone number of the petitioner's representative, if any, the site owner's name and address, if different from the petitioner, the FDEP facility number, and the name and address of the facility;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) An explanation of how each petitioner's substantial interests are or will be affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by the petitioner, or a statement that there are no disputed facts;
(e) A statement of the ultimate facts alleged, including a statement of the specific facts the petitioner contends warrant reversal or modification of the Department's action or proposed action;
(f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the Department's action or proposed action; and
(g) A statement of the relief sought by the petitioner, stating precisely the action petitioner wishes the Department to take with respect to the Department's action or proposed action.

This Order is final and effective as of the date on the top of the first page of this Order. Timely filing a petition for administrative hearing postpones the date this Order takes effect until the Department issues either a final order pursuant to an administrative hearing or an order responding to supplemental information provided pursuant to meetings with the Department.

Judicial Review

Any party to this Order has the right to seek judicial review of it under Section 120.68, F.S., by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within 30 days after this Order is filed with the clerk of the Department (see below).

Questions

Any questions regarding the Department's review of your No Further Action Proposal should be directed to Joseph F. Fugitt, P.G. at (850) 921-9989. Questions regarding legal issues should be referred to the Department's Office of General Counsel at (850) 488-9314. Contact with any of the above does not constitute a petition for administrative hearing or request for an extension of time to file a petition for administrative hearing.

Sincerely,

Douglas A. Jones, Chief
Bureau of Waste Cleanup
Division of Waste Management

DAJ/jff

cc: Robert Courtright, NAS Key West, Environmental Department, Post Office Box 9007, Key West, Florida 33040-9007
Chuck Bryan, Tetra Tech NUS, 900 Trail Ridge Road, Aiken, South Carolina, 29803
File

FILING AND ACKNOWLEDGMENT
FILED, on this date, pursuant to
§120.52 Florida Statutes, with the
designated Department Clerk, receipt
of which is hereby acknowledged.

Clerk (or Deputy Clerk) — Date 8/6/01

Mr. Byas Glover
Building 189 Pipeline Site NAS Key West

P.G. CERTIFICATION

Groundwater Monitoring Report/NFAP for Building 189 Pipeline Site

I hereby certify that in my professional judgement, the components of this Groundwater Monitoring Report and No Further Action Proposal for the Building 189 Pipeline Site at Naval Air Station Key West, Key West, Florida, satisfy the requirements set forth in Chapter 62-770, F.A.C., and that the geological interpretations in this report provide reasonable assurances of achieving the Assessment objectives stated in Chapter 62-770, F.A.C.

____ I personally completed this review.

✓ This review was conducted by Joseph F. Fugitt, P.G. working under my supervision.

James H. Cason, P.G.
Professional Geologist
Technical Review Section

August 1, 2001
Date

APPENDIX C

REVISIONS				
LET	DESCRIPTION	PREP'D BY	DATE	APPROVED

MISENER MARINE CONSTRUCTION, INC.

"It is hereby certified that the material/equipment shown and marked in this submittal, shop drawing, catalog cut(s), etc., to be incorporated with Contract Number N62467-85-C-0141 is in compliance with the contract drawings and specifications, can be installed in the allocated spaces, is approved for use, and is (submitted for Government approval) (submitted to Government for record purposes)."

Authorized Reviewer _____ Date _____

Signature CQC Rep. [signature] Date 10-25-86

AS-BUILTS

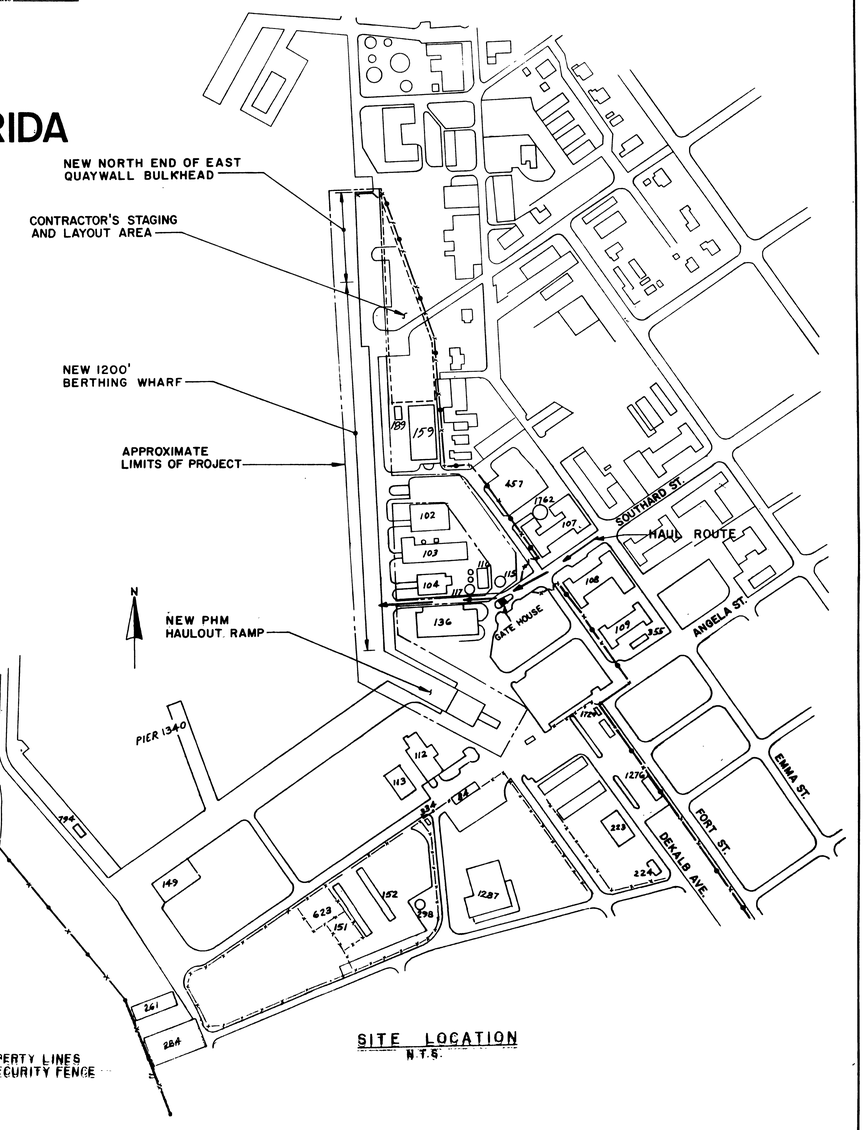
TRUMAN ANNEX

NAVAL AIR STATION KEY WEST, FLORIDA

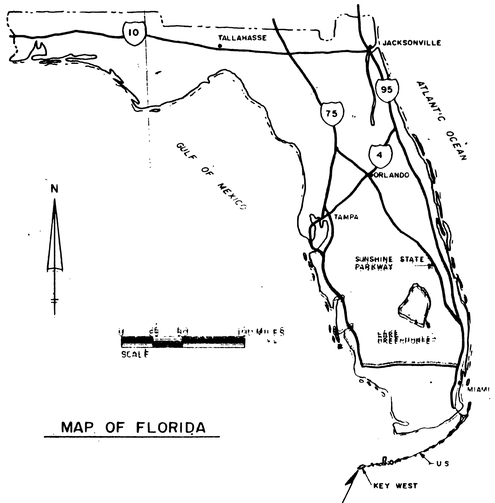
P H M BERTHING WHARF

CONSTRUCTION CONTRACT NO. N62467-85-C-0141

SPECIFICATION NO. 06-85-0141

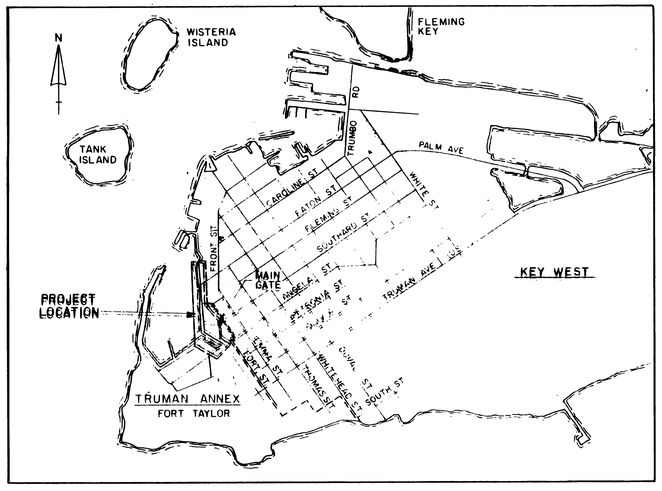


SITE LOCATION
N.T.S.



MAP OF FLORIDA

PROJECT LOCATION



VICINITY MAP

SCALE 1 1/2 0 1 MILE

FOR OFFICAL USE ONLY

ARCH. & ENGR SEAL

C-1

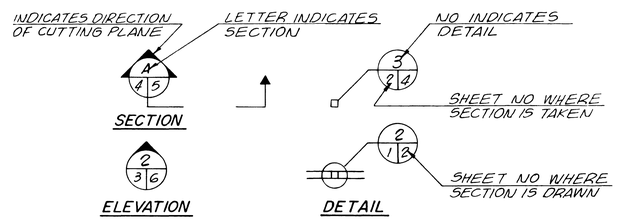
Greiner Engineering Sciences, Inc. CONSULTING ENGINEERS TAMPA, FLORIDA	DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND SOUTHERN DIVISION CHARLESTON, S.C.
DSGN ZICHLIN DR ZICHLIN CHK EVANS	NAVAL AIR STATION KEY WEST, FLA.
SUPV WALKER CH ENGR NIKITECLO	PHM BERTHING WHARF
SUBMITTED BY DATE	TRUMAN ANNEX
FIRM NAME (TITLE)	SITE LOCATION & VICINITY MAP
EIC DIR	
FPO DIR	
APPROVED DATE	SIZE F · CODE IDENT NO. 80091 · NAVFAC DRAWING NO. 5157631
OFFICER IN CHARGE	
APPROVED DATE 5/19/86	CONSTR CONTR NO. N62467-85-C-0141
CO FOR COMMANDER, NAVFAC	SCALE NOTED · SPEC 06-85-0141 · SHEET 1 OF 12

L E G E N D

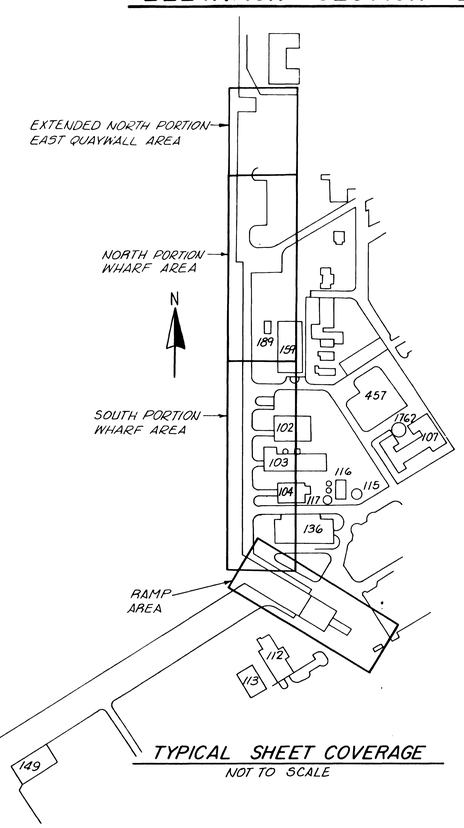
105 ℄	SURVEY CONTROL BASE LINE
—•—x—•—x—•—x—•—	NAVY PROPERTY BOUNDARY LINE AND SECURITY FENCE
➡	MAIN STATION ENTRANCE
═══	ROAD OR STREET

EXISTING	NEW	
◉	● SAN M.H	SANITARY SEWER MANHOLE
○	● S.M.H	STORM SEWER MANHOLE
▭ C.B	■ C.B	CATCH BASIN
[E]	● E.M.H	ELECTRICAL MANHOLE
[C]	● C.M.H	COMMUNICATIONS MANHOLE
——○——	——●——	POWER POLE
♀	♀	STREET LIGHTING
	—D—●—D—	FLOOD LIGHTING
	[FA]	PEDESTAL FIRE ALARM SYSTEM
—— ⋈ ——	—⋈—	GATE VALVE
	—⋈—	BALL VALVE
	—⋈—	PLUG VALVE
	—⋈—	FLOW CONTROL VALVE
	Y	EQUIPMENT DRAIN FUNNEL OILY WATER SEWER
	—(S)—	STRAINER BASKET
	—(M)—	FLOW METER
		CENTRIFUGAL PUMP
	(PI)	PRESSURE GAGE
	(FCV)	FLOW CONTROL VALVE
	(PS)	PRESSURE SWITCH
	S.O	SLIP-ON FLANGE
	W.N	WELDING NECK FLANGE
	B.O.P	BOTTOM OF PIPE
	S.W.	SOCKET WELD
[V]	[V]	VALVE BOX
—◥—	—◥—	CHECK VALVE
—(M)—	—(M)—	METER
6" ▷ 4"	6" ▷ 4"	REDUCER
—S—	—[S]—	STORM SEWERS
—SAN—	—[SAN]—	SANITARY SEWER (FORCE MAIN)
—SAN G.M.—	—[SAN G.M.]—	SANITARY SEWER (GRAVITY)
—W—	—[W]—	POTABLE WATER LINE
	—[SAL W]—	SALT WATER LINE
	—[T]—	TELEPHONE CONDUIT
—D.O.L—	—[D.O.L]—	DIESEL OIL LINE
	—[O.W]—	OILY WASTE LINE
—B.W—	—[B.W]—	BILGE WATER LINE
—○C.O—	—○C.O—	CLEAN OUT
—E—	—[E]—	ELECTRICAL DUCT BANK
—C—	—[C]—	COMMUNICATIONS DUCT BANK
[▭]	[▭]—(C)	MOORING CLEATS
	I—(L)	LADDER
	[oo]—(B)	DOUBLE BITTS
[o]		BOLLARD
	—[E]—	ELECTRICAL CONDUIT
7.95	(7.95)	ELEVATIONS
		CONCRETE
		GRADED AGGREGATE BASE FILL
		EXISTING GROUND
	F.R.P.	FIBERGLASS REINFORCED PIPE
	P.V.C	POLYVINYL CHORIDE
	C.I.P.	CAST IRON PIPE
	D.I.P.	DUCTILE IRON PIPE
	S.S.	STAINLESS STEEL
	U.G.	UNDERGROUND
	O.H.	OVERHEAD
	C.M.P.	CORRUGATED METAL PIPE

EXISTING	NEW	
	□ T.P.	TELEPHONE EQUIPMENT PAD
	▨	ELECTRIC DISTRIBUTION PANEL
	⊠	ELECTRIC MOTOR CONTROLLER
	● (TS)	TEST STATION (CATHODIC PROTECTION)
	INV.	INVERT OF PIPE
	R.C.P.	REINFORCED CONCRETE PIPE
	D.O.L.	DIESEL OIL LINE
	△	THRUST BLOCK



ELEVATION — SECTION — LEGEND



TYPICAL SHEET COVERAGE
NOT TO SCALE

INDEX OF DRAWINGS

NAVFAC DWG. NO.	SHEET NUMBER	TITLE
5157631	C-1	SITE LOCATION & VICINITY MAP
5157632	C-2	LEGEND AND INDEX
5157633	C-3	GENERAL NOTES
5157634	C-4	DEMOLITION PLAN AND PROFILE - RAMP
5157635	C-5	DEMOLITION AND DREDGING - SOUTH
5157636	C-6	DEMOLITION AND DREDGING - NORTH
5157637	C-7	WHARF AREA DEMOLITION LEGEND
5157638	C-8	DEMOLITION SECTIONS AND DETAILS - RAMP
5157639	C-9	DEMOLITION SECTIONS AND DETAILS
5157640	C-10	DEMOLITION OF DIESEL OIL STORAGE TANK NO. 115
5157641	C-11	TRAVERSE MAP
5157642	C-12	NEW PHM RAMP
5157643	C-13	CIVIL SITE PLAN - SOUTH
5157644	C-14	CIVIL SITE PLAN - NORTH
5157645	C-15	CIVIL SITE PLAN - EAST
5157646	C-16	SECTIONS AND DETAILS - RAMP
5157647	C-17	SECTIONS AND DETAILS - RAMP
5157648	C-18	SECTIONS AND DETAILS
5157649	C-19	SECTIONS AND DETAILS
5157650	C-20	SECTIONS AND DETAILS - STORM
5157651	C-21	MOVABLE SECURITY BARRIER
5157652	C-22	BORING LOCATIONS AND TEST PITS
5157653	C-23	BORING LOGS
5157654	C-24	TEST PITS
5157655	M-1	UTILITY PLAN - SOUTH WHARF
5157656	M-2	UTILITY PLAN - NORTH WHARF
5157657	M-3	UTILITY PROFILES
5157658	M-4	UTILITY STATION DETAILS
5157659	M-5	SALT WATER WELLS/OIL SEPARATOR DETAILS
5157660	M-6	UTILITY DETAILS
5157661	M-7	UTILITY DETAILS
5157662	M-8	UTILITY DETAILS
5157663	F-1	FUEL OIL DISTRIBUTION SYSTEM
5157664	F-2	FLOW DIAGRAM
5157665	F-3	FOUNDATION LOCATION PLAN
5157666	F-4	FUEL FARM PLAN
5157667	F-5	FUEL FARM SECTIONS
5157668	F-6	MAINTENANCE PLATFORM DETAILS
5157669	F-7	STORAGE TANK AND DIKE DETAILS
5157670	F-8	FOUNDATION AND PIPE SUPPORT DETAILS
5157671	F-9	FUEL LINES PLAN AND SECTIONS
5157672	F-10	PIPING RELOCATION AND CATHODIC PROTECTION-SOUTH
5157673	F-11	PIPING RELOCATION AND CATHODIC PROTECTION-NORTH
5157674	F-12	CATHODIC PROTECTION DETAILS
5159536	F-13	PARTIAL FUEL FARM PLAN
5157675	E-1	ELECTRICAL SITE PLAN & ONE LINE DIAGRAM - RAMP
5157676	E-2	ELECTRICAL DETAILS - RAMP
5157677	E-3	ELECTRICAL ONE LINE DIAGRAM - WHARF
5157678	E-4	ELECTRICAL SITE PLAN - SOUTH WHARF
5157679	E-5	ELECTRICAL SITE PLAN - NORTH WHARF
5157680	E-6	ELECTRICAL SITE PLAN - FUEL FARM
5157681	E-7	ELECTRICAL SUBSTATION LAYOUT - WHARF
5157682	E-8	ELECTRICAL DETAILS - WHARF
5157683	E-9	ELECTRICAL PLANS AND DETAILS
5157684	E-10	AREA LIGHTING - WHARF
5157685	E-11	SALT WATER PUMPING STATION CONTROLS
5157686	E-12	FUEL FARM PUMPING STATION CONTROLS
5159537	E-13	PAD MOUNTED SWITCHGEAR ONE-LINE AND LAYOUT

NAVFAC DWG. NO.	SHEET NUMBER	TITLE
5157687	S-1	STRUCTURAL SITE PLAN - SOUTH
5157688	S-2	STRUCTURAL SITE PLAN - NORTH
5157689	S-3	SECTIONS AND DETAILS
5157690	S-4	SECTIONS AND DETAILS
5157691	S-5	SECTIONS AND DETAILS
5157692	S-6	SECTIONS AND DETAILS
5157693	S-7	SECTIONS AND DETAILS - RAMP
5157694	S-8	PHM RAMP WALLS
5157695	S-9	SECTIONS - RAMP
5157696	S-10	SECTIONS AND DETAILS - RAMP
5157697	S-11	RAMP UTILITY STATION ENCLOSURE
5157698	S-12	BERTHING AND TIE-DOWN LOCATIONS
5157699	S-13	FENDERS, MOORING HARDWARE AND LADDERS
5157700	S-14	SECTIONS AND DETAILS
5157701	S-15	M. G. HOUSE
5157702	S-16	BERTHING PLAN
5159538	S-17	SECTIONS AND DETAILS
5157703	T-1	CAMEL GENERAL NOTES
5157704	T-2	CAMEL ASSEMBLY ARRANGEMENT
5157705	T-3	CAMEL ASSEMBLY ARRANGEMENT
5157706	T-4	CAMEL INTERMEDIATE SECTION
5157707	T-5	CAMEL INTERMEDIATE SECTION
5157708	T-6	CAMEL INTERMEDIATE SECTION
5157709	T-7	CAMEL INTERMEDIATE SECTION
5157710	T-8	CAMEL INTERMEDIATE SECTION
5157711	T-9	CAMEL INTERMEDIATE SECTION
5162757	WC-1	DEMOLITION AND DREDGING-EXTENDED NORTH
5162758	WC-2	DEMOLITION-DETAILS AND SECTIONS
5162759	WC-3	DEMOLITION-SECTIONS AND DETAILS
5162760	WC-4	CIVIL SITE PLAN-EXTENDED NORTH
5162761	WC-5	SECTIONS AND DETAILS
5162762	WS-1	STRUCTURAL SITE PLAN-EXTENDED NORTH
5162763	WS-2	SECTIONS AND DETAILS
5162764	WS-3	SECTIONS AND DETAILS

REVISIONS

LET	DESCRIPTION	PREP'D BY	DATE	APPROVED

FOR OFFICIAL USE ONLY

Greiner Engineering Sciences, Inc
CONSULTING ENGINEERS TAMPA, FLORIDA

DSGN ZICHLINSKI CHK EVANS
SLM WALKER CH ENGR MILITELLO
SUBMITTED BY Felix K. Walk AVP DATE 2-26-88
FIRM MEMBER/OFFICER
EC E.H. Stoneburg ASM HO
FPE CHR

APPROVED DATE
OFFICER IN CHARGE
APPROVED Arthur P.E. DATE 3/15/88
FOR COMMANDER NAVFAC

Felix K. Walk 2-26-88
ARCH & ENGR SEAL

C-2

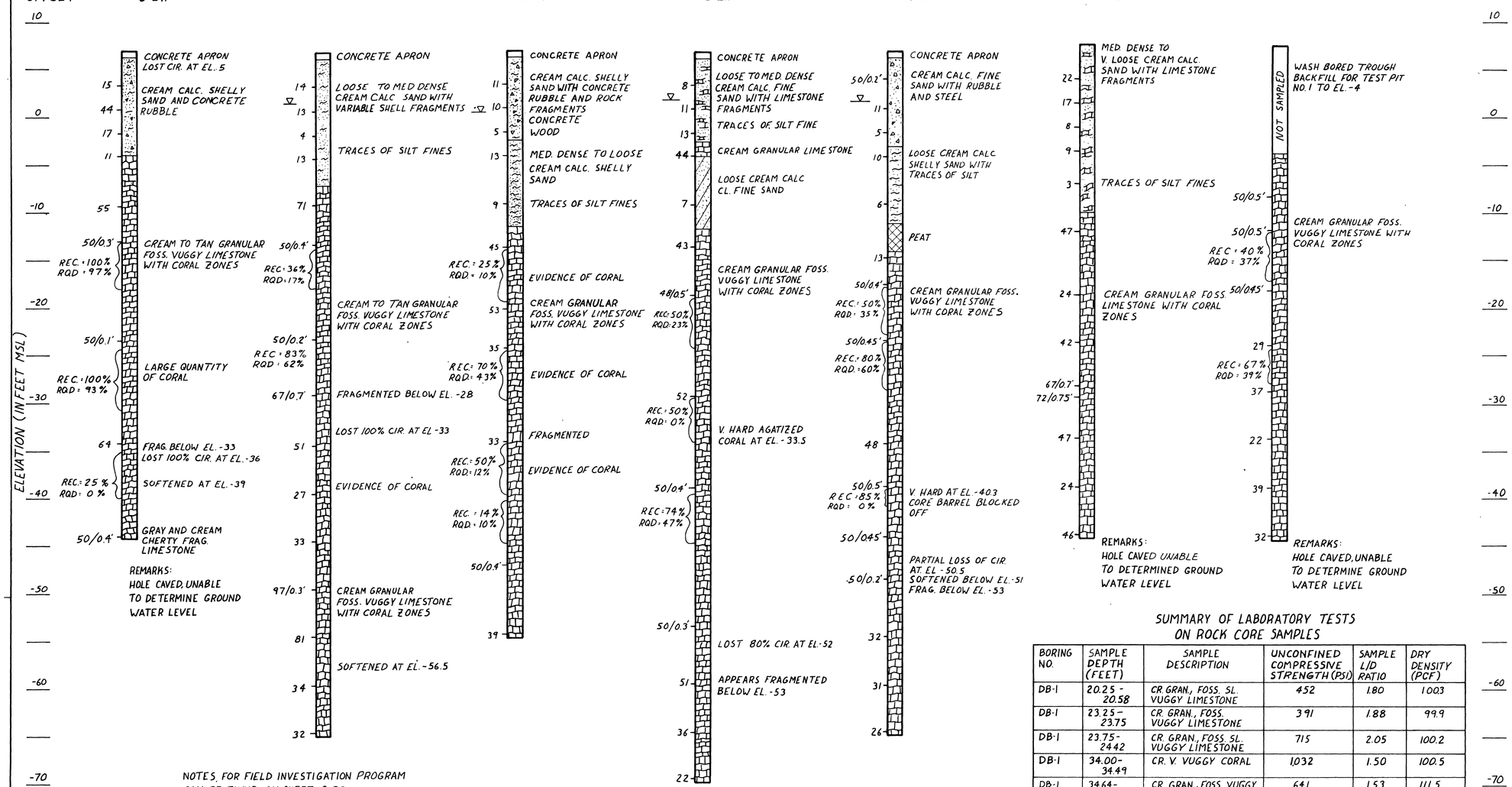
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON S.C.

NAVAL AIR STATION KEY WEST, FLA.

PHM BERTHING WHARF
TRUMAN ANNEX
LEGEND AND INDEX

SIZE	CODE IDENT NO	NAVFAC DRAWING NO
F	80091	5157632
		CONSTR CONTR NO N62467-85-C-0141
SCALE AS NOTED	SPEC 06-85-0141	SHEET 2 OF

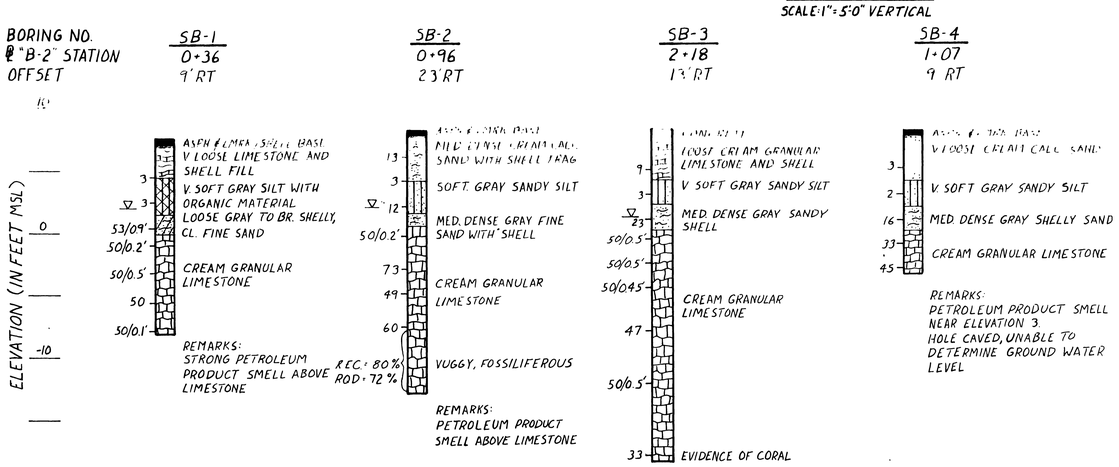
REVISIONS				
LET	DESCRIPTION	PREP'D BY	DATE	APPROVED



NOTES FOR FIELD INVESTIGATION PROGRAM CAN BE FOUND ON SHEET C-22

BORING LOGS

SCALE: 1" = 5'-0" VERTICAL



BORING LOGS

SCALE: 1" = 5'-0" VERTICAL

LEGEND FOR BORING LOGS

- CONCRETE
- LIMESTONE
- SANDY SILT (ML)
- ORGANIC MATERIAL (Pt)
- SHELL
- LIMESTONE AND SHELL
- ASPHALT AND BASE
- SAND (SW-SM TO SM)
- CLAYEY SAND (SW-SC TO SC)
- SAND WITH LIMESTONE FRAGMENTS (SW-SM TO SM WITH LIMESTONE)
- SAND WITH RUBBLE (SW-SM TO SM WITH RUBBLE)

UNIFIED SOIL CLASSIFICATION (TYPICAL)

ABBREVIATIONS

LMRK.	LIMEROCK
ASPH.	ASPHALT
FOSS.	FOSSILIFEROUS
CL.	CLAYEY
CIR.	CIRCULATION
FRAG.	FRAGMENTED
CALC.	CALCAREOUS
EL.	ELEVATION
V.	VERY
MED.	MEDIUM
BR.	BROWN
REC.	RECOVERY
RQD.	ROCK QUALITY DESIGNATION
S.P.T.	STANDARD PENETRATION TEST
SL.	SLIGHTLY
TR.	TRACES
CR.	CREAM
GRAN.	GRANULAR
L.S.	LIMESTONE

LOCATION OF GROUND WATER IN TEST HOLE

S.P.T. BLOWCOUNTS FOR 12 INCHES OF PENETRATION — 36

S.P.T. BLOWCOUNTS FOR PENETRATION INTERVAL INDICATED — 64/0.7'

INTERVAL OF 4" DIAMETER ROCK CORING

BORING NO.	PAVEMENT TYPE AND THICKNESS
SB-1	0.1' ASPHALT, 0.6' LIMEROCK
SB-2	0.13' ASPHALT, 0.47' LIMEROCK
SB-3	0.4' CONCRETE
SB-4	0.13' ASPHALT, 0.27' LIMEROCK
DB-1	0.6' CONCRETE
DB-2	0.65' CONCRETE
DB-3	0.6' CONCRETE
DB-4	0.85' CONCRETE
DB-5	0.6' CONCRETE
DB-6	BROKEN ASPHALT PAVEMENT
DB-7	0.6' CONCRETE

SUMMARY OF LABORATORY TESTS ON ROCK CORE SAMPLES

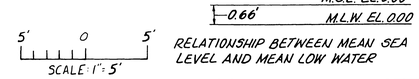
BORING NO.	SAMPLE DEPTH (FEET)	SAMPLE DESCRIPTION	UNCONFINED COMPRESSIVE STRENGTH (PSI)	SAMPLE L/D RATIO	DRY DENSITY (PCF)
DB-1	20.25 - 20.58	CR. GRAN., FOSS. SL. VUGGY LIMESTONE	452	1.80	100.3
DB-1	23.25 - 23.75	CR. GRAN., FOSS. VUGGY LIMESTONE	391	1.88	99.9
DB-1	23.75 - 24.42	CR. GRAN., FOSS. SL. VUGGY LIMESTONE	715	2.05	100.2
DB-1	34.00 - 34.49	CR. V. VUGGY CORAL	1,032	1.50	100.5
DB-1	34.64 - 35.13	CR. GRAN., FOSS. VUGGY LIMESTONE, TR. OF CORAL	641	1.53	111.5
DB-2	30.15 - 30.85	CR. SL. VUGGY CORAL	1,333	2.12	120.5
DB-3	32.00 - 32.45	CR GRAN, FOSS V VUGGY LIMESTONE	397	1.46	90.8
DB-4	26.65 - 27.05	CR. GRAN., V. SL. VUGGY LIMESTONE	502	1.32	100.4
DB-4	46.60 - 47.15	CR. GRAN., FOSS V VUGGY LIMESTONE	271	1.70	94.5
DB-5	25.10 - 25.56	CR. GRAN., FOSS VUGGY LIMESTONE	351	1.40	103.7
DB-5	32.65 - 33.09	CR. SL. VUGGY CORAL	383	1.39	102.1
DB-7	21.00 - 21.45	CR. GRAN., FOSS. V. SL. VUGGY LIMESTONE	668	1.37	103.1
SB-2	17.85 - 18.42	CR GRAN, FOSS	283	1.78	94.4

DRY DENSITIES WERE OBTAINED BY CALCULATING THE GROSS VOLUME OF THE CORE BASED ON THE LENGTH OF THE CORE AND AVERAGE OUTSIDE DIAMETER.

SUMMARY OF PULLOUT TEST RESULTS

TEST LOCATION	DEPTH TO BOTTOM OF PLUG (FEET)	TEST PLUG LENGTH (FEET)	FAILURE LOAD (TONS)
DB-2	25.0	3.5	27.5
DB-3	25.0	2.9	56.0
DB-4	37.0	3.3	60.0
DB-5	29.0	3.0	70.0

NOTE:
NO TEST PLUGS WERE RECOVERED.
THE 4" DIAMETER CORE BARREL USED CORES A NOMINAL 6" DIAMETER HOLE. TEST PLUG DIAMETERS ≥ 6".



RELATIONSHIP BETWEEN MEAN SEA LEVEL AND MEAN LOW WATER

FOR OFFICIAL USE ONLY

Sami Mihitello 6/20/86

ARCH & ENGR SEAL

C-23

Greiner Engineering Sciences, Inc. CONSULTING ENGINEERS TAMPA, FLORIDA

DSGN. EVANS DR. ROGERS CHK. WALKER
SUPV. WALKER CH ENGR. MILITELLO
SUBMITTED BY: S. Militello DATE 6/20/86
FIRM MEMBER (TITLE): EVP
BRHD.
PPE OW

APPROVED DATE
OFFICER IN CHARGE
APPROVED DATE 6/24/86
FOR COMMANDER NAVFAC

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON, S.C.

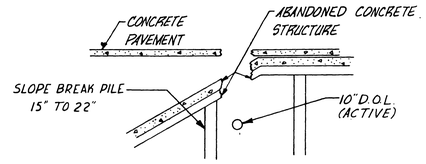
NAVAL AIR STATION — KEY WEST, FLA.

PHM BERTHING WHARF

TRUMAN ANNEX

BORING LOGS

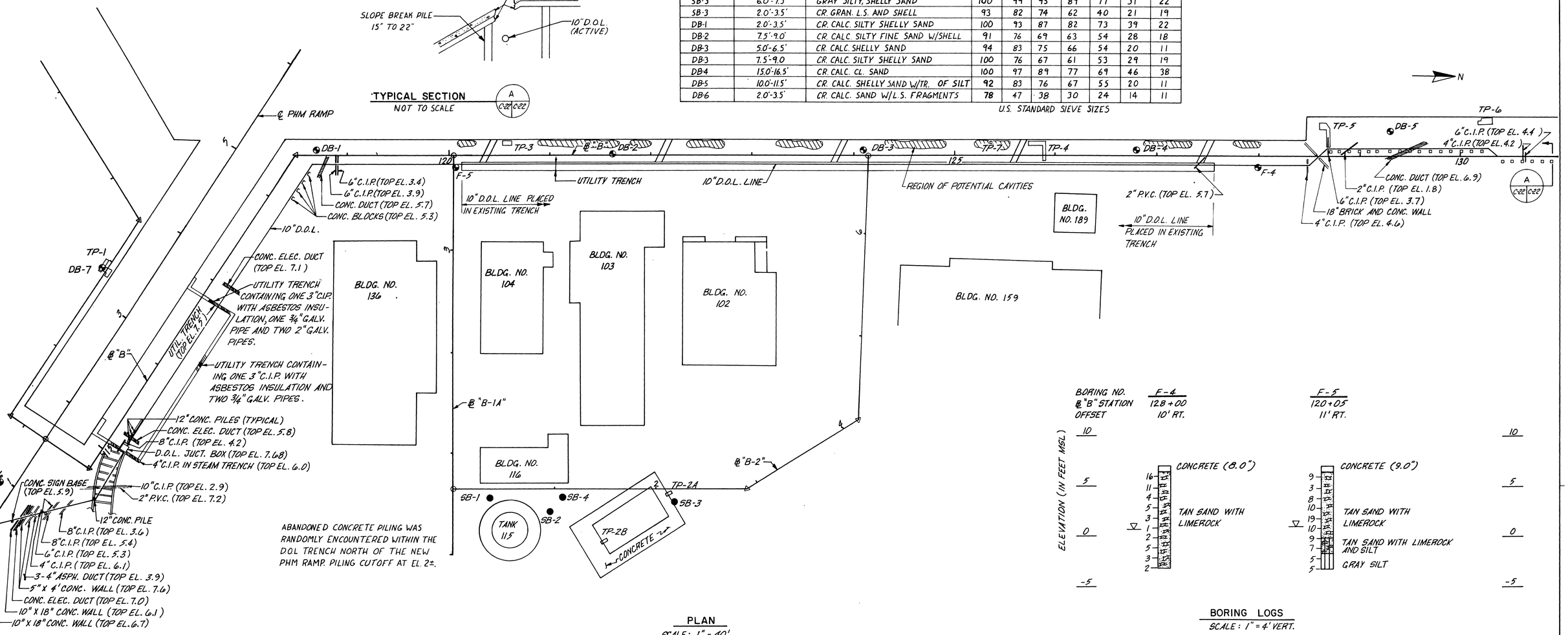
SIZE	CODE IDENT NO	NAVFAC DRAWING NO
F	80091	5157653
		CONSTR CONTR NO N62467-85-C-0141
SCALE AS NOTED		SPEC 06-85-0141 SHEET 23 OF



TYPICAL SECTION
NOT TO SCALE

BORING NO.	SAMPLE DEPTH	DESCRIPTION	PERCENT FINER BY WEIGHT						
			3/4"	NO. 4	NO. 10	NO. 20	NO. 40	NO. 100	NO. 200
SB-1	4.0'-5.5'	GRAY SANDY SILT	100	99	97	89	81	63	53
SB-3	6.0'-7.5'	GRAY SILTY, SHELLY SAND	100	99	95	89	77	31	22
SB-3	2.0'-3.5'	CR. GRAN. L.S. AND SHELL	93	82	74	62	40	21	19
DB-1	2.0'-3.5'	CR. CALC. SILTY SHELLY SAND	100	93	87	82	73	39	22
DB-2	7.5'-9.0'	CR. CALC. SILTY FINE SAND W/SHELL	91	76	69	63	54	28	18
DB-3	5.0'-6.5'	CR. CALC. SHELLY SAND	94	83	75	66	54	20	11
DB-3	7.5'-9.0	CR. CALC. SILTY SHELLY SAND	100	76	67	61	53	29	19
DB-4	15.0'-16.5'	CR. CALC. CL. SAND	100	97	89	77	69	46	38
DB-5	10.0'-11.5'	CR. CALC. SHELLY SAND W/TR. OF SILT	92	83	76	67	55	20	11
DB-6	2.0'-3.5'	CR. CALC. SAND W/L.S. FRAGMENTS	78	47	38	30	24	14	11

U.S. STANDARD SIEVE SIZES



PLAN
SCALE: 1" = 40'

BORING LOGS
SCALE: 1" = 4' VERT.

NOTES

1. "F" BORINGS WERE DRILLED BY FLORIDA TESTING AND ENGINEERING CO. OF FT. LAUDERDALE, FLORIDA DURING OCTOBER 1983. ALL OTHER BORINGS WERE DRILLED BY DRIGGERS ENGINEERING SERVICES, INC. OF CLEARWATER, FLORIDA DURING JULY AND AUGUST OF 1985.
2. BORINGS WERE STANDARD PENETRATION TEST (S.P.T.) BORINGS IN GENERAL ACCORDANCE WITH ASTM D 1586.
   SPOON SAMPLER = 1 3/8" INSIDE DIA., 2" OUTSIDE DIA.
   HAMMER WEIGHT = 140 POUNDS
   AVERAGE HAMMER DROP = 30".
3. NUMBERS TO LEFT OF BORING LOGS INDICATE S.P.T. BLOW COUNT FOR 12 INCH (UNLESS NOTED OTHERWISE) SPLIT SPOON PENETRATION.
4. FOUR INCH DIA. ROCK CORING WAS PERFORMED AT SELECTED LOCATIONS IN DB BORINGS. RECOVERY (CUMULATIVE LENGTH OF MATERIAL RECOVERED, EXPRESSED AS A PERCENT OF TOTAL CORE LENGTH) AND ROCK QUALITY DESIGNATION (CUMULATIVE LENGTH OF RECOVERED INTACT PIECES 4 INCHES AND LONGER, EXPRESSED AS A PERCENT OF TOTAL CORE LENGTH) FOR EACH CORE IS INDICATED ON THE CORRESPONDING BORING. THE ABBREVIATIONS "REC" AND "R & D" ARE USED.
5. THE BORING LOGS SHOWN ARE FOR THE CONTRACTOR'S GENERAL INFORMATION ONLY AND REPRESENT SUBSURFACE CONDITIONS ENCOUNTERED WITHIN THE TEST HOLE AT THE TIME OF TESTING.
6. LABORATORY TESTING ON SELECTED SAMPLES INCLUDED GRAIN SIZE ANALYSES, UNCONFINED COMPRESSION TEST, AND ROCK CORE DENSITY. RESULTS ARE PRESENTED IN TABULAR FORM ON THIS SHEET AND ON SHEET C-23.
7. PULLOUT TESTS WERE CONDUCTED AT SELECTED LOCATIONS IN DB BORINGS TO EVALUATE ROCK ULTIMATE FRICTIONAL STRENGTH. THIS WAS ACCOMPLISHED BY INSTALLING A REINFORCED GROUT PLUG AT A CHOSEN SMALL DEPTH INTERVAL IN A BOREHOLT AND JACKING THE PLUG UNTIL FAILURE OCCURRED. PULLOUT TEST RESULTS ARE PRESENTED IN TABULAR FORM ON SHEET C-23.
8. TEST PITS WERE EXCAVATED BY WILLIAM G STEVENS, INC. OF KEY WEST FLORIDA DURING JULY AND AUGUST OF 1985.
9. THE TEST PIT DETAILS SHOWN HEREIN ARE PROVIDED FOR THE CONTRACTOR'S GENERAL INFORMATION. THE CONTRACTOR SHALL ANTICIPATE THAT ACTUAL CONDITIONS MAY VARY BETWEEN AND ADJACENT TO TEST PIT LOCATIONS.
10. ALL TEST PITS EXCEPT TP-7 WERE BACKFILLED AND COMPACTED, AND ALL TEST PITS EXCEPT TP-2A, 2B, AND 7 RECEIVED A 6 TO 8 INCH CONCRETE SURFACE PATCH WITH WIRE MESH REINFORCEMENT.
11. IN THESE AREAS INDICATED, THE CONCRETE APRON PAVEMENT WAS OBSERVED TO EXHIBIT SEVERE CRACKING, AND SETTLEMENTS OF UP TO 16" WERE MEASURED AT SEVERAL LOCATIONS. TEST PIT NO. 7 SHOWED THAT CAVITIES DO EXIST IN SOME AREAS ADJACENT TO THE EXISTING BULKHEAD.
12. LOGS FOR SB AND DB BORINGS ARE SHOWN ON SHEET C-23.
13. THE 10" D.O.L. LINE SHOWN ON THE ABOVE PLAN WAS INSTALLED UNDER SEPARATE CONTRACT. THE FEATURES SHOWN ON THIS DRAWING WERE NOTED BY A REPRESENTATIVE OF GREINER ENGINEERING SCIENCES, INC. IN MARCH 1985 AFTER TRENCHING FOR THIS LINE WAS COMPLETED. THIS INFORMATION IS PROVIDED FOR THE CONTRACTORS GENERAL INFORMATION.

LEGEND

- SB — SHALLOW (10' TO 30') STANDARD PENETRATION TEST BORING.
- DB — DEEP (50' TO 75') STANDARD PENETRATION TEST BORING.
- TP — TEST PIT.
- ▽ — INDICATES LOCATION OF GROUND WATER TABLE.
- REGION OF POTENTIAL CAVITIES - SEE NOTE 11.

40' 20' 0 40'
SCALE: 1" = 40'

4' 2' 0 4'
SCALE: 1" = 4'

M.S.L. EL. 0.00
0.66'
M.L.W. EL. 0.00

RELATIONSHIP BETWEEN MEAN SEA LEVEL AND MEAN LOW WATER

REVISIONS

LET	DESCRIPTION	PREP'D BY	DATE	APPROVED

FOR OFFICIAL USE ONLY

Greiner Engineering Sciences, Inc.
CONSULTING ENGINEERS TAMPA, FLORIDA

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON S.C.

NAVAL AIR STATION — KEY WEST, FLA.

PHM BERTHING WHARF
TRUMAN ANNEX
BORING LOCATIONS AND TEST PITS

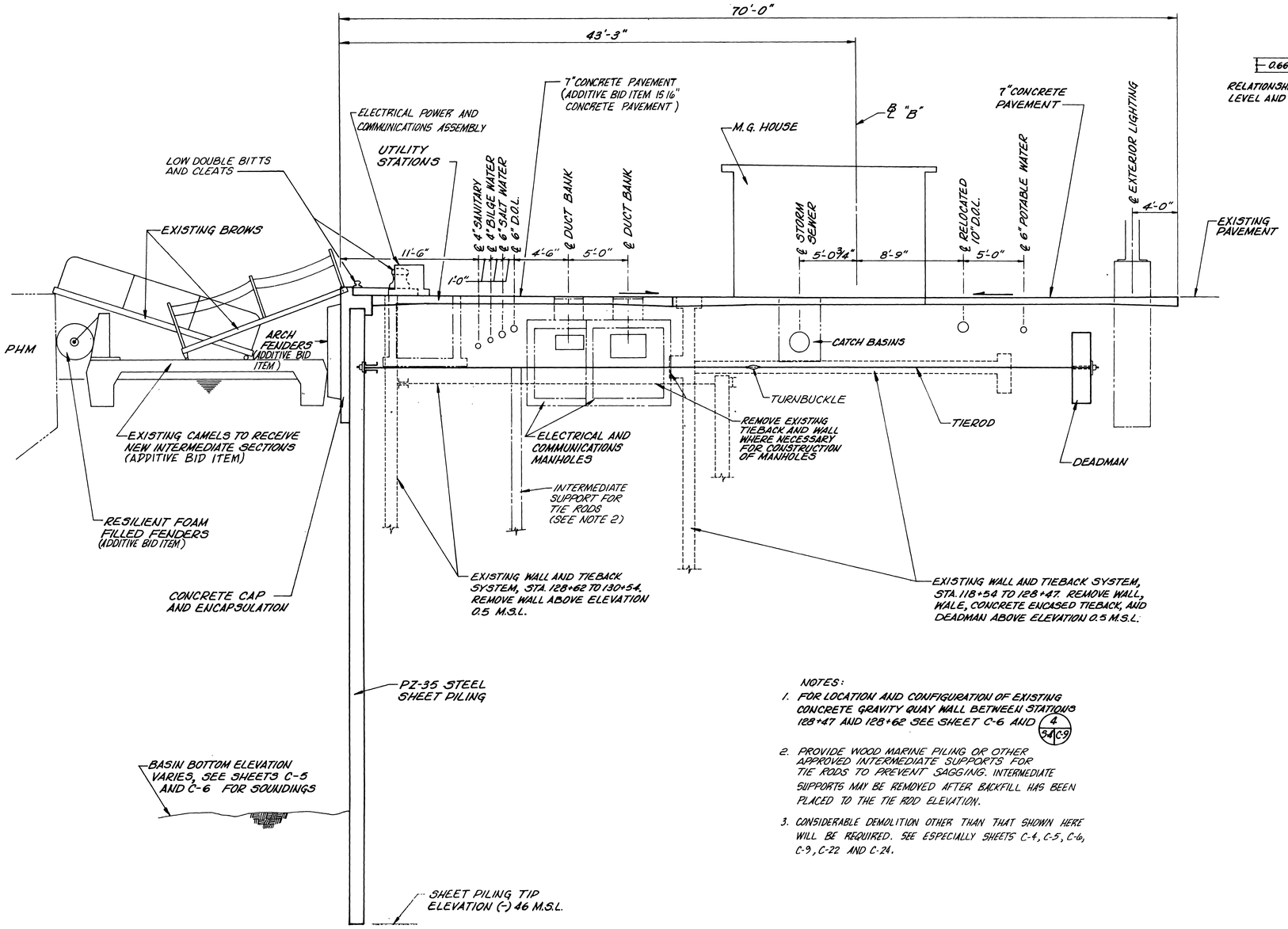
DSGN EVANS-ZICHLINE-WALKER
SUPV WALKER CHENGR MILITELLO
SUBMITTED BY S. Militello EVP 6/20/86
FIELD ENGINEER TITLE
EIC E.H. Stabrey Jr. DIR HD
FPE DIR
APPROVED DATE
OFFICER IN CHARGE
APPROVED Jerry Pie DATE 7/16/86
LED FOR COMMANDER, NAVFAC

S. Militello 6/20/86
ARCH & ENGR SEAL

C-22

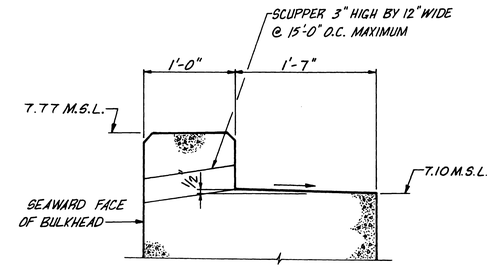
SIZE	CODE IDENT NO	NAVFAC DRAWING NO
F	80091	5157652
SCALE AS NOTED		CONSTR CONTR NO N62467-85-C-0141
		SPEC 06-85-0141 SHEET 22 OF

REVISIONS				
LET	DESCRIPTION	PREP'D BY	DATE	APPROVED



NOTES:

1. FOR LOCATION AND CONFIGURATION OF EXISTING CONCRETE GRAVITY QUAY WALL BETWEEN STATIONS 128+47 AND 128+62 SEE SHEET C-6 AND (4 / S-4 / C-9)
2. PROVIDE WOOD MARINE PILING OR OTHER APPROVED INTERMEDIATE SUPPORTS FOR TIE RODS TO PREVENT SAGGING. INTERMEDIATE SUPPORTS MAY BE REMOVED AFTER BACKFILL HAS BEEN PLACED TO THE TIE ROD ELEVATION.
3. CONSIDERABLE DEMOLITION OTHER THAN THAT SHOWN HERE WILL BE REQUIRED. SEE ESPECIALLY SHEETS C-4, C-5, C-6, C-9, C-22 AND C-24.



APPLIES FOR NEW BERTHING AREA ℄ "B" STA. 118+54 TO 133+66.

ENCAPSULATION GRADING DETAIL (1 / S-4)

SCALE: 1 1/2" = 1'-0"

C-13, C-14, WC-4

FOR TIE RODS BETWEEN ℄ PHM RAMP STATIONS 5+16.28 AND 5+61.56 AND WHARF AREA SOUTH OF STA. 130+64.55

SYSTEM	ROD DIA. (IN.)	UPSET DIA. (IN.)	TURNBUCKLE	ROD MATERIAL
1	3"	3 1/4"	3 1/4"	A-36
2	3 1/4"		3 1/4"	A-36
3	2 1/2"	3 1/4"	3 1/4"	A-588
4	3 1/4"		3 1/4"	A-588

NOTES:

1. THE CONTRACTOR SHALL HAVE THE OPTION TO SELECT ONE OF THE FOUR TIEROD SYSTEMS LISTED ABOVE FOR THE APPROPRIATE AREA. THE SELECTED SYSTEM SHALL NOT BE CHANGED DURING THE COURSE OF THE WORK.
2. ALL CHANNELS USED FOR WALES BEHIND PZ35 SHEETING SHALL BE A-572, GR. 50.
3. THE TIERODS PROVIDED BETWEEN ℄ PHM RAMP STATIONS 5+16.28 AND 5+31.38 SHALL SLOPE FROM EL. 1.25 M.S.L. AT THE WALE TO EL 0.90 AT THE DEADMAN.
4. THE TIERODS PROVIDED ALONG THE WHARF WALLS BETWEEN ℄ "B" STATIONS 118+55.77 AND 120+16.3 SHALL SLOPE FROM EL 1.00 M.S.L. AT THE WALE TO EL (-) 0.10 AT THE DEADMAN.
5. TIEROD SCHEDULE FOR RAMP AND WHARF WALLS SHEET S-3

TYPICAL CROSS SECTION (A / S-4)

SCALE: 1/4" = 1'-0"

S-1, S-2

12" 6" 0 1' 2'

SCALE: 1 1/2" = 1'-0"

12" 0 2' 4'

SCALE: 1/4" = 1'-0"

FOR OFFICIAL USE ONLY

Greiner Engineering Sciences, Inc.
CONSULTING ENGINEERS TAMPA, FLORIDA

DSGN EVANS/UNDBERG WALKER
SUPV WALKER CH ENGR MILITELLO
SUBMITTED BY S. M. Militello EVP 6/24/86
FIRM MEMBER (TITLE)
DC E. M. Stanaszek
PM DP

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON, S.C.

NAVAL AIR STATION — KEY WEST, FLA.

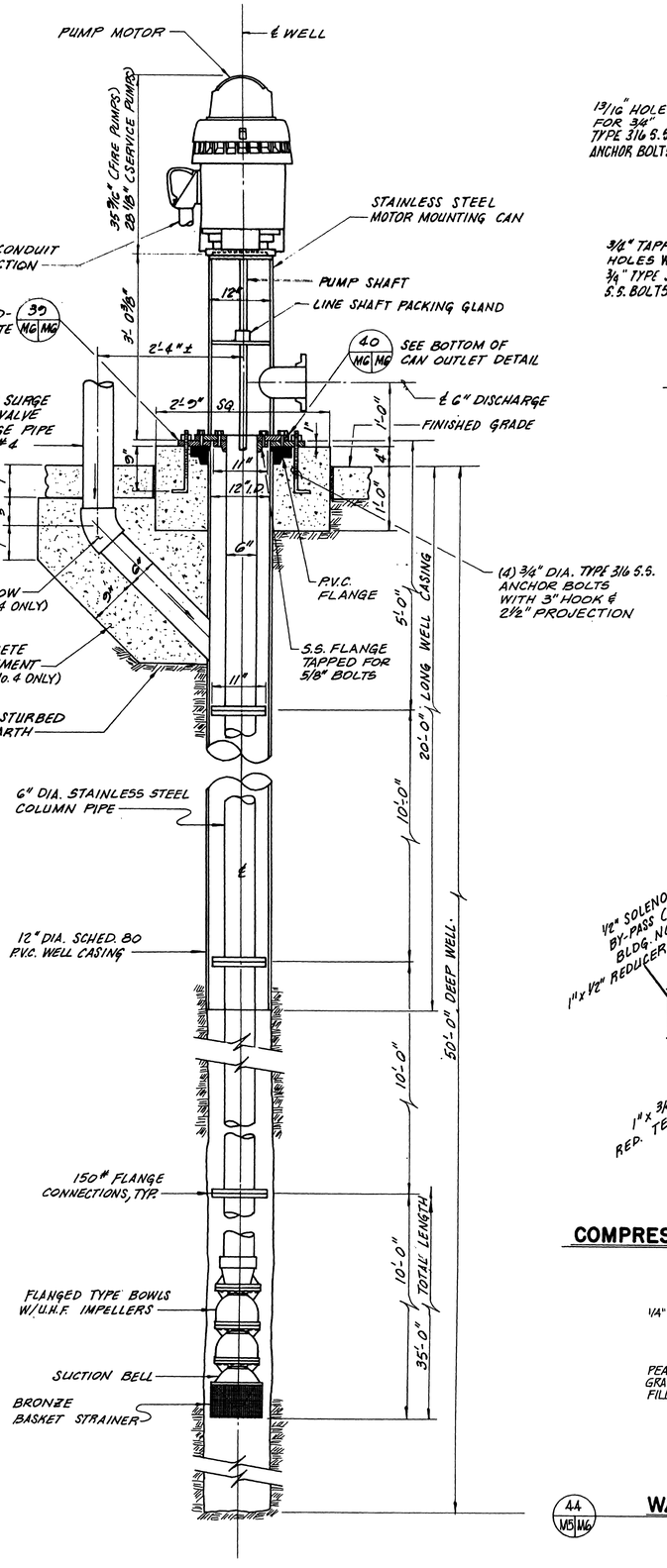
PHM BERTHING WHARF
TRUMAN ANNEX
SECTIONS AND DETAILS

APPROVED — DATE
OFFICER IN CHARGE
APPROVED — DATE
EFD FOR COMMANDER, NAVFAC — 9/4/86

ARCH & ENGR SEAL

S-4

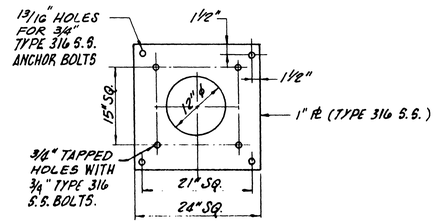
SIZE	CODE IDENT NO	NAVFAC DRAWING NO
F	80091	5157690
SCALE AS NOTED		CONSTR CONTR NO N62467-85-C-0141
		SPEC 06-85-0141 SHEET 62 OF



SALT WATER WELL DETAIL (35 MS MG)

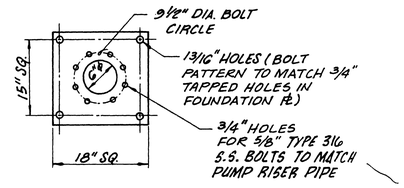
(FOUR REQUIRED)

SCALE: 1" = 1'-0"



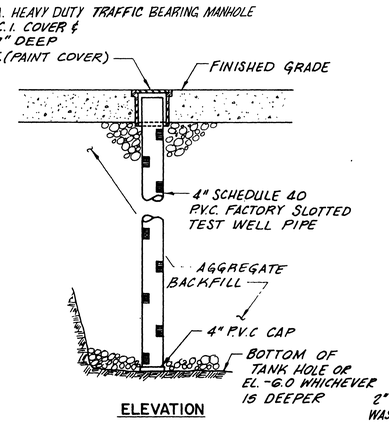
FOUNDATION PLATE DETAIL (39 MG MG)

SCALE: 1" = 1'-0"



BOTTOM OF CAN OUTLET DETAIL (40 MG MG)

SCALE: 1" = 1'-0"

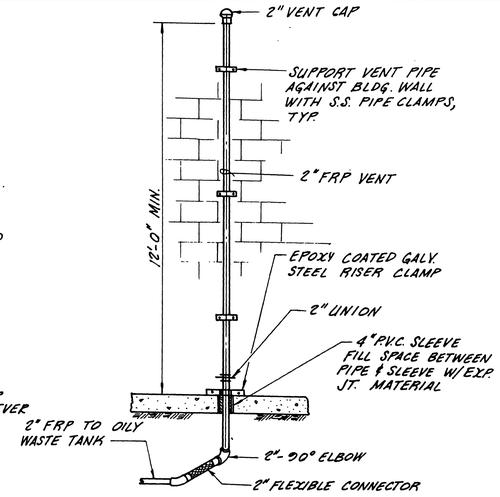


ELEVATION

LEAK MONITORING WELL DETAIL (38 MG)

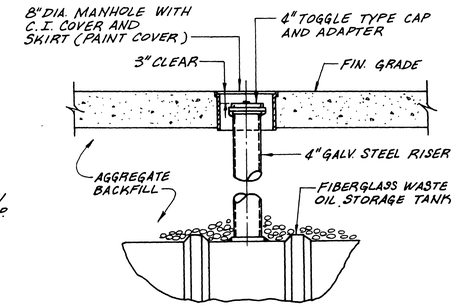
F-4, WC-4, M-1, M-2, M-5, F-9

NO SCALE



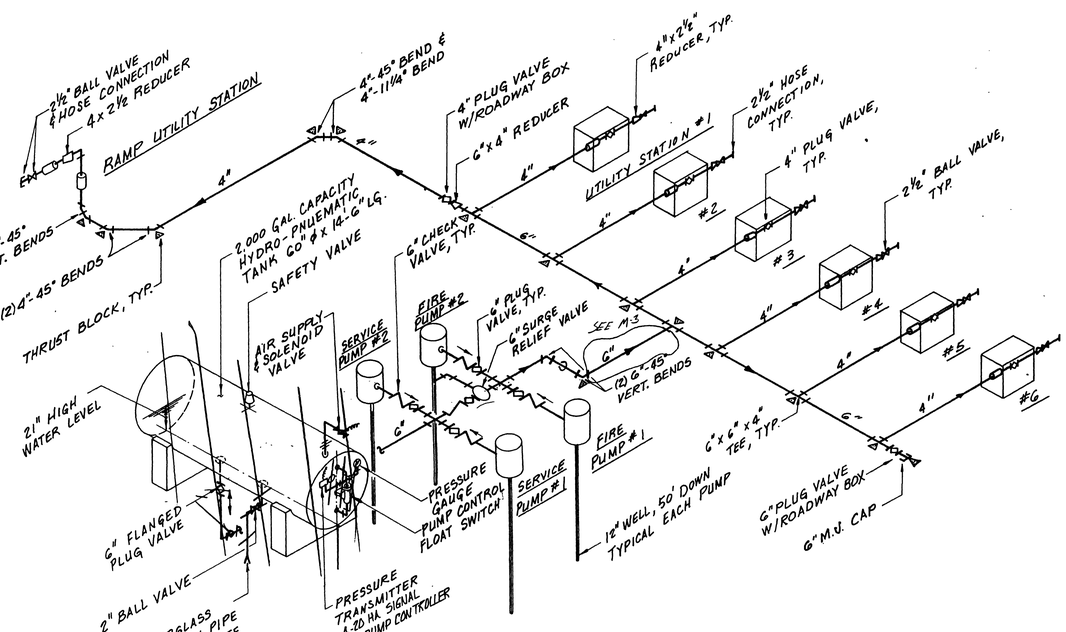
VENT PIPE DETAIL (36 MS MG)

SCALE: 1/2" = 1'-0"



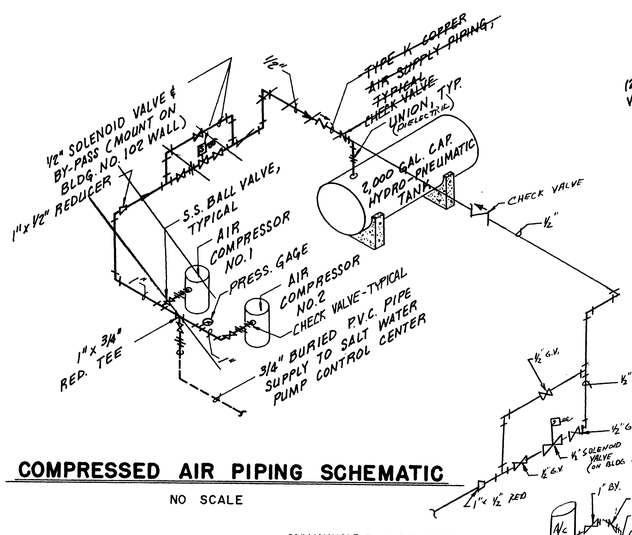
TANK GAUGING / OIL REMOVAL PIPING DETAIL (37 MS MG)

NO SCALE



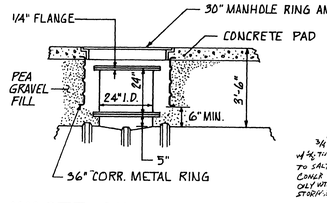
SALT WATER PIPING SCHEMATIC

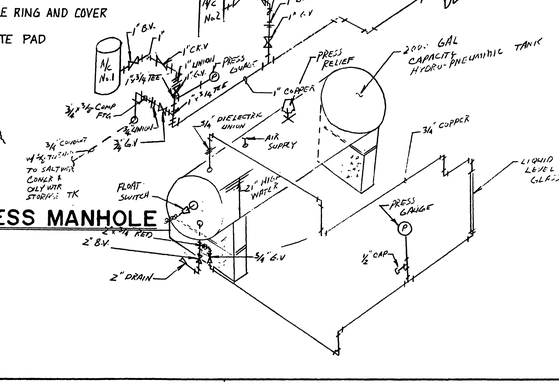
NO SCALE



COMPRESSED AIR PIPING SCHEMATIC

NO SCALE





WASTE OIL TANK ACCESS MANHOLE (44 MS MG)

NO SCALE

12" 6" 0 1'
SCALE: 1" = 1'-0"
12" 0 1' 2' 3'
SCALE: 1/2" = 1'-0"

FOR OFFICIAL USE ONLY

Greiner Engineering Sciences, Inc. CONSULTING ENGINEERS TAMPA, FLORIDA

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON, S.C.

NAVAL AIR STATION — KEY WEST, FLA.

PHM BERTHING WHARF
TRUMAN ANNEX
UTILITY DETAILS

DSGN RUSKEY DR DAVIS CHK FALK
SUPV WALKER CH ENGR MILITELLO
SUBMITTED BY S. Militello DATE 6/20/86
FIRM MEMBER TITLE: E.V.P.
EC E.R. Stennett ARCHO
FPE DR

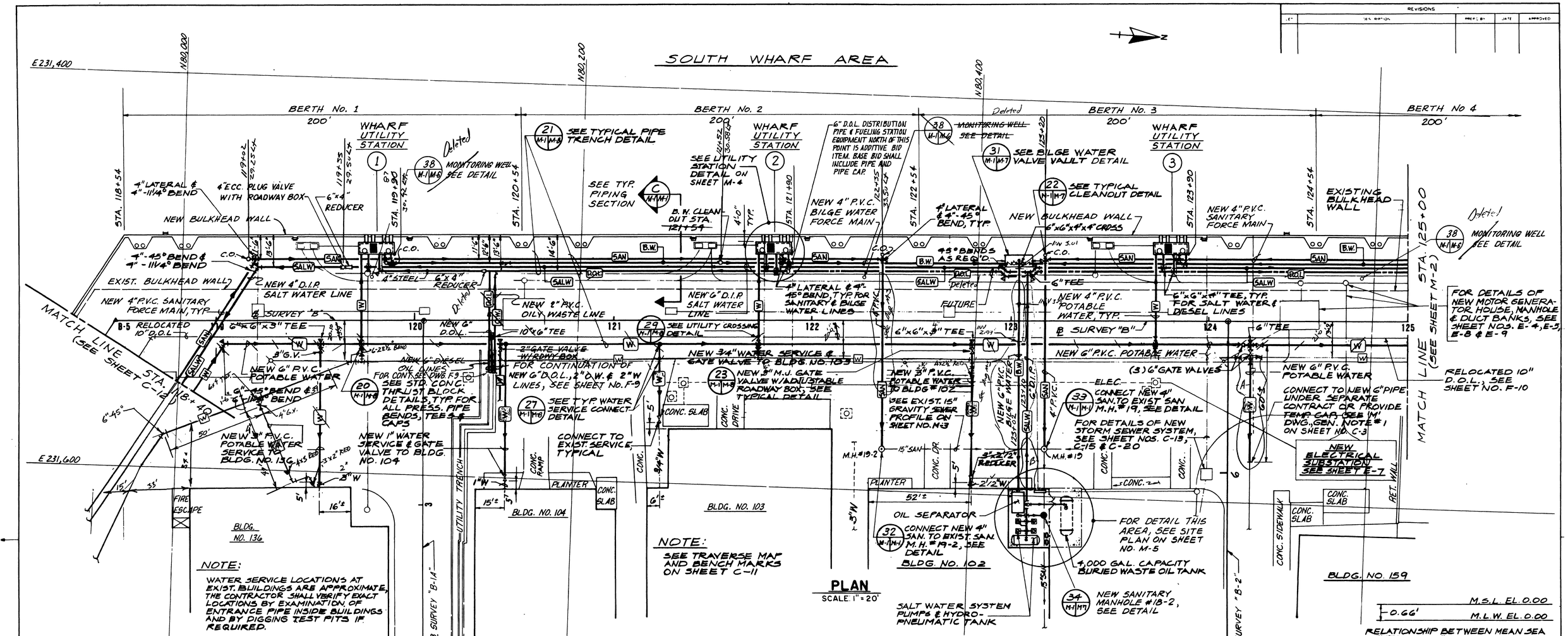
APPROVED DATE
OFFICER IN CHARGE
APPROVED P.E. DATE 9/14/86
FOR COMMANDER NAVFAC

ARCH & ENGR SEAL

M-6

SIZE	CODE IDENT NO	NAVFAC DRAWING NO
F	80091	5157660
SCALE AS NOTED	SPEC 06-85-0141	SHEET 30 OF

CONSTR CONTR NO N62467-85-C-0141



NOTE:

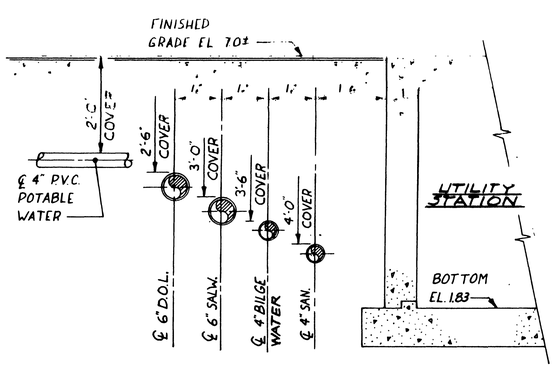
WATER SERVICE LOCATIONS AT EXIST. BUILDINGS ARE APPROXIMATE, THE CONTRACTOR SHALL VERIFY EXACT LOCATIONS BY EXAMINATION, OF ENTRANCE PIPE INSIDE BUILDINGS AND BY DIGGING TEST PITS IF REQUIRED.

NOTE:

SEE TRAVERSE MAP AND BENCH MARKS ON SHEET C-11

PLAN

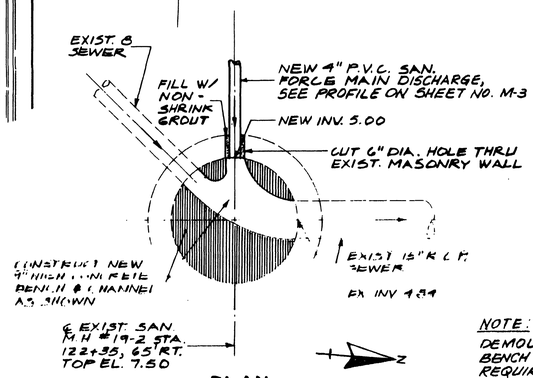
SCALE: 1" = 20'



TYP. PIPING SECTION

SCALE: 3/4" = 1'-0"

M-1, M-2



PLAN

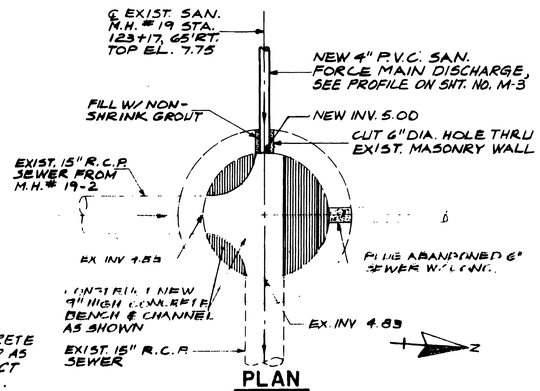
EXIST. SAN. M.H. #19-2

SCALE: 1/2" = 1'-0"

M-1, M-3

NOTE:

DEMOLISH EXIST. CONCRETE BENCH IN M.H. #19 & 19-2 AS REQUIRED TO CONSTRUCT NEW BENCH & CHANNEL.

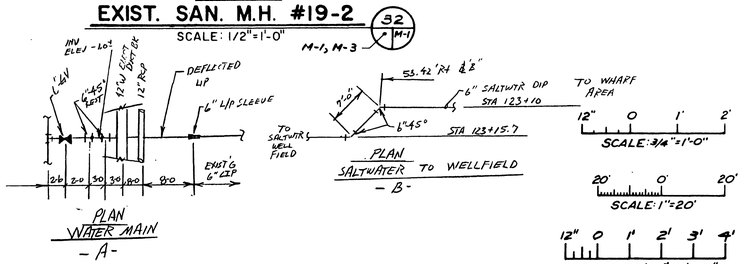


PLAN

EXIST. SAN. M.H. #19

SCALE: 1/2" = 1'-0"

M-1, M-3



NOTES:

1. FOR LEGEND, SEE SHEET C 2
2. FOR GENERAL NOTES, SEE SHEET C 3
3. THE ELECTRICAL DISTRIBUTION IS SHOWN SCHEMATICALLY ON THIS SHEET AND SHEET M-2. FOR EXACT LOCATIONS AND SIZES, SEE SHTS. E-4 AND E-5.
4. UNLESS OTHERWISE INDICATED, ALL EXISTING STRUCTURES OR UTILITIES ON THIS SHEET WHICH INTERFERE WITH NEW CONSTRUCTION SHALL BE DEMOLISHED AND REMOVED, TO THE EXTENT NECESSARY FOR NEW CONSTRUCTION. THE CONTRACTOR SHALL ALSO DEMOLISH AND REMOVE ALL STRUCTURES AND UTILITIES INDICATED ON OTHER SHEETS.
5. EXISTING PIPE, OBSTRUCTIONS AND ABANDONED UTILITIES SHOWN ARE FROM THE BEST INFORMATION AVAILABLE, BUT NOT GUARANTEED. SHOULD THE CONTRACTOR ENCOUNTER OBSTRUCTIONS AND/OR UTILITIES NOT INDICATED, THE CONTRACTING OFFICER SHALL BE NOTIFIED FOR DISPOSITION.
6. ALL ELEVATIONS SHOWN ARE MEAN SEA LEVEL (M.S.L.).

FOR OFFICIAL USE ONLY

Greiner Engineering Sciences, Inc. — CONSULTING ENGINEERS — TAMPA, FLORIDA

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON, S.C.

DSGN: RUSKEY CH DAVIS CHK FALK
SUPV: WALKER CH ENGR: MILITELLO
SUBMITTED BY: EVP DATE 6/30/86
FIRM NAME & TITLE
EIC: DIR
APPROVED — DATE
OFFICER IN CHARGE
APPROVED — DATE 7/16/86
DEPUTY COMMANDER NAVFAC

NAVAL AIR STATION — KEY WEST, FLA.

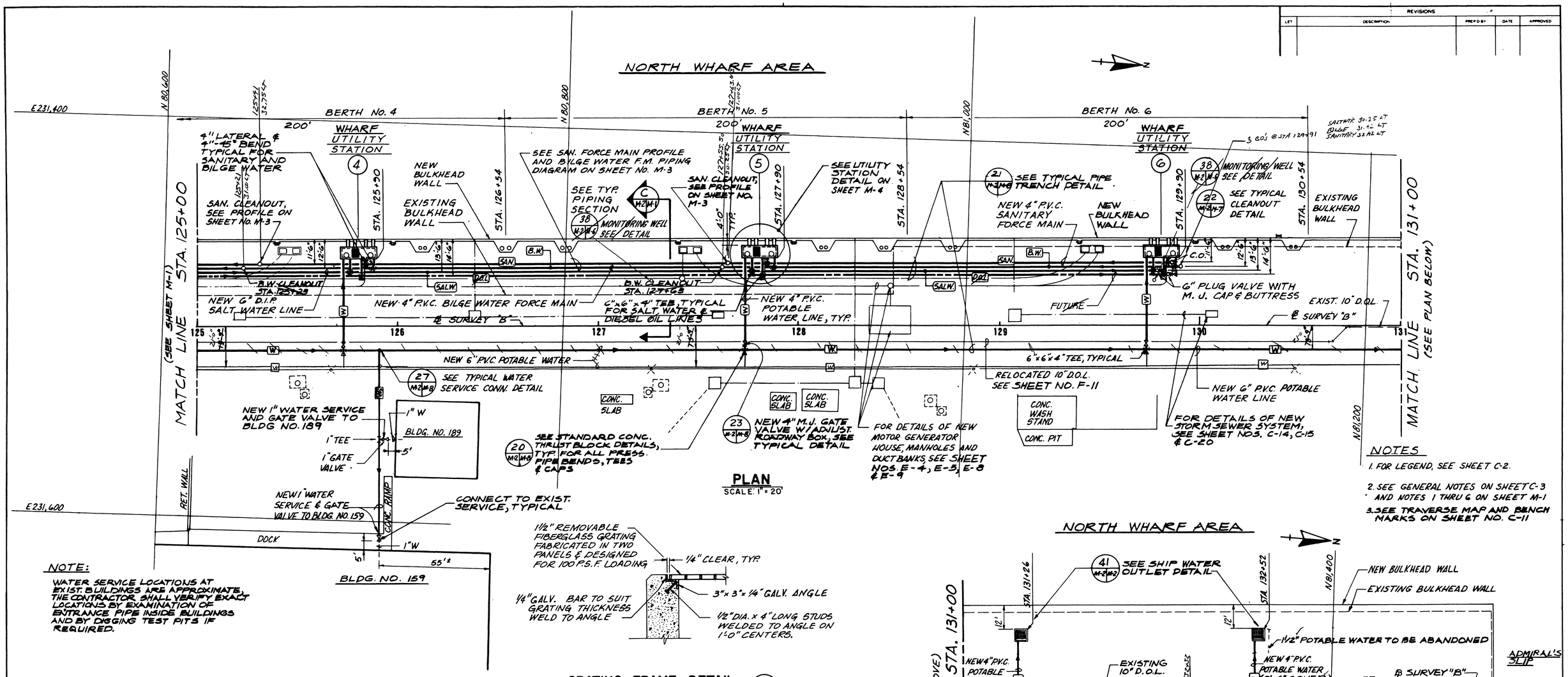
PHM BERTHING WHARF
TRUMAN ANNEX
UTILITY PLAN - SOUTH WHARF

SIZE: F — CODE IDENT NO: 80091 — NAVFAC DRAWING NO: 5157655
SCALE: AS NOTED — CONSTR CONTR NO: N62467-85-C-0141
SPEC 06-85-0141 — SHEET 25 OF

ARCH & ENGR SEAL

M-1

REVISIONS				
LET	DESCRIPTION	PREP'D BY	DATE	APPROVED



PLAN
SCALE: 1" = 20'

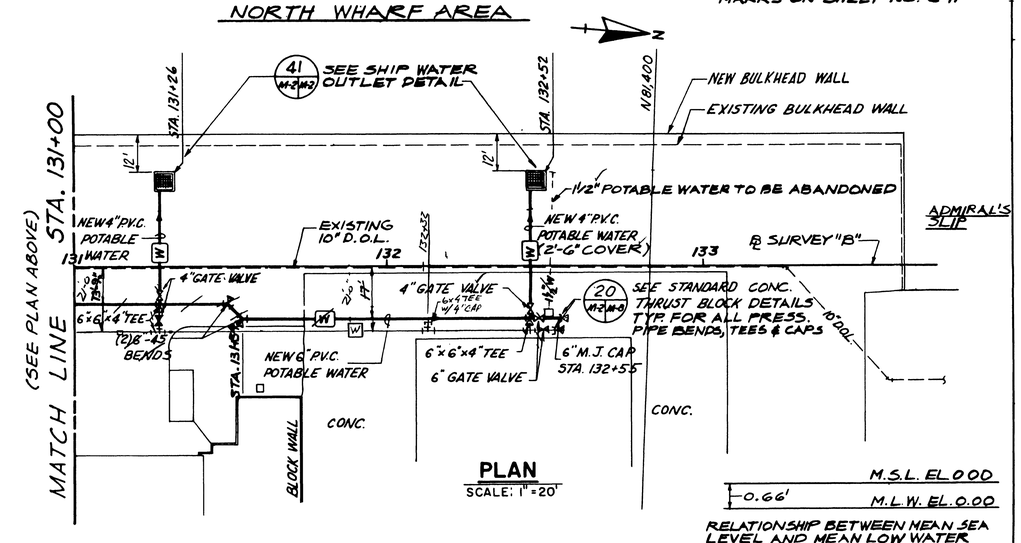
NOTES

1. FOR LEGEND, SEE SHEET C-2.
2. SEE GENERAL NOTES ON SHEET C-3 AND NOTES 1 THRU 6 ON SHEET M-1
3. SEE TRAVERSE MAP AND BENCH MARKS ON SHEET NO. C-11

NOTE:

WATER SERVICE LOCATIONS AT EXIST. BUILDINGS ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY EXACT LOCATIONS BY EXAMINATION OF ENTRANCE PIPE INSIDE BUILDINGS AND BY DIGGING TEST PITS IF REQUIRED.

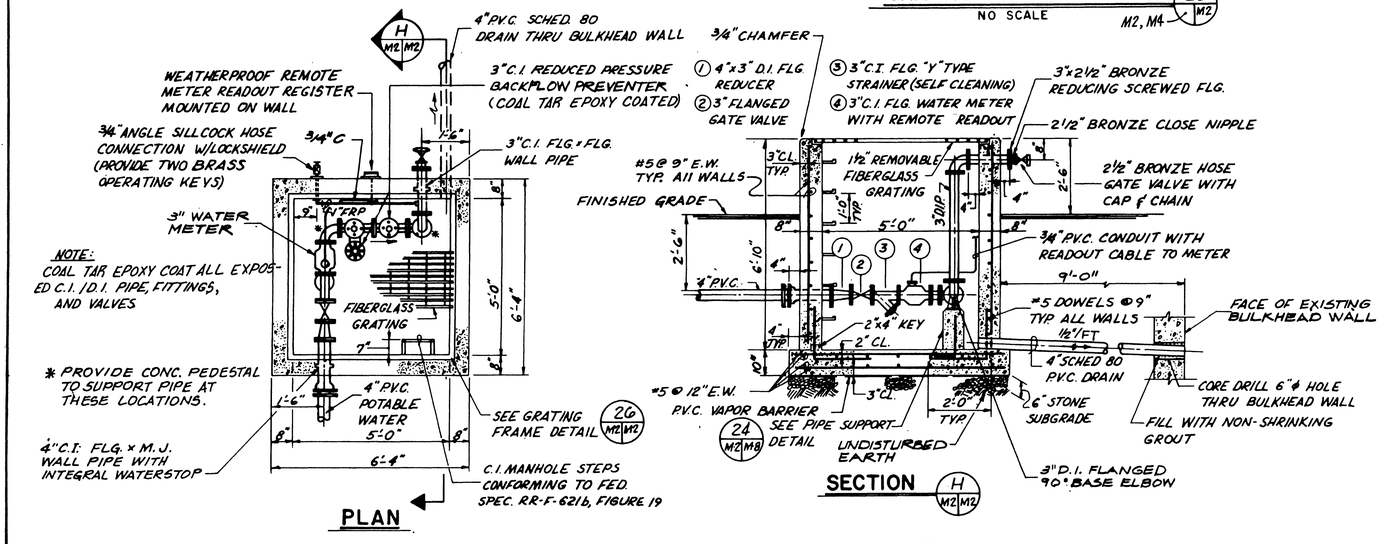
GRATING FRAME DETAIL 26 M2
NO SCALE
M2, M4



PLAN
SCALE: 1" = 20'

M.S.L. EL 0.00
0.66'
M.L.W. EL. 0.00

RELATIONSHIP BETWEEN MEAN SEA LEVEL AND MEAN LOW WATER



NOTE:
COAL TAR EPOXY COAT ALL EXPOSED C.I. / D.I. PIPE, FITTINGS, AND VALVES

* PROVIDE CONC. PEDESTAL TO SUPPORT PIPE AT THESE LOCATIONS.

SHIP WATER OUTLET DETAIL 41 M2 M2
(2 REQ'D. - STA. 131+32 & 132+51)
SCALE: 1/2" = 1'-0"

20' 10' 0' 10' 20'
SCALE: 1" = 20'
12" 0 1' 2' 3'
SCALE: 1/2" = 1'-0"

FOR OFFICIAL USE ONLY

Greiner Engineering Sciences, Inc.
CONSULTING ENGINEERS TAMPA FLORIDA

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON S C

NAVAL AIR STATION — KEY WEST, FLA.

DSGN RUSKEY DWN DAVIS CHK FALK
SUPV WALKER CH ENGR MILITELLO
SUBMITTED BY: J. Militello 6/20/86 DATE
FIRM MEMBER (TITLE)
EX C.H. Stevens BR NO
FPE CHR

PHM BERTHING WHARF
TRUMAN ANNEX
UTILITY PLAN - NORTH WHARF

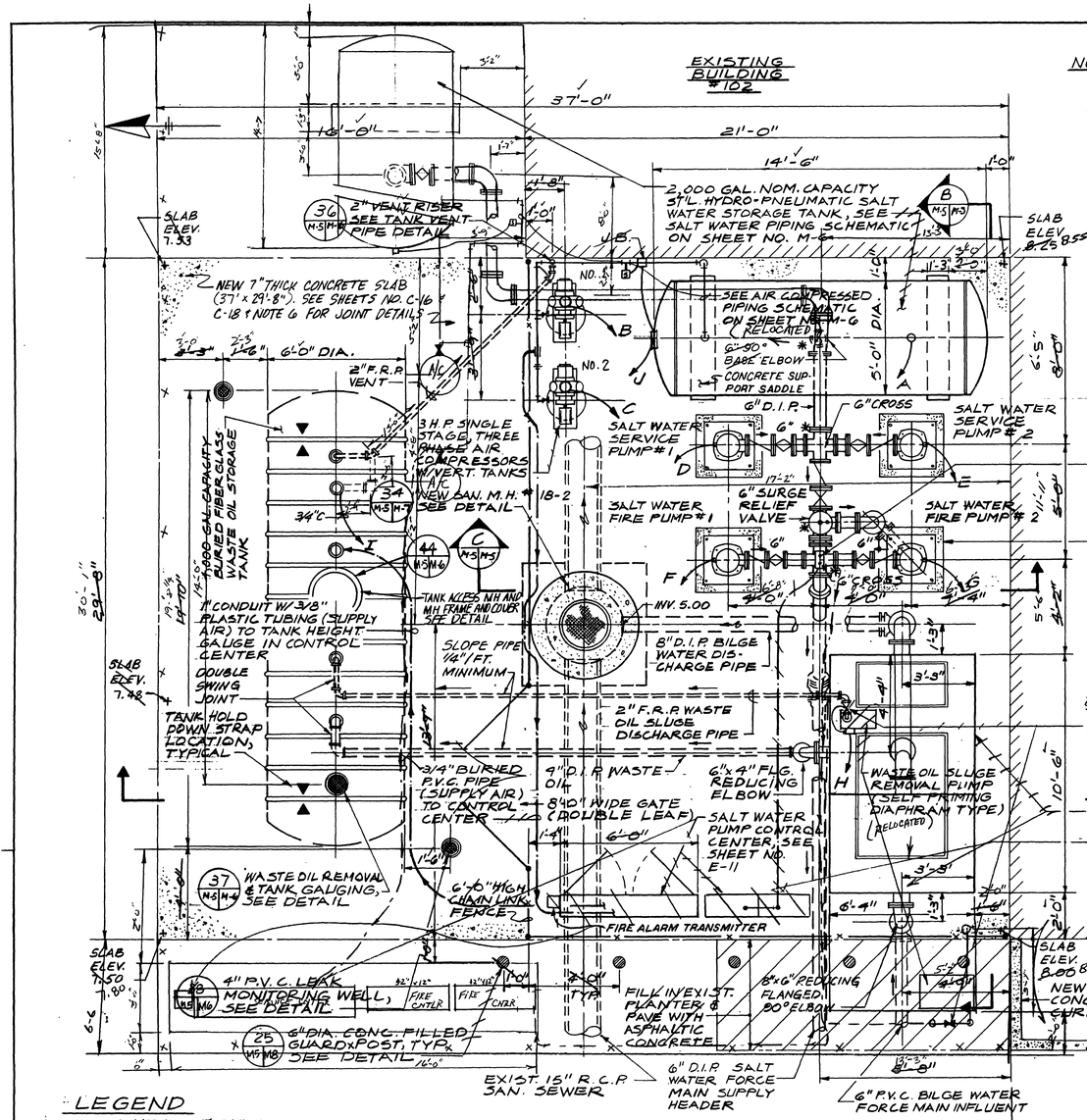
APPROVED DATE
OFFICER IN CHARGE
APPROVED 4/16/86
FOR COMMANDER, NAVFAC

J. Militello 6/20/86
Jerome L. Falk 6-30-1986
ARCH. & ENGR. SEAL

M-2

SIZE	CODE IDENT NO	NAVFAC DRAWING NO
F	80091	5157656
SCALE AS NOTED		CONSTR CONTR NO N62467-85-C-0141
		SPEC 06-85-0141 SHEET 26 OF

REVISIONS				
LET	DESCRIPTION	PREP'D BY	DATE	APPROVED



SALT WATER WELLS / OIL SEPARATOR SITE PLAN

SCALE: 3/8" = 1'-0"

NOTES:

1. FOR LEGEND, SEE SHEET NO. C-2.
2. FOR GENERAL NOTES, SEE SHEET NO C-3.
3. SHADED AREAS SHOWN ON SECTION (A) THIS SHEET INDICATE WHERE AGGREGATE BACKFILL WILL NOT FLOW AND COMPACT UNDER TANK. GRAVEL MUST BE WORKED INTO VOIDS FOR APPROX. THE FIRST 12 INCH LAYER OF FILL ABOVE THE BASE LAYER TO INSURE PROPER BEDDING OF THIS CRITICAL AREA.
4. ALL EXPOSED FERROUS METAL PIPING SHALL BE COATED WITH COAL TAR EPOXY AND ALL UNDERGROUND FERROUS PIPING SHALL BE BITUMINOUS COATED, D.I. PIPE SHALL BE CEMENT LINED.
5. ALL ELEVATIONS SHOWN ARE MEAN SEA LEVEL (M.S.L.).
6. PROVIDE TYPE (B) THICKENED EDGE JOINT AT ALL EDGES OF CONCRETE SLAB AND PROVIDE 3 TYPE (A-1) JOINTS AT EQUAL SPACINGS IN BOTH DIRECTIONS ACROSS SLAB.
7. PLACE 1/2" EXPANSION JOINT MATERIAL AND SEALANT AROUND ALL PROTRUSIONS THRU THE CONCRETE SLAB.

(43) M5/E11 SEE DETAIL OF TUBING CONNECTION @ 6" CROSS

(35) M-5/M-6 12" DIA. x 50' DEEP SALT WATER WELL, TYPICAL @ EACH PUMP SEE DETAIL (4 REQUIRED)

EXISTING BUILDING #102

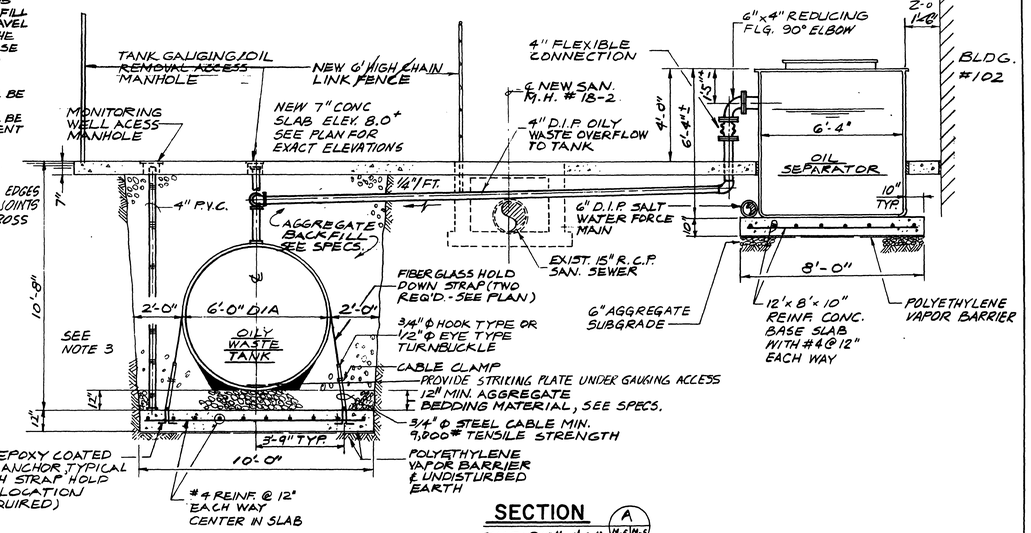
2" N.O. SOLENOID VALVE TO CLOSE WHEN WASTE TANK IS FULL.

(A) M-5/M-3

* PROVIDE CONCRETE PIPE SUPPORTS AT THESE LOCATIONS.

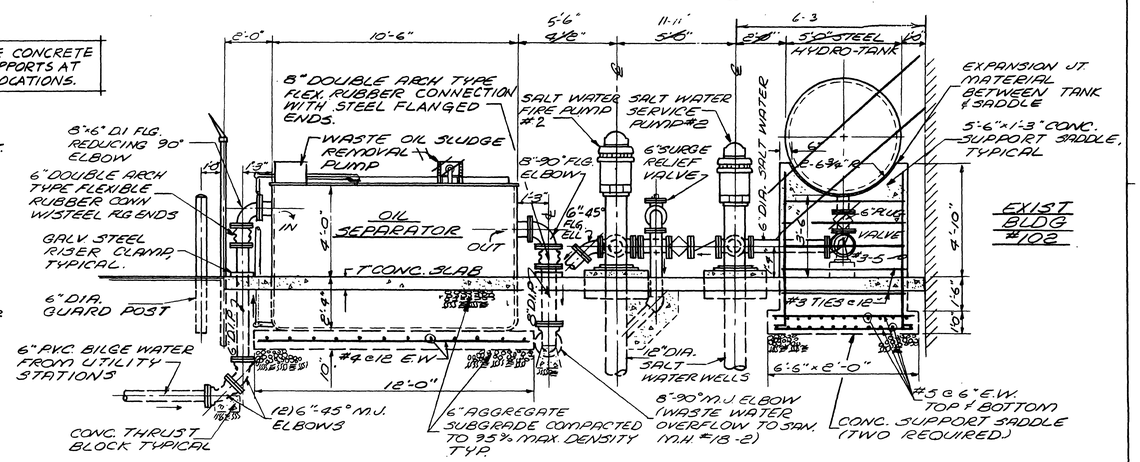
300 GAL. CAPACITY VERT. TUBE OIL SEPARATOR

1 1/2" CONDUIT W/ (2) 3/8" (SALT WATER PRESSURE) PLASTIC TUBING TO CONTROL CENTER. SEE SHEET E-11 FOR DETAILS



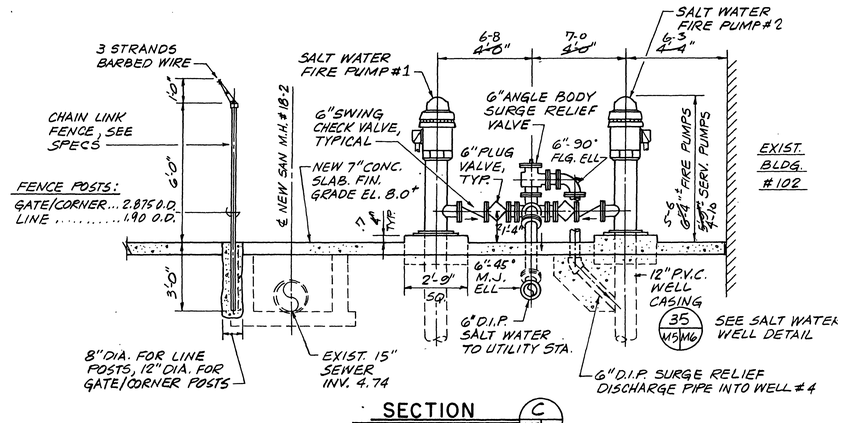
SECTION (A) M-5/M-3

SCALE: 3/8" = 1'-0"



SECTION (B) M-5/M-5

SCALE: 3/8" = 1'-0"



SECTION (C) M5/M5

SCALE: 3/8" = 1'-0"

12" 0 1' 2' 3' 4' 5'

SCALE: 3/8" = 1'-0"

CONDUIT & WIRE SCHEDULE

CONDUIT DESIGNATION	CONDUIT SIZE	DESCRIPTION
A	3/4"	DIFF. PRESS XMITTER 2-#12 CONDUCTORS
B	3/4"	AIR COMPRESSOR NO. 1 3-#12 CONDUCTORS
C	3/4"	AIR COMPRESSOR NO. 2 3-#12 CONDUCTORS
D	1"	SERVICE PUMP #1 3-#8 CONDUCTORS
E	1"	SERVICE PUMP # 2 3-#8 CONDUCTORS
F	2"	FIRE PUMP # 1 3-#1/0 CONDUCTORS
G	2"	FIRE PUMP # 2 3-#1/0 CONDUCTORS
H	3/4"	SLUDGE PUMP 3-#12 CONDUCTORS PLUS-2 #12 CONDUCTORS FOR SOLENOID VALVE.
I	3/4"	HIGH LEVEL ALARM 2-#12 CONDUCTORS
J	3/4"	FLOAT SWITCH AND SOLENOID VALVE 4-#12 CONDUCTORS

SALT WATER PUMP STATION EQUIPMENT SCHEDULE

DESCRIPTION	NO.	CAPACITY/SIZE
HYDRO-PNEUMATIC TANK	1	2,000 GAL.
SALT WATER WELLS	4	12" DIA.
SERVICE PUMPS	2	500 GPM @ 54 PSIG
FIRE PUMPS	2	500 GPM @ 178 PSIG
OIL/WATER SEPARATOR	1	300 GPM
AIR COMPRESSORS	2	11.9 CFM @ 100 PSIG
WASTE OIL TANK	1	4,000 GAL.
SALT WATER PUMP CONTROLS	1	200 AMP
SURGE RELIEF VALVE	1	6"

M.S.L. EL. 0.00

0.66'

M.L.W. EL. 0.00

RELATIONSHIP BETWEEN MEAN SEA LEVEL AND MEAN LOW WATER

FOR OFFICIAL USE ONLY

Greiner Engineering Sciences, Inc.
CONSULTING ENGINEERS TAMPA, FLORIDA

DSGN. RUSKIN-DAVIS CHK. FALK
SUPV. WORKER CH ENGR. MILITELLO
SUBMITTED BY: S. Militello EVP 6/20/86
FIELD VERIFICATION: DC ZH Stanczyk BR HD
PPE DIR

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON S.C.

NAVAL AIR STATION — KEY WEST, FLA.

PHM BERTHING WHARF
TRUMAN ANNEX
SALT WATER WELLS / OIL SEPARATOR DETAILS

APPROVED — DATE
OFFICER IN CHARGE
APPROVED — DATE
CAPT, CEC, USN — 7/16/86
CO/OIC COMMANDER NAVFAC

ARCH & ENGR SEAL — 6-30-1986

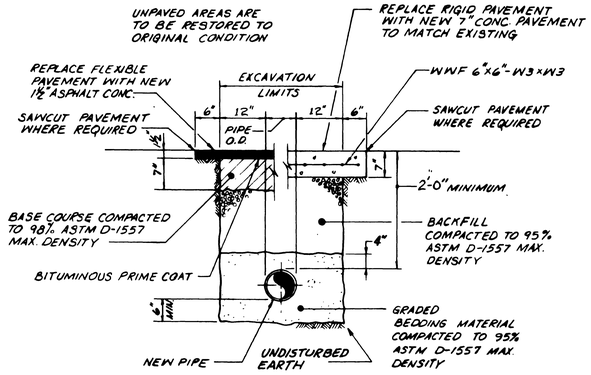
M-5

SIZE	CODE IDENT NO	NAVFAC DRAWING NO
F	80091	5157659
		CONSTR CONTR NO N62467-85-C-0141
SCALE AS NOTED	SPEC 06-85-0141	SHEET 29 OF

REVISIONS				
LET	DESCRIPTION	PREP'D BY	DATE	APPROVED

NOTE

UNPAVED AREAS ARE TO BE RESTORED TO ORIGINAL CONDITION



TYPICAL PIPE TRENCH DETAIL

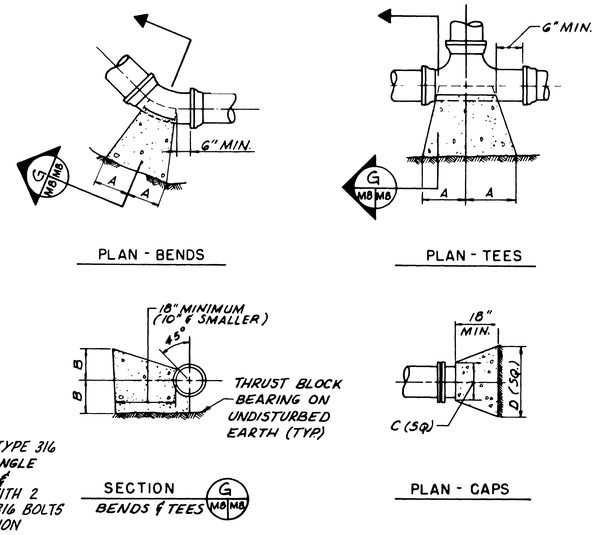
NO SCALE — 21 / M8 — C-12, M-1, M-2

HORIZONTAL BUTTRESS SCHEDULE										
SIZE	90° BENDS		45° BENDS		22½° BENDS*		TEES		CAPS	
	A	B	A	B	A	B	A	B	C	D
4"	14"	8"	7"	8"	6"	7"	8"	10"	8"	17"
6"	16"	10"	9"	10"	6"	8"	10"	12"	10"	21"
10"	26"	17"	14"	17"	10"	13"	16"	20"	14"	36"

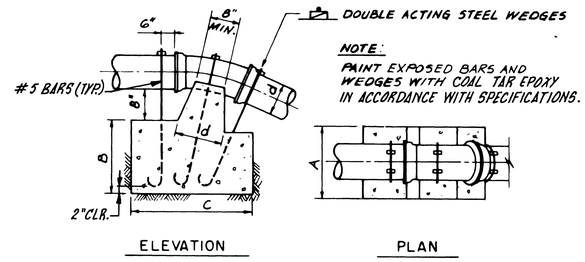
* OR LESS

VERTICAL BUTTRESS SCHEDULE							VERTICAL ANCHORAGE SCHEDULE					
SIZE	45° BENDS			22½° BENDS*			45° BENDS			22½° BENDS*		
	A	B	C	A	B	C	A	B	C	A	B	C
4"	15"	6"	6"	12"	6"	6"	24"	24"	30"	18"	18"	27"
6"	15"	7"	7"	12"	7"	7"	30"	30"	36"	24"	21"	30"
10"	25"	9"	10"	18"	8"	8"	48"	42"	54"	44"	30"	46"

* OR LESS

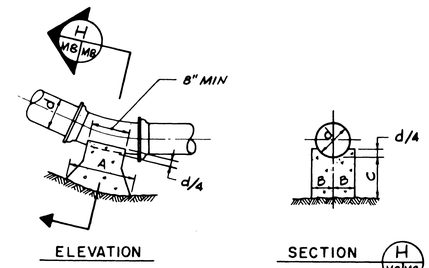


BUTTRESSES FOR HORIZONTAL BENDS, TEES & CAPS



NOTE:
PAINT EXPOSED BARS AND WEDGES WITH COAL TAR EPOXY IN ACCORDANCE WITH SPECIFICATIONS.

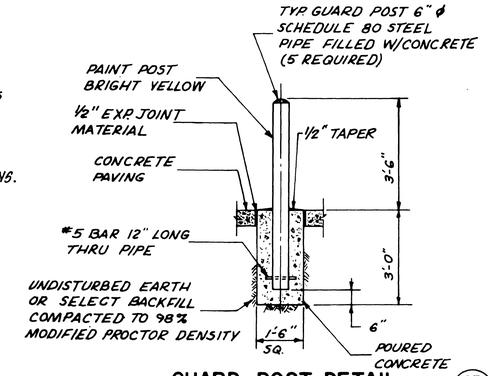
ANCHORAGE FOR VERTICAL BENDS



BUTTRESSES FOR VERTICAL BENDS

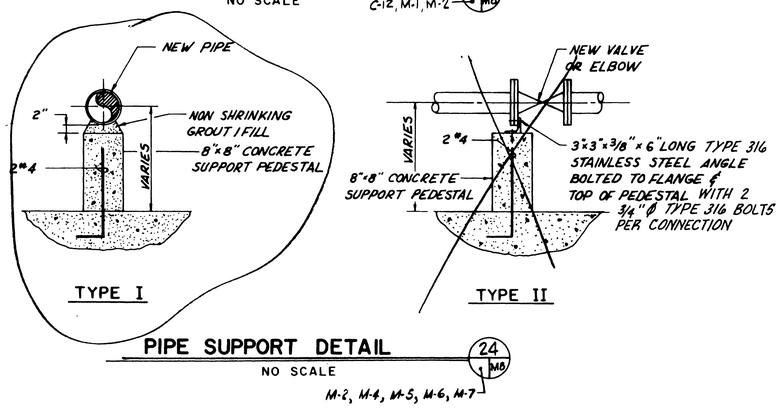
STANDARD THRUST BLOCK DETAILS

NO SCALE — 20 / M8 — AS NECESSARY



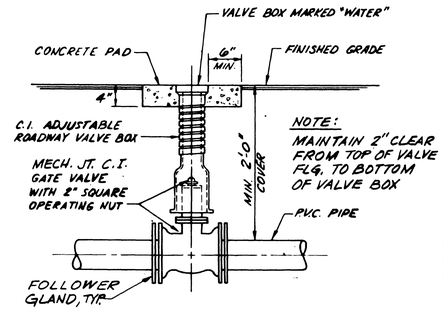
GUARD POST DETAIL

SCALE 1/2"=1'-0" — 25 / M5 M8



PIPE SUPPORT DETAIL

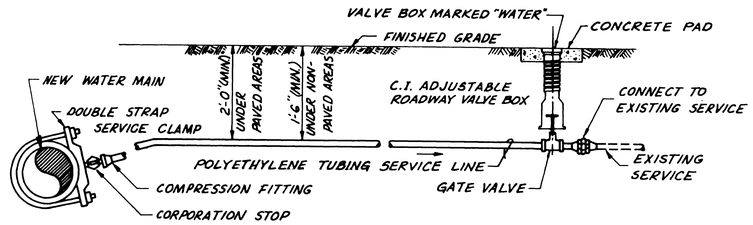
NO SCALE — 24 / M8 — M-2, M-4, M-5, M-6, M-7



NOTE:
MAINTAIN 2" CLEAR FROM TOP OF VALVE FLG. TO BOTTOM OF VALVE BOX

GATE VALVE & BOX DETAIL

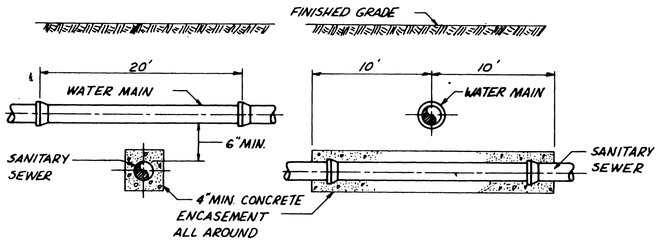
NO SCALE — 23 / M8 — C-12, M-1, M-2



1. SUCCESSIVE TAPS INTO THE WATER MAIN SHALL BE SPACED NOT LESS THAN 18" ON CENTERS.
2. NEW SERVICE PIPE SHALL BE AS SHOWN.
3. FOR 1" SERVICE LINES THE MINIMUM RADIUS SHALL BE 14" FOR 1½" SERVICES THE MINIMUM RADIUS SHALL BE 21."

TYPICAL WATER SERVICE CONNECTION DETAIL

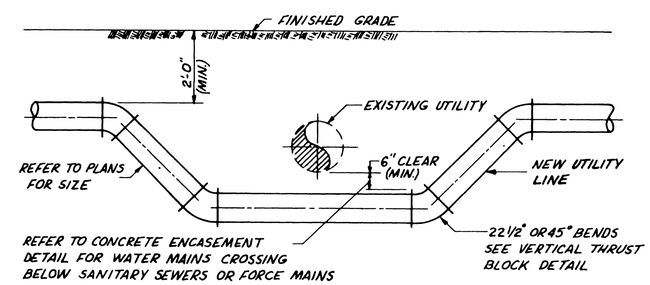
NO SCALE — 27 / M8 — M-1, M-2



1. WHERE THE LOCATION OF THE WATER LINE IS NOT CLEARLY DEFINED BY DIMENSIONS ON THE DRAWINGS, DO NOT LAY WATER LINE CLOSER HORIZONTALLY THAN 10 FEET FROM ANY SEWER LINE.
2. WHERE WATER LINES CROSS UNDER GRAVITY SEWER LINES, ENCASE SEWER LINE FULLY IN CONCRETE FOR A DISTANCE OF AT LEAST 10 FEET ON EACH SIDE OF THE CROSSING, UNLESS SEWER LINE IS MADE OF PRESSURE PIPE WITH RUBBER-GASKETED JOINTS AND NO JOINT IS LOCATED WITHIN 3 FEET HORIZONTALLY OF THE CROSSING.
3. LAY WATER LINES WHICH CROSS SEWER FORCE MAINS AT LEAST 2 FEET ABOVE SEWER LINES; WHEN JOINTS IN THE SEWER LINE ARE CLOSER THAN 3 FEET HORIZONTALLY FROM THE WATER LINE, ENCASE JOINTS IN CONCRETE.
4. CONSTRUCTION SHALL CONFORM WITH SPECIFICATION 02713 PARAGRAPH 3.1.1.1

CONCRETE ENCASEMENT DETAIL

NO SCALE — 28 / M8 — AS NECESSARY



UTILITY CROSSING DETAIL

NO SCALE — 29 / M8 — AS NECESSARY

12" 0' 1' 2' 3'
SCALE 1/2" = 1'-0"

FOR OFFICIAL USE ONLY

Greiner Engineering Sciences, Inc. — CONSULTING ENGINEERS — TAMPA, FLORIDA

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON, S.C.

DSGN RUSKEY CH LUTZ CHK FALK
SUPV WALKER CH ENGR MILITELLO
SUBMITTED BY: S. Militello GUP 6/20/86
FIRM MEMBER (TITLE): E.W. Stumpf
EIC ____ BR HD ____
FPE ____ DR ____

APPROVED ____ DATE ____
OFFICER IN CHARGE
APPROVED: Illy P.E. 9/16/86
EFD FOR COMMANDER NAVFAC

NAVAL AIR STATION — KEY WEST, FLA.

PHM BERTHING WHARF
TRUMAN ANNEX
UTILITY DETAILS

M-8

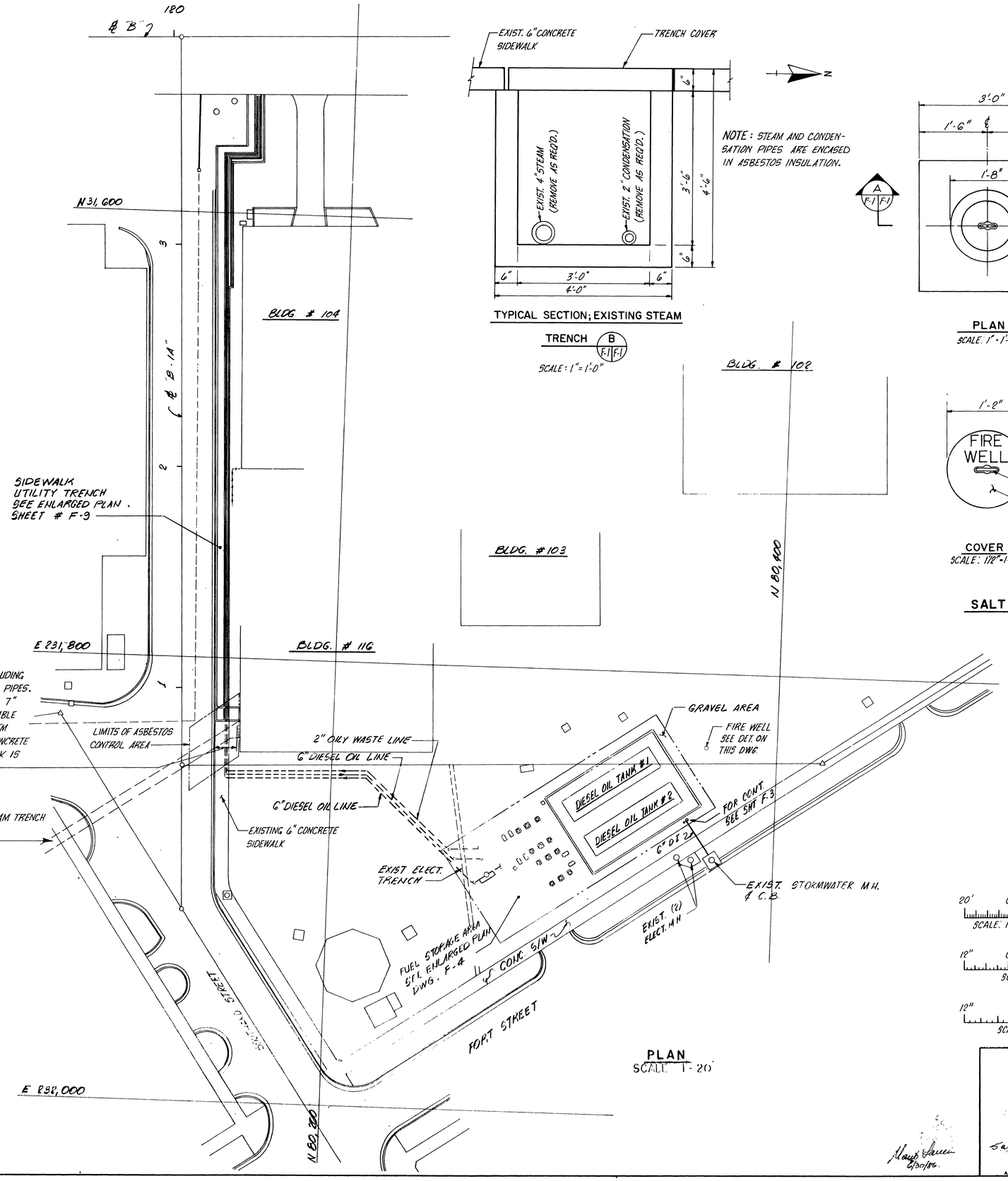
SIZE	CODE IDENT NO	NAVFAC DRAWING NO
F	80091	5157662

CONSTR CONTR NO N62467-85-C-0141
SCALE AS NOTED — SPEC 06-85-0141 — SHEET 32 OF

ARCH & ENGR SEAL

SOUTHDIV-6-110 (1 1/2 REV 2-61)

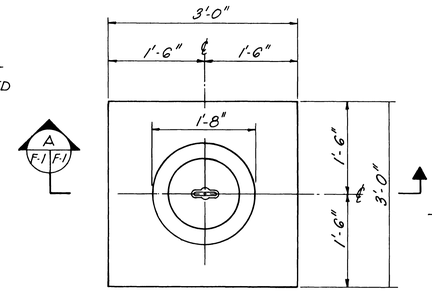
REVISIONS				
LET	DESCRIPTION	PREP'D BY	DATE	APPROVED



PLAN
SCALE: 1" = 20'

NOTE: STEAM AND CONDENSATION PIPES ARE ENCASED IN ASBESTOS INSULATION.

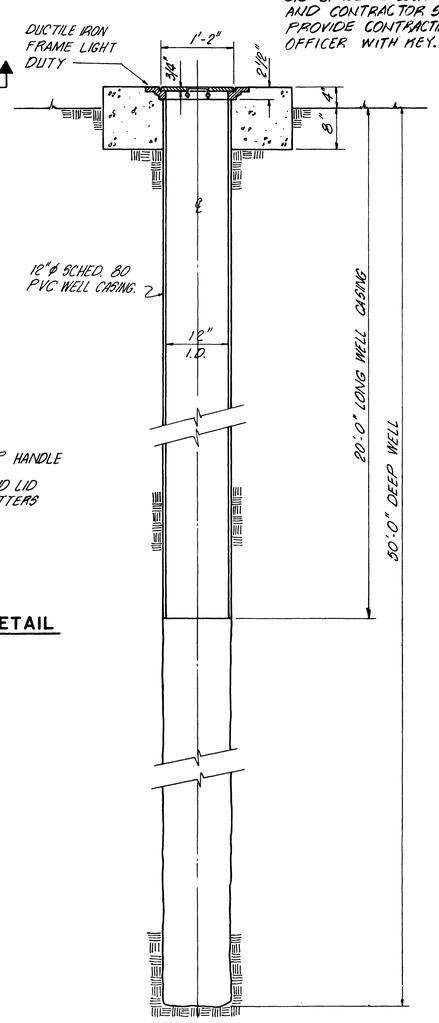
TYPICAL SECTION; EXISTING STEAM TRENCH B F-1 F-1
SCALE: 1" = 1'-0"



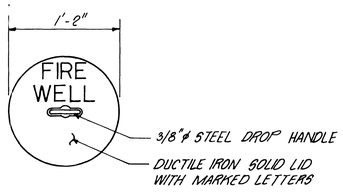
PLAN
SCALE: 1" = 1'-0"

NOTE:
FOR LEGEND SEE DRAWING C-2.

NOTE:
LID SHALL BE LOCKABLE AND CONTRACTOR SHALL PROVIDE CONTRACTING OFFICER WITH KEY.



SECTION A F-1 F-1
SCALE: 1" = 1'-0"



COVER
SCALE: 1 1/2" = 1'-0"

SALT WATER WELL DETAIL

20' 0 20'
SCALE: 1" = 20'

12" 0 1' 2'
SCALE: 1" = 1'-0

12" 0 1'
SCALE: 1 1/2" = 1'-0"

FOR OFFICIAL USE ONLY

Greiner Engineering Sciences, Inc.
CONSULTING ENGINEERS TAMPA, FLORIDA

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
P.O. BOX 10068
CHARLESTON, S.C.

NAVAL AIR STATION KEY WEST, FLA

PHM BERTHING WHARF
TRUMAN ANNEX
FUEL OIL DISTRIBUTION SYSTEM

DRAWN: PATRONA-LAMBIA-LARREA
SURV: WALKER CHECKED:
SUBMITTED BY: E. Mitchell SUP. DATE 6/30/86
FIELD ENGINEER TITLE:
ENGR: E.H. Schmuck BRHD: AB Scales
TPE: DIR:

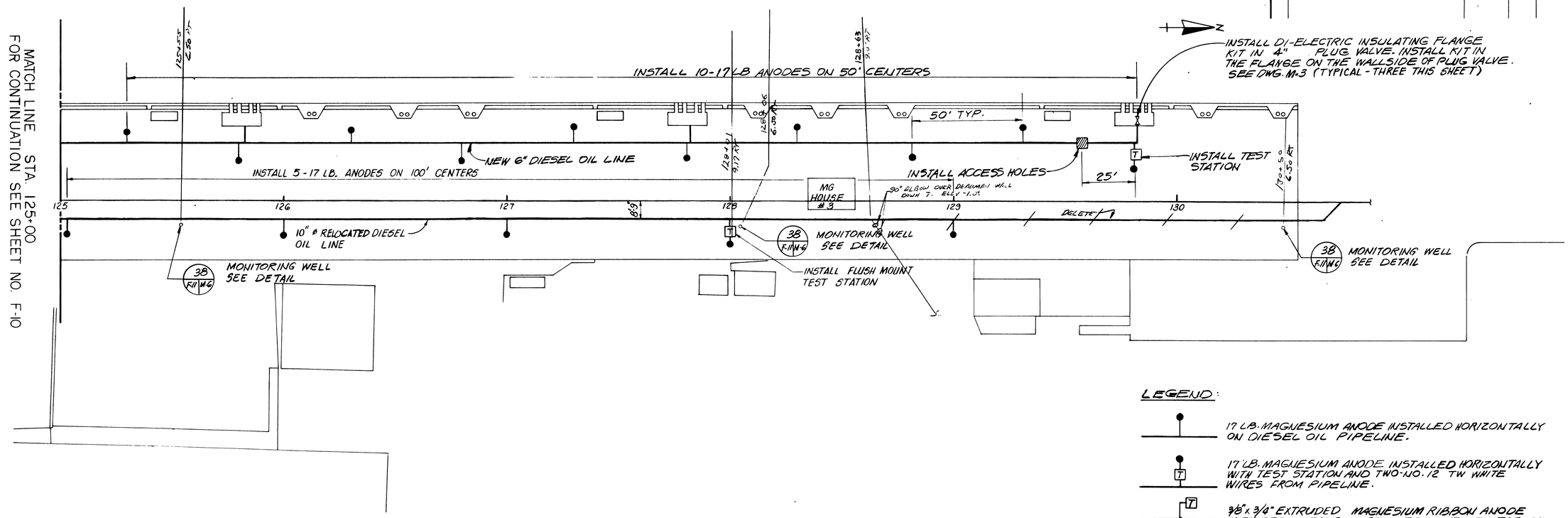
APPROVED DATE
OFFICER IN CHARGE
APPROVED DATE
CO FOR COMMANDER, NAVFAC

Sam Mitchell 6/30/86
ARCH & ENGR SEAL

F-1

SIZE	CODE IDENT NO	NAVFAC DRAWING NO
F	80091	5157663
		CONSTR CONTR NO N62467-85-C-0141
SCALE AS NOTED	SPEC 06-85-0141	SHEET 33 OF

REVISIONS				
LET	DESCRIPTION	PREP'D BY	DATE	APPROVED



LEGEND:

- 17 LB. MAGNESIUM ANODE INSTALLED HORIZONTALLY ON DIESEL OIL PIPELINE.
- 17 LB. MAGNESIUM ANODE INSTALLED HORIZONTALLY WITH TEST STATION AND TWO-NO. 12 TW WHITE WIRES FROM PIPELINE.
- 3/8" x 3/4" EXTRUDED MAGNESIUM RIBBON ANODE WITH TEST STATION INSTALLED IN UTILITY TRENCH AND CENTERED BETWEEN PIPELINES.
- ACCESS HOLE TO SOIL DIRECTLY OVER PIPELINE, CENTERED BETWEEN ANODES.
- NO. 8 HMWPE BOND CABLE THERMIT WELDED TO 2-6" DIESEL PIPELINES.

NOTES:

1 - ALL 17 LB. ANODES TO BE INSTALLED HORIZONTALLY AND PARALLEL TO PIPE.

2 - BOND CABLE BETWEEN 2-6" DIESEL PIPELINES TO BE NO. 8 HMWPE CABLE. THERMIT WELD CABLE TO BOTH PIPES AND REPAIR COATING.

3 - MAGNESIUM RIBBON ANODE TO BE INSTALLED IN UTILITY TRENCH AND CENTERED BETWEEN PIPELINES. RIBBON ANODE TO BE INSTALLED TO A MINIMUM DEPTH EQUAL TO THE DEPTH OF THE BOTTOM OF THE PIPELINES.

20' 10' 0 20'
SCALE: 1" = 20'

FOR OFFICIAL USE ONLY

Greiner Engineering Sciences, Inc.
CONSULTING ENGINEERS TAMPA, FLORIDA

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON, S C

DSGN LARREA DR RODRIGUEZ CH LARREA
SUPV WALKER CH ENGR MILITELLO
SUBMITTED BY DATE 6/20/86
FIRM MEMBER TITLE
EIC BRANCH HD
FPE DIR

NAVAL AIR STATION KEY WEST, FL A

PHM BERTHING WHARF
TRUMAN ANNEX
PIPING RELOCATION AND CATHODIC PROTECTION-NORTH

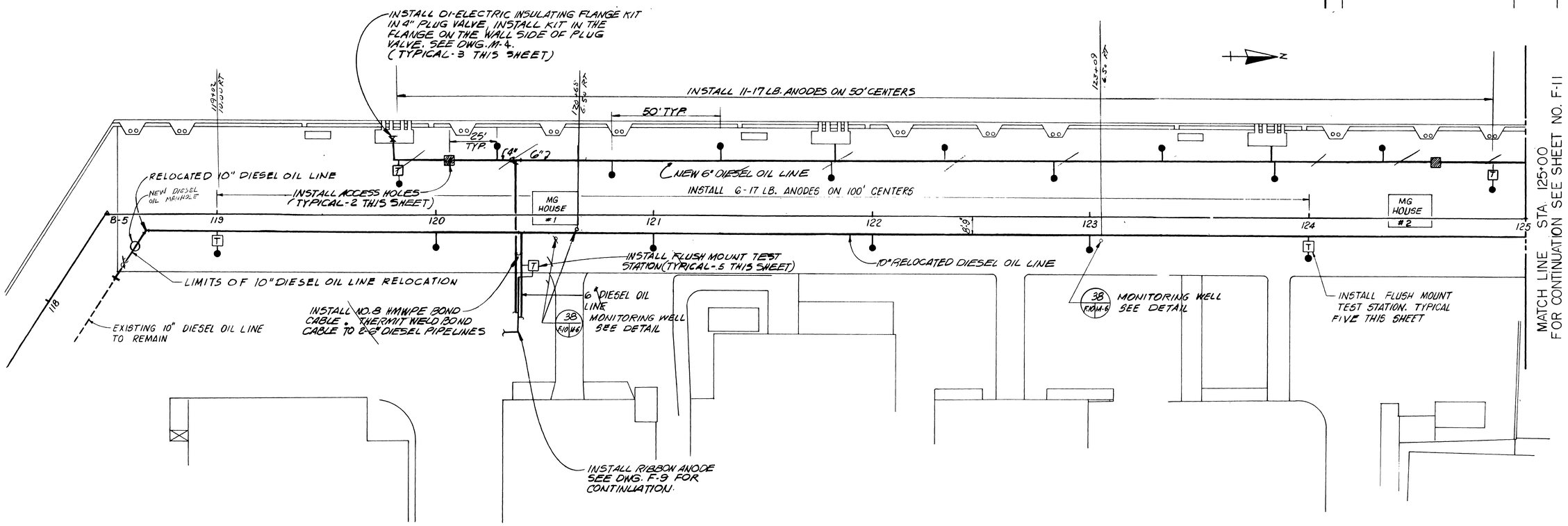
APPROVED DATE
OFFICER IN CHARGE
APPROVED DATE
CEC OFFICER COMMANDER NAVFAC 7/16/86

ARCH. & ENGR. SEAL

F-11

SIZE	CODE IDENT NO.	NAVFAC DRAWING NO
F	80091	5157673
		CONSTR CONTR NO N62467-85-C-0141
SCALE 1" = 20'		SPEC 06-85-0141 SHEET 43 OF

REVISIONS				
LET	DESCRIPTION	PREP'D BY	DATE	APPROVED



20' 10' 0 20'
SCALE: 1" = 20'

ARCH & ENGR. SEAL

F-10

FOR OFFICIAL USE ONLY

Greiner Engineering Sciences, Inc.
CONSULTING ENGINEERS TAMPA, FLORIDA

DSGN LARREA DR RODRIGUEZ MK LARREA
SUPV WALKER CH ENGR MILITELLO
SUBMITTED BY 6/18/86
FINAL REVIEW TITLE
EIC H. Stanquer BR HD
FPE DIR

APPROVED DATE
OFFICER IN CHARGE
APPROVED DATE 3/16/86
CEC FOR COMMANDER NAVFAC

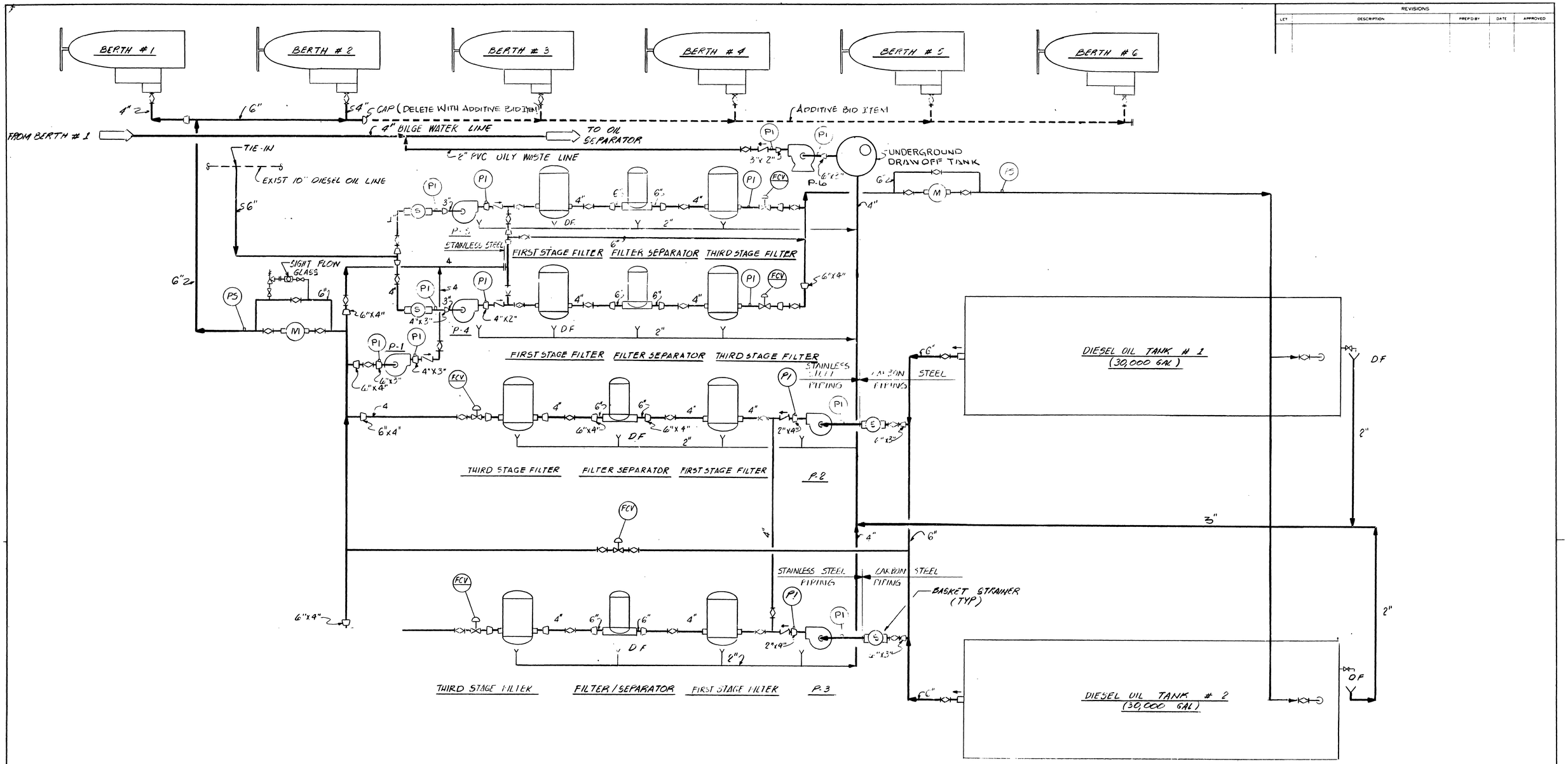
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON, S C

NAVAL AIR STATION KEY WEST, FLA.

PHM BERTHING WHARF
TRUMAN ANNEX
PIPING RELOCATION AND CATHODIC PROTECTION-SOUTH

SIZE	CODE IDENT NO	NAVFAC DRAWING NO
F	80091	5157672
		CONSTR CONTR NO N62467-85-C-0141
SCALE 1" = 20'		SPEC 06-85-0141 SHEET 42 OF

SOUTHDIV-4-110112-15 (REV. 2-81)



REVISIONS				
LET	DESCRIPTION	PREP'D BY	DATE	APPROVED

FOR OFFICIAL USE ONLY

Greiner Engineering Sciences, Inc.
CONSULTING ENGINEERS TAMPA, FLORIDA

DSGN LARREA CH MARTINEZ CHK LARREA
SUPV WALKER CH ENGR MILITELLO
SUBMITTED BY: S. Militello EVP 6/20/86
FIRM REVIEW (TITLE) E.W. Schmidt
EC ____ BRHD ____
FPE ____ DIR ____

APPROVED DATE
OFFICER IN CHARGE
APPROVED DATE
CO FOR COMMANDER, NAVFAC 3/16/86

ARCH & ENGR SEAL

F-2

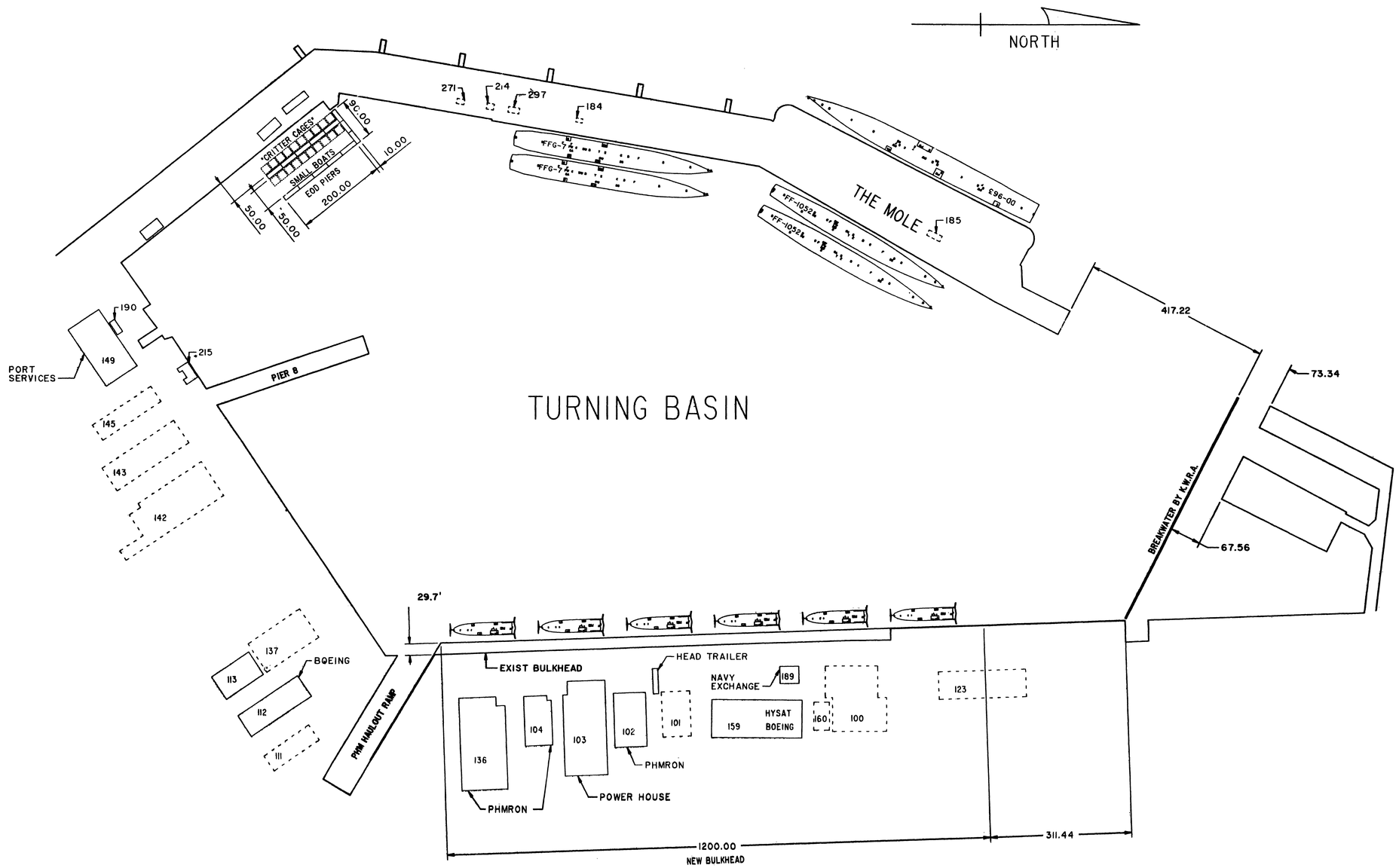
DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON S.C.

NAVAL AIR STATION — KEY WEST, FLA.

PHM BERTHING WHARF
TRUMAN ANNEX
FLOW DIAGRAM

SIZE	CODE IDENT NO	NAVFAC DRAWING NO
F	80091	5157664
SCALE NONE		CONSTR CONTR NO N62467-85-C-0141
		SPEC 06-85-0141 SHEET 34 OF

REVISIONS				
LET	DESCRIPTION	PREP'D BY	DATE	APPROVED

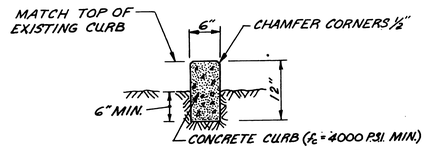


BERTHING PLAN

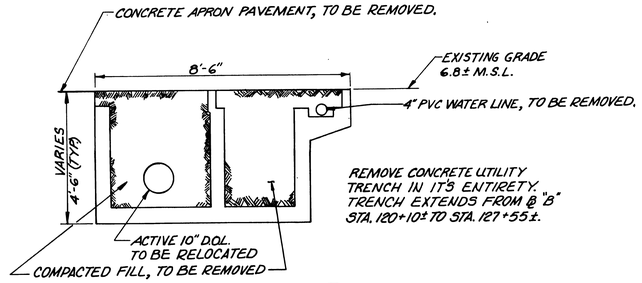
1" = 100'-0" 100' 0 100' 200' 300'

DESIGNED E.H.STEHMEYER, JR, P.E.	DEPARTMENT OF THE NAVY	NAVAL FACILITIES ENGINEERING COMMAND		
DRAWN BY SOUTHNAVFAC CADDS	SOUTHERN DIVISION CHARLESTON, SC			
CHECKED BY E.H.STEHMEYER, JR, P.E.	NAVAL AIR STATION	KEY WEST FLORIDA		
IN CHARGE T.E.KNISLEY	PHM BERTHING WHARF			
PROJ ENGR / DIRECTOR E.H. Stehmeyer Jr.	TRUMAN ANNEX			
	BERTHING PLAN			
S-16	APPROVED / DATE 9/16/86	SIZE F	CODE IDENT NO. 80091	NAVFAC DRAWING NO. 5157702
	FOR COMMANDER, NAVFAC	SCALE AS NOTED		CONSTR CONTR NO N62467-85-C-0141
			SPEC 06-85-0141	SHEET 74 OF

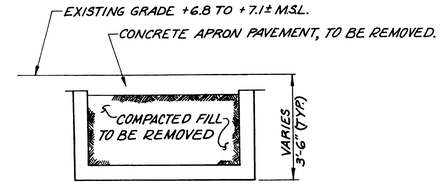
REVISIONS				
LET	DESCRIPTION	PREP'D BY	DATE	APPROVED



BUILDING 102 PLANTER CURB DETAIL (1 / C-9 C-9)
SCALE: 1" = 1'-0"

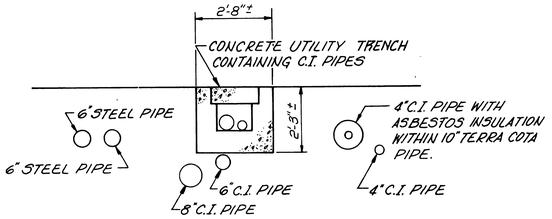


UTILITY TRENCH SECTION (A / C-9)
SCALE: ½" = 1'-0"
C-5, C-6, & C-7



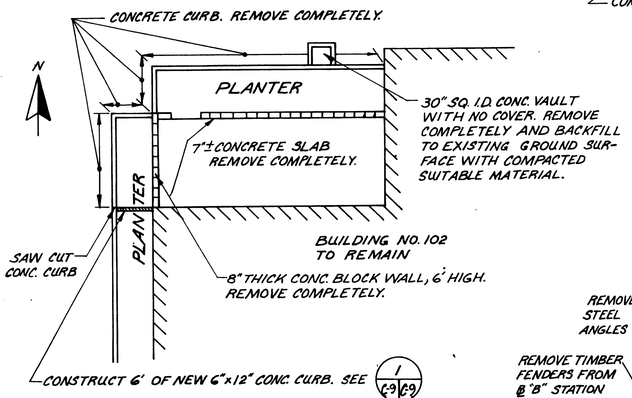
REMOVE CONCRETE UTILITY TRENCHES IN THEIR ENTIRETY. THERE ARE 5 SIMILAR TRENCHES, EACH 23'± IN LENGTH.

UTILITY TRENCH SECTION (D / C-9)
SCALE: ½" = 1'-0"
C-5, C-6

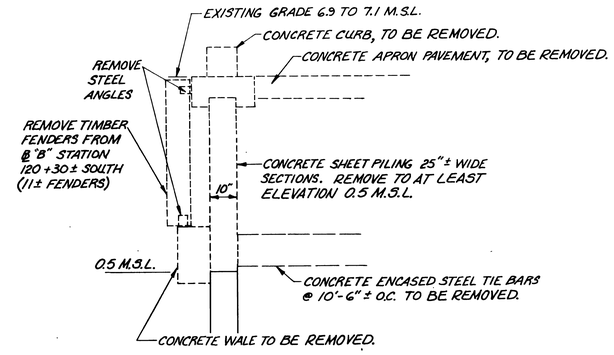


SECTION (E / C-7 C-9)
SCALE: ½" = 1'-0"

THE INFORMATION SHOWN ABOVE HAS BEEN EXTRACTED FROM NAVY DRAWING KW-81 DATED 3/29/52

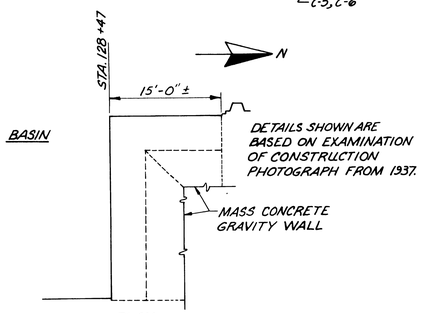


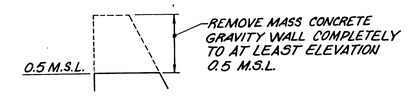
BUILDING 102 AREA DEMOLITION DETAIL (2 / C-9 C-9)
SCALE: 1/16" = 1'-0"



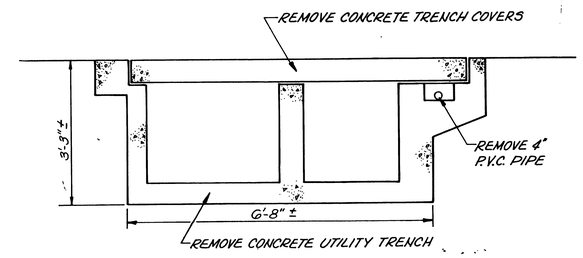
SECTION APPLIES FROM ℄ "B" STATION 128+47 SOUTH.

BULKHEAD DEMOLITION SECTION (B / C-9)
SCALE: ½" = 1'-0"
C-5, C-6

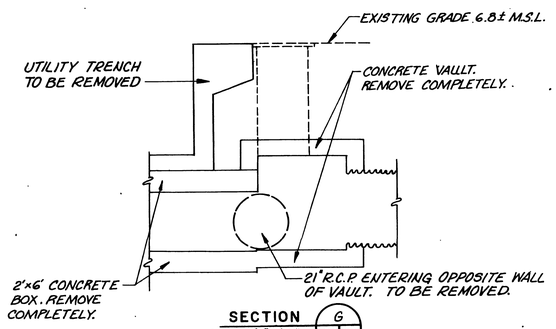




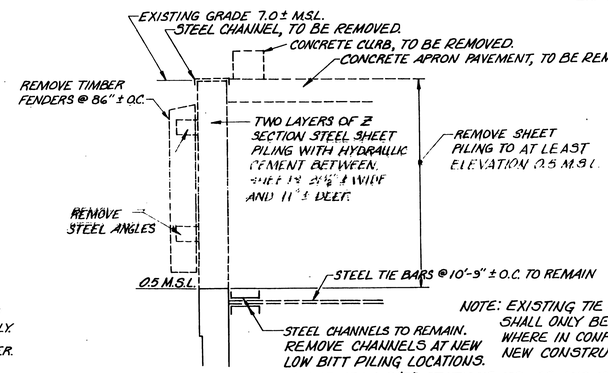
CONCRETE GRAVITY QUAY WALL DETAIL (4 / C-9)
SCALE: 1/8" = 1'-0"
C-6, & C-4



SECTION (F / C-7 C-9)
SCALE: ¾" = 1'-0"



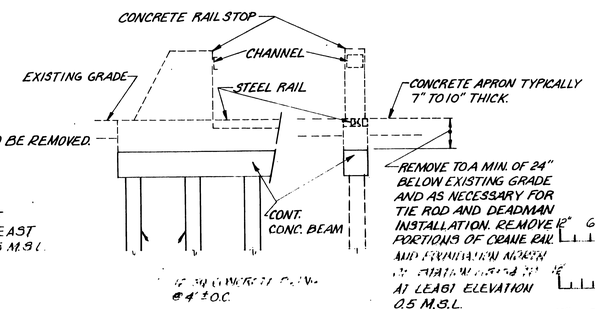
SECTION (G / C-9 C-9)
SCALE: ¼" = 1'-0"



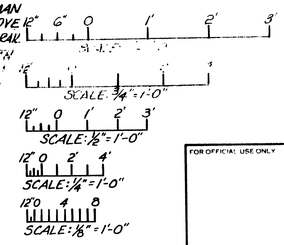
NOTE: EXISTING TIE BAR SYSTEM SHALL ONLY BE REMOVED WHERE IN CONFLICT WITH NEW CONSTRUCTION.

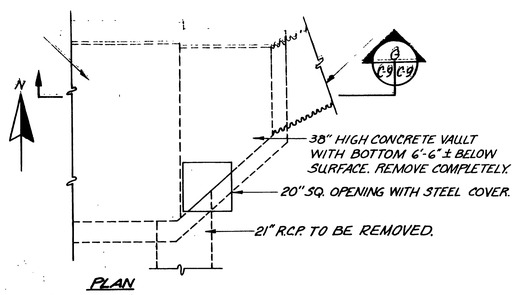
SECTION APPLIES BETWEEN ℄ "B" STATIONS 128+62 AND 130+54

BULKHEAD DEMOLITION SECTION (C / C-6 C-9)
SCALE: ½" = 1'-0"

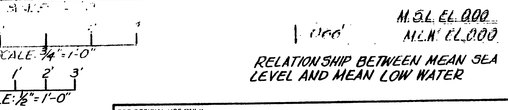


CRANE RAIL DETAIL (5 / C-9)
SCALE: ¼" = 1'-0"
C-4, C-7





DETAIL (3 / C-7 C-9)
SCALE: ¼" = 1'-0"



RELATIONSHIP BETWEEN MEAN SEA LEVEL AND MEAN LOW WATER

FOR OFFICIAL USE ONLY

Greiner Engineering Sciences, Inc.
CONSULTING ENGINEERS TAMPA, FLORIDA

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
SOUTHERN DIVISION
CHARLESTON S.C.

DSGN EVANS/WINCHURCH/WALKER
SUP'V WALKER CH ENGR MILITELLO
SUBMITTED BY: S. Militello EVP 6/23/86
FIRM MEMBER (TITLE)
EIC G.H. Schwager
FYI ____ DWR ____
APPROVED ____ DATE ____
OFFICER IN CHARGE
APPROVED ____ DATE ____
P.E.
FOR COMMANDER, NAVFAC — 9/16/86

ARCH & ENGR SEAL — S. Militello 6/23/86

C-9

NAVAL AIR STATION — KEY WEST, FLA.
PHM BERTHING WHARF
TRUMAN ANNEX
DEMOLITION SECTIONS AND DETAILS

SIZE	CODE IDENT NO	NAVFAC DRAWING NO
F	80091	5157639
SCALE AS NOTED		CONSTR CONTR NO N62467-85-C-0141
		SPEC 06-85-0141 — SHEET 9 OF

SOUTHDIV-A-1 (12-13) REV. 3-81

APPENDIX D

62-713.900 Forms.

The forms used by the Department for soil treatment facilities are adopted and incorporated by reference in this section. The form is listed by rule number, which is also the form number, and with the title, subject and effective date. Copies of forms may be obtained from a local District Office or by writing to the Florida Department of Environmental Protection, Solid Waste Section, MS 4565, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

(1) Form 62-713.900(1): Application for Permit to Construct or Operate a Stationary Soil Treatment Facility, effective August 5, 1999.

(2) Form 62-713.900(2): Notification of Intent to Use a General Permit to Construct or Operate a Mobile Soil Treatment Facility, effective August 5, 1999.

(3) Form 62-713.900(3): Soil Testing Reporting Form, effective August 5, 1999.

Specific Authority 403.061, 403.704 FS. Law Implemented 403.0877, 403.707 FS. History–New 8-5-99.

Table A. Minimum Number of Soil Samples Required

Amount of Soil by Volume, yd3	Amount of Soil by Weight, tons	Number of Discrete Samples Required for Volatile Organics	Number of Composite Samples Required for non-Volatile Organics
<100	<140	1	1
100 to <500	140 to <700	3	3
500 to <1000	700 to <1400	5	5
For each additional 500 yd3	For each additional 700 tons	1	1

Table B. Total Metals Analysis and TCLP Test Requirements

If	Exceeds	TCLP Test Criteria
Total Arsenic	100 mg/kg	5.0 mg/L
Total Barium	2000 mg/kg	100.0 mg/L
Total Cadmium	20 mg/kg	1.0 mg/L
Total Chromium	100 mg/kg	5.0 mg/L
Total Lead	100 mg/kg	5.0 mg/L
Total Mercury	4 mg/kg	0.2 mg/L
Total Selenium	20 mg/kg	1.0 mg/L
Total Silver	100 mg/kg	5.0 mg/L

APPENDIX E

TRUMAN WATERFRONT LUC AREA CONSTRUCTION PERMIT

GENERAL INFORMATION:

Requestor:	Location: (Include Bldg Nos. and Streets) Truman Waterfront Park	Date of Request:
Contractor:	Subcontractors:	SWMUs/AOCs Impacted: Parcel C - Former DRMO Parcel K - City Owned portion Parcel E

PROPOSED WORK:

Scope of Work: (Attach sketches, drawings & information outlined in Process to Conduct Construction Activities Document)

LAND USE CONTROLS:

Current Land Use Controls on Construction Area:

	City-owned portion of Parcel K	- Restricted to Allow Recreational Use Only.
	Parcel C: Former Defense Reutilization and Marketing Office Waste Storage Area (DRMO) Parcel	-No LUCs.
	Parcel E1	- Restricted to Allow Recreational Use Only.
	Parcel E2	- Restricted to Allow Recreational Use Only. - Engineering Control in place to prevent exposure to soil beyond two feet below land surface
	Parcel E3	- Restricted to Allow Recreational Use Only. - Engineering Control in place to prevent exposure to soil beyond two feet below land surface

Frequency and Date of Next LUC Inspection for Construction Area:

Potential Effect of Proposed Construction on LUCs:

- Relocation or reuse of contamination impacted soil.
- Alteration to existing and required engineering controls.
-Need to implement provisions specified in Soil and Groundwater Management Plan. This provisions include but are not limited to:
  *Restriction on soil reuse and relocation.
  *Soil storage and disposal protocols.
  *Equipment decontamination.
  *Dust and Sediment control.
  *Tree removal and relocation.
  *Record keeping and notifications.

CERTIFICATIONS:

As a representative of the property owner of the subject property, I hereby certify that: (check all that apply)

- [ ] I possess an updated copy of the LUC Areas Map.
- [ ] I possess an updated copy of the approved Soil and Groundwater Management Plan.
- [ ] I acknowledge that residual contamination exists on the subject property and protocols and provisions described in the Soil and Groundwater Management Plan must be observed and implemented at all times.
- [ ] I acknowledge that residual contamination exists on the subject property and am aware that further information on site contaminants beyond the information provided in the Soil and Groundwater Management Plan can be found in the Administrative Record located at City of Key West City Hall, 3126 Flagler Avenue, Key West, Florida
- [ ] Information regarding areas of concern and contaminants will be provided to all contractors and subcontractors.
- [ ] The proposed construction will not change the land use assigned to each individual parcel.
- [ ] Personnel hazards will be controlled where construction activities have the potential to interfere with existing remedies (i.e. engineering controls).
- [ ] Dewatering will not affect migration of contaminants, and water under groundwater use restriction will be tested and properly disposed in accordance with a Dewatering Permit to be procured from local and state agencies as necessary.
- [ ] Soil excavated within designated LUC areas will be tested and properly disposed of per the provisions included in the Soil and Groundwater Management Plan.
- [ ] Exposure assumptions used in deriving LUCs will not be altered.
- [ ] Soil excavation, stockpiling, relocation/resuse and disposal will be monitored and documented during construction activities.
- [ ] Any previously unknown contamination that is discovered will be reported immediately to the Navy and the City of Key West.

Signature of Requesting Official:	Printed Name and Phone Number:	Date:

Navy Review:

- [ ] Requestor Authorized to Proceed
- [ ] Further Information is Requested
- [ ] Permit Denied

Signature:

_____ Navy RPM/BEC

Date out: _____ Serial No: _____

(Authorization to proceed does not constitute approval of methods by which environmental, safety, and other regulations are satisfied.)

PAL BUILDING & STABLE LBP REPORT

PRE-DEMOLITION
REPORT OF BUILDING MATERIAL SURVEY, SAMPLING AND EVALUATION OF ASBESTOS-CONTAINING MATERIALS

FOR
THE CITY OF KEY WEST
PAL BUILDING AND STABLE
1287 TRUMAN WATERFRONT
KEY WEST, FLORIDA 33040

AIRQUEST PROJECT NUMBER: 14-01-7929

PREPARED FOR:

MR. J. MICHAEL VIEUX
SENIOR CONSTRUCTION MANAGER
THE CITY OF KEY WEST
3140 FLAGLER AVENUE
KEY WEST, FL 33040

PREPARED BY:

AIRQUEST ENVIRONMENTAL, INC.
6851 SOUTHWEST 45TH STREET
FORT LAUDERDALE, FLORIDA 33314

APRIL 1, 2014

PRE-DEMOLITION
REPORT OF BUILDING MATERIAL SURVEY, SAMPLING AND EVALUATION OF ASBESTOS-CONTAINING MATERIALS

FOR
THE CITY OF KEY WEST
PAL BUILDING AND STABLE
1287 TRUMAN WATERFRONT
KEY WEST, FLORIDA 33040

AIRQUEST PROJECT NUMBER: 14-01-7929

PREPARED FOR:

MR. J. MICHAEL VIEUX
SENIOR CONSTRUCTION MANAGER
THE CITY OF KEY WEST
3140 FLAGLER AVENUE
KEY WEST, FL 33040

PREPARED BY:

AIRQUEST ENVIRONMENTAL, INC.
6851 SOUTHWEST 45TH STREET
FORT LAUDERDALE, FLORIDA 33314

APRIL 1, 2014

George Raimundo
Project Manager

Traci-Anne Boyle, CIH, FLAC, CSP
Florida Asbestos Consultant #AX-60

EXECUTIVE SUMMARY

A survey for asbestos-containing building materials (ACM) was conducted within the City of Key West PAL Building and Stable, located at 1287 Truman Waterfront in Key West, Florida 33040 ("the site"). The survey was performed on March 11 and 12, 2014, by AirQuest Project Manager Mr. George Raimundo, a trained Asbestos Hazard Emergency Response Act (AHERA) certified asbestos inspector (see Appendix I).

The purpose of the survey was to locate and identify ACM in the building materials within the interior, exterior and roof of the PAL Building and stable prior to demolition activities.

The results of our observation and laboratory analysis identified non-friable asbestos containing black mirror mastic, gold duct mastic, built-up bituminous roofing, roofing mastics and friable asbestos containing pipe and elbow wrapping and associated compound within the samples that were collected from the site.

Prior to demolition, removal of the friable asbestos containing materials is required. Removal must be conducted by a Florida Licensed Asbestos Abatement Contractor.

NESHAP regulations do not require that the identified non-friable asbestos containing materials be removed prior to demolition activities as long as the materials are not rendered friable by demolition practices, kept wet during demolition activities and is segregated from the waste stream and disposed of in a Class I landfill capable of accepting such material. Removal prior to demolition will reduce the waste stream requiring asbestos handling and may reduce additional disposal costs.

If any non-friable asbestos remains in place, the demolition crew must abide by OSHA regulations pertaining to asbestos exposure. The owner should consider removal prior to demolition as this may be more cost-effective than the costs associated with segregating the waste stream and the additional disposal costs.

Prior to the removal or in-place wet demolition of the identified asbestos containing material, notification to the appropriate County and the State of Florida agencies is required.

Two (2) boilers were observed in the boiler room. No suspect materials were observed on the exterior. However, the interior of the boilers was inaccessible. If any materials are encountered during demolition activities that were not sampled in this report, the materials should not be disturbed until they have been sampled and identified as non-asbestos containing materials through laboratory analysis.

TABLE OF CONTENTS

PAGE

CERTIFICATION PAGE **II**

EXECUTIVE SUMMARY **III**

1 INTRODUCTION **1**

2 FACILITY DESCRIPTION **2**

3 SURVEY METHODS AND LABORATORY ANALYSIS **3**

4 SUSPECT ASBESTOS-CONTAINING MATERIALS **4**

5 ASBESTOS CONTAINING MATERIAL **9**

6 CONCLUSIONS **13**

7 LIMITATIONS **14**

TABLES

Table 1 - Laboratory Analysis and Summary 5

APPENDICES

Appendix I - Certification

Appendix II – Laboratory Report & Chain of Custody Record

1 INTRODUCTION

A survey for asbestos-containing building materials (ACM) was conducted within the City of Key West PAL Building and Stable, located at 1287 Truman Waterfront in Key West, Florida 33040 ("the site"). The survey was performed on March 11 and 12, 2014, by AirQuest Project Manager Mr. George Raimundo, a trained Asbestos Hazard Emergency Response Act (AHERA) certified asbestos inspector (see Appendix I).

The purpose of the survey was to locate and identify ACM in the building materials within the interior, exterior and roof of the PAL Building and stable prior to demolition activities.

The scope of services for this project consisted of the following five steps:

- Building Walk-Through and Observations,
- Bulk Sampling of Suspect Asbestos-Containing Building Materials (ACBM),
- Polarized Light Microscopy (PLM) Analysis of Bulk Samples,
- Hazard Assessment and Evaluation, and
- Final Report Preparation.

2 FACILITY DESCRIPTION

The City of Key West PAL Building and Stable, located at 1287 Truman Waterway in Key West, Florida, was a building of approximately 28,900 square feet.

The PAL Building was constructed of concrete block on a concrete slab and finished with exterior stucco. The ceiling was finished with acoustical ceiling tile and drywall. Interior walls were constructed of drywall and plaster (select areas were finished with ceramic tile). The concrete slab floor was finished with ceramic tile, vinyl floor tile and carpet.

Mirrors were observed in the boxing/ wrestling area. The mirrors were secured with mirror mastic. The remaining mirrors onsite were mechanically fastened.

Two (2) boilers were observed in the boiler room. No suspect materials were observed on the exterior. However, the interior of the boilers was inaccessible.

The stable was constructed of wood throughout. No suspect materials were observed.

3 SURVEY METHODS AND LABORATORY ANALYSIS

The sampling protocol used in this asbestos survey are those detailed in Title 40, Code of Federal Regulations (CFR), Part 763.86 for the sampling of friable surfacing materials, thermal systems insulation and miscellaneous materials (i.e. ceiling tiles). The Environmental Protection Agency (EPA) regulations require that sample locations be randomly selected. Suspect ACBM were identified and samples of each different type of material were obtained.

The bulk sampling procedure utilized for the collection of samples suspected of being ACBM required the establishment of homogeneous sampling areas. A homogeneous sampling area is defined as an area of friable or non-friable material of similar type that appeared to be applied or constructed during the same general period of time. This is the most acceptable and cost-effective method for the sampling of suspect ACBM.

Samples of suspect materials were collected from predetermined homogeneous sampling areas and the location of each sample was recorded. Samples were labeled and transported to the laboratory for analysis, using polarized light microscopy (PLM) coupled with dispersion staining. The samples were analyzed in accordance with Title 61 Code of Federal Regulation.

Polarized light microscopy is a method of analysis that utilizes the unique optical crystallographic properties of the various crystalline forms in the samples. These properties, such as refractive indices, birefringence, sign of elongation and extinction angle, are unique to crystalline asbestos forms and therefore can be used to identify the type of asbestos mineral as chrysotile, amosite, crocidolite, anthophyllite, tremolite, or actinolite. Each type of asbestos displays unique characteristics when subjected to these tests. Percentages of the identified types of asbestos are determined by visual estimation. Any material containing over one percent (1%) by weight is considered by the U.S. Environmental Protection Agency (EPA) to be an asbestos containing material and if disturbed must be handled according to specific local, state and federal regulations.

4 SUSPECT ASBESTOS-CONTAINING MATERIALS

Thirty-two (32) homogeneous areas (HA) of suspect material were identified and a total of eighty-four (84) samples were collected and analyzed. The laboratory split the samples into layers, resulting in the analysis of ninety-nine (99) samples. Sample descriptions and laboratory results are summarized in Table 1. A copy of the laboratory report and chain of custody record is included in Appendix II. Sample locations and homogeneous areas identified to be asbestos containing are described in Section 5.0.

Table 1 – Laboratory Analysis and Summary

Samples Collected on March 11 & 12, 2014

Sample Number	HA	Location	Description of Suspect Material	Asbestos Content %
7929-01	1	Boxing/ Wrestling Area	White 2' x 4' Acoustical Ceiling Tile	ND
7929-02	1	Boxing/ Wrestling Area	White 2' x 4' Acoustical Ceiling Tile	ND
7929-03	1	Weight Room	White 2' x 4' Acoustical Ceiling Tile	ND
7929-04	2	Boxing/ Wrestling Area	Drywall System	ND
7929-05	2	Boxing/ Wrestling Area	Drywall System	ND
7929-06	2	Weight Room	Drywall System	ND
7929-07	3	Boxing/ Wrestling Area	Interior Concrete Canape/ Plaster Finish	ND
7929-08	3	Boxing/ Wrestling Area	Interior Concrete Canape/ Plaster Finish	ND
7929-09	3	Boxing/ Wrestling Area	Interior Concrete Canape/ Plaster Finish	ND
7929-10	4	Boxing/ Wrestling Area	Beige 12" x 12" Vinyl Floor Tile & Mastic	ND
7929-11	4	Boxing/ Wrestling Area	Beige 12" x 12" Vinyl Floor Tile & Mastic	ND
7929-12	4	Boxing/ Wrestling Area	Beige 12" x 12" Vinyl Floor Tile & Mastic	ND
7929-13	5	Boxing/ Wrestling Area	White 4" Vinyl Floor Coving & Mastic	ND
7929-14	5	Boxing/ Wrestling Area	White 4" Vinyl Floor Coving & Mastic	ND
7929-15	5	Boxing/ Wrestling Area	White 4" Vinyl Floor Coving & Mastic	ND
7929-16	6	Boxing/ Wrestling Area	Yellow Carpet Glue	ND
7929-17	6	Boxing/ Wrestling Area	Yellow Carpet Glue	ND
7929-18	6	Weight Room	Yellow Carpet Glue	ND
7929-19	7	Boxing/ Wrestling Area	White 6" x 4" Ceramic Floor Tile & Grout (@ window base)	ND
7929-20	7	Boxing/ Wrestling Area	White 6" x 4" Ceramic Floor Tile & Grout (@ window base)	ND
7929-21	7	Boxing/ Wrestling Area	White 6" x 4" Ceramic Floor Tile & Grout (@ window base)	ND
7929-22	8	Weight Room	Brown 6" x 6" Ceramic Floor Tile & Grout	ND

Sample Number	HA	Location	Description of Suspect Material	Asbestos Content %
7929-23	8	Weight Room	Brown 6” x 6” Ceramic Floor Tile & Grout	ND
7929-24	8	Weight Room Storage	Brown 6” x 6” Ceramic Floor Tile & Grout	ND
7929-25	9	Weight Room	Beige 5” x 12” Ceramic Wall Tile & Grout (painted white)	ND
7929-26	9	Weight Room	Beige 5” x 12” Ceramic Wall Tile & Grout (painted white)	ND
7929-27	9	Weight Room Storage	Beige 5” x 12” Ceramic Wall Tile & Grout	ND
7929-28	10	Boxing/ Wrestling Area	Black Mirror Mastic	10% Chrysotile
7929-29	10	Boxing/ Wrestling Area	Black Mirror Mastic	10% Chrysotile
7929-30	10	Boxing/ Wrestling Area	Black Mirror Mastic	10% Chrysotile
7929-31	11	Walk-In Freezer Area	Plaster Wall	ND
7929-32	11	Walk-In Freezer Area	Plaster Wall	ND
7929-33	11	Walk-In Freezer Area	Plaster Wall	ND
7929-34	12	Walk-In Freezer Styrofoam Ceiling	Yellow Mastic	ND
7929-35	12	Walk-In Freezer Styrofoam Ceiling	Yellow Mastic	ND
7929-36	13	Kitchen Ceiling	White 4” OD Pipe Wrapping	10% Amosite, 3% Chrysotile
7929-37	13	Kitchen Ceiling	White 4” OD Pipe Wrapping	10% Amosite, 3% Chrysotile
7929-38	14	Kitchen Ceiling	White 5” OD Pipe Wrapping	10% Amosite, 2% Chrysotile
7929-39	14	Kitchen Ceiling	White 5” OD Pipe Wrapping	ND
7929-40	15	Kitchen Ceiling	White 6” OD Pipe Wrapping	ND
7929-41	15	Kitchen Ceiling	White 6” OD Pipe Wrapping	ND
7929-42	16	Kitchen Ceiling	White 4” OD Pipe Elbow Compound	3% Amosite
7929-43	16	Kitchen Ceiling	White 4” OD Pipe Elbow Compound	3% Amosite
7929-44	17	Kitchen Ceiling	White 5” OD Pipe Elbow Compound	10% Chrysotile
7929-45	17	Kitchen Ceiling	White 5” OD Pipe Elbow Compound	10% Chrysotile
7929-46	18	Kitchen Ceiling	White 6” OD Pipe Elbow Compound	10% Chrysotile

Sample Number	HA	Location	Description of Suspect Material	Asbestos Content %
7929-47	18	Kitchen Ceiling	White 6" OD Pipe Elbow Compound	10% Chrysotile
7929-48	19	Northeast Exterior	Exterior Stucco	ND
7929-49	19	Northeast Exterior	Exterior Stucco	ND
7929-50	19	Southeast Exterior	Exterior Stucco	ND
7929-51	19	South Exterior	Exterior Stucco	ND
7929-52	19	Southwest Exterior	Exterior Stucco	ND
7929-53	20	Upper Roof- Central Area	Upper Roof Built- Up Bituminous Roofing	ND
7929-54	20	Upper Roof- Northeast Area	Upper Roof Built- Up Bituminous Roofing	ND
7929-55	20	Upper Roof- Southeast Area	Upper Roof Built- Up Bituminous Roofing	ND
7929-56	21	Upper Roof- Southwest Area	Upper Roof @ Parapet Wall Built-Up Bituminous Roofing	2% Chrysotile
7929-57	21	Upper Roof- West Area	Upper Roof @ Parapet Wall Built-Up Bituminous Roofing	2% Chrysotile
7929-58	21	Upper Roof- Northeast Area	Upper Roof @ Parapet Wall Built-Up Bituminous Roofing	5% Chrysotile
7929-59	22	Upper Roof- Southeast Area	Upper Roof Deck Penetration Mastic	5% Chrysotile
7929-60	22	Upper Roof- Southeast Area	Upper Roof Deck Penetration Mastic	5% Chrysotile
7929-61	23	Lower Roof- Southwest Area	Lower Roof Built- Up Bituminous Roofing	ND
7929-62	23	Lower Roof- South Area	Lower Roof Built- Up Bituminous Roofing	ND
7929-63	23	Lower Roof- Northeast Area	Lower Roof Built- Up Bituminous Roofing	ND
7929-64	24	Lower Roof- South Area	Lower Roof Deck Penetration Mastic	ND
7929-65	24	Lower Roof- South Area	Lower Roof Deck Penetration Mastic	2% Chrysotile
7929-66	25	Lower Roof- Southwest Area	Lower Roof Pitch Pan Mastic	ND
7929-67	25	Lower Roof- Southeast Area	Lower Roof Pitch Pan Mastic	2% Chrysotile
7929-68	26	Lower Roof- Southwest Area Edging	Built-Up Bituminous Roofing Material & Mastic @ Edging	2% Chrysotile
7929-69	26	Lower Roof- South Area Edging	Built-Up Bituminous Roofing Material & Mastic @ Edging	2% Chrysotile

Sample Number	HA	Location	Description of Suspect Material	Asbestos Content %
7929-70	26	Lower Roof- East Area Edging	Built-Up Bituminous Roofing Material & Mastic @ Edging	2% Chrysotile
7929-71	27	Southwest Exterior Window	Exterior Window/ Door Caulking	ND
7929-72	27	Southwest Exterior Window	Exterior Window/ Door Caulking	ND
7929-73	27	West Exterior Door	Exterior Window/ Door Caulking	ND
7929-74	28	South Exterior	Concrete Slab	ND
7929-75	28	Southwest Exterior	Concrete Slab	ND
7929-76	28	East Exterior	Concrete Slab	ND
7929-77	29	Weight Room Storage/ Restroom (above plenum)	White 2” OD Pipe Elbow Compound	5% Chrysotile
7929-78	29	Weight Room Storage/ Restroom (above plenum)	White 2” OD Pipe Elbow Compound	10% Chrysotile
7929-79	30	Weight Room Storage/ Restroom (above plenum)	White 2” OD Pipe Wrap	ND
7929-80	30	Weight Room Storage/ Restroom (above plenum)	White 2” OD Pipe Wrap	ND
7929-81	31	Weight Room Storage/ Restroom (above plenum)	Black Duct Mastic	ND
7929-82	31	Weight Room Storage/ Restroom (above plenum)	Black Duct Mastic	ND
7929-83	32	Weight Room Storage/ Restroom (above plenum)	Gold Duct Mastic	5% Chrysotile
7929-84	32	Weight Room Storage/ Restroom (above plenum)	Gold Duct Mastic	5% Chrysotile

HA – Homogenous Area
ND – None Detected
OD- Outside Diameter

5 ASBESTOS CONTAINING MATERIAL

This section describes the asbestos-containing materials (ACM) observed during the inspection. The quantities of material described herein are approximate and are not to be relied upon by asbestos abatement contractors for bidding purposes.

The materials sampled and found to contain more than one percent (1%) asbestos are listed below.

Homogeneous Area Number 10	
Sample No.:	7929-28, 7929-29 & 7929-30
Material:	Black Mirror Mastic
Location:	Boxing/ Wrestling Area
Results:	10% Chrysotile
Quantity:	Estimated Twenty- Four (24) Square Feet of Mastic behind Approximately 240 Square Feet of Mirror
The material was in good condition and was non-friable.	

Homogeneous Area Number 13	
Sample No.:	7929-36 & 7929-37
Material:	White 4” OD Pipe Wrapping
Location:	Kitchen Ceiling
Results:	10% Amosite 3% Chrysotile
Quantity:	Approximately Twelve (12) Linear Feet
The material was in good condition and was friable.	

Homogeneous Area Number 14	
Sample No.:	7929-38 & 7929-39
Material:	White 5” OD Pipe Wrapping
Location:	Kitchen Ceiling
Results:	None Detected to 10% Amosite None Detected to 2% Chrysotile
Quantity:	Approximately Sixteen (16) Linear Feet
The material was in good condition and was friable.	

Homogeneous Area Number 16	
Sample No.:	7929-42 & 7929-43
Material:	White 4” OD Pipe Elbow Compound
Location:	Kitchen Ceiling
Results:	3% Amosite
Quantity:	Approximately Four (4) Square Feet
The material was in good condition and was friable.	

Homogeneous Area Number 17	
Sample No.:	7929-44 & 7929-45
Material:	White 5” OD Pipe Elbow Compound
Location:	Kitchen Ceiling
Results:	10% Chrysotile
Quantity:	Approximately Six (6) Square Feet
The material was in good condition and was friable.	

Homogeneous Area Number 18	
Sample No.:	7929-46 & 7929-47
Material:	White 6” OD Pipe Elbow Compound
Location:	Kitchen Ceiling
Results:	10% Chrysotile
Quantity:	Approximately Six (6) Square Feet
The material was in good condition and was friable.	

Homogeneous Area Number 21	
Sample No.:	7929-56, 7929-57 & 7929-58
Material:	Upper Roof @ Parapet Wall Built-Up Bituminous Roofing
Location:	Along the Parapet Walls of the Upper Roof
Results:	2-5% Chrysotile
Quantity:	Approximately 420 Square Feet
The material was in good condition and was non-friable.	

Homogeneous Area Number 22	
Sample No.:	7929-59 & 7929-60
Material:	Upper Roof Deck Penetration Mastic
Location:	Along the Deck Penetrations of the Upper Roof
Results:	5% Chrysotile
Quantity:	Approximately Six (6) Square Feet
The material was in good condition and was non-friable.	

Homogeneous Area Number 24	
Sample No.:	7929-64 & 7929-65
Material:	Lower Roof Deck Penetration Mastic
Location:	Along the Deck Penetrations of the Lower Roof
Results:	None Detected to 2% Chrysotile
Quantity:	Approximately Ten (10) Square Feet
The material was in good condition and was non-friable.	

Homogeneous Area Number 25	
Sample No.:	7929-66 & 7929-67
Material:	Lower Roof Pitch Pan Mastic
Location:	Along the Pitch Pans of the Lower Roof
Results:	None Detected to 2% Chrysotile
Quantity:	Approximately Thirty (30) Square Feet
The material was in good condition and was non-friable.	

Homogeneous Area Number 26	
Sample No.:	7929-68, 7929-69 & 7929-70
Material:	Lower Roof Built-Up Bituminous Roofing Material & Mastic
Location:	Along the Lower Roof Edging
Results:	2% Chrysotile
Quantity:	Approximately 300 Square Feet
The material was in good condition and was non-friable.	

Homogeneous Area Number 29	
Sample No.:	7929-77 & 7929-78
Material:	White 2” OD Pipe Elbow Compound
Location:	Weight Room Storage/ Restroom above Plenum
Results:	5-10% Chrysotile
Quantity:	Approximately Two (2) Square Feet
The material was in good condition and was friable.	

Homogeneous Area Number 32	
Sample No.:	7929-83 & 7929-84
Material:	Gold Duct Mastic
Location:	Weight Room Storage/ Restroom above Plenum
Results:	5% Chrysotile
Quantity:	Approximately Two (2) Square Feet
The material was in good condition and was non-friable.	

6 CONCLUSIONS

The results of our observation and laboratory analysis identified non-friable asbestos containing black mirror mastic, gold duct mastic, built-up bituminous roofing, roofing mastics and friable asbestos containing pipe and elbow wrapping and associated compound within the samples that were collected from the site.

Prior to demolition, removal of the friable asbestos containing materials is required. Removal must be conducted by a Florida Licensed Asbestos Abatement Contractor.

NESHAP regulations do not require that the identified non-friable asbestos containing materials be removed prior to demolition activities as long as the materials are not rendered friable by demolition practices, kept wet during demolition activities and is segregated from the waste stream and disposed of in a Class I landfill capable of accepting such material. Removal prior to demolition will reduce the waste stream requiring asbestos handling and may reduce additional disposal costs.

If any non-friable asbestos remains in place, the demolition crew must abide by OSHA regulations pertaining to asbestos exposure. The owner should consider removal prior to demolition as this may be more cost-effective than the costs associated with segregating the waste stream and the additional disposal costs.

Prior to the removal or in-place wet demolition of the identified asbestos containing material, notification to the appropriate County and the State of Florida agencies is required.

7 LIMITATIONS

Two (2) boilers were observed in the boiler room. No suspect materials were observed on the exterior. However, the interior of the boilers was inaccessible. If any materials are encountered during demolition activities that were not sampled in this report, the materials should not be disturbed until they have been sampled and identified as non-asbestos containing materials through laboratory analysis.

APPENDIX I

COPIES OF CERTIFICATION

The Environmental Institute

George Raimundo

Social Security Number - XXX-XX-1587

Air Quest Environmental, Inc. - 5150 SW 48th Way, Suite 610 - Ft. Lauderdale, Florida 33314

Has completed coursework and satisfactorily passed an examination that meets all criteria required for EPA/AHERA/ASHARA (TSCA Title II) Approved Reaccreditation

Asbestos in Buildings: Inspector Refresher

June 4, 2013
Course Date

June 4, 2013
Examination Date

June 3, 2014
Expiration Date

Thomas G. Laubenthal - Principal Instructor

Rachel G. McCain - Exam Administrator

13862
Certificate Number

David W. Hogue - Training Manager

Training Location: 2670 East Sunrise Blvd. - Fort Lauderdale, FL 33304

(Approved by the ABIH Certification Maintenance Committee for 1/2 CM point - Approval #11-577)

(Florida Provider Registration Number FL49-0001342 - Course #FL49-0002805)

TEI - 1841 West Oak Parkway, Suite F - Marietta, Georgia 30062 - (770) 427-3600 - www.tei-atl.com

APPENDIX II

LABORATORY REPORT AND CHAIN OF CUSTODY RECORD

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A, N. Miami Beach, FL 33179
Phone/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com miamilab@emsl.com

EMSL Order:	171401382
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Paul LeBlanc**
AirQuest Environmental, Inc.
6851 SW 45th Street
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/17/14 10:30 AM
Analysis Date:	3/19/2014
Collected:	3/11/2014

Project: **The City of Key West - 7929 - PAL Bldg. & Stable**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos				Asbestos
Sample	**Description**	**Appearance**	**%**	**Fibrous**	**%**	**Non-Fibrous**	**% Type**
7929-01 *171401382-0001*	Ceiling Tile	White Fibrous Heterogeneous	30% 30%	Cellulose Glass	40%	Non-fibrous (other)	**None Detected**
7929-02 *171401382-0002*	Ceiling Tile	White Fibrous Heterogeneous	30% 30%	Cellulose Glass	40%	Non-fibrous (other)	**None Detected**
7929-03 *171401382-0003*	Ceiling Tile	White Fibrous Heterogeneous	30% 30%	Cellulose Glass	40%	Non-fibrous (other)	**None Detected**
7929-04 *171401382-0004*	Drywall System	White Fibrous Heterogeneous	15%	Cellulose	85%	Non-fibrous (other)	**None Detected**
7929-05 *171401382-0005*	Drywall System	White Fibrous Heterogeneous	15%	Cellulose	85%	Non-fibrous (other)	**None Detected**
7929-06 *171401382-0006*	Drywall System	White Fibrous Heterogeneous	15%	Cellulose	85%	Non-fibrous (other)	**None Detected**
7929-07 *171401382-0007*	Plaster Finish	White Non-Fibrous Heterogeneous			100%	Non-fibrous (other)	**None Detected**
7929-08 *171401382-0008*	Plaster Finish	White Non-Fibrous Heterogeneous			100%	Non-fibrous (other)	**None Detected**

Analyst(s)

Edgar Rodriguez (45)
Kim Wallace (54)

Kimberly A Wallace

Kimberly Wallace, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from 03/19/2014 15:41:52

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A, N. Miami Beach, FL 33179
Phone/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com miamilab@emsl.com

EMSL Order:	171401382
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Paul LeBlanc**
AirQuest Environmental, Inc.
6851 SW 45th Street
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/17/14 10:30 AM
Analysis Date:	3/19/2014
Collected:	3/11/2014

Project: **The City of Key West - 7929 - PAL Bldg. & Stable**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
7929-09 *171401382-0009*	Plaster Finish	White Non-Fibrous Heterogeneous		100% Non-fibrous (other)	**None Detected**
7929-10 *171401382-0010*	Floor Tile	Beige Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-10A *171401382-0010A*	Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-11 *171401382-0011*	Floor Tile	Beige Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-11A *171401382-0011A*	Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-12 *171401382-0012*	Floor Tile	Beige Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-12A *171401382-0012A*	Mastic	Tan Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-13 *171401382-0013*	Floor Coving	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**

Analyst(s)

Edgar Rodriguez (45)
Kim Wallace (54)

Kimberly A Wallace

Kimberly Wallace, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from 03/19/2014 15:41:52

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A, N. Miami Beach, FL 33179
Phone/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com miamilab@emsl.com

EMSL Order:	171401382
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Paul LeBlanc**
AirQuest Environmental, Inc.
6851 SW 45th Street
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/17/14 10:30 AM
Analysis Date:	3/19/2014
Collected:	3/11/2014

Project: **The City of Key West - 7929 - PAL Bldg. & Stable**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
7929-13A *171401382-0013A*	Mastic	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-14 *171401382-0014*	Floor Coving	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-14A *171401382-0014A*	Mastic	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-15 *171401382-0015*	Floor Coving	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-15A *171401382-0015A*	Mastic	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-16 *171401382-0016*	Carpet Glue	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-17 *171401382-0017*	Carpet Glue	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-18 *171401382-0018*	Carpet Glue	Yellow Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**

Analyst(s)

Edgar Rodriguez (45)
Kim Wallace (54)

Kimberly A Wallace

Kimberly Wallace, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from 03/19/2014 15:41:52

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A, N. Miami Beach, FL 33179
Phone/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com miamilab@emsl.com

EMSL Order:	171401382
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Paul LeBlanc**
AirQuest Environmental, Inc.
6851 SW 45th Street
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/17/14 10:30 AM
Analysis Date:	3/19/2014
Collected:	3/11/2014

Project: **The City of Key West - 7929 - PAL Bldg. & Stable**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
7929-19 *171401382-0019*	Ceramic Tile	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-19A *171401382-0019A*	Grout	Grayish Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-20 *171401382-0020*	Ceramic Tile	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-20A *171401382-0020A*	Grout	Grayish Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-21 *171401382-0021*	Ceramic Tile	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-21A *171401382-0021A*	Grout	Grayish Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-22 *171401382-0022*	Ceramic Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-22A *171401382-0022A*	Grout	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**

Analyst(s)

Edgar Rodriguez (45)
Kim Wallace (54)

Kimberly A Wallace

Kimberly Wallace, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from 03/19/2014 15:41:52

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A, N. Miami Beach, FL 33179
Phone/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com miamilab@emsl.com

EMSL Order:	171401382
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Paul LeBlanc**
AirQuest Environmental, Inc.
6851 SW 45th Street
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/17/14 10:30 AM
Analysis Date:	3/19/2014
Collected:	3/11/2014

Project: **The City of Key West - 7929 - PAL Bldg. & Stable**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
7929-23 *171401382-0023*	Ceramic Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-23A *171401382-0023A*	Grout	Gray Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-24 *171401382-0024*	Ceramic Tile	Brown Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-24A *171401382-0024A*	Grout	Tan Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-25 *171401382-0025*	Wall Tile	Beige Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-25A *171401382-0025A*	Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-26 *171401382-0026*	Wall Tile	Beige Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-26A *171401382-0026A*	Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**

Analyst(s)

Edgar Rodriguez (45)
Kim Wallace (54)

Kimberly A Wallace

Kimberly Wallace, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from 03/19/2014 15:41:52

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A, N. Miami Beach, FL 33179
Phone/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com miamilab@emsl.com

EMSL Order:	171401382
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Paul LeBlanc**
AirQuest Environmental, Inc.
6851 SW 45th Street
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/17/14 10:30 AM
Analysis Date:	3/19/2014
Collected:	3/11/2014

Project: **The City of Key West - 7929 - PAL Bldg. & Stable**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos	
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**	
7929-27 *171401382-0027*	Wall Tile	Beige Non-Fibrous Homogeneous		100% Non-fibrous (other)		**None Detected**
7929-27A *171401382-0027A*	Grout	White Non-Fibrous Homogeneous		100% Non-fibrous (other)		**None Detected**
7929-28 *171401382-0028*	Mirror Mastic	Black Non-Fibrous Homogeneous		90% Non-fibrous (other)	**10%**	**Chrysotile**
7929-29 *171401382-0029*	Mirror Mastic	Black Non-Fibrous Homogeneous		90% Non-fibrous (other)	**10%**	**Chrysotile**
7929-30 *171401382-0030*	Mirror Mastic	Black Non-Fibrous Homogeneous		90% Non-fibrous (other)	**10%**	**Chrysotile**
7929-31 *171401382-0031*	Plaster Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (other)		**None Detected**
7929-32 *171401382-0032*	Plaster Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (other)		**None Detected**
7929-33 *171401382-0033*	Plaster Wall	White Non-Fibrous Homogeneous		100% Non-fibrous (other)		**None Detected**

Analyst(s)

Edgar Rodriguez (45)
Kim Wallace (54)

Kimberly A Wallace

Kimberly Wallace, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from 03/19/2014 15:41:52

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A, N. Miami Beach, FL 33179
Phone/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com miamilab@emsl.com

EMSL Order:	171401382
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Paul LeBlanc**
AirQuest Environmental, Inc.
6851 SW 45th Street
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/17/14 10:30 AM
Analysis Date:	3/19/2014
Collected:	3/11/2014

Project: **The City of Key West - 7929 - PAL Bldg. & Stable**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos				Asbestos	
Sample	**Description**	**Appearance**	**%**	**Fibrous**	**%**	**Non-Fibrous**	**%**	**Type**
7929-34 *171401382-0034*	Mastic	Yellow Non-Fibrous Homogeneous			100%	Non-fibrous (other)		**None Detected**
7929-35 *171401382-0035*	Mastic	Yellow Non-Fibrous Homogeneous			100%	Non-fibrous (other)		**None Detected**
7929-36 *171401382-0036*	Pipe Wrapping	White Fibrous Homogeneous			87%	Non-fibrous (other)	**10%** **3%**	**Amosite** **Chrysotile**
7929-37 *171401382-0037*	Pipe Wrapping	White Fibrous Homogeneous			87%	Non-fibrous (other)	**10%** **3%**	**Amosite** **Chrysotile**
7929-38 *171401382-0038*	Pipe Wrapping	White Fibrous Heterogeneous	40%	Cellulose	48%	Non-fibrous (other)	**10%** **2%**	**Amosite** **Chrysotile**
7929-39 *171401382-0039*	Pipe Wrapping	White/Black/Silver Fibrous Heterogeneous	20% 5%	Cellulose Glass	75%	Non-fibrous (other)		**None Detected**
7929-40 *171401382-0040*	Pipe Wrapping	White/Black/Silver Fibrous Heterogeneous	20% 5%	Cellulose Glass	75%	Non-fibrous (other)		**None Detected**
7929-41 *171401382-0041*	Pipe Wrapping	White/Black/Silver Fibrous Heterogeneous	20% 5%	Cellulose Glass	75%	Non-fibrous (other)		**None Detected**

Analyst(s)

Edgar Rodriguez (45)
Kim Wallace (54)

Kimberly A Wallace

Kimberly Wallace, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from 03/19/2014 15:41:52

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A, N. Miami Beach, FL 33179
Phone/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com miamilab@emsl.com

EMSL Order:	171401382
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Paul LeBlanc**
AirQuest Environmental, Inc.
6851 SW 45th Street
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/17/14 10:30 AM
Analysis Date:	3/19/2014
Collected:	3/11/2014

Project: **The City of Key West - 7929 - PAL Bldg. & Stable**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos				Asbestos	
Sample	**Description**	**Appearance**	**%**	**Fibrous**	**%**	**Non-Fibrous**	**%**	**Type**
7929-42 *171401382-0042*	Pipe Elbow Compound	White Non-Fibrous Homogeneous	10%	Glass	87%	Non-fibrous (other)	**3%**	**Amosite**
7929-43 *171401382-0043*	Pipe Elbow Compound	White Fibrous Homogeneous	10%	Glass	87%	Non-fibrous (other)	**3%**	**Amosite**
7929-44 *171401382-0044*	Pipe Elbow Compound	White Fibrous Homogeneous	5% 2%	Cellulose Glass	83%	Non-fibrous (other)	**10%**	**Chrysotile**
7929-45 *171401382-0045*	Pipe Elbow Compound	White Fibrous Homogeneous	2% 10%	Glass Cellulose	78%	Non-fibrous (other)	**10%**	**Chrysotile**
7929-46 *171401382-0046*	Pipe Elbow Compound	White Fibrous Homogeneous	10%	Glass	80%	Non-fibrous (other)	**10%**	**Chrysotile**
7929-47 *171401382-0047*	Pipe Elbow Compound	White Fibrous Homogeneous	10%	Glass	80%	Non-fibrous (other)	**10%**	**Chrysotile**
7929-48 *171401382-0048*	Stucco	Gray Non-Fibrous Heterogeneous			100%	Non-fibrous (other)		**None Detected**
7929-49 *171401382-0049*	Stucco	Gray Non-Fibrous Heterogeneous			100%	Non-fibrous (other)		**None Detected**

Analyst(s)

Edgar Rodriguez (45)
Kim Wallace (54)

Kimberly A Wallace

Kimberly Wallace, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from 03/19/2014 15:41:52

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A, N. Miami Beach, FL 33179
Phone/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com miamilab@emsl.com

EMSL Order:	171401382
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Paul LeBlanc**
AirQuest Environmental, Inc.
6851 SW 45th Street
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/17/14 10:30 AM
Analysis Date:	3/19/2014
Collected:	3/11/2014

Project: **The City of Key West - 7929 - PAL Bldg. & Stable**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos				Asbestos	
Sample	**Description**	**Appearance**	**%**	**Fibrous**	**%**	**Non-Fibrous**	**%**	**Type**
7929-50 *171401382-0050*	Stucco	Gray Non-Fibrous Heterogeneous			100%	Non-fibrous (other)		**None Detected**
7929-51 *171401382-0051*	Stucco	White Non-Fibrous Heterogeneous			100%	Non-fibrous (other)		**None Detected**
7929-52 *171401382-0052*	Stucco	Gray Non-Fibrous Heterogeneous			100%	Non-fibrous (other)		**None Detected**
7929-53 *171401382-0053*	Roofing Material	Black Fibrous Heterogeneous	10% 10%	Cellulose Glass	80%	Non-fibrous (other)		**None Detected**
7929-54 *171401382-0054*	Roofing Material	Black Fibrous Heterogeneous	10% 10%	Cellulose Glass	80%	Non-fibrous (other)		**None Detected**
7929-55 *171401382-0055*	Roofing Material	Black Fibrous Heterogeneous	10% 10%	Cellulose Glass	80%	Non-fibrous (other)		**None Detected**
7929-56 *171401382-0056*	Roofing Material	Black Fibrous Heterogeneous	10%	Glass	88%	Non-fibrous (other)	**2%**	**Chrysotile**
7929-57 *171401382-0057*	Roofing Material	Black Fibrous Heterogeneous	10%	Glass	88%	Non-fibrous (other)	**2%**	**Chrysotile**

Analyst(s)

Edgar Rodriguez (45)
Kim Wallace (54)

Kimberly A Wallace

Kimberly Wallace, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from 03/19/2014 15:41:52

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A, N. Miami Beach, FL 33179
Phone/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com miamilab@emsl.com

EMSL Order:	171401382
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Paul LeBlanc**
AirQuest Environmental, Inc.
6851 SW 45th Street
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/17/14 10:30 AM
Analysis Date:	3/19/2014
Collected:	3/11/2014

Project: **The City of Key West - 7929 - PAL Bldg. & Stable**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos				Asbestos	
Sample	**Description**	**Appearance**	**%**	**Fibrous**	**%**	**Non-Fibrous**	**%**	**Type**
7929-58 *171401382-0058*	Roofing Material	Black Non-Fibrous Homogeneous			95%	Non-fibrous (other)	**5%**	**Chrysotile**
7929-59 *171401382-0059*	Mastic	Black Non-Fibrous Homogeneous			95%	Non-fibrous (other)	**5%**	**Chrysotile**
7929-60 *171401382-0060*	Mastic	Black Non-Fibrous Homogeneous			95%	Non-fibrous (other)	**5%**	**Chrysotile**
7929-61 *171401382-0061*	Roofing Material	Black Fibrous Heterogeneous	10%	Glass	90%	Non-fibrous (other)		**None Detected**
7929-62 *171401382-0062*	Roofing Material	Black Fibrous Heterogeneous	10%	Glass	90%	Non-fibrous (other)		**None Detected**
7929-63 *171401382-0063*	Roofing Material	Black Fibrous Heterogeneous	10%	Glass	90%	Non-fibrous (other)		**None Detected**
7929-64 *171401382-0064*	Mastic	Black Non-Fibrous Homogeneous	2%	Cellulose	98%	Non-fibrous (other)		**None Detected**
7929-65 *171401382-0065*	Mastic	Black Non-Fibrous Homogeneous	2%	Cellulose	96%	Non-fibrous (other)	**2%**	**Chrysotile**

Analyst(s)

Edgar Rodriguez (45)
Kim Wallace (54)

Kimberly A Wallace

Kimberly Wallace, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from 03/19/2014 15:41:52

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A, N. Miami Beach, FL 33179
Phone/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com miamilab@emsl.com

EMSL Order:	171401382
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Paul LeBlanc**
AirQuest Environmental, Inc.
6851 SW 45th Street
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/17/14 10:30 AM
Analysis Date:	3/19/2014
Collected:	3/11/2014

Project: **The City of Key West - 7929 - PAL Bldg. & Stable**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos				Asbestos	
Sample	**Description**	**Appearance**	**%**	**Fibrous**	**%**	**Non-Fibrous**	**%**	**Type**
7929-66 *171401382-0066*	Mastic	Gray/Black Non-Fibrous Homogeneous	5%	Cellulose	95%	Non-fibrous (other)		**None Detected**
7929-67 *171401382-0067*	Mastic	Black Non-Fibrous Homogeneous	5%	Cellulose	93%	Non-fibrous (other)	**2%**	**Chrysotile**
7929-68 *171401382-0068*	Roofing Material	Black Non-Fibrous Homogeneous	10%	Glass	88%	Non-fibrous (other)	**2%**	**Chrysotile**
7929-69 *171401382-0069*	Roofing Material	Black Non-Fibrous Homogeneous	10%	Glass	88%	Non-fibrous (other)	**2%**	**Chrysotile**
7929-70 *171401382-0070*	Roofing Material	Black Non-Fibrous Homogeneous	10%	Glass	88%	Non-fibrous (other)	**2%**	**Chrysotile**
7929-71 *171401382-0071*	Caulking	White Non-Fibrous Homogeneous			100%	Non-fibrous (other)		**None Detected**
7929-72 *171401382-0072*	Caulking	White Non-Fibrous Homogeneous			100%	Non-fibrous (other)		**None Detected**
7929-73 *171401382-0073*	Caulking	Black Non-Fibrous Homogeneous			100%	Non-fibrous (other)		**None Detected**

Analyst(s)

Edgar Rodriguez (45)
Kim Wallace (54)

Kimberly A Wallace

Kimberly Wallace, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from 03/19/2014 15:41:52

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A, N. Miami Beach, FL 33179
Phone/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com miamilab@emsl.com

EMSL Order:	171401382
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Paul LeBlanc**
AirQuest Environmental, Inc.
6851 SW 45th Street
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/17/14 10:30 AM
Analysis Date:	3/19/2014
Collected:	3/11/2014

Project: **The City of Key West - 7929 - PAL Bldg. & Stable**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos				Asbestos	
Sample	**Description**	**Appearance**	**%**	**Fibrous**	**%**	**Non-Fibrous**	**%**	**Type**
7929-74 *171401382-0074*	Concrete Slab	Gray Non-Fibrous Homogeneous			100%	Non-fibrous (other)		**None Detected**
7929-75 *171401382-0075*	Concrete Slab	Gray Non-Fibrous Homogeneous			100%	Non-fibrous (other)		**None Detected**
7929-76 *171401382-0076*	Concrete Slab	Gray Non-Fibrous Homogeneous			100%	Non-fibrous (other)		**None Detected**
7929-77 *171401382-0077*	Pipe Elbow Compound	White Fibrous Heterogeneous	30%	Cellulose	65%	Non-fibrous (other)	**5%**	**Chrysotile**
7929-78 *171401382-0078*	Pipe Elbow Compound	White Fibrous Homogeneous			90%	Non-fibrous (other)	**10%**	**Chrysotile**
7929-79 *171401382-0079*	Pipe Wrap	White/Black/Silver Fibrous Heterogeneous	30% 2%	Cellulose Glass	68%	Non-fibrous (other)		**None Detected**
7929-80 *171401382-0080*	Pipe Wrap	White/Silver Fibrous Heterogeneous	50% 2%	Cellulose Glass	48%	Non-fibrous (other)		**None Detected**
7929-81 *171401382-0081*	Mastic	Black Non-Fibrous Homogeneous			100%	Non-fibrous (other)		**None Detected**

Analyst(s)

Edgar Rodriguez (45)
Kim Wallace (54)

Kimberly A Wallace

Kimberly Wallace, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from 03/19/2014 15:41:52

EMSL Analytical, Inc.
19501 NE 10th Ave. Bay A, N. Miami Beach, FL 33179
Phone/Fax: (305) 650-0577 / (305) 650-0578
http://www.EMSL.com miamilab@emsl.com

EMSL Order:	171401382
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Paul LeBlanc**
AirQuest Environmental, Inc.
6851 SW 45th Street
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/17/14 10:30 AM
Analysis Date:	3/19/2014
Collected:	3/11/2014

Project: **The City of Key West - 7929 - PAL Bldg. & Stable**

Test Report: Asbestos Analysis of Bulk Materials via EPA 600/R-93/116 Method using Polarized Light Microscopy

			Non-Asbestos		Asbestos
Sample	**Description**	**Appearance**	**% Fibrous**	**% Non-Fibrous**	**% Type**
7929-82 *171401382-0082*	Mastic	Black Non-Fibrous Homogeneous		100% Non-fibrous (other)	**None Detected**
7929-83 *171401382-0083*	Mastic	Gold Non-Fibrous Homogeneous		95% Non-fibrous (other)	**5% Chrysotile**
7929-84 *171401382-0084*	Mastic	Gold Non-Fibrous Homogeneous		95% Non-fibrous (other)	**5% Chrysotile**

Analyst(s)

Edgar Rodriguez (45)
Kim Wallace (54)

Kimberly A Wallace

Kimberly Wallace, Laboratory Manager
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the federal government. Non-friable organically bound materials present a problem matrix and therefore EMSL recommends gravimetric reduction prior to analysis. Samples received in good condition unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample. Reporting limit is 1%

Samples analyzed by EMSL Analytical, Inc. N. Miami Beach, FL NVLAP Lab Code 200204-0

Initial report from 03/19/2014 15:41:52

THIS IS THE LAST PAGE OF THE REPORT.

171401382

AIRQUEST ENVIRONMENTAL, INC.
5150 SW 48th Way, Ste 610
Fort Lauderdale, Florida 33314
Phone: 954/792-4549
Fax: 954/792-2221
Email: Labresults@airquestinc.com

Stop at First Positive: N Y/N
Turnaround Time:
_____Rush
X 24 Hour
____Standard

72 hour TAT

Sample Date: 3/11/2014
Project Name: The City of Key West
Project Number: **7929 - PAL Bldg. & Stable**
Surveyor: George Raimundo
Signature: George

HA	Sample Number	HA Description	Sample Location	HA Location	Quantity SF	G/F/P	Dist. Pot.	Friable	Comments/Photo #
1	7929-01	White 2'x4'Acoustic Ceiling Tile	Boxing/Wrestling Area	Throughout	5.000 SF	G	L	Y	
1	7929-02	White 2'x4'Acoustic Ceiling Tile	Boxing/Wrestling Area	Throughout	5.000 SF	G	L	Y	
1	7929-03	White 2'x4'Acoustic Ceiling Tile	Weight Room Area	Throughout	5.00 SF	G	L	Y	
2	7929-04	Drywall system	Boxing/Wrestling Area	Throughout	T.O.	G	L	Y	
2	7929-05	Drywall system	Boxing/Wrestling Area	Throughout	T.O.	G	L	Y	
2	7929-06	Drywall system	Weight Room Area	Throughout	T.O.	G	L	Y	
3	7929-07	Interior Concrete Canapé / Plaster finish	Boxing/Wrestling Area	Boxing/Wrestling Area	960 SF	G	L	Y	
3	7929-08	Interior Concrete Canapé / Plaster finish	Boxing/Wrestling Area	Boxing/Wrestling Area	960 SF	G	L	Y	
3	7929-09	Interior Concrete Canapé / Plaster finish	Boxing/Wrestling Area	Boxing/Wrestling Area	960 SF	G	L	Y	
4	7929-10	Beige 12"x12"Vinyl Floor Tile & Mastic	Boxing/Wrestling Area	Boxing/Wrestling Area	530 SF	G	L	N	
4	7929-11	Beige 12"x12"Vinyl Floor Tile & Mastic	Boxing/Wrestling Area	Boxing/Wrestling Area	530 SF	G	L	N	
4	7929-12	Beige 12"x12"Vinyl Floor Tile & Mastic	Boxing/Wrestling Area	Boxing/Wrestling Area	530 SF	G	L	N	
5	7929-13	4"White Vinyl Floor Coving & Mastic	Boxing/Wrestling Area	Boxing/Wrestling Area	100 SF	G	L	N	
5	7929-14	4"White Vinyl Floor Coving & Mastic	Boxing/Wrestling Area	Boxing/Wrestling Area	101 SF	G	L	N	
5	7929-15	4"White Vinyl Floor Coving & Mastic	Boxing/Wrestling Area	Boxing/Wrestling Area	102 SF	G	L	N	

Relinquished by: **GEORGE RAIMUNDO** Date & Time: **03/13/2014 @ 17:37**
Received by: _____ Date & Time: _____
Relinquished by: _____ Date & Time: _____
Received by: AL-GMSL-Fed Ex Date & Time: ~~03/17~~ 03/17/14 @ 10:30 am

Initial

Tracking #

☒ **Fedex: 803625726397**

☐ **Hand Couriered**

Page 1 of 6

OrderID: 171401382

Page 1 Of 6

171401382

AIR QUEST ENVIRONMENTAL, INC.
5150 SW 48th Way, Ste 610
Fort Lauderdale, Florida 33314
Phone: 954/792-4549
Fax: 954/792-2221
Email: Labresults@airquestinc.com

Stop at First Positive: **N** Y/N
Turnaround Time:
_____Rush
X 24 Hour
____Standard

Sample Date: 3/11/2014
Project Name: The City of Key West
Project Number: **7929 - PAL Bldg. & Stable**
Surveyor: George Raimundo
Signature:

HA	Sample Number	HA Description	Sample Location	HA Location	Quantity SF	G/F/P	Dist. Pot.	Friable	Comments/Photo #
6	7929-16	Yellow Carpet Glue	Boxing/Wrestling Area	Boxing/Wrestling Area, Weight Room & Offices	4.000SF	G	L	N	
6	7929-17	Yellow Carpet Glue	Boxing/Wrestling Area	Boxing/Wrestling Area, Weight Room & Offices	4.000SF	G	L	N	
6	7929-18	Yellow Carpet Glue	Weight Room Area	Boxing/Wrestling Area, Weight Room & Offices	4.000SF	G	L	N	
7	7929-19	White 6"x4"Ceramic Tile & Grout	Boxing/Wrestling Area	at window base	17SF	G	L	N	
7	7929-20	White 6"x4"Ceramic Tile & Grout	Boxing/Wrestling Area	at window base	17SF	G	L	N	
7	7929-21	White 6"x4"Ceramic Tile & Grout	Boxing/Wrestling Area	at window base	17SF	G	L	N	
8	7929-22	Brown 6"x6"Ceramica Floor Tile & Grout	Weight Room Area	Weight Room, Storage, Kitchen and Kitchen Support	5.000 SF	G	L	N	
8	7929-23	Brown 6"x6"Ceramica Floor Tile & Grout	Weight Room Area	Weight Room, Storage, Kitchen and Kitchen Support	5.000SF	G	L	N	
8	7929-24	Brown 6"x6"Ceramica Floor Tile & Grout	Weight Room Storage Area	Weight Room, Storage, Kitchen and Kitchen Support	5.000SF	G	L	N	
9	7929-25	Beige5"x12"Ceramic Wall Tile & Grout	Weight Room Area	Weight Room, Storage,	3.500 SF	G	L	N	Painted White
9	7929-26	Beige5"x12"Ceramic Wall Tile & Grout	Weight Room Area	Weight Room, Storage,	3.500 SF	G	L	N	Painted White
9	7929-27	Beige5"x12"Ceramic Wall Tile & Grout	Weight Room Storage Area	Weight Room, Storage,	3.500 SF	G	L	N	
10	7929-28	Black Mirror Mastic	Boxing/Wrestling Area	Boxing/Wrestling Area	24 SF	G	L	N	8 Mirrors covering an area of 240 sf
10	7929-29	Black Mirror Mastic	Boxing/Wrestling Area	Boxing/Wrestling Area	25 SF	G	L	N	8 Mirrors covering an area of 240 sf
10	7929-30	Black Mirror Mastic	Boxing/Wrestling Area	Boxing/Wrestling Area	26 SF	G	L	N	8 Mirrors covering an area of 240 sf

Relinquished by: **GEORGE RAIMUNDO** Date & Time: **03/13/2014 @ 17:37**
Received by: Date & Time:
Relinquished by: Date & Time:
Received by: Date & Time:

Initial Tracking #
☐ **Fedex: 803625726397**
Hand Couriered
☐

171401382

AIRQUEST ENVIRONMENTAL, INC.
5150 SW 48th Way, Ste 610
Fort Lauderdale, Florida 33314
Phone: 954/792-4549
Fax: 954/792-2221
Email: Labresults@airquestinc.com

Stop at First Positive: **N** Y/N
Turnaround Time:
_____Rush
X 24 Hour
____Standard

Sample Date: 3/11/2014
Project Name: The City of Key West
Project Number: **7929 - PAL Bldg. & Stable**
Surveyor: George Raimundo
Signature:

HA	Sample Number	HA Description	Sample Location	HA Location	Quantity SF	G/F/P	Dist. Pot.	Friable	Comments/Photo #
11	7929-31	Plaster Wall	Walk-in Freezer Area	Storage/Kitchen Support	240 SF	G	L	Y	
11	7929-32	Plaster Wall	Walk-in Freezer Area	Storage/Kitchen Support	240 SF	G	L	Y	
11	7929-33	Plaster Wall	Walk-in Freezer Area	Storage/Kitchen Support	240 SF	G	L	Y	
12	7929-34	Yellow Mastic	Walk-in Freezer Styrofoam Ceiling	Walk-in Freezers	1.500 SF	G	L	N	
12	7929-35	Yellow Mastic	Walk-in Freezer Styrofoam Ceiling	Walk-in Freezers	1.500 SF	G	L	N	
13	7929-36	White 4 "Ø Pipe Wrapping	Kitchen Area/ Ceiling	Kitchen Area	12 LF	G	L	Y	
13	7929-37	White 4 "Ø Pipe Wrapping	Kitchen Area/ Ceiling	Kitchen Area	12 LF	G	L	Y	
14	7929-38	White 5 "Ø Pipe Wrapping	Kitchen Area/ Ceiling	Kitchen Area	16 LF	G	L	Y	
14	7929-39	White 5 "Ø Pipe Wrapping	Kitchen Area/ Ceiling	Kitchen Area	16 LF	G	L	Y	
15	7929-40	White 6 "Ø Pipe Wrapping	Kitchen Area/ Ceiling	Kitchen Area	14 LF	G	L	Y	
15	7929-41	White 6 "Ø Pipe Wrapping	Kitchen Area/ Ceiling	Kitchen Area	14 LF	G	L	Y	
16	7929-42	White 4 "Ø Pipe Elbow Compound	Kitchen Area/ Ceiling	Kitchen Area	4 SF	G	L	Y	
16	7929-43	White 4 "Ø Pipe Elbow Compound	Kitchen Area/ Ceiling	Kitchen Area	4 SF	G	L	Y	
17	7929-44	White 5 "Ø Pipe Elbow Compound	Kitchen Area/ Ceiling	Kitchen Area	6 SF	G	L	Y	
17	7929-45	White 5 "Ø Pipe Elbow Compound	Kitchen Area/ Ceiling	Kitchen Area	6 SF	G	L	Y	

Relinquished by: **GEORGE RAIMUNDO** Date & Time: **03/13/2014 @ 17:37**
Received by: Date & Time:
Relinquished by: Date & Time:
Received by: Date & Time:

Initial

Tracking #

☒ **Fedex: 803625726397**
Hand Couriered
☐

OrderID: 171401382

171401382

AIRQUEST ENVIRONMENTAL, INC.
5150 SW 48th Way, Ste 610
Fort Lauderdale, Florida 33314
Phone: 954/792-4549
Fax: 954/792-2221
Email: Labresults@airquestinc.com

Stop at First Positive: **N** Y/N
Turnaround Time:
_____Rush
X 24 Hour
____Standard

Sample Date: 3/11/2014
Project Name: The City of Key West
Project Number: **7929 - PAL Bldg. & Stable**
Surveyor: George Raimundo
Signature: George

HA	Sample Number	HA Description	Sample Location	HA Location	Quantity SF	G/F/P	Dist. Pot.	Friable	Comments/Photo #
18	7929-46	White 6 "Ø Pipe Elbow Compound	Kitchen Area/ Ceiling	Kitchen Area	6 SF	G	L	Y	
18	7929-47	White 6 "Ø Pipe Elbow Compound	Kitchen Area/ Ceiling	Kitchen Area	6 SF	G	L	Y	
19	7929-48	Exterior Stucco	Northeast Area	Exterior Walls	6.000 SF	G	L	Y	
19	7929-49	Exterior Stucco	Northeast Area	Exterior Walls	6.000 SF	G	L	N	
19	7929-50	Exterior Stucco	Southeast Area	Exterior Walls	6.000 SF	G	L	N	
19	7929-51	Exterior Stucco	South Area	Exterior Walls	6.000 SF	G	L	Y	
19	7929-52	Exterior Stucco	Southwest Area	Exterior Walls	6.000 SF	G	L	Y	
20	7929-53	Built-up Bituminous Roofing Material	Upper Roof - Center Area	Upper Roof - Deck	8.400 SF	G	L	N	
20	7929-54	Built-up Bituminous Roofing Material	Upper Roof - Northeast Area	Upper Roof - Deck	8.400 SF	G	L	N	
20	7929-55	Built-up Bituminous Roofing Material	Upper Roof - Southeast Area	Upper Roof - Deck	8.400 SF	G	L	N	
21	7929-56	Built-up Bituminous Roofing Material	Upper Roof - Southwest Area	Upper Roof - Parapet Wall	420 SF	G	L	N	
21	7929-57	Built-up Bituminous Roofing Material	Upper Roof - West Area	Upper Roof - Parapet Wall	420 SF	G	L	N	
21	7929-58	Built-up Bituminous Roofing Material	Upper Roof - Northeast Area	Upper Roof - Parapet Wall	420 SF	G	L	N	
22	7929-59	Black Mastic	Upper Roof - Southeast Area	Upper Roof - Penetration	6 FS	G	L	N	
22	7929-60	Black Mastic	Upper Roof - Southeast Area	Upper Roof - Penetration	6 SF	G	L	N	

Relinquished by: **GEORGE RAIMUNDO** Date & Time: **03/13/2014 @ 17:37**
Received by: _____ Date & Time: _____
Relinquished by: _____ Date & Time: _____
Received by: _____ Date & Time: _____

Initial

Tracking #
☒ **Fedex: 803625726397**
Hand Couriered
☐

171401382

AIRQUEST ENVIRONMENTAL, INC.
5150 SW 48th Way, Ste 610
Fort Lauderdale, Florida 33314
Phone: 954/792-4549
Fax: 954/792-2221
Email: Labresults@airquestinc.com

Stop at First Positive: **N** Y/N
Turnaround Time:
_____Rush
X 24 Hour
____Standard

Sample Date: 3/11/2014
Project Name: The City of Key West
Project Number: **7929 - PAL Bldg. & Stable**
Surveyor: George Raimundo
Signature: George

HA	Sample Number	HA Description	Sample Location	HA Location	Quantity SF	G/F/P	Dist. Pot.	Friable	Comments/Photo #
23	7929-61	Built-up Bituminous Roofing Material	Lower Roof - Southwest Area	Lower Roof - Deck	20.500 SF	G	L	N	
23	7929-62	Built-up Bituminous Roofing Material	Lower Roof - South Area	Lower Roof - Deck	20.500 SF	G	L	N	
23	7929-63	Built-up Bituminous Roofing Material	Lower Roof - Northeast Area	Lower Roof - Deck	20.500 SF	G	L	N	
24	7929-64	Black Mastic	Lower Roof - South Area	Lower Roof - Penetrations	10 SF	G	L	N	
24	7929-65	Black Mastic	Lower Roof - South Area	Lower Roof - Penetrations	10 SF	G	L	N	
25	7929-66	Black Mastic	Lower Roof - Southwest Area	Lower Roof - Pitch pan	30 SF	G	L	N	
25	7929-67	Black Mastic	Lower Roof - Southeast Area	Lower Roof - Pitch pan	30 SF	G	L	N	
26	7929-68	Built-up Bituminous Roofing Material & Mastic	Lower Roof - Southwest Area	Lower Roof - Edging	300 SF	G	L	N	
26	7929-69	Built-up Bituminous Roofing Material & Mastic	Lower Roof - South Area	Lower Roof - Edging	300 SF	G	L	N	
26	7929-70	Built-up Bituminous Roofing Material & Mastic	Lower Roof - East Area	Lower Roof - Edging	300 SF	G	L	N	
27	7929-71	Window/Door Caulking	Southwest Area	Exterior Window	26 SF	G	L	N	
27	7929-72	Window/Door Caulking	Southwest Area	Exterior Window	26 SF	G	L	N	
27	7929-73	Window/Door Caulking	West Area	Exterior Door	26 SF	G	L	N	
28	7929-74	Concrete Slab	South Area	Exterior Slab	T.O.	G	L	N	
28	7929-75	Concrete Slab	Southwest Area	Exterior Slab	T.O.	G	L	N	

Relinquished by: **GEORGE RAIMUNDO** Date & Time: **03/13/2014 @ 17:37**
Received by:_____ Date & Time:_____
Relinquished by: AV Date & Time:_____
Received by:_____ Date & Time:_____

Initial R

Tracking #
☒ **Fedex: 803625726397**
Hand Couriered
☐

OrderID: 171401382

171401388

AIR QUEST ENVIRONMENTAL, INC
5150 SW 48th Way, Ste 610
Fort Lauderdale, Florida 33314
Phone: 954/792-4549
Fax: 954/792-2221
Email: Labresults@airquestinc.com

Stop at First Positive: N Y/N
Turnaround Time:
_____Rush
X 24 Hour
____Standard

Sample Date: 3/11/2014
Project Name: The City of Key West
Project Number: 7929 - PAL Bldg. & Stable
Surveyor: George Raimundo
Signature:

HA	Sample Number	HA Description	Sample Location	HA Location	Quantity SF	G/F/P	Dist. Pot.	Friable	Comments/Photo #
28	7929-76	Concrete Slab	East Area	Exterior Slab	T.O.	G	L	N	
29	7929-77	White 2 "Ø Pipe Elbow Compound	Weight Room Storage Restroom	Piping	2 SF	G	L	F ~~N~~	Above Acoustic Ceiling Tile PAL
29	7929-78	White 2 "Ø Pipe Elbow Compound	Weight Room Storage Restroom	Piping	2 SF	G	L	F ~~N~~	Above Acoustic Ceiling Tile PAL
30	7929-79	White 2 "Ø Pipe Wrap	Weight Room Storage Restroom	Piping	8 LF	G	L	F ~~N~~	Above Acoustic Ceiling Tile PAL
30	7929-80	White 2 "Ø Pipe Wrap	Weight Room Storage Restroom	Piping	8 LF	G	L	F ~~N~~	Above Acoustic Ceiling Tile PAL
31	7929-81	Black Mastic	Weight Room Storage Restroom	Air Handling Unit	4 SF	G	L	N	Above Acoustic Ceiling Tile
31	7929-82	Black Mastic	Weight Room Storage Restroom	Air Handling Unit	4 SF	G	L	N	Above Acoustic Ceiling Tile
32	7929-83	Gold Mastic	Weight Room Storage Restroom	Air Handling Unit	2 SF	G	L	N	Above Acoustic Ceiling Tile
32	7929-84	Gold Mastic	Weight Room Storage Restroom	Air Handling Unit	2 SF	G	L	N	Above Acoustic Ceiling Tile

Relinquished by: **GEORGE RAIMUNDO** Date & Time: **03/13/2014 @ 17:37**
Received by: Date & Time:
Relinquished by: Date & Time:
Received by: Date & Time:

Initial

Tracking #
[X] **Fedex: 803625726397**
Hand Couriered
[ ]

OrderID: 171401382

PAL BUILDING ASBESTOS REPORT

INTERIOR AND EXTERIOR LEAD-BASED PAINT INSPECTION

FOR
THE CITY OF KEY WEST
PAL BUILDING AND STABLE
1287 TRUMAN WATERFRONT
KEY WEST, FLORIDA 33040

AIRQUEST PROJECT NUMBER: 14-15-7929

PREPARED FOR:

MR. J. MICHAEL VIEUX
SENIOR CONSTRUCTION MANAGER
THE CITY OF KEY WEST
3140 FLAGLER AVENUE
KEY WEST, FL 33040

PREPARED BY:
AIRQUEST ENVIRONMENTAL, INC.
6851 SOUTHWEST 45TH STREET
FORT LAUDERDALE, FLORIDA 33314

APRIL 1, 2014

CERTIFICATION PAGE

INTERIOR AND EXTERIOR LEAD-BASED PAINT INSPECTION

FOR
THE CITY OF KEY WEST
PAL BUILDING AND STABLE
1287 TRUMAN WATERFRONT
KEY WEST, FLORIDA 33040

AIRQUEST PROJECT NUMBER: 14-15-7929

PREPARED FOR:

MR. J. MICHAEL VIEUX
SENIOR CONSTRUCTION MANAGER
THE CITY OF KEY WEST
3140 FLAGLER AVENUE
KEY WEST, FL 33040

PREPARED BY:
AIRQUEST ENVIRONMENTAL, INC.
6851 SOUTHWEST 45TH STREET
FORT LAUDERDALE, FLORIDA 33314

APRIL 1, 2014

Nicholas Nalepa
Lead Inspector 159021

EXECUTIVE SUMMARY

AirQuest Environmental, Inc. ("AirQuest") performed a lead-based paint (LBP) inspection to identify surfaces coated with LBP and their general locations on the interior and exterior of the City of Key West PAL Building and Stable, located at 1287 Truman Waterfront in Key West, Florida 33040 ("the site"). The inspection was performed by Mr. Nicholas Nalepa, a US Environmental Protection Agency (EPA) certified LBP inspector.

The inspection was conducted to determine the presence of LBP within accessible areas of the interior and exterior of the City of Key West PAL Building and Stable prior to demolition activities.

The LBP inspection was conducted using an x-ray fluorescence (XRF) instrument and laboratory analysis for any painted surfaces that tested within the inconclusive range of the instrument. LBP was defined as any paint containing more than 1.0 milligrams per square centimeter (mg/cm^2) lead as indicated on the XRF or that contained more than 0.50% lead by weight when analyzed by Flame Atomic Absorption (FAA).

Based on the results of this LBP inspection, the following were identified as LBP:

<u>PAL Building Ceramic:</u>

- The front office white ceramic wall "A" (Northeast wall)
- The front office ceramic window base on wall "A" (Northeast wall)
- The weight room white ceramic wall "A", ceramic wall "B", ceramic wall "C" and ceramic wall "D" (Northeast, Southeast, Northwest and Southwest walls)

<u>PAL Building</u>

- The red chiller room pipe on wall "C" (Southwest wall)
- The red chiller room conduit on wall "C" (Southwest wall)
- The yellow exterior loading dock on wall "D" (Northwest wall)

<u>Stables</u>

- The pink baseboard on wall "A" (Northeast wall)
- The pink conduit on wall "A" (Northeast wall)
- The pink beam on wall "C" (Southwest wall)
- The pink post on wall "C" (Southwest wall)
- The white ceiling near wall "C" (Southwest wall)
- The white exterior soffit on wall "A", wall "B", wall "C" and wall "D" (Northeast, Southeast, Northwest and Southwest walls)
- The white exterior fascia on wall "A", wall "B", wall "C" and wall "D" (Northeast, Southeast, Northwest and Southwest walls)
- The pink upper wall on wall "A" (Northeast wall)

Under the present OSHA lead construction standard, all identified lead-containing materials affected by construction activities falls under the requirements of 29 CFR 1926. There are no

current government guidelines defining a lead-based paint (LBP) or lead concentration that creates a hazardous atmosphere when disturbed. Based on current Occupational Safety and Health Administration (OSHA) guidelines, for those employees who will be disturbing lead-containing paint, their employer must make an initial determination by monitoring employee exposure if any employee is exposed to lead at or above 30 micrograms per cubic meter for an eight hour time weighted average (30 $\mu g/m^3$ 8-hour time weighted average). The employer must implement OSHA prescribed protective measures until they can demonstrate that the employee exposure is not in excess of the action level.

Lead was detected in the various coated surfaces surveyed. Depending on the degree and type of disturbance of these surfaces (i.e. sanding, cutting, or demolishing), employers may be required to implement varying degrees of OSHA prescribed protective measures. These protective measures must be maintained until it can be demonstrated that employee exposures do not exceed the action level. The employer should also implement and maintain a written compliance program detailing the protective measures they will utilize to control lead exposure during renovation activities.

Lead containing materials may be subject to disposal restrictions. Prior to disposal, the contractor should characterize all wastes so that they are properly disposed in accordance with all local, state and federal regulations.

TABLE OF CONTENTS

1 INTRODUCTION AND FACILITY DESCRIPTION 1

2 LEAD-BASED PAINT SURVEY PROCEDURES 2

3 LEAD-BASED PAINT RESULTS 3

4 CONCLUSIONS AND RECOMMENDATIONS 41

5 LIMITATIONS 43

TABLES

Table 1- Facility Description 1
Table 2 – LBP Results 4

APPENDICES

Appendix I – Copies of Certifications
Appendix II – Laboratory Results and Chain of Custody Record
Appendix III- Photographs

1 INTRODUCTION AND FACILITY DESCRIPTION

On March 11 and 12, 2014, a lead-based paint (LBP) inspection was conducted by Mr. Nicholas Nalepa of AirQuest Environmental, Inc. ("AirQuest") on the interior and exterior of the City of Key West PAL Building and Stable, located at 1287 Truman Waterfront in Key West, Florida 33040 ("the site"). Mr. Nalepa is a US Environmental Protection Agency (EPA) certified LBP inspector (see Appendix I).

The inspection was conducted to determine the presence of LBP within accessible areas of the interior and exterior of the City of Key West PAL Building and Stable prior to demolition activities.

The report was prepared in general accordance with *"Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing"* 2012 revision published by the US Department of Housing and Urban Development (HUD).

A summary of the building materials associated with the facility investigated is presented below in Table 1.

Table 1- Facility Description

Each of the following building components was tested if paint was present.

Facility Type:	Government Facility
Year of Construction:	Pre-1978
Door Structure:	Metal & Wood
Wall Structure:	Concrete

2 LEAD-BASED PAINT SURVEY PROCEDURES

According to the EPA and HUD, all painted surfaces or components located in or on buildings constructed prior to 1978, are suspected to contain LBP. This assumption can be rebutted if a survey of each suspect painted surface or component has been conducted, and a minimum of one sample of each has been collected and proven not to contain LBP in quantities of greater than 0.5 percent by Atomic Absorption analysis or 1.0 milligrams per square centimeter (mg/cm^2) by a direct reading X-Ray Fluorescence (XRF) testing device. In addition, EPA regulations require that LBP be abated prior to undertaking any type of renovations, which could potentially disturb these materials.

The LBP inspection was performed by observing and sampling accessible painted surfaces on the exterior of the building as per the survey methodology established by HUD. The inspector assigned A, B, C or D to the walls based on main entrance side as A, then rotating clockwise. A different visible color does not by itself result in a separate testing combination.

Testing of the samples was performed using the Innov-X A6500 (Serial #10862). The XRF is a screening method currently recommended by HUD for analysis of lead levels in paint. The exact number of testing locations per area may vary depending on existing conditions. The XRF instrument exposes the painted surface to gamma radiation, causing the irradiated substance to emit a spectrum of characteristic frequencies. The frequencies which are characteristic of lead are singled out and measured by the instrument and converted into a number representing the amount of lead in the paint per unit area. At least three (3) calibration check readings were performed prior to and at the completion of each building. Calibration checks were performed before the instrument is turned off and again after it has warmed up.

If a reading is collected and falls within the inconclusive range for the Innov-X A6500 XRF (0.6 to 1.1 mg/cm^2), then a paint chip sample is submitted to a certified laboratory for analysis of lead (see Section 3).

3 LEAD-BASED PAINT RESULTS

Painted surfaces were tested with the XRF. Paint chip samples were then collected when the overall results for a component type were within the inconclusive range of the instrument (0.6 to 1.1 mg/cm^2) or XRF results were not available. Paint chip samples were submitted under chain custody to EMSL Analytical, Inc. (EMSL), an EPA National Lead Laboratory Accreditation Program (NLLAP) laboratory for analysis of lead by Flame Atomic Absorption (FAA) in accordance with ASTM Method SW846-7000B. A copy of the laboratory report and chain-of-custody record is included in Appendix II.

The results of the LBP inspection are presented in Table 2. The XRF sample results are reported in mg/cm^2. The FAA analysis results are reported in % lead by weight.

LBP was defined as any paint containing more than 1.0 mg/cm^2 lead as indicated on the XRF or that contained more than 0.50% lead by weight when analyzed by FAA.

Based on the results of this LBP inspection, the following were identified as LBP:

<u>PAL Building Ceramic:</u>

- The front office white ceramic wall "A" (Northeast wall)
- The front office ceramic window base on wall "A" (Northeast wall)
- The weight room white ceramic wall "A", ceramic wall "B", ceramic wall "C" and ceramic wall "D" (Northeast, Southeast, Northwest and Southwest walls)

<u>PAL Building</u>

- The red chiller room pipe on wall "C" (Southwest wall)
- The red chiller room conduit on wall "C" (Southwest wall)
- The yellow exterior loading dock on wall "D" (Northwest wall)

<u>Stables</u>

- The pink baseboard on wall "A" (Northeast wall)
- The pink conduit on wall "A" (Northeast wall)
- The pink beam on wall "C" (Southwest wall)
- The pink post on wall "C" (Southwest wall)
- The white ceiling near wall "C" (Southwest wall)
- The white exterior soffit on wall "A", wall "B", wall "C" and wall "D" (Northeast, Southeast, Northwest and Southwest walls)
- The white exterior fascia on wall "A", wall "B", wall "C" and wall "D" (Northeast, Southeast, Northwest and Southwest walls)
- The pink upper wall on wall "A" (Northeast wall)

Representative photographs are included in Appendix III.

Table 2 – LBP Results

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
1	1.00		Calibration							
2	1.00		Calibration							
3	1.00		Calibration							
4	0.00	A	Wrestling Area	Wall	Lower	White	Good	Plaster	Interior	
5	0.05	A	Wrestling Area	Wall	Lower	White	Good	Plaster	Interior	
6	0.00	A	Wrestling Area	Wall	Lower	White	Good	Concrete	Interior	
7	0.00	A	Wrestling Area	Wall	Upper	White	Good	Drywall	Interior	
8	0.00	A	Wrestling Area	Soffit		White	Good	Plaster	Interior	
9	0.00	A	Wrestling Area	Fascia		White	Good	Plaster	Interior	
10	0.07	B	Wrestling Area	Wall	Lower	White	Good	Plaster	Interior	
11	0.04	B	Wrestling Area	Wall	Lower	White	Good	Plaster	Interior	
12	0.00	B	Wrestling Area	Wall	Lower	White	Good	Concrete	Interior	
13	0.00	B	Wrestling Area	Wall	Upper	White	Good	Drywall	Interior	
14	0.00	B	Wrestling Area	Soffit		White	Good	Plaster	Interior	
15	0.00	B	Wrestling Area	Fascia		White	Good	Plaster	Interior	
16	0.04	C	Wrestling Area	Wall	Lower	White	Good	Plaster	Interior	
17	0.07	C	Wrestling Area	Wall	Lower	White	Good	Plaster	Interior	
18	0.00	C	Wrestling Area	Wall	Lower	White	Good	Drywall	Interior	
19	0.00	C	Wrestling Area	Wall	Upper	White	Good	Drywall	Interior	
20	0.00	C	Wrestling Area	Soffit		White	Good	Plaster	Interior	
21	0.00	C	Wrestling Area	Fascia		White	Good	Plaster	Interior	
22	0.00	C	Wrestling Area	Crown Molding		White	Good	Wood	Interior	
23	0.00	D	Wrestling Area	Wall	Lower	White	Good	Drywall	Interior	
24	0.00	D	Wrestling Area	Wall	Lower	White	Good	Drywall	Interior	
25	0.00	D	Wrestling Area	Wall	Upper	White	Good	Drywall	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
26	0.00	D	Wrestling Area	Soffit		White	Good	Plaster	Interior	
27	0.00	D	Wrestling Area	Fascia		White	Good	Plaster	Interior	
28	0.00	D	Wrestling Area	Crown Molding		White	Good	Wood	Interior	
29	0.00	A	Wrestling Area	Double Door	Trim	White	Poor	Metal	Interior	
30	0.00	A	Wrestling Area	Double Door	Slab	White	Poor	Metal	Interior	
31	0.00	A	Wrestling Area	Window	Base	White	Good	Ceramic	Interior	
32	0.00	A	Wrestling Area	Window	Trim	White	Good	Ceramic	Interior	
33	0.00	A	Wrestling Area	Baseboard		White	Good	Vinyl	Interior	
34	0.02	A	Wrestling Area	A/C Vent		White	Good	Metal	Interior	
35	0.00	A	Wrestling Area	Wall	Corner	White	Good	Brick	Interior	
36	0.01	A	Wrestling Area	Conduit		White	Good	Metal	Interior	
37	0.00	B	Wrestling Area	Double Door	Trim	White	Poor	Metal	Interior	Left
38	0.00	B	Wrestling Area	Double Door	Slab	White	Poor	Metal	Interior	Left
39	0.00	B	Wrestling Area	Double Door	Trim	White	Poor	Metal	Interior	Right
40	0.00	B	Wrestling Area	Double Door	Slab	White	Poor	Metal	Interior	Right
41	0.00	B	Wrestling Area	Window	Base	White	Good	Brick	Interior	
42	0.00	B	Wrestling Area	Window	Trim	White	Good	Brick	Interior	
43	0.00	B	Wrestling Area	Window	Base	White	Good	Brick	Interior	
44	0.00	B	Wrestling Area	Window	Trim	White	Good	Brick	Interior	
45	0.00	B	Wrestling Area	Baseboard		White	Good	Vinyl	Interior	
46	0.01	B	Wrestling Area	A/C Vent		White	Good	Metal	Interior	
47	0.03	B	Wrestling Area	A/C Vent		White	Good	Metal	Interior	
48	0.06	B	Wrestling Area	Conduit		White	Good	Metal	Interior	
49	0.00	C	Wrestling Area	Window	Sill	White	Good	Brick	Interior	
50	0.00	C	Wrestling Area	Window	Trim	White	Good	Brick	Interior	
51	0.03	C	Wrestling Area	A/C Vent		White	Good	Metal	Interior	
52	0.00	C	Wrestling Area	Baseboard		White	Good	Vinyl	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
53	0.00	C	Wrestling Area	Baseboard		White	Good	Wood	Interior	
54	0.00	D	Wrestling Area	Door	Trim	White	Good	Wood	Interior	Left
55	0.00	D	Wrestling Area	Double Door	Trim	White	Good	Wood	Interior	Center
56	0.00	D	Wrestling Area	Double Door	Slab	White	Good	Wood	Interior	Center
57	0.00	D	Wrestling Area	Double Door	Jamb	White	Good	Wood	Interior	Center
58	0.00	D	Wrestling Area	Door	Trim	White	Good	Wood	Interior	Right
59	0.00	D	Wrestling Area	Door	Slab	White	Good	Wood	Interior	Right
60	0.00	D	Wrestling Area	Door	Jamb	White	Good	Wood	Interior	Right
61	0.00	D	Wrestling Area	Baseboard		White	Good	Wood	Interior	
62	0.00	D	Wrestling Area	A/C Vent	Upper	White	Good	Metal	Interior	
63	0.00	D	Wrestling Area	A/C Vent	Upper	White	Good	Metal	Interior	
64	0.00	D	Wrestling Area	A/C Vent	Lower	White	Good	Metal	Interior	
65	0.00	D	Wrestling Area	Window	Frame	White	Good	Metal	Interior	
66	0.00	D	Wrestling Area	Window	Trim	White	Good	Wood	Interior	
67	2.82	A	Front Office	Wall		White	Good	Ceramic	Interior	LBP Identified
68	0.00	A	Front Office	Wall		White	Good	Concrete	Interior	
69	0.00	B	Front Office	Wall		White	Good	Drywall	Interior	
70	0.00	C	Front Office	Wall		White	Good	Drywall	Interior	
71	0.00	D	Front Office	Wall		White	Good	Drywall	Interior	
72	0.00	A	Front Office	Window	Trim	White	Good	Metal	Interior	
73	2.34	A	Front Office	Window	Base	White	Good	Ceramic	Interior	LBP Identified
74	0.00	B	Front Office	Window	Frame	White	Good	Metal	Interior	
75	0.00	B	Front Office	Door	Trim	White	Good	Wood	Interior	
76	0.00	B	Front Office	Door	Slab	White	Good	Wood	Interior	
77	0.00	B	Front Office	Door	Jamb	White	Good	Wood	Interior	
78	0.00	C	Front Office	Crown Molding		White	Good	Wood	Interior	
79	0.00	C	Front Office	Baseboard		White	Good	Wood	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
80	2.01	A	Weight Room	Wall		White	Good	Ceramic	Interior	LBP Identified
81	0.00	A	Weight Room	Wall		White	Good	Drywall	Interior	
82	0.12	B	Weight Room	Wall		White	Good	Wood	Interior	
83	2.53	B	Weight Room	Wall		White	Good	Ceramic	Interior	LBP Identified
84	2.41	C	Weight Room	Wall		White	Good	Ceramic	Interior	LBP Identified
85	0.05	C	Weight Room	Wall		White	Good	Plaster	Interior	
86	2.61	D	Weight Room	Wall		White	Good	Ceramic	Interior	LBP Identified
87	0.04	D	Weight Room	Wall		White	Good	Concrete	Interior	
88	0.00	D	Weight Room	Wall		White	Good	Wood	Interior	
89	0.00	A	Weight Room	Corner Trim		White	Good	Wood	Interior	
90	0.00	A	Weight Room	Crown Molding		White	Good	Wood	Interior	
91	0.00	A	Weight Room	Baseboard		White	Good	Wood	Interior	
92	0.00	B	Weight Room	Ceiling		White	Good	Drywall	Interior	
93	0.11	B	Weight Room	Crown Molding		White	Good	Wood	Interior	
94	0.00	B	Weight Room	Baseboard		White	Good	Wood	Interior	
95	0.00	B	Weight Room	Double Door	Trim	White	Good	Wood	Interior	Left
96	0.00	B	Weight Room	Double Door	Slab	White	Good	Wood	Interior	Left
97	0.00	B	Weight Room	Double Door	Jamb	White	Good	Wood	Interior	Left
98	0.41	B	Weight Room	Door	Trim	White	Poor	Wood	Interior	Center
99	0.16	B	Weight Room	Door	Slab	White	Poor	Wood	Interior	Center
100	0.07	B	Weight Room	Door	Jamb	White	Poor	Wood	Interior	Center
101	0.00	B	Weight Room	Door	Trim	White	Good	Wood	Interior	Right
102	0.00	B	Weight Room	Door	Slab	White	Good	Wood	Interior	Right
103	0.00	B	Weight Room	Door	Jamb	White	Good	Wood	Interior	Right
104	0.51	B	Weight Room	Breaker Box	Trim	White	Good	Wood	Interior	
105	0.01	C	Weight Room	Window	Vertical Trim	White	Good	Wood	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
106	0.03	C	Weight Room	Window	Horizontal Trim	White	Good	Wood	Interior	
107	0.00	C	Weight Room	Window	Upper Panel	White	Good	Wood	Interior	
108	0.00	C	Weight Room	Window	Lower Panel	White	Good	Wood	Interior	
109	0.17	C	Weight Room	Door	Trim	White	Good	Metal	Interior	
110	0.00	C	Weight Room	Door	Slab	White	Good	Wood	Interior	
111	0.20	C	Weight Room	Window	Trim	White	Good	Metal	Interior	
112	0.02	D	Weight Room	Breaker Box		White	Good	Metal	Interior	
113	0.00	A	Weight Room Office	Wall		White	Good	Drywall	Interior	
114	0.00	B	Weight Room Office	Wall		White	Good	Drywall	Interior	
115	0.00	C	Weight Room Office	Wall		White	Good	Drywall	Interior	
116	0.00	D	Weight Room Office	Wall		White	Good	Drywall	Interior	
117	0.03	A	Weight Room Office	Window	Trim	White	Good	Wood	Interior	
118	0.00	A	Weight Room Office	Window	Sill	White	Good	Wood	Interior	
119	0.00	D	Weight Room Office	Door	Trim	White	Poor	Wood	Interior	
120	0.10	D	Weight Room Office	Door	Slab	White	Poor	Wood	Interior	
121	0.08	D	Weight Room Office	Door	Jamb	White	Poor	Wood	Interior	
122	0.00	D	Weight Room Office	Baseboard		White	Good	Wood	Interior	
123	0.03	D	Weight Room Office	Wall	Trim	White	Good	Wood	Interior	
124	0.16	C	Weight Room Office	Ladder		Black	Poor	Metal	Interior	
125	0.00	A	Weight Room Storage	Wall		White	Good	Drywall	Interior	
126	0.00	B	Weight Room Storage	Wall		White	Good	Drywall	Interior	
127	0.00	C	Weight Room Storage	Wall		White	Good	Drywall	Interior	
128	0.00	D	Weight Room Storage	Wall		White	Good	Drywall	Interior	
129	0.15	A	Weight Room Storage	Door	Trim	White	Poor	Metal	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
130	0.00	A	Weight Room Storage	Door	Slab	White	Good	Wood	Interior	
131	0.18	A	Weight Room Storage	Door	Jamb	White	Poor	Metal	Interior	
132	0.10	A	Weight Room Storage	Window	Trim	White	Good	Metal	Interior	
133	0.00	B	Weight Room Storage	Baseboard		White	Good	Wood	Interior	
134	0.00	B	Weight Room Storage	Crown Molding		White	Good	Wood	Interior	
135	0.15	B	Weight Room Storage	Conduit		White	Good	Metal	Interior	
136	0.00	C	Weight Room Storage	Door	Trim	White	Poor	Wood	Interior	
137	0.04	C	Weight Room Storage	Door	Slab	White	Poor	Wood	Interior	
138	0.05	C	Weight Room Storage	Door	Jamb	Beige	Good	Metal	Interior	
139	0.03	A	Bathroom	Wall		Beige	Good	Concrete	Interior	
140	0.05	B	Bathroom	Wall		Beige	Good	Drywall	Interior	
141	0.04	C	Bathroom	Wall		Beige	Good	Concrete	Interior	
142	0.03	D	Bathroom	Wall		Beige	Good	Drywall	Interior	
143	0.09	A	Bathroom	Door	Trim	Beige	Good	Metal	Interior	
144	0.06	A	Bathroom	Door	Slab	Beige	Good	Wood	Interior	
145	0.05	A	Bathroom	Door	Jamb	Beige	Good	Metal	Interior	
146	0.09	A	Weight Room Storage #2	Ceiling		White	Good	Wood	Interior	
147	0.05	A	Weight Room Storage #2	Ceiling	Trim	White	Good	Wood	Interior	
148	0.08	C	Weight Room Storage #2	Door	Trim	Beige	Good	Wood	Interior	
149	0.00	C	Weight Room	Door	Slab	Beige	Good	Wood	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
			Storage #2							
150	0.22	D	Weight Room Storage #2	Door	Trim	Beige	Poor	Wood	Interior	
151	0.00	D	Weight Room Storage #2	Door	Jamb	White	Good	Wood	Interior	
152	1.00		Calibration							
153	1.00		Calibration							
154	1.00		Calibration							
155	1.00		Calibration							
156	1.00		Calibration							
157	1.00		Calibration							
158	0.10	A	Freezer	Wall		Tan	Poor	Plaster	Interior	
159	0.00	B	Freezer	Wall		Tan	Good	Plaster	Interior	
160	0.00	C	Freezer	Wall		Tan	Good	Plaster	Interior	
161	0.00	D	Freezer	Wall		Tan	Good	Plaster	Interior	
162	0.02	A	Freezer	Sliding Door	Trim	Beige	Good	Metal	Interior	
163	0.02	A	Freezer	Sliding Door	Slab	Beige	Good	Metal	Interior	
164	0.19	A	Freezer	Sliding Door	Rail	Beige	Good	Metal	Interior	
165	0.05	A	Freezer	Conduit		Tan	Good	Metal	Interior	
166	0.00	A	Freezer	Pipe		Tan	Poor	Metal	Interior	
167	0.00	B	Freezer	Door	Trim	Beige	Good	Wood	Interior	
168	0.04	B	Freezer	Door	Slab	White	Good	Metal	Interior	
169	0.03	B	Freezer	Door	Jamb	White	Good	Metal	Interior	
170	0.00	C	Freezer	Door	Trim	Beige	Good	Wood	Interior	
171	0.02	C	Freezer	Door	Slab	Beige	Good	Metal	Interior	
172	0.02	C	Freezer	Door	Jamb	Beige	Good	Metal	Interior	
173	0.06	D	Freezer	Sliding Door	Trim	Beige	Good	Metal	Interior	
174	0.02	D	Freezer	Sliding Door	Slab	Beige	Good	Metal	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
175	0.00	A	17A	Wall		Tan	Good	Plaster	Interior	
176	0.00	B	17A	Wall		Tan	Good	Plaster	Interior	
177	0.00	C	17A	Wall		Tan	Good	Plaster	Interior	
178	0.00	D	17A	Wall		Tan	Good	Plaster	Interior	
179	0.00	B	17A	Conduit		Tan	Good	Metal	Interior	
180	0.00	C	17A	Sliding Door	Trim	Tan	Good	Wood	Interior	
181	0.00	C	17A	Sliding Door	Slab	Tan	Good	Metal	Interior	
182	0.03	C	17A	Sliding Door	Jamb	Tan	Good	Metal	Interior	
183	0.11	A	Prep Room	Wall		Tan	Good	Concrete	Interior	
184	0.05	B	Prep Room	Wall		Tan	Good	Concrete	Interior	
185	0.04	C	Prep Room	Wall		Tan	Good	Concrete	Interior	
186	0.04	D	Prep Room	Wall		Tan	Good	Concrete	Interior	
187	0.03	A	Prep Room	Ceiling		White	Poor	Plaster	Interior	
188	0.02	A	Prep Room	Door	Trim	Beige	Good	Metal	Interior	
189	0.02	A	Prep Room	Door	Slab	Beige	Good	Metal	Interior	
190	0.09	B	Prep Room	Door	Trim	Beige	Poor	Metal	Interior	
191	0.33	B	Prep Room	Door	Slab	Beige	Poor	Wood	Interior	
192	0.10	B	Prep Room	Door	Jamb	Beige	Poor	Metal	Interior	
193	0.05	A	Kitchen	Wall		Tan	Good	Concrete	Interior	
194	0.11	B	Kitchen	Wall		Tan	Good	Plaster	Interior	
195	0.11	C	Kitchen	Wall		Tan	Good	Plaster	Interior	
196	0.12	D	Kitchen	Wall		Tan	Poor	Plaster	Interior	
197	0.07	A	Kitchen	Door	Trim	White	Good	Metal	Interior	32-38
198	0.04	A	Kitchen	Door	Slab	White	Good	Metal	Interior	32-38
199	0.16	A	Kitchen	Door	Trim	Beige	Good	Metal	Interior	Dishwasher
200	0.09	A	Kitchen	Door	Trim	Beige	Poor	Metal	Interior	Right
201	0.07	A	Kitchen	Door	Slab	Beige	Poor	Wood	Interior	Right
202	0.10	A	Kitchen	Door	Jamb	Beige	Poor	Metal	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
203	0.04	B	Kitchen	Hood		Tan	Poor	Metal	Interior	
204	0.05	C	Kitchen	Door	Trim	Beige	Poor	Metal	Interior	Left
205	0.05	C	Kitchen	Door	Slab	Beige	Poor	Wood	Interior	Left
206	0.18	C	Kitchen	Door	Jamb	Beige	Poor	Metal	Interior	Left
207	0.00	C	Kitchen	Sliding Door	Trim	White	Poor	Metal	Interior	Right
208	0.00	C	Kitchen	Sliding Door	Slab	White	Good	Metal	Interior	Right
209	0.14	C	Kitchen	Sliding Door	Rail	White	Poor	Metal	Interior	Right
210	0.13	D	Kitchen	Door	Trim	Beige	Poor	Metal	Interior	Left
211	0.21	D	Kitchen	Door	Slab	Beige	Poor	Wood	Interior	Left
212	0.17	D	Kitchen	Door	Jamb	Beige	Poor	Metal	Interior	Left
213	0.17	D	Kitchen	Door	Trim	Tan	Poor	Metal	Interior	Left Center
214	0.16	D	Kitchen	Door	Slab	Tan	Good	Wood	Interior	Left Center
215	0.13	D	Kitchen	Door	Jamb	Tan	Poor	Metal	Interior	Left Center
216	0.02	D	Kitchen	Door	Trim	White	Good	Metal	Interior	Freezer
217	0.00	D	Kitchen	Door	Slab	White	Good	Metal	Interior	Freezer
218	0.03	D	Kitchen	Door	Trim	White	Good	Metal	Interior	32-35
219	0.01	D	Kitchen	Door	Slab	White	Good	Metal	Interior	32-35
220	0.02	D	Kitchen	Conduit		Tan	Poor	Metal	Interior	
221	0.07	C	Kitchen	Duct		Tan	Poor	Plaster	Interior	
222	0.01	A	Meat Chiller 32-35	Wall		Tan	Poor	Plaster	Interior	
223	0.00	B	Meat Chiller 32-35	Wall		Tan	Good	Plaster	Interior	
224	0.01	C	Meat Chiller 32-35	Wall		Tan	Poor	Plaster	Interior	
225	0.00	D	Meat Chiller 32-35	Wall		Tan	Good	Plaster	Interior	
226	0.01	A	Meat Chiller 32-35	Conduit		Tan	Good	Metal	Interior	
227	0.00	B	Meat Chiller 32-35	Door	Trim	Beige	Good	Metal	Interior	
228	0.05	B	Meat Chiller 32-35	Door	Slab	Beige	Good	Metal	Interior	
229	0.01	B	Meat Chiller 32-35	Door	Jamb	Beige	Good	Metal	Interior	
230	0.02	C	Meat Chiller 32-35	Sliding Door	Trim	Beige	Good	Metal	Interior	Veg. Freezer

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
231	0.04	C	Meat Chiller 32-35	Sliding Door	Slab	Beige	Good	Metal	Interior	Veg. Freezer
232	0.06	C	Meat Chiller 32-35	Sliding Door	Rail	Beige	Good	Metal	Interior	Veg. Freezer
233	0.00	D	Meat Chiller 32-35	Door	Trim	Beige	Good	Wood	Interior	
234	0.03	D	Meat Chiller 32-35	Door	Slab	Beige	Poor	Metal	Interior	
235	0.02	D	Meat Chiller 32-35	Door	Jamb	Beige	Good	Metal	Interior	
236	0.00	A	Veg. Freezer	Wall		Tan	Good	Plaster	Interior	
237	0.00	B	Veg. Freezer	Wall		Tan	Good	Plaster	Interior	
238	0.00	C	Veg. Freezer	Wall		Tan	Good	Plaster	Interior	
239	0.00	D	Veg. Freezer	Wall		Tan	Good	Plaster	Interior	
240	0.00	A	Veg. Freezer	Sliding Door	Trim	Beige	Good	Wood	Interior	
241	0.03	A	Veg. Freezer	Sliding Door	Slab	Beige	Good	Metal	Interior	
242	0.03	A	Veg. Freezer	Sliding Door	Jamb	Beige	Good	Metal	Interior	
243	0.01	C	Veg. Freezer	Pipe		Beige	Good	Metal	Interior	
244	0.09	B	Thaw-Refer 32-38	Pipe	Bracket	White	Good	Metal	Interior	
245	0.00	C	Thaw-Refer 32-38	Door	Trim	Beige	Good	Wood	Interior	
246	0.07	C	Thaw-Refer 32-38	Door	Slab	Beige	Good	Metal	Interior	
247	0.00	C	Thaw-Refer 32-38	Door	Jamb	Beige	Good	Metal	Interior	
248	0.00	D	Thaw-Refer 32-38	Double Door	Trim	Beige	Good	Wood	Interior	
249	0.02	D	Thaw-Refer 32-38	Double Door	Slab	Beige	Good	Wood	Interior	
250	0.01	D	Thaw-Refer 32-38	Double Door	Slab	Beige	Good	Metal	Interior	
251	0.07	A	Dairy-Refer 32-34	Wall		Tan	Poor	Plaster	Interior	
252	0.00	B	Dairy-Refer 32-34	Wall		Tan	Good	Plaster	Interior	
253	0.03	C	Dairy-Refer 32-34	Wall		Tan	Poor	Plaster	Interior	
254	0.00	D	Dairy-Refer 32-34	Wall		Tan	Good	Plaster	Interior	
255	0.00	A	Dairy-Refer 32-34	Sliding Door	Trim	Beige	Good	Metal	Interior	
256	0.17	A	Dairy-Refer 32-34	Sliding Door	Slab	Beige	Good	Metal	Interior	
257	0.09	A	Dairy-Refer 32-34	Sliding Door	Rail	Beige	Good	Metal	Interior	
258	0.01	A	Dairy-Refer 32-34	Conduit		Beige	Good	Metal	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
259	0.00	B	Dairy-Refer 32-34	Double Door	Trim	Tan	Good	Wood	Interior	
260	0.02	B	Dairy-Refer 32-34	Double Door	Slab	Beige	Good	Wood	Interior	
261	0.03	B	Dairy-Refer 32-34	Double Door	Slab	Beige	Good	Metal	Interior	
262	0.00	D	Dairy-Refer 32-34	Sliding Door	Trim	Beige	Good	Metal	Interior	
263	0.01	D	Dairy-Refer 32-34	Sliding Door	Slab	Beige	Good	Metal	Interior	
264	0.04	D	Dairy-Refer 32-34	Sliding Door	Jamb	Beige	Good	Metal	Interior	
265	0.00	A	Dish Washer	Wall		Tan	Good	Concrete	Interior	
266	0.00	B	Dish Washer	Wall		Tan	Good	Concrete	Interior	
267	0.00	C	Dish Washer	Wall		Tan	Good	Concrete	Interior	
268	0.00	C	Dish Washer	Wall		Tan	Good	Plaster	Interior	
269	0.01	D	Dish Washer	Wall		Tan	Good	Concrete	Interior	
270	0.00	B	Dish Washer	Ceiling		White	Poor	Concrete	Interior	
271	0.06	B	Dish Washer	Pipe		White	Good	Metal	Interior	
272	0.15	C	Dish Washer	Door	Trim	Beige	Poor	Metal	Interior	
273	0.32	A	Closet	Wall		Blue	Good	Ceramic	Interior	
274	0.02	A	Closet	Wall		Blue	Good	Concrete	Interior	
275	0.02	B	Closet	Wall		Blue	Good	Concrete	Interior	
276	0.03	B	Closet	Wall		Blue	Good	Plaster	Interior	
277	0.03	C	Closet	Wall		Blue	Good	Concrete	Interior	
278	0.03	C	Closet	Wall		Blue	Good	Plaster	Interior	
279	0.36	D	Closet	Wall		Blue	Good	Ceramic	Interior	
280	0.02	D	Closet	Wall		Blue	Good	Concrete	Interior	
281	0.00	A	Closet	Ceiling		White	Good	Concrete	Interior	
282	0.11	A	Closet	Pipe		White	Good	Metal	Interior	
283	0.07	C	Closet	Door	Trim	Beige	Poor	Metal	Interior	
284	0.18	C	Closet	Door	Slab	Beige	Poor	Wood	Interior	
285	0.17	C	Closet	Door	Jamb	Beige	Poor	Metal	Interior	
286	0.11	A	Oven Room	Door	Trim	Beige	Poor	Metal	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
287	0.10	A	Oven Room	Door	Slab	Beige	Poor	Wood	Interior	
288	0.18	A	Oven Room	Door	Jamb	Beige	Poor	Metal	Interior	
289	0.10	A	Oven Room	Ceiling		White	Poor	Plaster	Interior	
290	0.05	C	Oven Room	Window	Trim	White	Poor	Wood	Interior	
291	0.00	D	Oven Room	Ceiling	Duct	White	Poor	Metal	Interior	
292	0.00	D	Oven Room	Ceiling	Grate	White	Poor	Metal	Interior	
293	0.00	A	Kitchen Office 1	Wall		White	Good	Drywall	Interior	
294	0.00	B	Kitchen Office 1	Wall		White	Good	Drywall	Interior	
295	0.00	C	Kitchen Office 1	Wall		White	Good	Drywall	Interior	
296	0.00	D	Kitchen Office 1	Wall		White	Good	Drywall	Interior	
297-L-01	NC	A	Kitchen Office 1	Wall	Trim	Black	Good	Wood	Interior	Paint Chip Sample Taken (<0.068%)
298	NC	C	Kitchen Office 1	Wall	Trim	Black	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (<0.068%)
299	Sample Taken of Similar Structure (0.07)	B	Kitchen Office 1	Door	Trim	Beige	Poor	Metal	Interior	
300	Sample Taken of Similar Structure (0.18)	B	Kitchen Office 1	Door	Slab	Beige	Poor	Wood	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
301	Sample Taken of Similar Structure (0.17)	B	Kitchen Office 1	Door	Jamb	Beige	Poor	Metal	Interior	
302	NC	D	Kitchen Office 1	Window	Trim	Black	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (<0.068%)
303	NC	D	Kitchen Office 1	Window	Sill	Black	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (<0.068%)
304	NC	A	Corridor	Wall		Tan	Good	Concrete	Interior	Paint Chip Sample Taken of Similar Structure (0.096%)
305-L-02	NC	B	Corridor	Wall		Tan	Poor	Concrete	Interior	Paint Chip Sample Taken (0.096%)
306	NC	C	Corridor	Wall		Tan	Good	Concrete	Interior	Paint Chip Sample Taken of Similar Structure (0.096%)
307	NC	D	Corridor	Wall		Tan	Good	Concrete	Interior	Paint Chip Sample Taken of Similar Structure (0.096%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
308-L-03	NC	A	Corridor	Ceiling		White	Poor	Plaster	Interior	Paint Chip Sample Taken (0.021%)
309	NC	A	Corridor	Door	Trim	Beige	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (0.12%)
310	NC	A	Corridor	Door	Jamb	Beige	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (0.087%)
311	NC	C	Corridor	Door	Trim	Beige	Poor	Metal	Interior	His; Paint Chip Sample Taken of Similar Structure (0.12%)
312	NC	C	Corridor	Door	Slab	Beige	Poor	Wood	Interior	His: Paint Chip Sample Taken of Similar Structure (0.087%)
313	NC	C	Corridor	Door	Jamb	Beige	Poor	Metal	Interior	His; Paint Chip Sample Taken of Similar Structure (0.11%)
314	NC	C	Corridor	Door	Trim	Beige	Poor	Metal	Interior	Hers: Paint Chip Sample Taken of Similar Structure (0.12%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
315	NC	C	Corridor	Door	Slab	Beige	Poor	Wood	Interior	Hers: Paint Chip Sample Taken of Similar Structure (0.087%)
316	NC	C	Corridor	Door	Jamb	Beige	Poor	Metal	Interior	Hers: Paint Chip Sample Taken of Similar Structure (0.11%)
317	Sample Taken of Similar Structure (0.00)	A	Kitchen Office 2	Wall		White	Good	Drywall	Interior	
318	Sample Taken of Similar Structure (0.00)	B	Kitchen Office 2	Wall		White	Good	Drywall	Interior	
319	Sample Taken of Similar Structure (0.00)	C	Kitchen Office 2	Wall		White	Good	Drywall	Interior	
320	Sample Taken of Similar Structure (0.00)	D	Kitchen Office 2	Wall		White	Good	Drywall	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
321	NC	A	Kitchen Office 2	Wall	Trim	Black	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (<0.068%)
322	NC	D	Kitchen Office 2	Wall	Trim	Black	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (<0.068%)
323	NC	B	Kitchen Office 2	Window	Trim	Black	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (<0.068%)
324	NC	B	Kitchen Office 2	Window	Sill	Black	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (<0.068%)
325	Sample Taken of Similar Structure (0.08)	C	Kitchen Office 2	Door	Jamb	White	Poor	Wood	Interior	
326	Sample Taken of Similar Structure (0.00)	A	Men's Restroom	Wall		White	Good	Concrete	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
327	Sample Taken of Similar Structure (0.00)	B	Men's Restroom	Wall		White	Good	Concrete	Interior	
328	Sample Taken of Similar Structure (0.00)	C	Men's Restroom	Wall		White	Good	Concrete	Interior	
329	Sample Taken of Similar Structure (0.00)	D	Men's Restroom	Wall		White	Good	Concrete	Interior	
330-L-04	NC	A	Men's Restroom	Door	Trim	Beige	Poor	Metal	Interior	Paint Chip Sample Taken (0.12%)
331-L-05	NC	A	Men's Restroom	Door	Slab	Beige	Poor	Wood	Interior	Paint Chip Sample Taken (0.087%)
332-L-06	NC	A	Men's Restroom	Door	Jamb	Beige	Poor	Metal	Interior	Paint Chip Sample Taken (0.11%)
333	NC	A	Men's Restroom	Door	Trim	Beige	Poor	Metal	Interior	Paint Chip Sample Taken of Similar Structure (0.12%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
334	NC	A	Men's Restroom	Door	Jamb	Beige	Poor	Metal	Interior	Paint Chip Sample Taken of Similar Structure (0.11%)
335	Sample Taken of Similar Structure (0.00)	A	Men's Restroom	Ceiling		White	Good	Concrete	Interior	
336-L-07	NC	D	Men's Restroom	Pole		White	Good	Metal	Interior	Paint Chip Sample Taken (0.040%)
337-L-08	NC	D	Men's Restroom	Vent	Trim	White	Good	Wood	Interior	Paint Chip Sample Taken (0.043%)
338	Sample Taken of Similar Structure (0.00)	A	Women's Restroom	Wall		White	Good	Concrete	Interior	
339	Sample Taken of Similar Structure (0.00)	B	Women's Restroom	Wall		White	Good	Concrete	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
340	Sample Taken of Similar Structure (0.00)	C	Women's Restroom	Wall		White	Good	Concrete	Interior	
341	Sample Taken of Similar Structure (0.00)	D	Women's Restroom	Wall		White	Good	Concrete	Interior	
342	NC	A	Women's Restroom	Door	Trim	Beige	Poor	Metal	Interior	Paint Chip Sample Taken of Similar Structure (0.12%)
343	NC	A	Women's Restroom	Door	Slab	Beige	Poor	Wood	Interior	Paint Chip Sample Taken of Similar Structure (0.087%)
344	NC	A	Women's Restroom	Door	Jamb	Beige	Poor	Metal	Interior	Paint Chip Sample Taken of Similar Structure (0.11%)
345	Sample Taken of Similar Structure (0.00)	A	Women's Restroom	Ceiling		White	Good	Concrete	Interior	

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
346	NC	D	Women's Restroom	Vent	Trim	White	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (0.043%)
347-L-09	NC	C	Boiler Room	Wall		White	Good	Concrete	Interior	Paint Chip Sample Taken (<0.012%)
348-L-10	NC	A	Boiler Room	Louvre		Pink	Good	Plaster	Interior	Paint Chip Sample Taken (<0.010%)
349	NC	B	Boiler Room	Louvre		Pink	Good	Plaster	Interior	Paint Chip Sample Taken of Similar Structure (<0.010%)
350-L-11	NC	B	Boiler Room	Pipe		Yellow	Poor	Metal	Interior	Paint Chip Sample Taken (0.22%)
351	NC	C	Boiler Room	Door	Trim	Gray	Poor	Metal	Interior	Paint Chip Sample Taken of Similar Structure (0.16%)
352-L-12	NC	D	Boiler Room	Double Door	Trim	Gray	Poor	Metal	Interior	Paint Chip Sample Taken (0.16%)
353-L-13	NC	D	Boiler Room	Double Door	Slab	Gray	Poor	Metal	Interior	Paint Chip Sample Taken (0.035%)
354-L-14	NC	D	Boiler Room	Double Door	Jamb	Gray	Poor	Metal	Interior	Paint Chip Sample Taken (0.36%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
355-L-15	NC	A	Boiler Room	Boiler		Gray	Poor	Metal	Interior	Paint Chip Sample Taken (0.36%)
356-L-16	NC	C	Boiler Room	Boiler		Blue	Poor	Metal	Interior	Paint Chip Sample Taken (<0.010%)
357-L-17	NC	A	Chiller Room	Wall		Gray	Good	Concrete	Interior	Paint Chip Sample Taken (<0.013%)
358	NC	B	Chiller Room	Wall		Gray	Good	Concrete	Interior	Paint Chip Sample Taken (<0.013%)
359	NC	C	Chiller Room	Wall		Gray	Good	Concrete	Interior	Paint Chip Sample Taken (<0.013%)
360	NC	D	Chiller Room	Wall		Gray	Good	Concrete	Interior	Paint Chip Sample Taken (<0.013%)
361	Sample Taken of Similar Structure (0.00)	A	Chiller Room	Ceiling		White	Good	Concrete	Interior	
362	NC	A	Chiller Room	Door	Trim	Gray	Poor	Metal	Interior	Paint Chip Sample Taken of Similar Structure (0.16%)
363-L-18	NC	C	Chiller Room	Pipe		Red	Poor	Metal	Interior	Paint Chip Sample Taken (7.8%) LBP Identified

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
364-L-19	NC	C	Chiller Room	Conduit		Gray	Poor	Metal	Interior	Paint Chip Sample Taken (0.50%) LBP Identified
365-L-20	NC	A	Loading Dock Storage	Wall		Beige	Poor	Concrete	Interior	Paint Chip Sample Taken (0.074%)
366	NC	A	Loading Dock Storage	Wall		Beige	Poor	Concrete	Interior	Paint Chip Sample Taken of Similar Structure (0.074%)
367	NC	A	Loading Dock Storage	Wall		Beige	Poor	Concrete	Interior	Paint Chip Sample Taken of Similar Structure (0.074%)
368	NC	A	Loading Dock Storage	Wall		Beige	Poor	Concrete	Interior	Paint Chip Sample Taken of Similar Structure (0.074%)
369	NC	A	Loading Dock Storage	Wall		Beige	Poor	Wood	Interior	Paint Chip Sample Taken of Similar Structure (0.010%)
370-L-21	NC	A	Loading Dock Storage	Door	Trim	Beige	Poor	Metal	Interior	Paint Chip Sample Taken (0.23%)
371-L-22	NC	A	Loading Dock Storage	Door	Slab	Beige	Poor	Metal	Interior	Paint Chip Sample Taken (0.11%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
372-L-23	NC	A	Loading Dock Storage	Door	Jamb	Beige	Poor	Metal	Interior	Paint Chip Sample Taken (0.20%)
373-L-24	NC	A	Loading Dock Storage	Door	Slab	Beige	Good	Wood	Interior	Paint Chip Sample Taken (0.010%)
374-L-25	NC	A	Loading Dock Storage	Door	Trim	Beige	Good	Wood	Interior	Paint Chip Sample Taken (<0.019%)
375-L-26	NC	A	Loading Dock Storage	Duct		Beige	Poor	Metal	Interior	Paint Chip Sample Taken (<0.010%)
376	Sample Taken of Similar Structure (0.00)	A	Loading Dock Storage	Ceiling		White	Good	Concrete	Interior	
377-L-27	NC	A	Stables	Wall		Gray	Good	Concrete	Interior	Paint Chip Sample Taken (0.12%)
378-L-28	NC	A	Stables	Wall		White	Good	Concrete	Interior	Paint Chip Sample Taken (0.051%)
379-L-29	NC	A	Stables	Wall		Pink	Good	Concrete	Interior	Paint Chip Sample Taken (0.034%)
380	NC	B	Stables	Wall		White	Good	Concrete	Interior	Paint Chip Sample Taken of Similar Structure (0.051%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
381	NC	B	Stables	Wall		Gray	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (0.12%)
382	NC	C	Stables	Wall		White	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (0.051%)
383	NC	D	Stables	Wall		White	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (0.051%)
384	NC	D	Stables	Wall		Pink	Good	Wood	Interior	Paint Chip Sample Taken of Similar Structure (0.034%)
384-L-30	NC	A	Stables	Door	Trim	Pink	Good	Wood	Interior	Paint Chip Sample Taken (<0.013%)
385-L-31	NC	A	Stables	Door	Slab	White	Good	Wood	Interior	Paint Chip Sample Taken (<0.018%)
386-L-32	NC	A	Stables	Door	Jamb	White	Good	Wood	Interior	Paint Chip Sample Taken (<0.010%)
387-L-33	NC	A	Stables	Baseboard		Pink	Good	Vinyl	Interior	Paint Chip Sample Taken (0.82%) LBP Identified

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
388-L-34	NC	A	Stables	Conduit		Pink	Good	Metal	Interior	Paint Chip Sample Taken (0.81%) LBP Identified
389-L-35	NC	C	Stables	Beam		Pink	Good	Wood	Interior	Paint Chip Sample Taken (3.4%) LBP Identified
390-L-36	NC	C	Stables	Post		Pink	Good	Metal	Interior	Paint Chip Sample Taken (0.88%)
391-L-37	NC	C	Stables	Ceiling		White	Good	Wood	Interior	Paint Chip Sample Taken (8.4%)
392-L-38	NC	C	Stables	Window	Trim	Pink	Good	Wood	Interior	Paint Chip Sample Taken (0.040%)
393-L-39	NC	C	Stables	Window	Sill	Pink	Good	Wood	Interior	Paint Chip Sample Taken (<0.020%)
394-L-40	NC	D	Stables	Crown Molding		Pink	Good	Wood	Interior	Paint Chip Sample Taken (<0.019%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
1-L-41	NC	A	Exterior	Wall		White	Good	Wood	Exterior	Stables; Paint Chip Sample Taken (0.26%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
2-L-42	NC	A	Exterior	Wall	Trim	White	Good	Wood	Exterior	Stables; Paint Chip Sample Taken (0.45%)
3-L-43	NC	A	Exterior	Soffit		White	Good	Wood	Exterior	Stables; Paint Chip Sample Taken (1.4%) LBP Identified
4-L-44	NC	A	Exterior	Fascia		White	Good	Metal	Exterior	Stables; Paint Chip Sample Taken (1.7%) LBP Identified
5-L-45	NC	A	Exterior	Wall		Pink	Good	Plaster	Exterior	Paint Chip Sample Taken (<0.019%)
6-L-46	NC	A	Exterior	Wall	Trim	White	Good	Plaster	Exterior	Paint Chip Sample Taken (<0.010%)
7-L-47	NC	A	Exterior	Wall	Upper	Pink	Good	Plaster	Exterior	Paint Chip Sample Taken (1.7%) LBP Identified

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
8	NC	A	Exterior	Door	Trim	Pink	Good	Metal	Exterior	Paint Chip Sample Taken of Similar Structure (<0.029%)
9-L-49	NC	A	Exterior	Soffit		White	Good	Plaster	Exterior	Paint Chip Sample Taken (<0.011%)
10-L-50	NC	A	Exterior	Fascia		White	Good	Wood	Exterior	Paint Chip Sample Taken (0.012%)
11-L-51	NC	A	Exterior	Fascia		White	Good	Metal	Exterior	Paint Chip Sample Taken (<0.028%)
12	NC	A	Exterior	Louvre		Pink	Good	Plaster	Exterior	Paint Chip Sample Taken of Similar Structure (<0.010%)
13-L-52	NC	A	Exterior	Wall	Pattern	Pink	Good	Plaster	Exterior	Paint Chip Sample Taken (<0.010%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
14	NC	B	Exterior	Wall		Pink	Good	Plaster	Exterior	Paint Chip Sample Taken of Similar Structure (<0.019%)
15	NC	B	Exterior	Wall	Pattern	Pink	Good	Plaster	Exterior	Paint Chip Sample Taken of Similar Structure (<0.010%)
16	NC	B	Exterior	Wall		White	Good	Wood	Exterior	Stables; Paint Chip Sample Taken of Similar Structure (0.26%)
17	NC	B	Exterior	Wall	Trim	White	Good	Wood	Exterior	Stables; Paint Chip Sample Taken of Similar Structure (0.45%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
18	NC	B	Exterior	Soffit		White	Good	Wood	Exterior	Stables; Paint Chip Sample Taken of Similar Structure (1.4%) LBP Identified
19	NC	B	Exterior	Soffit		White	Good	Plaster	Exterior	Paint Chip Sample Taken of Similar Structure (<0.011%)
20	NC	B	Exterior	Fascia		White	Good	Wood	Exterior	Paint Chip Sample Taken of Similar Structure (0.012%)
21	NC	B	Exterior	Fascia		White	Good	Metal	Exterior	Stables; Paint Chip Sample Taken of Similar Structure (1.7%) LBP Identified

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
22	NC	B	Exterior	Wall	Trim	Pink	Good	Plaster	Exterior	Paint Chip Sample Taken of Similar Structure (<0.010%)
23-L-53	NC	B	Exterior	Window	Sill	Pink	Good	Metal	Exterior	Paint Chip Sample Taken (<0.011%)
24-L-54	NC	B	Exterior	Garage Door	Slab	Pink	Good	Metal	Exterior	Paint Chip Sample Taken (<0.016%)
25	NC	C	Exterior	Wall		White	Good	Wood	Exterior	Stables; Paint Chip Sample Taken of Similar Structure (0.26%)
26	NC	C	Exterior	Wall	Trim	White	Good	Wood	Exterior	Stables; Paint Chip Sample Taken of Similar Structure (0.45%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
27	ND	C	Exterior	Wall		White	Good	Concrete	Exterior	Paint Chip Sample Taken of Similar Structure (<0.010%)
28	ND	C	Exterior	Wall		Pink	Good	Concrete	Exterior	Paint Chip Sample Taken of Similar Structure (<0.019%)
29	ND	C	Exterior	Soffit		White	Good	Wood	Exterior	Stables; Paint Chip Sample Taken of Similar Structure (1.4%) LBP Identified
30		C	Exterior	Soffit		White	Good	Plaster	Exterior	Paint Chip Sample Taken of Similar Structure (<0.011%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
31	NC	C	Exterior	Fascia		White	Good	Wood	Exterior	Paint Chip Sample Taken of Similar Structure (0.012%)
32	NC	C	Exterior	Fascia		White	Good	Metal	Exterior	Stables; Paint Chip Sample Taken of Similar Structure (1.7%) LBP Identified
33-L-55	NC	C	Exterior	Vent		White	Good	Metal	Exterior	Paint Chip Sample Taken (0.041%)
34-L-56	NC	C	Exterior	Pipe		White	Good	Metal	Exterior	Paint Chip Sample Taken (0.012%)
35-L-57	NC	C	Exterior	Door	Trim	Pink	Good	Metal	Exterior	Paint Chip Sample Taken (<0.029%)
36-L-58	NC	C	Exterior	Door	Slab	Pink	Good	Metal	Exterior	Paint Chip Sample Taken (<0.034%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
37	NC	D	Exterior	Wall		White	Good	Wood	Exterior	Stables; Paint Chip Sample Taken of Similar Structure (0.26%)
38	NC	D	Exterior	Wall	Trim	White	Good	Wood	Exterior	Stables; Paint Chip Sample Taken of Similar Structure (0.45%)
39	NC	D	Exterior	Wall		Pink	Good	Plaster	Exterior	Paint Chip Sample Taken of Similar Structure (<0.019%)
40	NC	D	Exterior	Wall	Pattern	Pink	Good	Plaster	Exterior	Paint Chip Sample Taken of Similar Structure (<0.010%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
41	NC	D	Exterior	Soffit		White	Good	Wood	Exterior	Stables; Paint Chip Sample Taken of Similar Structure (1.4%) LBP Identified
42	NC	D	Exterior	Soffit		White	Good	Plaster	Exterior	Paint Chip Sample Taken of Similar Structure (<0.011%)
43	NC	D	Exterior	Fascia		White	Good	Wood	Exterior	Paint Chip Sample Taken of Similar Structure (0.012%)
44	NC	D	Exterior	Fascia		White	Good	Metal	Exterior	Stables; Paint Chip Sample Taken of Similar Structure (1.7%) LBP Identified

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
45	NC	D	Exterior	Overhang		White	Good	Concrete	Exterior	Paint Chip Sample Taken of Similar Structure (<0.010%)
46-L-59	NC	D	Exterior	Sliding Door	Slab	Pink	Good	Metal	Exterior	Paint Chip Sample Taken (<0.010%)
47-L-60	NC	D	Exterior	Sliding Door	Rail	Pink	Good	Metal	Exterior	Paint Chip Sample Taken (0.027%)
48-L-61	NC	D	Exterior	Double Door	Trim	Pink	Good	Metal	Exterior	Paint Chip Sample Taken (0.057%)
49-L-62	NC	D	Exterior	Double Door	Slab	Pink	Good	Metal	Exterior	Paint Chip Sample Taken (0.021%)
50	NC	D	Exterior	Garage Door	Slab	Pink	Good	Metal	Exterior	Paint Chip Sample Taken of Similar Structure (<0.016%)

Sample #	Results (mg/cm^2)	Wall	Location	Structure	Component	Color	Condition	Substrate	Int/Ext	Comment or FAA Results (% lead)
51-L-63	NC	D	Exterior	Vent		Pink	Good	Metal	Exterior	Paint Chip Sample Taken (0.017%)
52	NC	D	Exterior	Louvre		Pink	Good	Plaster	Exterior	Paint Chip Sample Taken of Similar Structure (<0.010%)
53-L-64	NC	D	Exterior	Loading Dock		Yellow	Good	Metal	Exterior	Paint Chip Sample Taken (7.9%) LBP Identified
54-L-65	NC	D	Exterior	Loading Dock		Yellow	Good	Wood	Exterior	Paint Chip Sample Taken (7.8%) LBP Identified
55-L-66	NC	D	Exterior	Stairs		White	Good	Concrete	Exterior	Paint Chip Sample Taken (0.18%)
56-L-67	NC	D	Exterior	Stairs	Hand Rail	White	Good	Metal	Exterior	Paint Chip Sample Taken (0.23%)

Mg/cm^2- Milligram per square centimeter

NC- No Reading Collected

Lead Based Paint Identified

4 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this LBP inspection, the following were identified as LBP:

PAL Building Ceramic:

- The front office white ceramic wall "A" (Northeast wall)
- The front office ceramic window base on wall "A" (Northeast wall)
- The weight room white ceramic wall "A", ceramic wall "B", ceramic wall "C" and ceramic wall "D" (Northeast, Southeast, Northwest and Southwest walls)

PAL Building

- The red chiller room pipe on wall "C" (Southwest wall)
- The red chiller room conduit on wall "C" (Southwest wall)
- The yellow exterior loading dock on wall "D" (Northwest wall)

Stables

- The pink baseboard on wall "A" (Northeast wall)
- The pink conduit on wall "A" (Northeast wall)
- The pink beam on wall "C" (Southwest wall)
- The pink post on wall "C" (Southwest wall)
- The white ceiling near wall "C" (Southwest wall)
- The white exterior soffit on wall "A", wall "B", wall "C" and wall "D" (Northeast, Southeast, Northwest and Southwest walls)
- The white exterior fascia on wall "A", wall "B", wall "C" and wall "D" (Northeast, Southeast, Northwest and Southwest walls)
- The pink upper wall on wall "A" (Northeast wall)

OSHA Information for Contractors

Under the present OSHA lead construction standard, all identified lead-containing materials affected by construction activities falls under the requirements of 29 CFR 1926. There are no current government guidelines defining a lead-based paint (LBP) or lead concentration that creates a hazardous atmosphere when disturbed. Based on current Occupational Safety and Health Administration (OSHA) guidelines, for those employees who will be disturbing lead-containing paint, their employer must make an initial determination by monitoring employee exposure if any employee is exposed to lead at or above 30 micrograms per cubic meter for an eight hour time weighted average (30 $\mu g/m^3$ 8-hour time weighted average). The employer must implement OSHA prescribed protective measures until they can demonstrate that the employee exposure is not in excess of the action level.

Lead was detected in the various coated surfaces surveyed. Depending on the degree and type of disturbance of these surfaces (i.e. sanding, cutting, or demolishing), employers may be required to implement varying degrees of OSHA prescribed protective measures. These protective measures must be maintained until it can be demonstrated that employee exposures do not exceed the action level. The employer should also implement and maintain a written compliance

program detailing the protective measures they will utilize to control lead exposure during renovation activities.

Disposal Considerations

Lead containing materials may be subject to disposal restrictions. Prior to disposal, the contractor should characterize all wastes so that they are properly disposed in accordance with all local, state and federal regulations.

5 LIMITATIONS

Due to the inaccessibility of some building elements, it is conceivable that all potential LBP may not have been located and identified. The investigations and methodology reflect our best efforts based upon the prevailing standard of care in the environmental industry.

APPENDIX I

PERSONNEL CERTIFICATIONS

CWD International, Inc. dba

Environmental Training Fund

40166.4627CERT/PBIRE

900 N.W. 5TH Avenue, Fort Lauderdale, Florida 33311 (954) 524-7208

Processed By:

Seagull

To Authenticate Certificate:
www.seagulltraining.com
1-800-966-9933

This is to Certify that

Nicholas Nalepa

XXX-XX-7608

33325

has successfully completed an English

Lead 24 Hr. Paint Inspector Course

16-Dec-13 TO 18-Dec-13

Initial courses include an extensive hands-on component.

Complies with Sec. 402 TSCA 15 USC 2682 and Accredited by the IL-DPH, CT-DPH, MO-DOH, PA-DLI, TX-

UNDER CIVIL AND CRIMINAL PENALTIES OF LAW FOR MAKING OR SUBMISSION OF FALSE OR FRAUDULENT STATEMENTS OR REPRESENTATIONS (18 U.S.C. 1001 AND 15 U.S.C. 2615), I CERTIFY THAT THIS TRAINING COMPLIES WITH ALL APPLICABLE REQUIREMENTS OF TITLE IV OF THE "TOXIC SUBSTANCES CONTROL ACT", 40 CFR PART 745 OR 763, AND ANY OTHER APPLICABLE FEDERAL, STATE OR LOCAL REQUIREMENTS, AS AMENDED.

Trainer(s): Mark Knick

Training Address: 900 NW 5 AV, Fort Lauderdale, FL, 33311

Passed the hands-on assessment & completed the course exam on: 12/18/13

James F. Stump, Training Manager

This Certificate Expires:

OSHA DATE: 18-Dec-14

SUNSET DATE: 17-Dec-16

12/17/16

17-Dec-16

Certificate Number..... 159021

Course Number SE1351

USEPA's actual expiration date will appear on individual's license. See individual state rules for actual state expiration date.

© GOES 442

APPENDIX II

LABORATORY RESULTS AND CHAIN OF CUSTODY RECORD

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 786-5974
http://www.EMSL.com cinnaminsonleadlab@emsl.com

EMSL Order:	201403538
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Traci-Anne Boyle**
AirQuest Environmental, Inc.
5150 SW 48th Way, Ste. 610
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/14/14 11:04 AM
Collected:	3/12/2014

Project: **7856**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
7929-L01	*0001*	3/12/2014	3/18/2014	<0.068 % wt
Site: Kitchen Office 1 Wal Trim-Black-Wood-Wall A				
7929-L02	*0002*	3/12/2014	3/18/2014	0.096 % wt
Site: Corridor Wall-Tan-Concrete-Wall B				
7929-L03	*0003*	3/12/2014	3/18/2014	0.021 % wt
Site: Corridor Ceiling-White-Plaster-Wall A				
7929-L04	*0004*	3/12/2014	3/18/2014	0.12 % wt
Site: Mens Restrooms Door Trim-Beige-Metal-Wall A				
7929-L05	*0005*	3/12/2014	3/18/2014	0.087 % wt
Site: Mens Restrooms Door Slab-Beige-Metal-Wall A				
7929-L06	*0006*	3/12/2014	3/18/2014	0.11 % wt
Site: Mens Restrooms Door Jamb-Beige-Metal-Wall A				
7929-L07	*0007*	3/12/2014	3/18/2014	0.040 % wt
Site: Mens Restrooms Pole-White-Metal-Wall D				
7929-L08	*0008*	3/12/2014	3/18/2014	0.043 % wt
Site: Mens Restrooms Vent Trim-White-Wood-Wall D				
7929-L09	*0009*	3/12/2014	3/18/2014	<0.012 % wt
Site: Boiler Room Wall-White-Concrete-Wall C				
7929-L10	*0010*	3/12/2014	3/18/2014	<0.010 % wt
Site: Boiler Room Louvres-Pink-Plaster-Wall A				
7929-L11	*0011*	3/12/2014	3/18/2014	0.22 % wt
Site: Boiler Room Pipe-Yellow-Metal-Wall B				
7929-L12	*0012*	3/12/2014	3/18/2014	0.16 % wt
Site: Boiler Room Double Door Trim-Gray-Metal-Wall D				
7929-L13	*0013*	3/12/2014	3/18/2014	0.035 % wt
Site: Boiler Room Double Door Slab-Gray-Metal-Wall D				
7929-L14	*0014*	3/12/2014	3/18/2014	0.36 % wt
Site: Boiler Room Double Door Jamb-Gray-Metal-Wall D				
7929-L15	*0015*	3/12/2014	3/18/2014	0.026 % wt
Site: Boiler Room Boiler-Gray-Mertal-Wall A				

Julie Smith - Laboratory Director
NJ-NELAP Accredited:03036
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. * slight modifications to methods applied. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements established by the AIHA-LAP, unless specifically indicated otherwise

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NELAP Certifications: NJ 03036, NY 10872, PA 68-00367, AIHA-LAP, LLC ELLAP 100194, A2LA 2845.01

Initial report from 03/19/2014 17:38:08

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 786-5974
http://www.EMSL.com cinnaminsonleadlab@emsl.com

EMSL Order: 201403538
CustomerID: AQE63
CustomerPO:
ProjectID:

Attn: **Traci-Anne Boyle**
AirQuest Environmental, Inc.
5150 SW 48th Way, Ste. 610
Fort Lauderdale, FL 33314

Phone: (954) 792-4549
Fax: (954) 792-2221
Received: 03/14/14 11:04 AM
Collected: 3/12/2014

Project: **7856**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
7929-L16	*0016*	3/12/2014	3/18/2014	<0.010 % wt
Site: Boiler Room Boiler-Blue-Metal-Wall C				
7929-L17	*0017*	3/12/2014	3/18/2014	<0.013 % wt
Site: Boiler Room 2 Wall-Gray-Concrete-Wall A				
7929-L18	*0018*	3/12/2014	3/18/2014	7.8 % wt
Site: Boiler Room 2 Pipe-Red-Metal-Wall C				
7929-L19	*0019*	3/12/2014	3/18/2014	0.50 % wt
Site: Boiler Room 2 Conduit-Gray-Metral-Wall C				
7929-L20	*0020*	3/12/2014	3/19/2014	0.074 % wt
Site: Loading Dock Storage Wall-Beige-Concrete-Wall A				
7929-L21	*0021*	3/12/2014	3/19/2014	0.23 % wt
Site: Loading Dock Storage Door Trim-Beige-Metal-Wall A				
7929-L22	*0022*	3/12/2014	3/19/2014	0.11 % wt
Site: Loading Dock Storage Door Slab-Beige-Metal-Wall A				
7929-L23	*0023*	3/12/2014	3/19/2014	0.20 % wt
Site: Loading Dock Storage Door Jamb-Beige-Metal-Wall A				
7929-L24	*0024*	3/12/2014	3/19/2014	0.010 % wt
Site: Loading Dock Storage Door Slab-Beige-Wood-Wall A				
7929-L25	*0025*	3/12/2014	3/19/2014	<0.019 % wt
Site: Loading Dock Storage Door Trim-Beige-Wood-Wall A				
7929-L26	*0026*	3/12/2014	3/19/2014	<0.010 % wt
Site: Loading Dock Storage Duct-Beige-Metal-Wall A				
7929-L27	*0027*	3/12/2014	3/19/2014	0.12 % wt
Site: Stables Wall-Gray-Concrete-Wall A				
7929-L28	*0028*	3/12/2014	3/19/2014	0.051 % wt
Site: Stables Wall-White-Concrete-Wall A				
7929-L29	*0029*	3/12/2014	3/19/2014	0.034 % wt
Site: Stables Wall-Pink-Concrete-Wall A				
7929-L30	*0030*	3/12/2014	3/19/2014	<0.013 % wt
Site: Stables Door Trim-Pink-Wood-Wall A				

Julie Smith - Laboratory Director
NJ-NELAP Accredited:03036
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. * slight modifications to methods applied. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements established by the AIHA-LAP, unless specifically indicated otherwise

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NELAP Certifications: NJ 03036, NY 10872, PA 68-00367, AIHA-LAP, LLC ELLAP 100194, A2LA 2845.01

Initial report from 03/19/2014 17:38:08

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 786-5974
http://www.EMSL.com cinnaminsonleadlab@emsl.com

EMSL Order:	201403538
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Traci-Anne Boyle**
AirQuest Environmental, Inc.
5150 SW 48th Way, Ste. 610
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/14/14 11:04 AM
Collected:	3/12/2014

Project: **7856**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
7929-L31	*0031*	3/12/2014	3/19/2014	<0.018 % wt
Site: Stables Door Slab-White-Wood-Wall A				
7929-L32	*0032*	3/12/2014	3/19/2014	<0.010 % wt
Site: Stables Door Jamb-White-Wood-Wall A				
7929-L33	*0033*	3/12/2014	3/19/2014	0.82 % wt
Site: Stables Baseboard-Pink-Vinyl-Wall A				
7929-L34	*0034*	3/12/2014	3/19/2014	0.81 % wt
Site: Stables Conduit-Pink-Metal-Wall A				
7929-L35	*0035*	3/12/2014	3/19/2014	3.4 % wt
Site: Stables Beam-Pink-Wood-Wall C				
7929-L36	*0036*	3/12/2014	3/19/2014	0.88 % wt
Site: Stables Post-Pink-Metal-Wall C				
7929-L37	*0037*	3/12/2014	3/19/2014	8.4 % wt
Site: Stables Ceiling-White-Wood-Wall C				
7929-L38	*0038*	3/12/2014	3/19/2014	0.040 % wt
Site: Stables Window Trim-Pink-Wood-Wall C				
7929-L39	*0039*	3/12/2014	3/19/2014	<0.020 % wt
Site: Stables Window Sill-Pink-Wood-Wall C				
7929-L40	*0040*	3/12/2014	3/19/2014	<0.019 % wt
Site: Stables Crown Molding-Pink-Wood-Wall D				
7929-L41	*0041*	3/12/2014	3/19/2014	0.26 % wt
Site: Exterior Wall-White-Wood-Wall A				
7929-L42	*0042*	3/12/2014	3/19/2014	0.45 % wt
Site: Exterior Wall- Trim-White-Wood-Wall A				
7929-L43	*0043*	3/12/2014	3/19/2014	1.4 % wt
Site: Exterior Soffit-White-Wood-Wall A				
7929-L44	*0044*	3/12/2014	3/19/2014	1.7 % wt
Site: Exterior Fascia-White-Metal-Wall A				
7929-L45	*0045*	3/12/2014	3/19/2014	<0.019 % wt
Site: Exterior Wall-Pink-Plaster-Wall A				

Julie Smith - Laboratory Director
NJ-NELAP Accredited:03036
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. * slight modifications to methods applied. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements established by the AIHA-LAP, unless specifically indicated otherwise

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NELAP Certifications: NJ 03036, NY 10872, PA 68-00367, AIHA-LAP, LLC ELLAP 100194, A2LA 2845.01

Initial report from 03/19/2014 17:38:08

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 786-5974
http://www.EMSL.com cinnaminsonleadlab@emsl.com

EMSL Order:	201403538
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Traci-Anne Boyle**
AirQuest Environmental, Inc.
5150 SW 48th Way, Ste. 610
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/14/14 11:04 AM
Collected:	3/12/2014

Project: **7856**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
7929-L46	*0046*	3/12/2014	3/19/2014	<0.010 % wt
Site: Exterior Wall Trim-White-Plaster-Wall A				
7929-L47	*0047*	3/12/2014	3/19/2014	1.7 % wt
Site: Exterior Wall Upper-Pink-Plaster-Wall A				
7929-L49	*0048*	3/12/2014	3/19/2014	<0.011 % wt
Site: Exterior Soffit-White-Plaster-Wall A				
7929-L50	*0049*	3/12/2014	3/19/2014	0.012 % wt
Site: Exterior Fascia-White-Wood-Wall A				
7929-L51	*0050*	3/12/2014	3/19/2014	<0.028 % wt
Site: Exterior Fascia-White-Metal-Wall A				
7929-L52	*0051*	3/12/2014	3/19/2014	<0.010 % wt
Site: Exterior Wall Pattern-Pink-Plster-Wall A				
7929-L53	*0052*	3/12/2014	3/19/2014	<0.011 % wt
Site: Exterior Window Sill;-Pink-Metal-Wall B				
7929-L54	*0053*	3/12/2014	3/19/2014	<0.016 % wt
Site: Exterior Garage Door Slab-Pink-Metal-Wall B				
7929-L55	*0054*	3/12/2014	3/19/2014	0.041 % wt
Site: Exterior Vent-White-Metal-Wall C				
7929-L56	*0055*	3/12/2014	3/19/2014	0.012 % wt
Site: Exterior Pipe-White-Metal-Wall C				
7929-L57	*0056*	3/12/2014	3/19/2014	<0.029 % wt
Site: Exterior Door Trim-Pink-Metal-Wall C				
7929-L58	*0057*	3/12/2014	3/19/2014	<0.034 % wt
Site: Exterior Door Slab-Pink-Metal-Wall C				
7929-L59	*0058*	3/12/2014	3/17/2014	<0.010 % wt
Site: Exterior Sliding Door Slab-Pink-Metal-Wall D				
7929-L60	*0059*	3/12/2014	3/17/2014	0.027 % wt
Site: Exterior Sliding Door Rail-Pink-Metal-Wall D				
7929-L61	*0060*	3/12/2014	3/17/2014	0.057 % wt
Site: Exterior Double Door Trim-Pink-Metal-Wall D				

Julie Smith - Laboratory Director
NJ-NELAP Accredited:03036
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. * slight modifications to methods applied. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements established by the AIHA-LAP, unless specifically indicated otherwise

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NELAP Certifications: NJ 03036, NY 10872, PA 68-00367, AIHA-LAP, LLC ELLAP 100194, A2LA 2845.01

Initial report from 03/19/2014 17:38:08

EMSL Analytical, Inc.
200 Route 130 North, Cinnaminson, NJ 08077
Phone/Fax: (856) 303-2500 / (856) 786-5974
http://www.EMSL.com cinnaminsonleadlab@emsl.com

EMSL Order:	201403538
CustomerID:	AQE63
CustomerPO:	
ProjectID:	

Attn: **Traci-Anne Boyle**
AirQuest Environmental, Inc.
5150 SW 48th Way, Ste. 610
Fort Lauderdale, FL 33314

Phone:	(954) 792-4549
Fax:	(954) 792-2221
Received:	03/14/14 11:04 AM
Collected:	3/12/2014

Project: **7856**

Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)*

Client Sample Description	*Lab ID*	*Collected*	*Analyzed*	*Lead Concentration*
7929-L62	*0061*	3/12/2014	3/17/2014	0.021 % wt
Site: Exterior Double Door Slab-Pink-Metal-Wall D				
7929-L63	*0062*	3/12/2014	3/17/2014	0.017 % wt
Site: Exterior Vent-Pink-Metal-Wall D				
7929-L64	*0063*	3/12/2014	3/17/2014	7.9 % wt
Site: Exterior Loading Dock-Yellow-Metal-Wall D				
7929-L65	*0064*	3/12/2014	3/17/2014	7.8 % wt
Site: Exterior Loading Dock-Yellow-Wood-Wall D				
7929-L66	*0065*	3/12/2014	3/17/2014	0.18 % wt
Site: Exterior Stairs-White-Concrete-Wall D				
7929-L67	*0066*	3/12/2014	3/17/2014	0.23 % wt
Site: Exterior Stairs Rail-White-Metal-Wall D				

Julie Smith - Laboratory Director
NJ-NELAP Accredited:03036
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. * slight modifications to methods applied. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements established by the AIHA-LAP, unless specifically indicated otherwise

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NELAP Certifications: NJ 03036, NY 10872, PA 68-00367, AIHA-LAP, LLC ELLAP 100194, A2LA 2845.01

Initial report from 03/19/2014 17:38:08

OrderID: 171401382

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Lead (Pb) Chain of Custody

EMSL Order ID *(Lab Use Only):* 201403538

EMSL ANALYTICAL, INC.
3 COOPER STREET
WESTMONT, NJ 08108
PHONE: (856) 858-4800
FAX: (856) 858-3899

Company : AirQuest Inc.		**EMSL-Bill to:** ☒ Same ☐ Different If Bill to is Different note instructions in Comments** *Third Party Billing requires written authorization from third party*	
Street: 6851 SW 45th St.			
City: Ft. Lauderdale	**State/Province: FL**	**Zip/Postal Code: 33314**	**Country: United States**
Report To (Name): Traci-Anne Boyle		**Fax #:**	
Telephone #: (954) 792-4549		**Email Address: Labresults@airquestinc.com**	
Project Name/Number: 7856			
Please Provide Results: ☐ Fax ☒ Email	**Purchase Order:**	**U.S. State Samples Taken: Florida**	

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hours ☐ 6 Hours ☒ 24 Hours ☐ 48 Hours ☐ 3 Days ☐ 4 Days ☐ 5 Days ☐ 10 Days

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Price Guide*

Matrix	Method	Instrument	Reporting Limit	Check
Chips ☐ mg/cm² ☒ % by wt.	SW846-7000B/7420 or AOAC 974.02	Flame Atomic Absorption	0.01%	☒
Air	NIOSH 7082	Flame Atomic Absorption	4 µg/filter	☐
	NIOSH 7105	Graphite Furnace AA	0.03 µg/filter	☐
	NIOSH 7300 modified	ICP-AES	0.5 µg/filter	☐
Wipe* ☐ ASTM ☐ non ASTM *if no box is checked, non-ASTM Wipe is assumed	SW846-7000B/7420	Flame Atomic Absorption	10 µg/wipe	☐
	SW846-6010B or C	ICP-AES	0.5 µg/wipe	☐
TCLP	SW846-1311/7420/SM 3111B	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	SW846-6010B or C	ICP-AES	0.1 mg/L (ppm)	☐
Soil	SW846-7420	Flame Atomic Absorption	40 mg/kg (ppm)	☐
	SW846-7421	Graphite Furnace AA	0.3 mg/kg (ppm)	☐
	SW86-6010B or C	ICP-AES	1 mg/kg (ppm)	☐
Wastewater	SM3111B or SW846-7000B/7420	Flame Atomic Absorption	0.4 mg/L (ppm)	☐
	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐
	SW846-6010B or C	ICP-AES	1 mg/kg (ppm)	☐
Drinking Water	EPA 200.9	Graphite Furnace AA	0.003 mg/L (ppm)	☐

Other: | **Preservation Method (Water):**

Name of Sampler: Nicholas Nalepa | **Signature of Sampler:**

Sample #	Location	Volume/Area	Date/Time Sampled
7929-L01	Kitchen Office 1 Wall Trim - Black - Wood - Wall A		3/12/2014 - 14:00
7929-L02	Corridor Wall - Tan - Concrete - Wall B		3/12/2014 - 14:00
7929-L03	Corridor Ceiling - White - Plaster - Wall A		3/12/2014 - 14:00
7929-L04	Mens Restrooms Door Trim - Beige - Metal - Wall A		3/12/2014 - 14:00
7929-L05	Mens Restrooms Door Slab - Beige - Metal - Wall A		3/12/2014 - 14:00
7929-L06	Mens Restrooms Door Jamb - Beige - Metal - Wall A		3/12/2014 - 14:00

Client Sample #'s 7929-L01 - 7929-L67 | **Total # of Samples:** 67

Relinquished (Client):	Nicholas Nalepa	**Date:**	3/13/2014	**Time:**	17:30
Received (Lab):	[illegible]	**Date:**	3/14/14	**Time:**	1009

Comments:

* 3/14/14 Called client. RE: single bag # 7929-48 is empty, s/w Traci-Anne Boyle - skip #48; proceed w/ analysis. 11:04 Am

3/14/14 Returned call of Nick -- told him about the bag that was empty also; TAT will be changed to 48hr. -- ok w/ him, he will inform Traci. 1220pm

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

LEAD (Pb) CHAIN OF CUSTODY

EMSL ORDER ID *(Lab Use Only):* 201403538

EMSL ANALYTICAL, INC.
3 COOPER STREET
WESTMONT, NJ 08108
PHONE: (856) 858-4800
FAX: (856) 858-3899

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

	Sample #	Location	Volume/Area	Date/Time Sampled
-7	7929-L07	Mens Restrooms Pole - White - Metal - Wall D		3/12/2014 - 14:00
-8	7929-L08	Mens Restrooms Vent Trim - White - Wood - Wall D		3/12/2014 - 14:00
-9	7929-L09	Boiler Room Wall - White - Concrete - Wall C		3/12/2014 - 14:00
-10	7929-L10	Boiler Room Louvres - Pink - Plaster - Wall A		3/12/2014 - 14:00
-11	7929-L11	Boiler Room Pipe - Yellow - Metal - Wall B		3/12/2014 - 14:00
-12	7929-L12	Boiler Room Double Door Trim - Gray - Metal - Wall D		3/12/2014 - 14:00
-13	7929-L13	Boiler Room Double Door Slab - Gray - Metal - Wall D		3/12/2014 - 14:00
-14	7929-L14	Boiler Room Double Door Jamb - Gray - Metal - Wall D		3/12/2014 - 14:00
-15	7929-L15	Boiler Room Boiler - Gray - Metal - Wall A		3/12/2014 - 14:00
-16	7929-L16	Boiler Room Boiler - Blue - Metal - Wall C		3/12/2014 - 14:00
-17	7929-L17	Boiler Room 2 Wall - Gray - Concrete - Wall A		3/12/2014 - 14:00
-18	7929-L18	Boiler Room 2 Pipe - Red - Metal - Wall C		3/12/2014 - 14:00
-19	7929-L19	Boiler Room 2 Conduit - Gray - Metal - Wall C		3/12/2014 - 14:00
-20	7929-L20	Loading Dock Storage Wall - Beige - Concrete - Wall A		3/12/2014 - 14:00
-21	7929-L21	Loading Dock Storage Door Trim - Beige - Metal - Wall A		3/12/2014 - 14:00
-22	7929-L22	Loading Dock Storage Door Slab - Beige - Metal - Wall A		3/12/2014 - 14:00
-23	7929-L23	Loading Dock Storage Door Jamb - Beige - Metal - Wall A		3/12/2014 - 14:00
-24	7929-L24	Loading Dock Storage Door Slab - Beige - Wood - Wall A		3/12/2014 - 14:00

Comments/Special Instructions:

RECEIVED
EMSL
CLARKSON, NJ
MAR 17 A 10:09

Page 2 of 5 pages

EMSL ANALYTICAL, INC.
LABORATORY•PRODUCTS•TRAINING

LEAD (Pb) CHAIN OF CUSTODY

EMSL ORDER ID *(Lab Use Only):* 201403538

EMSL ANALYTICAL, INC.
3 COOPER STREET
WESTMONT, NJ 08108
PHONE: (856) 858-4800
FAX: (856) 858-3899

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

	Sample #	Location	Volume/Area	Date/Time Sampled
-25	7929-L25	Loading Dock Storage Door Trim - Beige - Wood - Wall A		3/12/2014 - 14:00
-26	7929-L26	Loading Dock Storage Duct - Beige - Metal - Wall A		3/12/2014 - 14:00
-27	7929-L27	Stables Wall - Gray - Concrete - Wall A		3/12/2014 - 14:00
-28	7929-L28	Stables Wall - White - Concrete - Wall A		3/12/2014 - 14:00
-29	7929-L29	Stables Wall - Pink - Concrete - Wall A		3/12/2014 - 14:00
-30	7929-L30	Stables Door Trim - Pink - Wood - Wall A		3/12/2014 - 14:00
-31	7929-L31	Stables Door Slab - White - Wood - Wall A		3/12/2014 - 14:00
-32	7929-L32	Stables Door Jamb - White - Wood - Wall A		3/12/2014 - 14:00
-33	7929-L33	Stables Baseboard - Pink - Vinyl - Wall A		3/12/2014 - 14:00
-34	7929-L34	Stables Conduit - Pink - Metal - Wall A		3/12/2014 - 14:00
-35	7929-L35	Stables Beam - Pink - Wood - Wall C		3/12/2014 - 14:00
-36	7929-L36	Stables Post - Pink - Metal - Wall C		3/12/2014 - 14:00
-37	7929-L37	Stables Cealing - White - Wood - Wall C		3/12/2014 - 14:00
-38	7929-L38	Stables Window Trim - Pink - Wood - Wall C		3/12/2014 - 14:00
-39	7929-L39	Stables Window Sill - Pink - Wood - Wall C		3/12/2014 - 14:00
-40	7929-L40	Stables Crown Molding - Pink - Wood - Wall D		3/12/2014 - 14:00
-41	7929-L41	Exterior Wall - White - Wood - Wall A		3/12/2014 - 14:00
-42	7929-L42	Exterior Wall Trim - White - Wood - Wall A		3/12/2014 - 14:00

Comments/Special Instructions:

Page 3 of 5 pages

EMSL ANALYTICAL, INC.
LABORATORY•PRODUCTS•TRAINING

LEAD (Pb) CHAIN OF CUSTODY

EMSL ORDER ID *(Lab Use Only):*

20140353 8

EMSL ANALYTICAL, INC.
3 COOPER STREET
WESTMONT, NJ 08108
PHONE: (856) 858-4800
FAX: (856) 858-3899

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

	Sample #	Location	Volume/Area	Date/Time Sampled
-43	7929-L43	Exterior Soffit - White - Wood - Wall A		3/12/2014 - 14:00
-44	7929-L44	Exterior Fascia - White - Metal - Wall A		3/12/2014 - 14:00
-45	7929-L45	Exterior Wall - Pink - Plaster - Wall A		3/12/2014 - 14:00
-46	7929-L46	Exterior Wall Trim - White - Plaster - Wall A		3/12/2014 - 14:00
-47	7929-L47	Exterior Wall Upper - Pink - Plaster - Wall A		3/12/2014 - 14:00
*	7929-L48	Exterior Door Trim - Pink - Metal - Wall A		3/12/2014 - 14:00
-48	7929-L49	Exterior Soffit - White - Plaster - Wall A		3/12/2014 - 14:00
-49	7929-L50	Exterior Fascia - White - Wood - Wall A		3/12/2014 - 14:00
-50	7929-L51	Exterior Fascia - White - Metal - Wall A		3/12/2014 - 14:00
-51	7929-L52	Exterior Wall Pattern - Pink - Plaster - Wall A		3/12/2014 - 14:00
-52	7929-L53	Exterior Window Sill - Pink - Metal - Wall B		3/12/2014 - 14:00
-53	7929-L54	Exterior Garage Door Slab - Pink - Metal - Wall B		3/12/2014 - 14:00
-54	7929-L55	Exterior Vent - White - Metal - Wall C		3/12/2014 - 14:00
-55	7929-L56	Exterior Pipe - White - Metal - Wall C		3/12/2014 - 14:00
-56	7929-L57	Exterior Door Trim - Pink - Metal - Wall C		3/12/2014 - 14:00
-57	7929-L58	Exterior Door Slab - Pink - Metal - Wall C		3/12/2014 - 14:00
-58	7929-L59	Exterior Sliding Door Slab - Pink - Metal - Wall D		3/12/2014 - 14:00
-59	7929-L60	Exterior Sliding Door Rail - Pink - Metal - Wall D		3/12/2014 - 14:00

Comments/Special Instructions:

RECEIVED
MAR 17 2014
10:09

* Rec'd empty bag - (no sample) 1-3/14

Page 4 of 5 pages

OrderID: 171401382

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

LEAD (Pb) CHAIN OF CUSTODY

EMSL ORDER ID *(Lab Use Only):* 201403538

EMSL ANALYTICAL, INC.
3 COOPER STREET
WESTMONT, NJ 08108
PHONE: (856) 858-4800
FAX: (856) 858-3899

Additional Pages of the Chain of Custody are only necessary if needed for additional sample information

	Sample #	Location	Volume/Area	Date/Time Sampled
-60	7929-L61	Exterior Double Door Trim - Pink - Metal - Wall D		3/12/2014 - 14:00
-61	7929-L62	Exterior Double Door Slab - Pink - Metal - Wall D		3/12/2014 - 14:00
-62	7929-L63	Exterior Vent - Pink - Metal - Wall D		3/12/2014 - 14:00
-63	7929-L64	Exterior Loading Dock - Yellow - Metal - Wall D		3/12/2014 - 14:00
-64	7929-L65	Exterior Loading Dock - Yellow - Wood - Wall D		3/12/2014 - 14:00
-65	7929-L66	Exterior Stairs - White - Concrete - Wall D		3/12/2014 - 14:00
-66	7929-L67	Exterior Stairs Rail - White - Metal - Wall D		3/12/2014 - 14:00

Comments/Special Instructions:

RECEIVED
CINNAMINSON, NJ
2014 MAR 14 A 10: 09

Page 5 of 5 pages

APPENDIX III

PHOTOGRAPHS

City of Key West PAL Building and Stable
1287 Truman Waterfront, Key West, FL – Photo Log of LBP Materials
3/11/2014 & 3/12/2014

Chiller Room Pipe, Red

Chiller Room Conduit, Gray

Stables Beam, Pink
Stables Ceiling, White

Stables Post, Pink

Exterior Stables Soffit, White
Exterior Stables Fascia, White

Exterior Upper Wall, Pink

City of Key West PAL Building and Stable
1287 Truman Waterfront, Key West, FL – Photo Log of LBP Materials
3/11/2014 & 3/12/2014

 Exterior Loading Docks, Yellow	**Front Office Ceramic Window Base** **Weight Room Ceramic Walls** **Stables Vinyl Baseboard, Pink** **Stables Conduit, Pink** **(Photos Not Available)**

FRUIT TREE GROVE DRAWINGS

TRUMAN WATERFRONT PARK
FRUIT TREE GROVE

PREPARED FOR:

CITY OF KEY WEST, FLORIDA

KEY WEST, FLORIDA 33041

ISSUED FOR:

DRAFT 100% Construction Drawings
October 09, 2017
Final Construction Drawings
November 21, 2017
Revised by City of Key West Engineering Services
August 29, 2018

DRAWING INDEX

~~SP-00~~	~~SITE PLAN~~
	PLANTING &
LF-01	HARDSCAPE LAYOUT PLAN
~~LF-02~~	~~HARDSCAPE PAVING & FURNITURE PLAN~~
LF-03	HARDSCAPE PAVING & FURNITURE SCHEDULES
LF-04	HARDSCAPE PAVING DETAILS
LF-05	HARDSCAPE FURNITURE DETAILS
~~LL-01~~	~~LANDSCAPE PLAN~~
LL-02	PLANT INSTALLATION DETAILS
LL-03	TREE PROTECTION DETAILS AND NOTES
LL-04	PLANT MATERIAL LIST, LANDSCAPE NOTES AND SOIL BACKFILL SPECIFICATIONS
IR-01	IRRIGATION PLAN
IR-02	IRRIGATION DETAILS

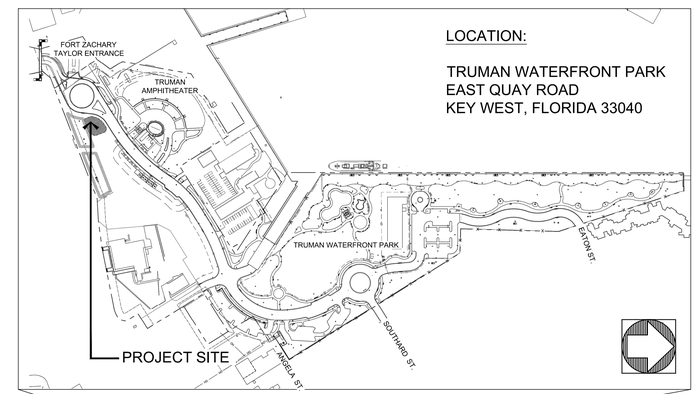
DESIGN PROFESSIONALS

LANDSCAPE ARCHITECT
BERMELLO AJAMIL & PARTNERS, INC.
Architecture, Engineering, Planning, Interior Design, Landscape Architecture
2601 South Bayshore Drive, 10th Floor
Miami, Florida 33133
(305) 859-2050
(305) 860-3700 (Fax)
Contact: Kirk Olney
kolney@bermelloajamil.com

IRRIGATION
DIXIE LANDSCAPE
12950 Northwest 113 Ct.
Miami, Fl. 33178
(305) 884-5700 ext. 115
(305) 884-8843 (Fax)
Contact: Diego Vanderbiest
diego@dixielandscape.com

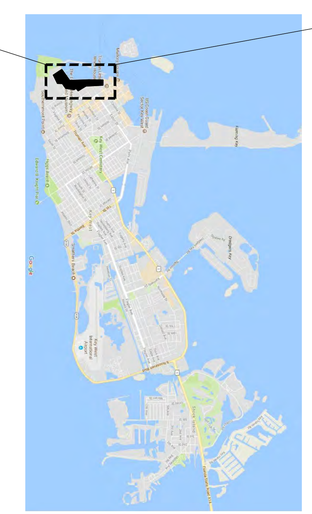
FRUIT TREE EXPERT
GRIMAL GROVE
258 Cunningham Ln.
Big Pine Key, Florida 33043
(305) 923-6663
Contact: Patrick B. Garvey
patrickbgarvey@gmail.com

LOCATION MAP

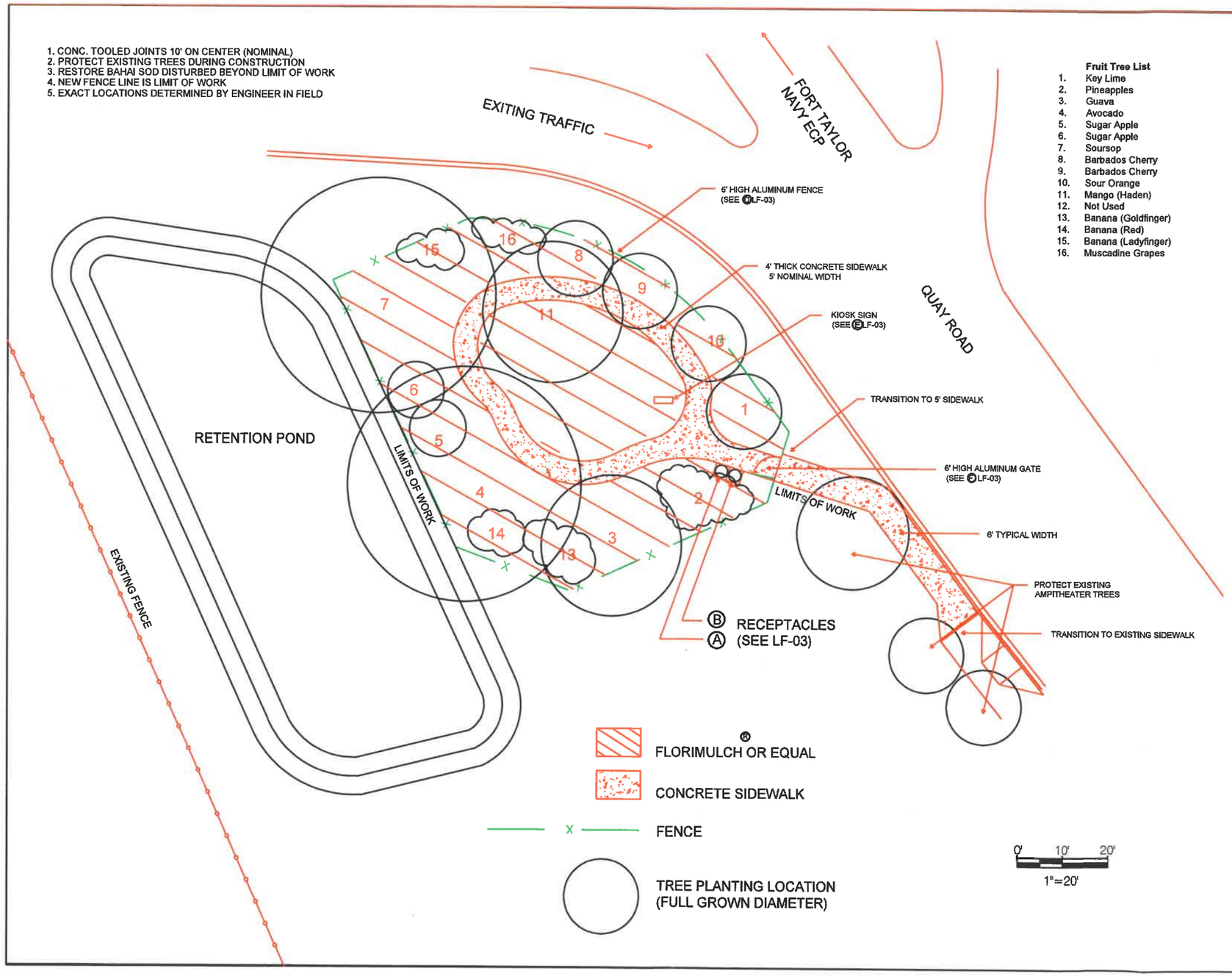


LOCATION:

TRUMAN WATERFRONT PARK
EAST QUAY ROAD
KEY WEST, FLORIDA 33040



1. CONC. TOOLED JOINTS 10' ON CENTER (NOMINAL)
2. PROTECT EXISTING TREES DURING CONSTRUCTION
3. RESTORE BAHAI SOD DISTURBED BEYOND LIMIT OF WORK
4. NEW FENCE LINE IS LIMIT OF WORK
5. EXACT LOCATIONS DETERMINED BY ENGINEER IN FIELD



Fruit Tree List

1. Key Lime
2. Pineapples
3. Guava
4. Avocado
5. Sugar Apple
6. Sugar Apple
7. Soursop
8. Barbados Cherry
9. Barbados Cherry
10. Sour Orange
11. Mango (Haden)
12. Not Used
13. Banana (Goldfinger)
14. Banana (Red)
15. Banana (Ladyfinger)
16. Muscadine Grapes

PLANTING AND HARDSCAPING PLAN

WATER FRONT PARK
FRUIT TREE GROVE

DATE 8/28/18
SHEET LF-01
MODIFIED BY EPA
SCALE 1" = 20'

City of Key West
Engineering Services
1300 White Street Key West, FL. 33040

NUMBER	DESCRIPTION	SPECIFICATION	REFERENCE SHEET FOR DETAILS	NOTES	CONTACT
1	4" CONCRETE	3,000 PSI	SEE DETAIL 1 ON SHEET LF-04		
2	CONCRETE EXPANSION JOINT		SEE DETAIL 3 ON SHEET LF-04		
3	CONCRETE TOOLED CONTROL JOINT		SEE DETAIL 4 ON SHEET LF-04		
4	Not Used COMPACTED GRAVEL	50/50 MIX OF WASH #57 STONE AND MIX GRADATION CRUSHED GRANITE; PARTICLE SIZE ON TOP 2 INCHES SHALL NOT EXCEED 1/8" DIAMETER AND SHALL BE ADA COMPLIANT	SEE DETAIL 5 ON SHEET LF-04		

1 HARDSCAPE PAVING AND FINISHES SHEDULE

LF-03 SCALE: N/A

LETTER	TYPE	SPECIFICATIONS	NOTES	REFERENCE SHEET FOR DETAILS	COLOR / FINISH	CONTACT
A	TRASH RECEPTACLE	LANDSCAPE FORMS, POE TRASH RECEPTACLE CAST ALUMINUM	SURFACE MOUNT. INSTALLATION PER MFG. SPECIFICATIONS AND FLORIDA BUILDING CODE.	FOR LAYOUT SEE DETAIL 9 ON LF-05	MERCURY	LANDSCAPE FORMS 1-800-430-6206 LUIS SALAZAR - EXT 1314 LUISS@LANDSCAPEFORMS.COM WWW.LANDSCAPEFORMS.COM
B	RECYCLE RECEPTACLE	LANDSCAPE FORMS, POE RECYCLING RECEPTACLE CAST ALUMINUM. SIDE OPENING.	SURFACE MOUNT. INSTALLATION PER MFG. SPECIFICATIONS AND FLORIDA BUILDING CODE.	FOR LAYOUT SEE DETAIL 7 ON LF-05	MERCURY	LANDSCAPE FORMS 1-800-430-6206 LUIS SALAZAR - EXT 1314 LUISS@LANDSCAPEFORMS.COM WWW.LANDSCAPEFORMS.COM
C	Not Used BENCH	LANDSCAPE FORMS, REST BENCH BACKED WITH ARMS AND SEAT DIVIDERS, CAST ALUMINUM	SURFACE MOUNT. INSTALLATION PER MFG. SPECIFICATIONS AND FLORIDA BUILDING CODE.	FOR LAYOUT SEE DETAIL 8 ON LF-05	MERCURY	LANDSCAPE FORMS 1-800-430-6206 LUIS SALAZAR - EXT 1314 LUISS@LANDSCAPEFORMS.COM WWW.LANDSCAPEFORMS.COM
D	6' FENCE	AMERISTAR FENCE ECHELLON II MAJESTIC STYLE 3-RAIL PANEL 6' HIGH	INSTALLATION PER MFG. SPECIFICATIONS AND FLORIDA BUILDING CODE. INDUSTRIAL GRADE. SPECIALTY ENGINEERED ITEM: CONTACTOR, AS PART OF BID AND SERVICES SHALL PROVIDE ENGINEERED STRUCTURAL DESIGN, PER F.B.C. FOR ATTACHMENT AND OR INSTALLATION OF THIS ITEM; INCLUDING FOOTING DESIGN.	SEE DETAIL 1 ON SHEET LF-05	BLACK	AMERISTAR FENCE 1-888-333-3422 REGION4FAX@AMERISTARFENCE.COM WWW.AMERISTARFENCE.COM
E	6' PEDESTRIAN GATE	AMERISTAR FENCE ECHELLON II MAJESTIC STYLE 3-RAIL SINGLE GATE. WELD INDUSTRIAL STRENGTH AMERISTAR BOX HINGE PART HU518 TO 4" 11-GAUGE STEEL POST	INSTALLATION PER MFG. SPECIFICATIONS AND FLORIDA BUILDING CODE. INDUSTRIAL GRADE. SPECIALTY ENGINEERED ITEM: CONTRACTOR, AS PART OF BID AND SERVICES SHALL PROVIDE ENGINEERED STRUCTURAL DESIGN, PER F.B.C. FOR ATTACHMENT AND OR INSTALLATION OF THIS ITEM; INCLUDING FOOTING DESIGN.	SEE DETAIL 2 ON SHEET LF-05	BLACK	AMERISTAR FENCE 1-888-333-3422 REGION4FAX@AMERISTARFENCE.COM WWW.AMERISTARFENCE.COM
F	KIOSK SIGN		INSTALLATION PER FABRICATOR SPECIFICATIONS AND FLORIDA BUILDING CODE.SPECIALTY ENGINEERED ITEM: CONTRACTOR, AS PART OF BID AND SERVICES SHALL PROVIDE ENGINEERED STRUCTURAL DESIGN, PER F.B.C. FOR ATTACHMENT AND OR INSTALLATION OF THIS ITEM; INCLUDING FOOTING DESIGN.	SEE DETAIL 5 & 6 ON SHEET LF-05		
G	Not Used EDGING	SURE-LOC ELITE-EDGE POLYETHYLENE EDGING; ITEM No. PE6A; 5" X 20' SECTIONS		SEE DETAIL 6 ON SHEET LF-04	BLACK	SURE-LOC 1-800-787-3562 INFO@SURELOCEDGING.COM WWW.SURELOCEDGING.COM
H	Not Used PLANT I.D. / DEDICATION MARKER	BRONZE PLAQUE. PROVIDE ONE PLAQUE FOR EACH TREE AND PLANT SPECIES LISTED ON THE PLANT MATERIAL LIST		SEE DETAIL 3 & 4 ON SHEET LF-05		

2 HARDSCAPE FURNITURE AND MATERIALS SCHEDULE

LF-03 SCALE: N/A

Bermello Ajamil & Partners
Architecture • Engineering • Planning
Interior Design • Landscape Architecture
2601 South Bayshore Drive
Suite 1000
Miami, Florida 33133
(305) 859-2050
Fax (305) 860-3700

PREPARED FOR/OWNER:
CITY OF KEY WEST, FL
1300 WHITE STREET
KEY WEST, FL 33040

PROJECT NAME:
TRUMAN WATERFRONT PARK FRUIT TREE GROVE

PROJECT LOCATION/ADDRESS:
TRUMAN WATERFRONT PARK
EAST QUAY ROAD
KEY WEST, FLORIDA 33040

SUB-CONSULTANT INFORMATION:

PROFESSIONAL SEAL:

KIRK J. OLNEY
FLORIDA REGISTERED LANDSCAPE
LA0001705

SUBMITTAL DESCRIPTION / MILESTONE:

100% CD'S
NOVEMBER 22, 2017

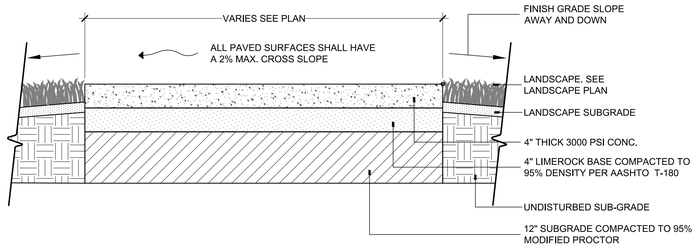
REVISIONS:
Revised 8/29/2018 CKW

DRAWING SHEET INFORMATION

BA PROJECT NO.:	17073.000
SCALE:	N/A
DATE:	OCTOBER 09, 2017
DRAWN BY:	KJO
CHECKED BY:	RPH

DRAWING TITLE:
HARDSCAPE PAVING & FURNITURE SCHEDULES

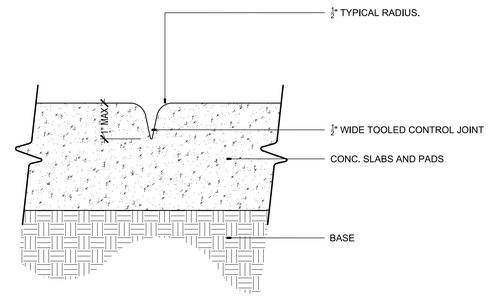
SHEET NO.
LF-03



CONCRETE NOTE:

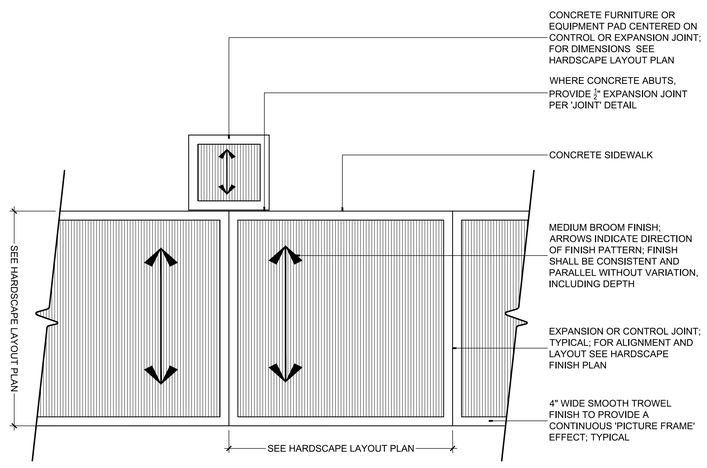
1. WHERE CONCRETE ABUTS CONCRETE, CONTRACTOR SHALL PROVIDE AN EXPANSION JOINT THAT IS CONTINUOUS AND TO THE FULL DEPTH OF SAID CONCRETE; THIS INCLUDES STRUCTURES
2. WATER SHALL FLOW FREELY FROM SURFACE OF CONCRETE AND NOT BE IMPEDED BY ADJACENT LANDSCAPE. SLOPE ADJACENT FINISH GRADE AND INSTALL LANDSCAPE / GRASS ACCORDINGLY.

1 LF-04 — 4" CONCRETE SECTION DETAIL
SCALE: 1"=1'-0"

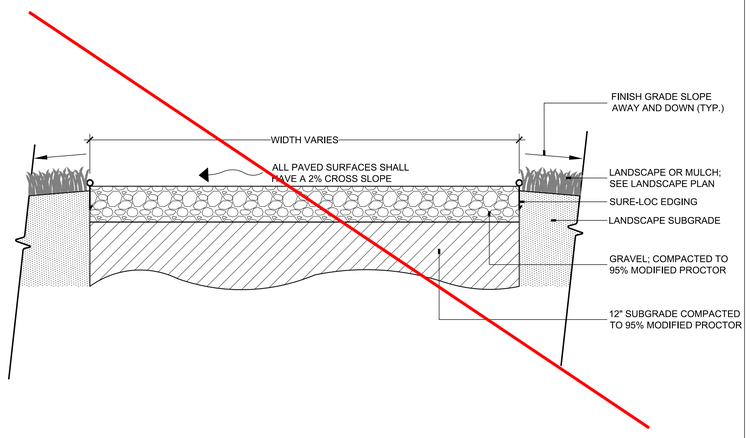


4 LF-04 — CONCRETE TOOLED CONTROL JOINT SECTION DETAIL
SCALE: 3"=1'-0"

7 LF-04 — SCALE:

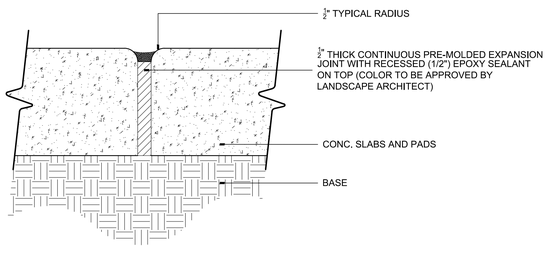


2 LF-04 — SIDEWALK FINISH DETAIL
SCALE: 3/8"=1'-0"

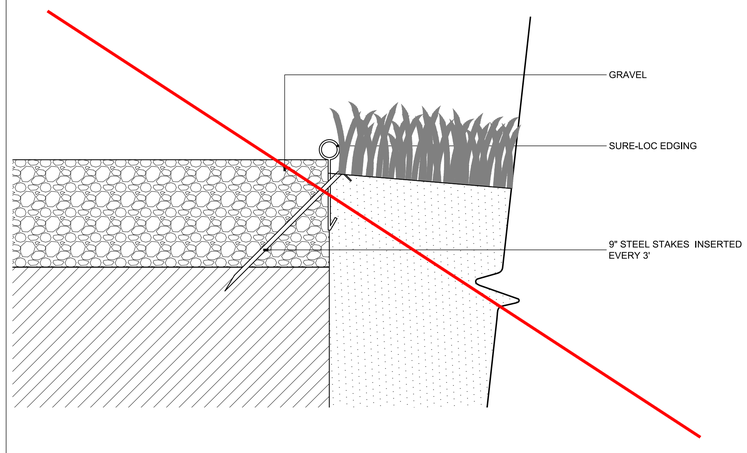


5 LF-04 — COMPACTED GRAVEL SECTION DETAIL
SCALE: 1"=1'-0"

8 LF-04 — SCALE:



3 LF-04 — CONCRETE EXPANSION JOINT SECTION DETAIL
SCALE: 3"=1'-0"



6 LF-04 — EDGING INSTALLATION DETAIL
SCALE: 3"=1'-0"

9 LF-04 — SCALE:

Bermello Ajamil & Partners
Architecture • Engineering • Planning
Interior Design • Landscape Architecture
2601 South Bayshore Drive
Suite 1000
Miami, Florida 33133
(305) 859-2050
Fax (305) 860-3700

PREPARED FOR/OWNER:
CITY OF KEY WEST, FL
1300 WHITE STREET
KEY WEST, FL 33040

PROJECT NAME:
TRUMAN WATERFRONT PARK FRUIT TREE GROVE

PROJECT LOCATION/ADDRESS:
TRUMAN WATERFRONT PARK
EAST QUAY ROAD
KEY WEST, FLORIDA 33040

SUB-CONSULTANT INFORMATION:

PROFESSIONAL SEAL:

REGISTERED LANDSCAPE ARCHITECT KIRK J. OLNEY LA0001705 STATE OF FLORIDA

KIRK J. OLNEY
FLORIDA REGISTERED LANDSCAPE
LA0001705

SUBMITTAL DESCRIPTION / MILESTONE:

100% CD'S
NOVEMBER 22, 2017

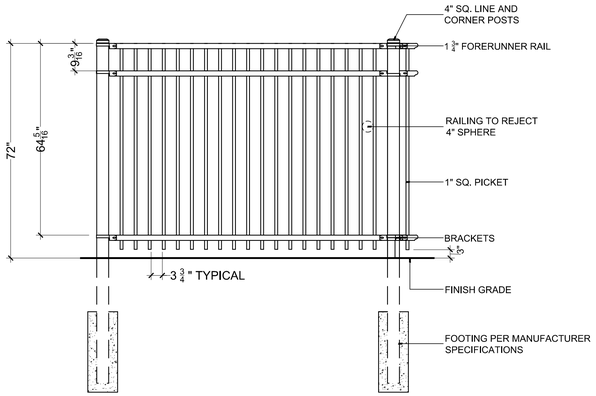
REVISIONS:
Revised 8/29/2018 CKW

DRAWING SHEET INFORMATION

BA PROJECT NO.:	17073.000
SCALE:	AS NOTED
DATE:	OCTOBER 09, 2017
DRAWN BY:	KJO
CHECKED BY:	RPH

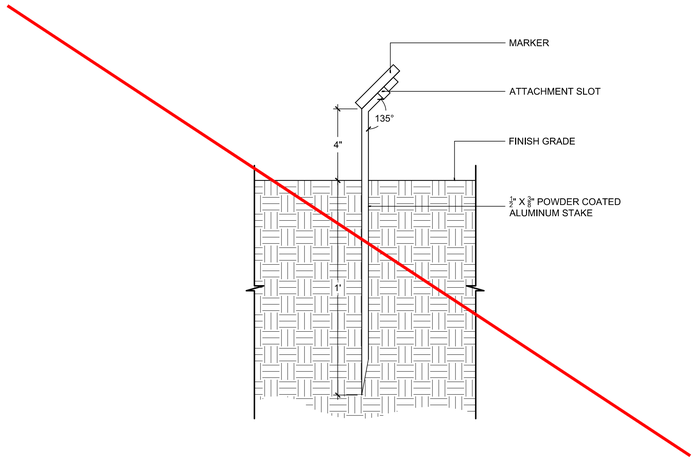
DRAWING TITLE:
HARDSCAPE PAVING DETAILS

SHEET NO.
LF-04



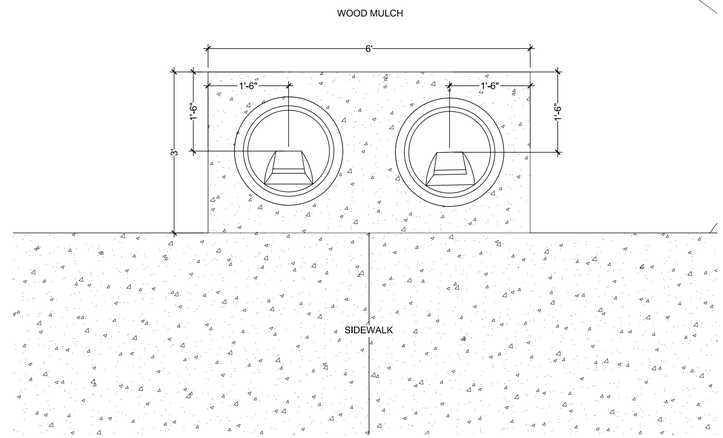
1 LF-05 6' HIGH ALUMINUM FENCE ELEVATION DETAIL

SCALE: 1/2"=1'-0"



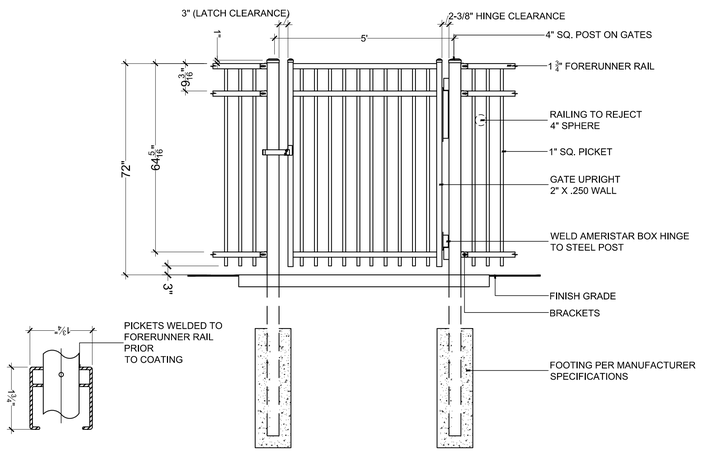
4 LF-05 MARKER INSTALLATION DETAIL

SCALE: 3"=1'-0"



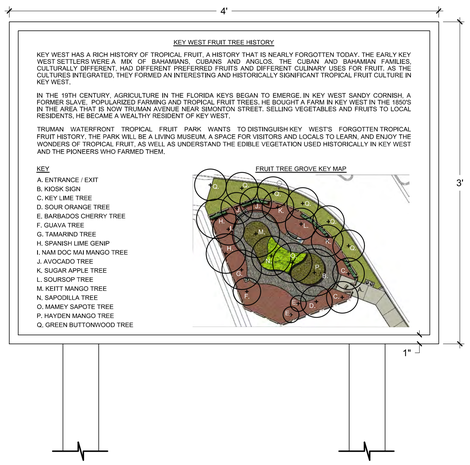
7 LF-05 RECYCLE / TRASH RECEPTACLE LAYOUT PLAN

SCALE: 3/4"=1-0"



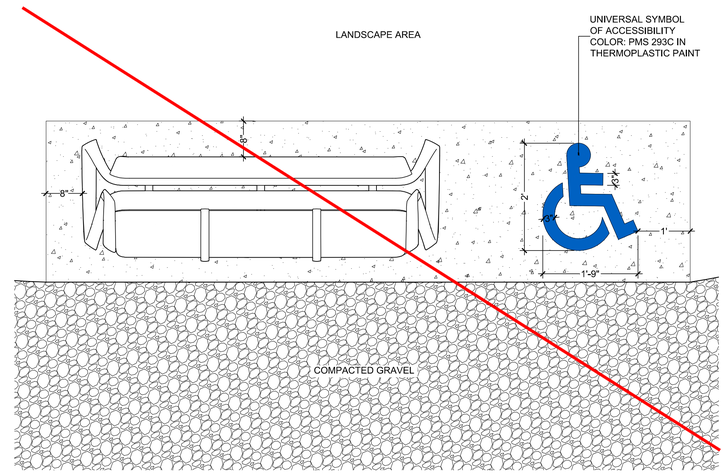
2 LF-05 6' HIGH ALUMINUM PEDESTRIAN GATE ELEVATION DETAIL

SCALE: 1/2"=1'-0"



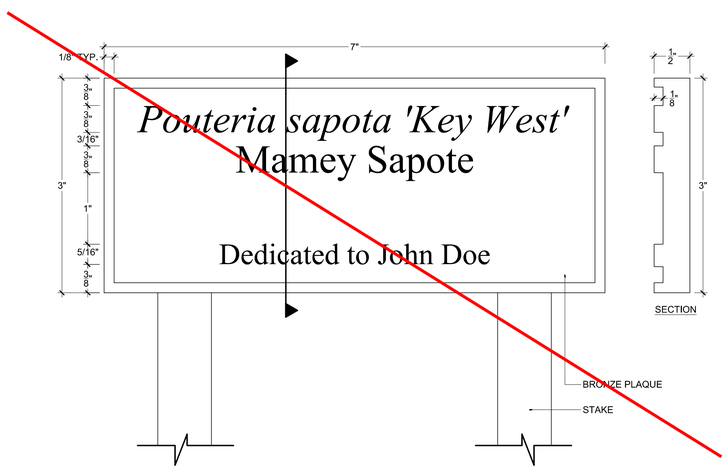
5 LF-05 KIOSK SIGN

SCALE: 1-1/2"=1'-0"



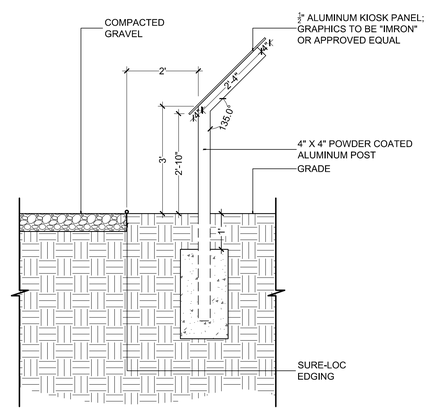
8 LF-05 TYP. BENCH LAYOUT PLAN

SCALE: 3/4"=1'-0"



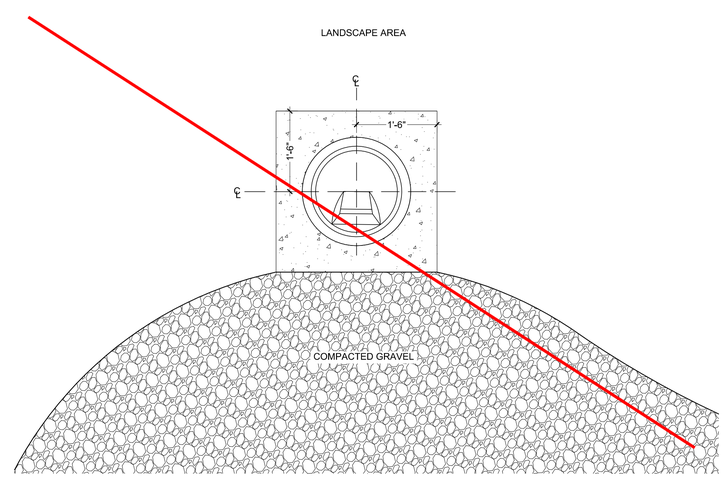
3 LF-05 PROTOTYPICAL PLANT IDENTIFICATION/DEDICATION MARKER

SCALE: 1:1



6 LF-05 KIOSK SIGN INSTALLATION DETAIL

SCALE: 1/2"=1'-0"



9 LF-05 TRASH RECEPTACLE LAYOUT PLAN

SCALE: 3/4"=1'-0"

Bermello Ajamil & Partners
Architecture • Engineering • Planning
Interior Design • Landscape Architecture
2601 South Bayshore Drive
Suite 1000
Miami, Florida 33133
(305) 859-2050
Fax (305) 860-3700

PREPARED FOR/OWNER:

CITY OF KEY WEST, FL
1300 WHITE STREET
KEY WEST, FL 33040

PROJECT NAME:

TRUMAN WATERFRONT PARK FRUIT TREE GROVE

PROJECT LOCATION/ADDRESS:

TRUMAN WATERFRONT PARK
EAST QUAY ROAD
KEY WEST, FLORIDA 33040

SUB-CONSULTANT INFORMATION:

PROFESSIONAL SEAL:

REGISTERED LANDSCAPE ARCHITECT
KIRK J. OLNEY
LA0001705
STATE OF FLORIDA

KIRK J. OLNEY
FLORIDA REGISTERED LANDSCAPE
LA0001705

SUBMITTAL DESCRIPTION / MILESTONE:

100% CD'S
NOVEMBER 22, 2017

REVISIONS:

Revised 8/29/2018 CKW

DRAWING SHEET INFORMATION

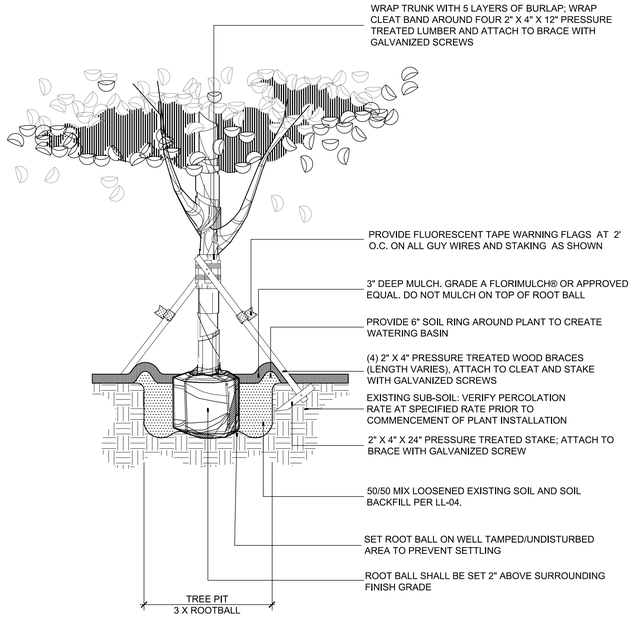
BA PROJECT NO.:	17073.000
SCALE:	AS NOTED
DATE:	OCTOBER 09, 2017
DRAWN BY:	KJO
CHECKED BY:	RPH

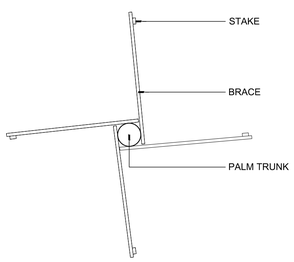
DRAWING TITLE:

HARDSCAPE FURNITURE DETAILS

SHEET NO.

LF-05





STAKING PLAN VIEW

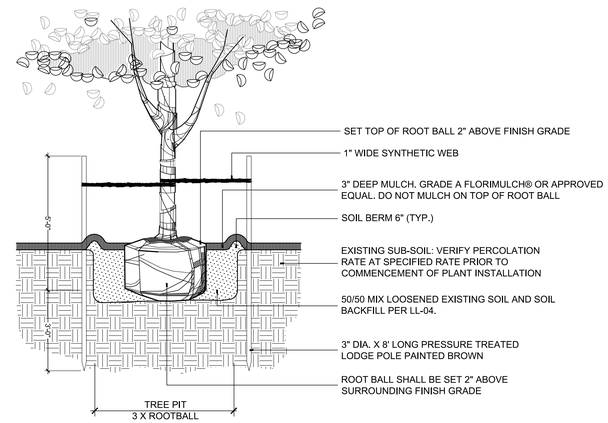
N.T.S.

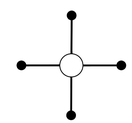
TREE INSTALLATION NOTES

1. ALL PLANTING AREAS AND PLANTING PITS SHALL BE TESTED FOR SUFFICIENT PERCOLATION (AT A RATE OF 1" OF STANDING WATER IN 10 MINUTES) PRIOR TO INSTALLATION OF PLANT MATERIAL TO ENSURE SUFFICIENT DRAINAGE.
2. PLANT BEDS COMPACTED BY EQUIPMENT AND MACHINERY SHALL BE LOOSENED SO THAT THE SPECIFIED DRAINAGE/PERCOLATION RATE IS ACHIEVED.
3. ALL SYNTHETIC BURLAP, STRING, CORDS OR WIRE BASKETS SHALL BE REMOVED BEFORE TREES ARE PLANTED, WITHOUT BREAKING THE SOIL BALL. ALL SYNTHETIC TAPE SHALL BE REMOVED FROM BRANCHES AND TRUNKS PRIOR TO FINAL ACCEPTANCE. THE TOP 1/3 OF NATURAL BURLAP SHALL BE REMOVED. AFTER THE TREE IS SET IN THE PLANTING HOLE AND BEFORE THE TREES ARE BACKFILLED.

1 LL-02 TREE PLANTING DETAIL

SCALE: 1/2" = 1'-0"





PLAN VIEW OF STAKING

TREE INSTALLATION NOTES

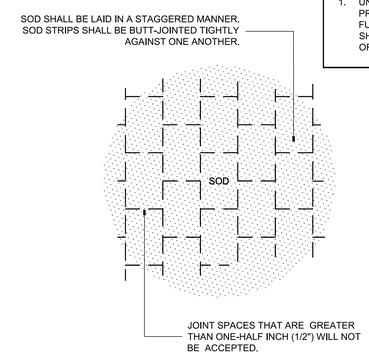
1. ALL PLANTING AREAS AND PLANTING PITS SHALL BE TESTED FOR SUFFICIENT PERCOLATION (AT A RATE OF 1" OF STANDING WATER IN 10 MINUTES) PRIOR TO INSTALLATION OF PLANT MATERIAL TO ENSURE SUFFICIENT DRAINAGE.
2. PLANT BEDS COMPACTED BY EQUIPMENT AND MACHINERY SHALL BE LOOSENED SO THAT THE SPECIFIED DRAINAGE/PERCOLATION RATE IS ACHIEVED.
3. ALL SYNTHETIC BURLAP, STRING, CORDS OR WIRE BASKETS SHALL BE REMOVED BEFORE TREES ARE PLANTED, WITHOUT BREAKING THE SOIL BALL. ALL SYNTHETIC TAPE SHALL BE REMOVED FROM BRANCHES AND TRUNKS PRIOR TO FINAL ACCEPTANCE. THE TOP 1/3 OF NATURAL BURLAP SHALL BE REMOVED, AFTER THE TREE IS SET IN THE PLANTING HOLE AND BEFORE THE TREES ARE BACKFILLED.

3 LL-02 ORNAMENTAL TREE PLANTING DETAIL

SCALE: 3/8"=1'-0"

SOD LAYOUT AND INSTALLATION NOTES:

1. UNLESS OTHERWISE STATED, WHERE SOD IS PROPOSED ADJACENT TO CURB, SIDEWALKS, FURNITURE PADS OR PAVEMENT, FINISH GRADE SHALL BE 3" LOWER PRIOR TO INSTALLATION OF SAID SOD.

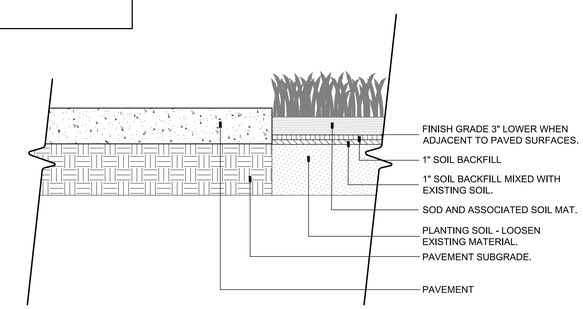


5 LL-02 SOD LAYOUT AND INSTALLATION DETAIL

SCALE: 1/2" = 1'-0"

SOD INSTALLATION NOTES

1. ALL PLANTING AREAS AND PLANTING PITS SHALL BE TESTED FOR SUFFICIENT PERCOLATION (AT A RATE OF 1" OF STANDING WATER IN 10 MINUTES) PRIOR TO INSTALLATION OF PLANT MATERIAL TO ENSURE SUFFICIENT DRAINAGE.
2. PLANT BEDS COMPACTED BY EQUIPMENT AND MACHINERY SHALL BE LOOSENED SO THAT THE SPECIFIED DRAINAGE/PERCOLATION RATE IS ACHIEVED.

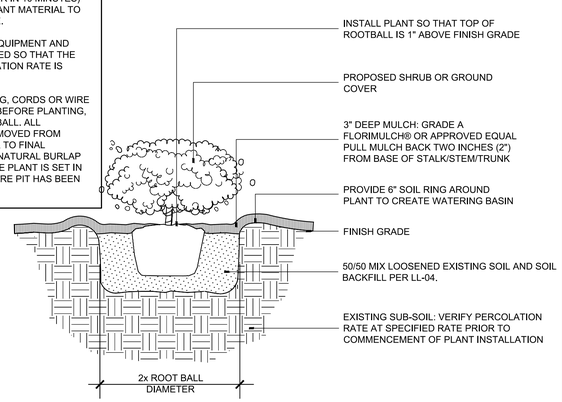


8 LL-02 SOD INSTALLATION SECTION DETAIL

SCALE: 1-1/2"=1'-0"

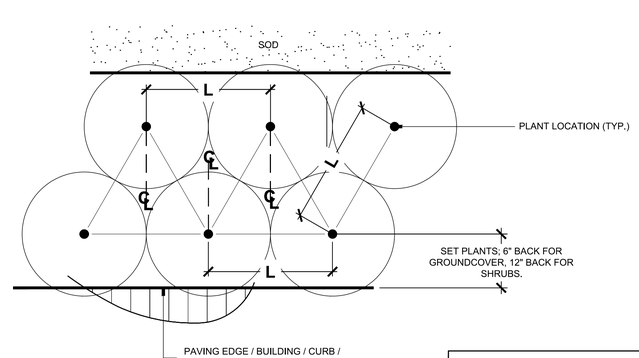
SHRUB & GROUNDCOVER INSTALLATION NOTES

1. ALL PLANTING AREAS AND PLANTING PITS SHALL BE TESTED FOR SUFFICIENT PERCOLATION (AT A RATE OF 1" OF STANDING WATER IN 10 MINUTES) PRIOR TO INSTALLATION OF PLANT MATERIAL TO ENSURE SUFFICIENT DRAINAGE.
2. PLANT BEDS COMPACTED BY EQUIPMENT AND MACHINERY SHALL BE LOOSENED SO THAT THE SPECIFIED DRAINAGE/PERCOLATION RATE IS ACHIEVED.
3. ALL SYNTHETIC BURLAP, STRING, CORDS OR WIRE BASKETS SHALL BE REMOVED BEFORE PLANTING, WITHOUT BREAKING THE SOIL BALL. ALL SYNTHETIC TAPE SHALL BE REMOVED FROM BRANCHES AND TRUNKS PRIOR TO FINAL ACCEPTANCE. THE TOP 1/3 OF NATURAL BURLAP SHALL BE REMOVED, AFTER THE PLANT IS SET IN THE PLANTING HOLE AND BEFORE PIT HAS BEEN BACKFILLED.



2 LL-02 SHRUB AND GROUNDCOVER PLANTING DETAIL

SCALE: 1/2"=1'-0"



SHRUB AND GROUNDCOVER SPACING NOTES:

1. SPACING DIAGRAM REFERS TO ALL PLANTING UNLESS NOTED OTHERWISE.
2. L= SPACING AS CALLED FOR IN PLANTING PLAN AND PLANT LIST.

4 LL-02 SHRUB AND GROUNDCOVER LAYOUT DETAIL

SCALE: 1-1/2"=1-0"

9 LL-02

SCALE:

Bermello Ajamil & Partners

Architecture • Engineering • Planning
Interior Design • Landscape Architecture
2601 South Bayshore Drive
Suite 1000
Miami, Florida 33133
(305) 859-2050
Fax (305) 860-3700

PREPARED FOR/OWNER:

CITY OF KEY WEST, FL
1300 WHITE STREET
KEY WEST, FL 33040

PROJECT NAME:

TRUMAN WATERFRONT PARK FRUIT TREE GROVE

PROJECT LOCATION/ADDRESS:

TRUMAN WATERFRONT PARK
EAST QUAY ROAD
KEY WEST, FLORIDA 33040

SUB-CONSULTANT INFORMATION:

PROFESSIONAL SEAL:

KIRK J. OLNEY
FLORIDA REGISTERED LANDSCAPE
LA0001705

SUBMITTAL DESCRIPTION / MILESTONE:

100% CD'S
NOVEMBER 22, 2017

REVISIONS:

DRAWING SHEET INFORMATION

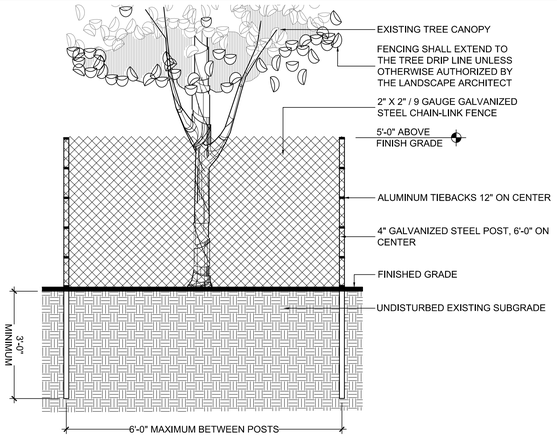
BA PROJECT NO.:	17073.000
SCALE:	AS NOTED
DATE:	OCTOBER 09, 2017
DRAWN BY:	KJO
CHECKED BY:	RPH

DRAWING TITLE:

PLANT INSTALLATION DETAILS

SHEET NO.

LL-02



NOTE: BARRIER TO BE CONTINUOUS AROUND THE TREE OR GROUP OF TREES.
SEE LANDSCAPE PLAN FOR LOCATION OF TREES TO REMAIN

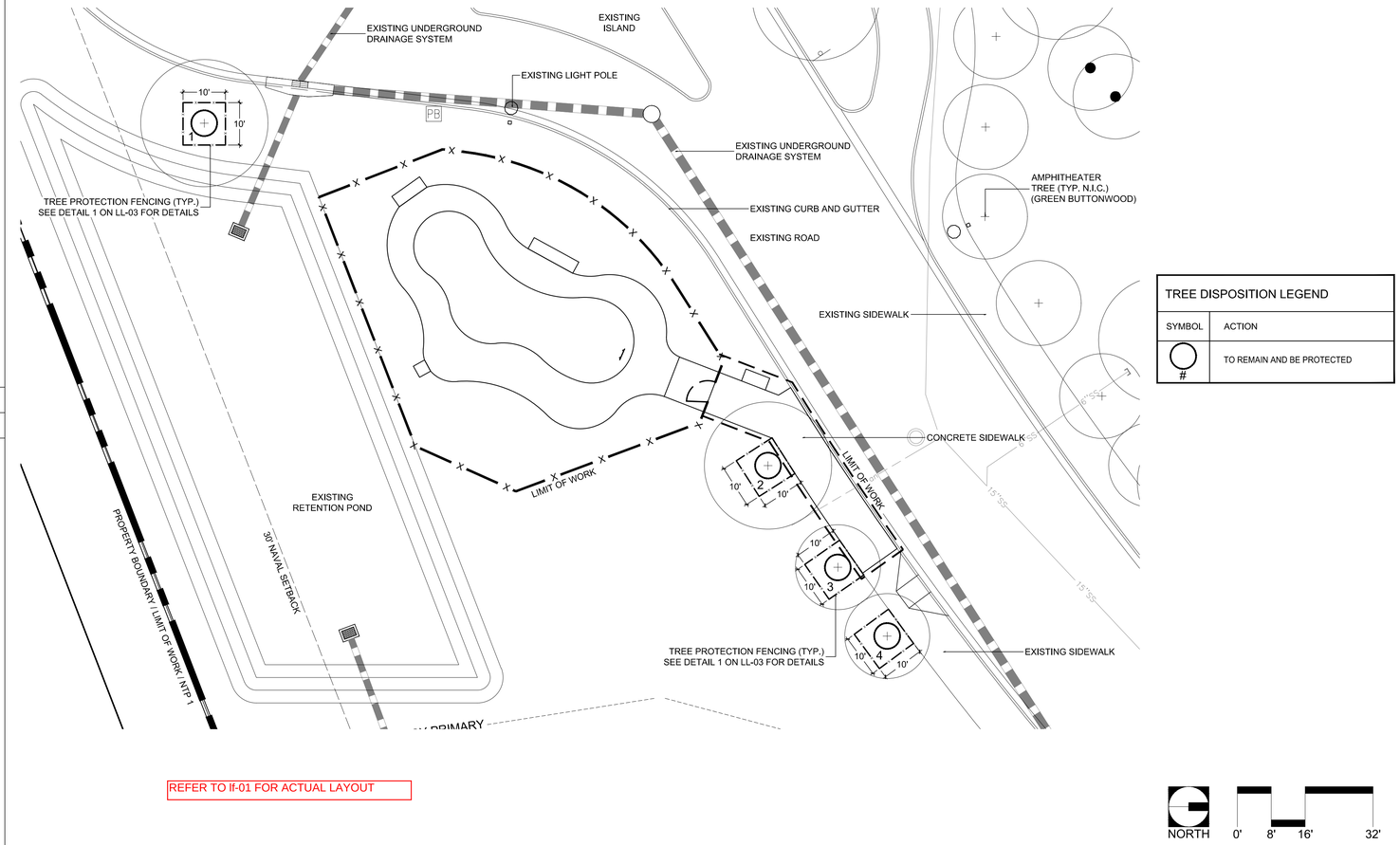
1 / LL-03 TREE PROTECTION DETAIL

SCALE: 1/2" = 1'-0"

1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTE AND PROTECT THE EXISTING TREES TO REMAIN ON SITE.
2. CONTRACTOR SHALL INSTALL A PERMANENT RIGID BARRIER PRIOR TO COMMENCEMENT OF WORK TO PROTECT THE CANOPY, TRUNK AND OR ROOT SYSTEM FROM DAMAGE. ORANGE CONSTRUCTION FENCING IS UNACCEPTABLE!
3. PROTECTION INCLUDES BUT IS NOT LIMITED TO THE PROHIBITION OF THE FOLLOWING ACTIVITIES UNDER THE CANOPY: STORING OF EQUIPMENT, STOCK PILING OF MATERIALS, TRASH OR DEBRIS AND STORING OF TRAILERS, MACHINERY AND OR VEHICLES.
4. PRIOR TO COMMENCEMENT OF ANY WORK CONTRACTOR SHALL PERFORM ROUTINE MAINTENANCE, PER ANSI A300, ON THE EXISTING TREES TO REMAIN INCLUDING REMOVAL OF DEAD/DECAYED WOOD, REMOVAL OF ATTACHED BRANCHES AND STRUCTURALLY UNSOUND LIMBS AS WELL AS REMOVAL OF SUBORDINATED BRANCHES WHERE INCLUDED BARK IS PRESENT AND REMOVAL OF BRANCHES TO INCREASE LIGHT AND AIR PENETRATION WITHIN THE CANOPY. REDUCTION OF OVERALL CANOPY SIZE IS PROHIBITED. UNDER NO CIRCUMSTANCES SHALL MORE THAT 25% OF ANY CANOPY BE REMOVED IN A TWELVE MONTH PERIOD.
5. PER ANSI A300, CONTRACTOR SHALL REMOVE DEAD BRANCHES AND SUCKERS FROM PRESERVED TREES.
6. PER ANSI A300, CONTRACTOR SHALL REMOVE RIPPED, TORN OR "LION TAILED' BRANCHES FROM PRESERVED TREES.
7. PRIOR TO COMMENCEMENT OF WORK THE CONTRACTOR, UNDER THE DIRECTION OF A CERTIFIED ASCA ARBORIST, SHALL PERFORM AN INTERNAL DECAY SURVEY AND INSPECTION AND PROVIDE A WRITTEN REPORT OF FINDINGS TO THE OWNER'S REPRESENTATIVE. IF IT IS DEEMED NECESSARY TO REMOVE ANY EXISTING TREES THAT ARE NOTED AS "REMAIN", THE CONTRACTOR SHALL BE RESPONSIBLE FOR APPLYING FOR THE APPROPRIATE TREE REMOVAL LICENSE REQUIRED BY LOCAL CODES, LAWS AND OR REGULATIONS.
8. WHERE CONSTRUCTION ACTIVITIES REQUIRE IMPACT TO THE EXISTING TREES ROOT SYSTEMS, THE CONTRACTOR, UNDER THE GUIDANCE OF AN ASCA ARBORIST, SHALL ROOT PRUNE TREES IN THE IMPACTED AREAS PER ANSI A300 STANDARDS. THE CONTRACTOR, AS WELL AS HIS/HER APPOINTED REGISTERED ASCA ARBORIST, SHALL TAKE ANY AND ALL CUSTOMARY PRECAUTIONS NECESSARY FOR THE SURVIVAL AND CONTINUED VIGOROUS GROWTH OF SAID TREES TO REMAIN.
9. ANY REQUIRED ROOT PRUNING SHALL BE COMPLETED PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES. UNDER NO CIRCUMSTANCE SHALL THE ROOT SYSTEM BE SUBJECT TO COMPACTION, TEARING, RIPPING OR ANY OTHER METHOD EXCEPT CLEAN CUTS AS DESCRIBED IN ANSI A300.
10. IF MORE THAN 25% OF THE TREE'S ROOT SYSTEM IS IMPACTED OR WHERE INDICATED ON THE DRAWINGS, FOR ANY REASON (IMPLIED IN THE DRAWINGS OR INCIDENTAL), THE CONTRACTOR SHALL BRACE THE TREE AS DESCRIBED ON THIS SHEET. THIS INCLUDES TREES WHOSE ROOTS ARE IMPACTED BY THE TRENCHING AND INSTALLATION OF ELECTRICAL CONDUIT.
11. ANY TREE WHO'S ROOT SYSTEM IS IMPACTED SHALL BE WATERED DAILY AS DESCRIBED ON THIS SHEET.
12. ALL ACTIVITY UNDER DRIP LINES AND IN THE PROXIMITY OF PRESERVED TREES SHALL BE ACCOMPLISHED BY NON-MECHANICAL METHODS.
13. CONTRACTOR SHALL REMOVE BY HAND METHOD ALL VINES, NATIVE OR EXOTIC, IN TREES TO REMAIN.
14. CONTRACTOR SHALL REMOVE WEEDS AND SHRUBS AT THE BASE OF TREES TO REMAIN. CONTRACTOR SHALL ALSO REMOVE DEBRIS, RUBBLE AND TRASH. NO MECHANICAL METHODS OR MACHINERY SHALL BE PERMITTED OR ACCEPTED TO ACCOMPLISH THESE TASKS.
15. CONTRACTOR SHALL PROVIDE 3" MULCH UNDER AND AROUND THE BASE OF ALL PRESERVED TREES INCLUDING TREE GROUPINGS.

2 / LL-03 TREE PROTECTION AND SPECIFICATION NOTES

SCALE: N/A



TREE DISPOSITION LEGEND	
SYMBOL	ACTION
#	TO REMAIN AND BE PROTECTED

3 / LL-03 TREE PROTECTION PLAN

SCALE: 1/16" = 1'-0"

1. PROVIDE 2" X 4" PRESSURE TREATED WOOD BRACES AND STAKES FOR TREES UP TO 6" CALIPER.
2. PROVIDE 4" X 4" PRESSURE TREATED WOOD BRACES AND STAKES FOR TREES OVER 8" CALIPER.
3. PROVIDE THE NUMBER OF BRACE MEMBERS AND ASSOCIATED STAKES PER TREE AS FOLLOWS:

EXISTING TREE CALIPER	NUMBER OF PRESSURE TREATED BRACES AND STAKES
UP TO 4"	THREE
4" TO 8"	FOUR
8" TO 12"	FIVE
12" AND UP	EIGHT

4. ALL BRACING SHALL BE ATTACHED TO STAKE AND BATTENS WITH GALVANIZED WOOD SCREWS.

4 / LL-03 PRESERVED TREE BRACING NOTE FOR IMPACTED TREES

SCALE: N/A

1. WATER SHALL BE FREE OF SUBSTANCES HARMFUL TO PLANT GROWTH, OBJECTIONABLE ODOR OR STAINING AGENTS.
2. THE WATER SHALL BE FREE OF DIRT, DEBRIS, POISONS, PESTICIDES, CONTAMINANTS AND ANY OTHER MATERIAL OR COMPOUND THAT IS DETRIMENTAL OR INHIBITS VIGOROUS PLANT HEALTH AND GROWTH.
3. WATER SHALL BE OBTAINED FROM ITS SOURCE LEGALLY. WATER DRAWN FROM CANALS AND OR LAKES AND ACCESS THERETO SHALL BE DONE ONLY WITH THE EXPRESS WRITTEN APPROVAL OF THE OWNER OF SAID PROPERTY AND OR APPLICABLE FEDERAL, STATE AND LOCAL LAWS, REGULATIONS, CODES, STANDARDS OR OTHER REGULATORY REQUIREMENTS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN THESE APPROVALS WITHOUT ADDITIONAL COST TO THE OWNER.
4. CONTRACTOR SHALL ROUTINELY AND REGULARLY PROVIDE SUFFICIENT SUPPLEMENTAL WATER TO EXISTING TREES IMPACTED BY CONSTRUCTION ACTIVITIES, AS WELL AS RELOCATED TREES, TO PROVIDE FOR VIGOROUS PLANT HEALTH AND GROWTH.
5. WATER SHALL BE APPLIED AT A RATE OF 50 GALLONS OF WATER PER INCH OF CALIPER PER DAY.

5 / LL-03 PRESERVED TREE WATERING NOTES

SCALE:

Bermello Ajamil & Partners
Architecture • Engineering • Planning
Interior Design • Landscape Architecture
2601 South Bayshore Drive
Suite 1000
Miami, Florida 33133
(305) 859-2050
Fax (305) 860-3700

PREPARED FOR/OWNER:
CITY OF KEY WEST, FL
1300 WHITE STREET
KEY WEST, FL 33040

PROJECT NAME:
TRUMAN WATERFRONT PARK FRUIT TREE GROVE

PROJECT LOCATION/ADDRESS:
TRUMAN WATERFRONT PARK
EAST QUAY ROAD
KEY WEST, FLORIDA 33040

SUB-CONSULTANT INFORMATION:

PROFESSIONAL SEAL:

REGISTERED LANDSCAPE ARCHITECT
KIRK J. OLNEY
LA0001705
STATE OF FLORIDA

KIRK J. OLNEY
FLORIDA REGISTERED LANDSCAPE
LA0001705

SUBMITTAL DESCRIPTION / MILESTONE:

100% CD'S
NOVEMBER 22, 2017

REVISIONS:

DRAWING SHEET INFORMATION

BA PROJECT NO.:	17073.000
SCALE:	AS NOTED
DATE:	OCTOBER 09, 2017
DRAWN BY:	KJO
CHECKED BY:	RPH

DRAWING TITLE:
TREE PROTECTION , PLAN, NOTES & DETAILS

SHEET NO.
LL-03

1. CONTRACTOR SHALL GUARANTEE THAT ALL PLANT MATERIAL WILL SURVIVE FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.

2. CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE AND WATERING OF PLANT MATERIAL UNTIL FINAL ACCEPTANCE.

3. IF NECESSARY FOR PLANT VIGOR, THE CONTRACTOR SHALL PROVIDE TEMPORARY IRRIGATION.

4. CONTRACTOR SHALL SUBMIT WRITTEN MAINTENANCE PLAN FOR ESTABLISHMENT PERIOD (FROM FINAL ACCEPTANCE TO END OF ONE-YEAR GROW-IN PERIOD) INCLUDING WATERING SCHEDULE, TEMPORARY IRRIGATION, FERTILIZATION SCHEDULE, PRUNING ETC. TO OWNER'S REPRESENTATIVE.

5. LOCATION OF ALL UTILITIES AND BASE INFORMATION IS APPROXIMATE. CONTRACTOR SHALL VERIFY ALL UNDERGROUND UTILITIES AND OBSTRUCTIONS AND COORDINATE WITH THE OWNER'S REPRESENTATIVE PRIOR TO INITIATING INSTALLATION WORK. CONTRACTOR SHALL BE SOLELY RESPONSIBLE TO REPAIR OR REPLACE ANY DAMAGE COMMITTED TO EXISTING ELEMENTS ABOVE OR BELOW GROUND TO ITS ORIGINAL CONDITION AND TO THE SATISFACTION OF THE THE OWNER'S REPRESENTATIVE.

6. CONTRACTOR SHALL FIELD ADJUST LOCATION OF PLANT MATERIAL AS NECESSARY TO AVOID DAMAGE TO EXISTING UNDERGROUND UTILITIES AND/OR EXISTING ABOVE GROUND ELEMENTS. ALL CHANGES REQUIRED SHALL BE COORDINATED WITH THE LANDSCAPE ARCHITECT.

7. CONTRACTOR SHALL FIELD STAKE THE LOCATION OF ALL PLANT MATERIAL PRIOR TO INITIATING INSTALLATION FOR THE REVIEW AND APPROVAL OF THE LANDSCAPE ARCHITECT.

8. CONTRACTOR SHALL CLEAN THE WORK AREAS AT THE END OF EACH WORKING DAY. RUBBISH AND DEBRIS SHALL BE COLLECTED AND DISPOSED OF, AS DIRECTED, DAILY. ALL MATERIALS, PRODUCTS, AND EQUIPMENT SHALL BE STORED IN AN ORGANIZED FASHION AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

9. ALL PLANT MATERIAL SHALL BE IN FULL AND STRICT ACCORDANCE WITH FLORIDA NO. 1 GRADE, ACCORDING TO THE "GRADES AND STANDARDS FOR NURSERY PLANTS" PUBLISHED BY THE FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES.

10. CONTRACTOR AND EMPLOYEE VEHICLE PARKING SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE. SHUTTLING OF EMPLOYEES TO THE PROJECT AREA(S) SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL NOT DISRUPT OR CONFLICT IN ANY WAY WITH VEHICULAR TRAFFIC.

11. CONSTRUCTION ACCESS SHALL BE INDICATED BY THE OWNER'S REPRESENTATIVE. COORDINATION OF HEAVY EQUIPMENT AND MATERIALS SHALL BE THE CONTRACTOR'S RESPONSIBILITY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING AND COORDINATION OF WORK WITH OTHER TRADES.

12. THE CONTRACTOR SHALL TAKE WHATEVER MEANS THAT MAY BE NECESSARY TO FULLY UNDERSTAND ALL THE ACCESS ROUTES, CONSTRUCTION SCHEDULES, AND SECURITY CLEARANCES IN ORDER TO PROVIDE A COMPLETE AND FINISHED PROJECT, ON SCHEDULE.

13. ONCE PLANT MATERIAL IS INSTALLED, IF DRAINAGE PROBLEMS EXIST, IT IS THE CONTRACTORS RESPONSIBILITY TO REMOVE ALL PLANTS IF NEEDED, RE-GRADE AREA AND REPLANT AT NO EXTRA COST.

14. ALL NOTED CONTAINERS SIZES ARE MINIMUM. INCREASE CONTAINER SIZE IF NECESSARY TO PROVIDE PLANT HEIGHT AND WIDTH SIZE AND SPECIFICATIONS. ALL HEIGHT AND SPREAD SPECIFICATIONS ARE MINIMUM.

15. SHRUB AND GROUND COVER BED QUANTITIES ARE INDICATED FOR EACH PLANT BED.

16. SHRUB AND GROUNDCOVER SPACING IS INDICATED ON THE PLANT LIST UNDER "SPACING" FOR ALL PLANTS AND SHALL APPLY FOR ALL "MASS PLANTINGS." SPACING FOR TREES IS INDICATED ON THE PLANT LIST AS "AS SHOWN" DELINEATED INDIVIDUAL PLANTS.

17. CONTRACTOR SHALL MULCH ALL NEW PLANT MATERIAL THROUGHOUT AND COMPLETELY TO DEPTH SPECIFIED.

18. ANY SUBSTITUTIONS IN SIZE AND/OR PLANT MATERIAL MUST BE APPROVED BY THE LANDSCAPE ARCHITECT. ALL PLANTS SHALL BE SUBJECT TO APPROVAL BY THE LANDSCAPE ARCHITECT BEFORE PLANTING CAN BEGIN.

19. CONTRACTOR SHALL COORDINATE ALL PLANTING WORK WITH IRRIGATION WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL HAND WATERING TO SUPPLEMENT IRRIGATION WATERING AND RAINFALL. CONTRACTOR SHALL BE RESPONSIBLE FOR HAND WATERING IN ALL PLANTING AREAS, REGARDLESS OF THE STATUS OF EXISTING OR PROPOSED IRRIGATION.

20. CONTRACTOR SHALL REPLACE (BY EQUAL SIZE AND QUALITY) ANY AND ALL EXISTING PLANT MATERIAL DISTURBED OR DAMAGED BY PLANT REMOVAL, RELOCATION, AND/OR INSTALLATION WORK.

21. Refer to Irrigation drawings for Truman Waterfront Park Phase 1B by Blue Island/K2M. Connect to existing irrigation system stub-out shown on Truman Amphitheater Sheet IR-01.

1 LANDSCAPE NOTES

LL-04 SCALE: N/A

Canopy Trees

SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	NATIVE	PLANT INSTALLATION SPECIFICATION	SPACING	AERIAL SALT TOLERANCE	SOIL SALT TOLERANCE	DROUGHT TOLERANCE	WIND TOLERANCE	MATURE SIZE
ANM	1	*Annona muricata*	Soursop	NO	8' X 4'-5'; 2" cal. at DBH; 4' clear turnk	As Shown	Moderate	Low	High	Low	20' tall X 20' wide
~~COE~~	~~6~~	~~*Conocarpus erectus*~~	~~Green Buttonwood~~	~~YES~~	~~12' X 4'; 1.5" cal. at DBH; 5' clear trunk~~	~~As Shown~~	~~High~~	~~High~~	~~High~~	~~Moderate~~	~~45' tall X 40' wide~~
~~MAZ~~	~~1~~	~~*Manilkara zapota*~~	~~Sapodilla~~	~~NO~~	~~12' X 3'; 2.5" cal. at DBH; 4' clear trunk~~	~~As Shown~~	~~High~~	~~High~~	~~Moderate~~	~~High~~	~~80' tall X 60' wide~~
MAH	1	*Mangifera indica 'Haden'*	Haden Mango	NO	10' X 8'; 3" cal at DBH; 4' clear trunk	As Shown	Moderate	Moderate	Moderate	Moderate	40' tall X 35' wide
~~MAK~~	~~1~~	~~*Mangifera indica 'Keitt'*~~	~~Keitt Mango~~	~~NO~~	~~5' X 4' 2" cal. at DBH~~	~~As Shown~~	~~Moderate~~	~~Moderate~~	~~Moderate~~	~~Moderate~~	~~40' tall X 35' wide~~
~~MAN~~	~~1~~	~~*Mangifera indica 'Nam Doc Mai'*~~	~~Nam Doc Mai Mango~~	~~NO~~	~~3' X 4' 2" cal. at DBH~~	~~As Shown~~	~~Moderate~~	~~Moderate~~	~~Moderate~~	~~Moderate~~	~~15' tall X 10' wide~~
~~MEB1~~	~~1~~	~~*Melicoccus bijugatus (male)*~~	~~Spanish Lime Genip~~	~~NO~~	~~8' X 4'; 2" cal. at DBH; 4' clear turnk~~	~~As Shown~~	~~High~~	~~High~~	~~High~~	~~Moderate~~	~~85' tall X 75' wide~~
~~MEB2~~	~~1~~	~~*Melicoccus bijugatus (female)*~~	~~Spanish Lime Genip~~	~~NO~~	~~8' X 4'; 2" cal. at DBH; 4' clear turnk~~	~~As Shown~~	~~High~~	~~High~~	~~High~~	~~Moderate~~	~~85' tall X 75' wide~~
PEA1	1	*Persea americana ~~(male)~~*	Avocado	NO	8' X 4'; 2" cal. at DBH; 4' clear turnk	As Shown	Moderate	Moderate	Moderate	Moderate	40'tall X 30' wide
~~PEA2~~	~~1~~	~~*Persea americana (female)*~~	~~Avocado~~	~~NO~~	~~8' X 4'; 2" cal. at DBH; 4' clear turnk~~	~~As Shown~~	~~Moderate~~	~~Moderate~~	~~Moderate~~	~~Moderate~~	~~40'tall X 30' wide~~
~~POS~~	~~1~~	~~*Pouteria sapota 'key west'*~~	~~Mamey Sapote~~	~~NO~~	~~10' X 6'; 3" cal. at DBH; 5' clear trunk~~	~~As Shown~~	~~High~~	~~High~~	~~Low~~	~~Moderate~~	~~50' tall X 40' wide~~
~~TAM~~	~~1~~	~~*Tamarindus indica Edible*~~	~~Tamarind~~	~~NO~~	~~12' X 6'; 4" cal. at DBH; 6' clear trunk~~	~~As Shown~~	~~Moderate~~	~~Moderate~~	~~High~~	~~High~~	~~60' tall X 60' wide~~

Ornamental Trees

SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	NATIVE	PLANT INSTALLATION SPECIFICATION	SPACING	AERIAL SALT TOLERANCE	SOIL SALT TOLERANCE	DROUGHT TOLERANCE	WIND TOLERANCE	MATURE SIZE
ANS	2	*Annona squamosa*	Sugar Apple	NO	25 gal.; 3" cal. at DBH; 4' clear turnk	As Shown	Moderate	Low	Moderate	Moderate	20' tall X 10' wide
CIA	1	*Citrus x aurantifolia*	Key Lime	NO	6' X 4'; 2" cal. at DBH; 3' standard	As Shown	High	High	Moderate	Moderate	30' tall X 25' wide
CIX	1	*Citrus x aurantium*	Sour Orange	NO	7 gal.; 2" cal. at DBH; 3' standard	As Shown	High	High	Moderate	Moderate	30' tall X 25' wide
MAG	2	*Malpighia glabra*	Barbados Cherry	NO	15 gal.; 2" cal. at DBH; 4' clear turnk	As Shown	Moderate	Moderate	High	Moderate	12' tall X 15' wide
PSG	1	*Psidium guajava*	Guava	NO	15 gal.; 2" cal. at DBH; 4' clear turnk	As Shown	Moderate	Moderate	High	High	20' tall X 25' wide

Shrubs and Groundcover

SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	NATIVE	PLANT INSTALLATION SPECIFICATION	SPACING	AERIAL SALT TOLERANCE	SOIL SALT TOLERANCE	DROUGHT TOLERANCE	WIND TOLERANCE	MATURE SIZE
ANA	34	*Ananas comosus*	Pineapples	NO	3 gal.; 24" X 24"	30" O.C.	Moderate	Low	High	High	3' tall X 5' wide
ENV	5	*Ensete ventricosum 'Maurelii'*	Red Banana	NO	7 gal	48" O.C.	Low	Low	Low	Moderate	18' tall x 15' wide
MUA	5	*Musa acuminata 'Dwarf Cavendish'*	Ladyfinger Banana	NO	7 gal.; 36" high	48" O.C.	Low	Low	Low	Moderate	7' tall X 10' wide
MUS	5	*Musa acuminata 'Goldfinger'*	Goldfinger Banana	NO	7 gal	48" O.C.	Low	Low	Low	Moderate	14' tall X 12' wide
VIR	6	*Vitis rotundifolia*	Muscadine Grape	NO	3 gal; Trained to Picket Fence	24" O.C.	Low	Low	Moderate	Moderate	8' tall X 60' wide

Turf Grass

SYMBOL	QUANTITY	BOTANICAL NAME	COMMON NAME	NATIVE	PLANT INSTALLATION SPECIFICATION	SPACING	AERIAL SALT TOLERANCE	SOIL SALT TOLERANCE	DROUGHT TOLERANCE	WIND TOLERANCE	MATURE SIZE
PAN	As Required	*Paspalum notatum*	Bahia Sod	YES		solid sod	High	High	High	High	6" to 12" tall

3 PLANT MATERIAL LIST

LL-04 SCALE: N/A

1. SOIL BACKFILL SHALL BE NATURAL SURFACE SOIL FROM WELL-DRAINED AREAS, FERTILE, FRIABLE AND FREE OF WEEDS AND TYPICAL OF PRODUCTIVE, CULTIVATED TOPSOIL; POSSESSING CHARACTERISTICS REPRESENTATIVE OF A WELL-DRAINED AREA IN FLORIDA.
2. SOIL CONTAINING MUCK OR POORLY-DRAINED SOILS SHALL NOT BE USED.
3. SOIL BACKFILL SHALL NOT BE EXCESSIVELY ACID OR ALKALINE (PH 5.5 TO 7.0), NOR CONTAIN TOXIC SUBSTANCES SUCH AS LEAD OR MERCURY.
4. SOIL BACKFILL SHALL BE REASONABLY FREE OF CLAY, STONES, STICKS, STUMPS, ROOTS, OR OTHER SIMILAR SUBSTANCES ONE-QUARTER-INCH (1/4") OR MORE IN DIAMETER OR ANY OTHER OBJECT WHICH MAY BE A HINDRANCE TO THE FINISH-GRADING OPERATION OR DETRIMENTAL OR INJURIOUS TO PLANTS. PARTICULAR CARE SHOULD BE TAKEN TO REMOVE PIECES OF MORTAR, CEMENT, WOOD, ROAD ROCK, LIME ROCK CHUNKS AND OTHER SIMILAR REMAINS OF CONSTRUCTION FROM ALL PLANTING AREAS.
5. SOIL BACKFILL SHALL BE AS FOLLOWS: 1/3 TOPSOIL (AS DESCRIBED ABOVE), 1/3 FLORIDA PEAT, AND 1/3 CLEAN D.O.T. SAND.
6. PRIOR TO INSTALLATION OF PLANT MATERIAL, CONTRACTOR SHALL WATER-IN IMPORTED SOIL BACKFILL, TO 2'-0" DEPTH, TO REMOVE ALL AIR POCKETS. CONTRACTOR SHALL PERFORM THIS TASK TWICE, TWO WEEKS APART. MECHANICAL COMPACTION OF PLANTING AREAS, WHERE LIVING SPECIES ARE TO BE LOCATED, IS PROHIBITED.

2 SOIL BACKFILL SPECIFICATIONS

LL-04 SCALE: N/A

4

LL-04 SCALE:

9

LL-04 SCALE:

Bermello Ajamil & Partners

Architecture • Engineering • Planning
Interior Design • Landscape Architecture
2601 South Bayshore Drive
Suite 1000
Miami, Florida 33133
(305) 859-2050
Fax (305) 860-3700

PREPARED FOR/OWNER:
CITY OF KEY WEST, FL
1300 WHITE STREET
KEY WEST, FL 33040

PROJECT NAME:

TRUMAN WATERFRONT PARK FRUIT TREE GROVE

PROJECT LOCATION/ADDRESS:

TRUMAN WATERFRONT PARK
EAST QUAY ROAD
KEY WEST, FLORIDA 33040

SUB-CONSULTANT INFORMATION:

PROFESSIONAL SEAL:

REGISTERED LANDSCAPE ARCHITECT KIRK J. OLNEY LA0001705 STATE OF FLORIDA

KIRK J. OLNEY
FLORIDA REGISTERED LANDSCAPE
LA0001705

SUBMITTAL DESCRIPTION / MILESTONE:

100% CD'S
NOVEMBER 22, 2017

REVISIONS:

Revised 8/29/2018 CKW

DRAWING SHEET INFORMATION

BA PROJECT NO.:	17073.000
SCALE:	N/A
DATE:	OCTOBER 09, 2017
DRAWN BY:	KJO
CHECKED BY:	RPH

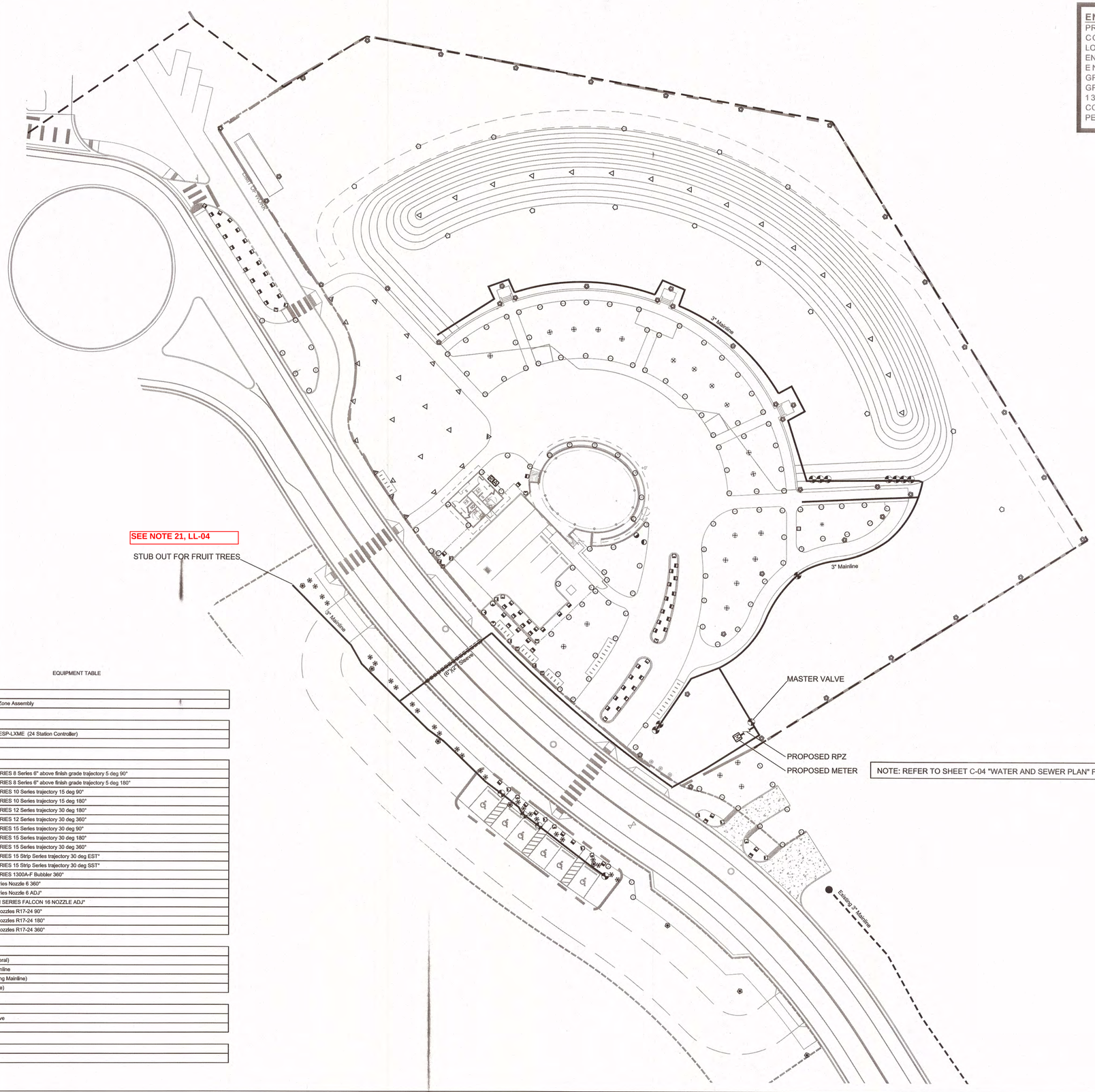
DRAWING TITLE:

PLANT MATERIAL LIST, LANDSCAPE NOTES, & SOIL BACKFILL SPEC.

SHEET NO.

LL-04

ENVIRONMENTAL LAND USE CONTROLS NOTE:
PRIOR TO ANY AND ALL CONSTRUCTION ACTIVITIES, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING IF LOCATION OF CONSTRUCTION ACTIVITIES ARE SUBJECT TO ENVIRONMENTAL LAND USE CONTROLS (LUC). ANY AND ALL ENCOUNTERED CONTAMINATED SOIL AND OR GROUNDWATER SHALL BE HANDLED PER THE "SOIL AND GROUND WATER MANAGEMENT PLAN", DATED FEBRUARY 13, 2015 INCLUDED IN THE PROJECT MANUAL. CONTRACTOR SHALL VERIFY THAT LUC CONSTRUCTION PERMIT HAS BEEN FILED AND APPROVED FOR THIS WORK.



NOTE: REFER TO SHEET C-04 "WATER AND SEWER PLAN" FOR PROPOSED METER SERVICE LOCATION.

EQUIPMENT TABLE

Backflow Preventers

Symbol	Description
	Reduced Pressure Zone Assembly

Controllers

Symbol	Description
	Rainbird Controller ESP-LXME (24 Station Controller)
	Rain Sensor

Irrigation Heads

Symbol	Description
	RAINBIRD 1800 SERIES 8 Series 6" above finish grade trajectory 5 deg 90°
	RAINBIRD 1800 SERIES 8 Series 6" above finish grade trajectory 5 deg 180°
	RAINBIRD 1800 SERIES 10 Series trajectory 15 deg 90°
	RAINBIRD 1800 SERIES 10 Series trajectory 15 deg 180°
	RAINBIRD 1800 SERIES 12 Series trajectory 30 deg 180°
	RAINBIRD 1800 SERIES 12 Series trajectory 30 deg 360°
	RAINBIRD 1800 SERIES 15 Series trajectory 30 deg 90°
	RAINBIRD 1800 SERIES 15 Series trajectory 30 deg 180°
	RAINBIRD 1800 SERIES 15 Series trajectory 30 deg 360°
	RAINBIRD 1800 SERIES 15 Strip Series trajectory 30 deg EST°
	RAINBIRD 1800 SERIES 15 Strip Series trajectory 30 deg SST°
	RAINBIRD 1800 SERIES 1300A-F Bubbler 360°
	RAINBIRD 5000 Series Nozzle 6 360°
	RAINBIRD 5000 Series Nozzle 6 ADJ°
	RAINBIRD FALCON SERIES FALCON 16 NOZZLE ADJ°
	RAINBIRD Rotary Nozzles R17-24 90°
	RAINBIRD Rotary Nozzles R17-24 180°
	RAINBIRD Rotary Nozzles R17-24 360°

Pipe

Symbol	Description
	Class 160 PVC (Lateral)
	SCD 40 PVC 3" Mainline
	SCH 40 PVC (Existing Mainline)
	SCH 40 PVC (Sleeve)

Valves

Symbol	Description
	RAINBIRD PGA Valve
	Master Valve

Water Meters

Symbol	Description
	Water Meter 1-1/2"

BERMELLO AJAMIL & PARTNERS • INC
Architecture • Engineering • Planning
Interior Design • Landscape Architecture
2601 South Bayshore Drive
Suite 1000
Miami, Florida 33133
(305) 859-2050
Fax (305) 860-3700

PREPARED FOR/OWNER:
CITY OF KEY WEST, FL
P. O. BOX 1409
3140 FLAGLER AVENUE
KEY WEST, FL 33041

PROJECT NAME:
TRUMAN WATERFRONT PARK AMPHITHEATER

PROJECT LOCATION/ADDRESS:
TRUMAN WATERFRONT PARK

SUB-CONSULTANT INFORMATION:

DIXIE LANDSCAPE
12950 Northwest 113 Ct.
Miami, FL 33178
P. 305-884-5700 F. 305-884-8843

PROFESSIONAL ARCHITECT:
REGISTERED LANDSCAPE ARCHITECT
DIEGO JOSE VANDERBIEST
LA6667355
STATE OF FLORIDA

DIEGO J. VANDERBIEST, RLA
FLORIDA NO. 6667355

SUBMITTAL DESCRIPTION / MILESTONE:

RECORD DRAWINGS
PER CONTRACTOR
MARK-UP
May 15, 2018

REVISIONS:

1	2018-05-15	CONTRACTOR AS-BUILT MARK-UP

DRAWING SHEET INFORMATION

BA PROJECT NO.:	15086
SCALE:	1" = 30'-0"
DATE:	
DRAWN BY:	kk
CHECKED BY:	DV

DRAWING TITLE:
IRRIGATION PLAN

SHEET NO.
IR-01

Irrigation Notes

LAYOUT

LAYOUT IRRIGATION SYSTEM MAINLINES AND LATERAL LINES. MAKE ALL NECESSARY ADJUSTMENTS AS REQUIRED TO TAKE INTO ACCOUNT ALL SITE OBSTRUCTIONS AND LIMITATIONS PRIOR TO EXCAVATING TRENCHES.

FLAG ALL SPRINKLER HEAD LOCATIONS. ADJUST LOCATION AND MAKE THE NECESSARY MODIFICATIONS TO NOZZLE TYPES ETC. AS REQUIRED TO INSURE 100% COVERAGE AND 50% OVERLAP.

LOW ANGLE TRAJECTORY NOZZLES SHALL BE USED WHEN ALL SPRINKLERS AND ROTORS ARE LOCATED WITHIN 100' OF POOLS OR PUBLIC GATHERING AREAS.

PIPE

PIPE LOCATIONS SHOWN ON PLAN ARE SCHEMATIC ONLY AND SHALL BE ADJUSTED IN THE FIELD. WHEN LAYING-OUT MAINS AND LATERALS, LOCATE PIPE NEAR EDGES OF PAVEMENT OR AGAINST BUILDINGS WHEREVER POSSIBLE TO ALLOW SPACE FOR PLANT ROOT BALLS.

PIPING UNDER HARDSCAPES SUCH AS ROADS, WALKS, AND PATIOS ARE TO BE SLEEVED USING SCH. 40 PIPE.

PIPES 4" AND UNDER TO BE SOLVENT WELD. LARGER PIPES TO BE GASKETED 'O' RING PIPES AND USE THRUST BLOCKS OR MEGA LUGS AND DUCTILE IRON FITTINGS AT TURNING LOCATIONS.

*SIZE ALL PIPE SO NOT TO EXCEED 5' PER SECOND
*INSTALL RAIN SENSOR AS PER LOCAL CODE

PIPES CONVEYING RECLAIM WATER SHALL HAVE A 3' HORIZONTAL DISTANCE SEPARATION FROM OTHER PIPING OR UTILITY SERVICES. AN 18" VERTICAL SEPARATION SHALL BE MAINTAINED WHEN APPLICABLE.

AIR RELEASE VALVES TO BE USED AT THE END OF ALL MAINLINE RUNS.

WIRES

LOW VOLTAGE WIRE TO BE INSTALLED ALONG MAINLINE INSTALLATION. USE 2" SCH. 40 PVC WITH SWEEP ELBOWS AT TURNING LOCATIONS WHEN SLEEVING IS REQUIRED. ALL SPLICES SHALL BE ENCLOSED WITHIN A VALVE/SPLICE BOX AND ALL WIRE SPLICES SHALL BE INSTALLED USING WATERPROOF CONNECTORS. WIRES SHALL BE TAPED EVERY TWENTY LINEAL FEET WITH ADEQUATE SLACK FOR EXPANSION.

WIRE SIZED AND COLORED AS FOLLOWS:
#12 WHITE FOR COMMON
#12 SPARE BLACK COMMON (1 SPARE NEEDED PER 10 HOT WIRES)
#14 RED HOT WIRES
#14 SPARE YELLOW HOT WIRE (1 SPARES NEEDED PER 10 HOT WIRES, 3 SPARE MINIMUM)

WHEN WIRE RUNS EXCEEDS 3,500 LINEAR FEET, USE #10 FOR COMMON WIRES AND #12 FOR HOT/SPARE WIRES.

ALL IRRIGATION CONTROLLERS TO BE PROPERLY GROUNDED IN ACCORDANCE WITH MANUFACTURE'S RECOMMENDATIONS.

FLUSHING

PRIOR TO PLACEMENT OF HEADS FLUSH ALL LINES UNTIL LINES ARE COMPLETELY CLEAN OF DEBRIS.

TRENCHING

TRENCH BOTTOM TO BE UNIFORM AND FREE OF DEBRIS. NATIVE EXCAVATED MATERIAL USED TO BACKFILL TRENCH SHALL BE FREE FROM ROCKS OR STONES LARGER THAN 1" IN DIAMETER.

MISC.

PRESSURE TEST MAINLINE AS PER FLORIDA BUILDING CODE. INSTALL IRRIGATION SYSTEM AS PER LATEST EDITION OF THE FLORIDA BUILDING CODE, APPENDIX F., AND ALL PERTINENT LOCAL CODES.

SPRAY HEADS INSTALLED IN SHRUB AREAS TO BE 12 INCH POP-UPS OR INSTALLED ON RISERS.

DESIGN

THIS DESIGN IS DIAGRAMMATIC. ALL IRRIGATION EQUIPMENT SUCH AS PIPES, VALVES, , ETC., SHOWN WITHIN PERVIOUS AREAS ARE FOR DESIGN CLARIFICATION ONLY. THE IRRIGATION CONTRACTOR SHALL INSTALL IRRIGATION EQUIPMENT IN PLANTING AREAS WHEREVER POSSIBLE.

THE IRRIGATION CONTRACTOR IS RESPONSIBLE TO FAMILIARIZE741 THEMSELVES WITH THE SCOPE OF WORK, INCLUDING BUT NOT LIMITED TO GRADE DIFFERENCES, LOCATION OF WALLS, STRUCTURES, UTILITIES AND EXISTING IRRIGATION EQUIPMENT. THE IRRIGATION CONTRACTOR IS RESPONSIBLE SHALL REPAIR AND/OR REPLACE ANY DAMAGE CREATED BY THEIR WORK. THEY SHALL COORDINATE HIS WORK WITH OTHER CONTRACTOR OR MUNICIPAL AUTHORITIES FOR THE LOCATION AND INSTALLATION OF IRRIGATION EQUIPMENT UNDER ROADWAYS AND PAVING, SLEEVES THROUGH WALLS AND FLOORS, ETC.

INSTALL ALL IRRIGATION EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS AND SPECIFICATIONS. SUBSTITUTIONS FOR IRRIGATION EQUIPMENT TO BE APPROVED BY THE IRRIGATION DESIGNER. EQUIPMENT CHANGES TO INCLUDE BUT NOT LIMITED TO PUMP, CONTROLLER, SPRAY HEADS, ROTORS, AND VALVES.

DO NOT INSTALL IRRIGATION EQUIPMENT AS SHOWN ON THE DRAWINGS WHEN FIELD CONDITIONS DIFFER. OBSTRUCTIONS OR DIFFERENCES TO BE BROUGHT TO THE ATTENTION OF THE ARCHITECT. IN THE EVENT THIS NOTIFICATION IS NOT PERFORMED, THE IRRIGATION CONTRACTOR TO ASSUME FULL RESPONSIBILITY.

IRRIGATION AUDIT PROCEDURE

1. INSPECT EVERY IRRIGATION ZONE AND PROVIDE A WRITTEN REPORT DESCRIBING PROBLEMS. THE REPORT TO INCLUDE A LIST OF EACH ZONE INSPECTED. USE THE FOLLOWING LIST TO ASSIST IN THE REPORT (SEE BELOW).

- TURN OFF EACH ZONE FROM THE CONTROLLER (WHEN POSSIBLE) TO VERIFY AUTOMATIC OPERATION. FOR BATTERY OPERATED ZONES, TURN ZONES ON AT BATTERY CONTROLLERS.
- CHECK REMOTE CONTROL VALVES TO ENSURE PROPER OPERATION.
- CHECK SETTING ON PRESSURE REGULATOR TO ENSURE PROPER SETTING.
- CHECK FLOW CONTROL AND ADJUST AS NEEDED. ENSURE VALVE IS CLOSED WITHIN 10-15 SECONDS AFTER VALVE HAS BEEN TURNED OFF.
- CHECK FOR LEAKS IN MAINLINE, LATERAL LINES, VALVES AND HEADS.
- CHECK SPRAY HEADS AND ROTORS TO ENSURE PROPER OPERATION. (e.g. LEAKS, POP-UP HEIGHT, PROPER PATTERN, AND PROPER ALIGNMENT.)

2. CHECK PUMP STATION FOR PROPER OPERATION, WATER VOLUME, FLOW RATE, PRESSURE AND PUMP CAPABILITIES.

3. INSPECT ALL FILTERS.

4. CHECK THE CONTROLLER FOR PROPER GROUNDING.

5. CHECK RAIN SHUT-OFF DEVICE FOR PROPER OPERATION.

6. INSPECT ALL VALVE BOXES AND COVERS TO ENSURE GOOD CONDITION.

7. CONDUCT ANY ADDITIONAL INSPECTIONS IF NECESSARY.

ADDITIONAL NOTES:

- IRRIGATION DESIGN IS SCHEMATIC BY NATURE. EXISTING IRRIGATION EQUIPMENT AND MAINLINE TO BE FIELD VERIFIED BY IRRIGATION CONTRACTOR.
- PRIOR TO ANY WORK, THE IRRIGATION CONTRACTOR MUST COORDINATE AN ON-SITE IRRIGATION MEETING WITH THE LANDSCAPE ARCHITECT AND/OR GENERAL CONTRACTOR IN ADVANCE OF ANY SITE CLEARING OPERATIONS.
- CONNECT TO EXISTING IRRIGATION SYSTEM AT TRUMAN AMPHITHEATER.

EQUIPMENT TABLE

Irrigation Heads

Symbol	Description
	RAINBIRD 1800 SERIES 8 Series 6" above finish grade trajectory 5 deg 90°
	RAINBIRD 1800 SERIES 8 Series 6" above finish grade trajectory 5 deg 180°
	RAINBIRD 1800 SERIES 10 Series trajectory 15 deg 180°
	RAINBIRD 1800 SERIES 12 Series trajectory 30 deg 90°
	RAINBIRD 1800 SERIES 12 Series trajectory 30 deg 180°
	RAINBIRD 1800 SERIES 15 Series trajectory 30 deg 90°
	RAINBIRD 1800 SERIES 15 Series trajectory 30 deg 180°
	RAINBIRD 1800 SERIES 15 Strip Series trajectory 30 deg EST°

Pipe (Lateral)

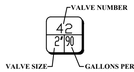
Symbol	Description
———	Class 160 PVC (Lateral)

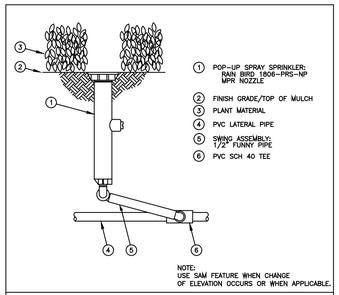
Pipe (Sleeve)

Symbol	Description
	Schedule 40 PVC Pipe

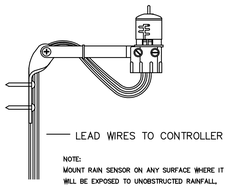
Valves

Symbol	Description
	Rainbird PGA Valve

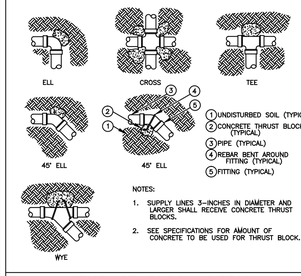




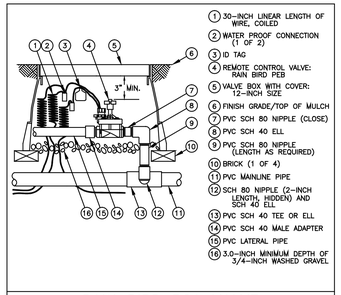
RAIN BIRD 1800 SERIES SPRINKLER



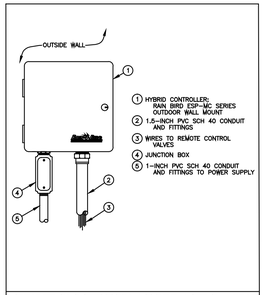
RAIN BIRD RAIN SENSOR



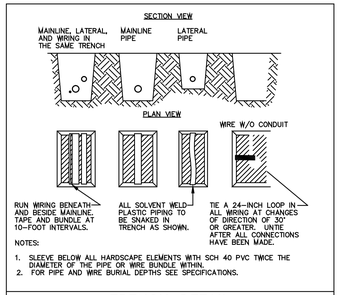
THRUST BLOCK DETAIL



RAIN BIRD PGA VALVE



RAIN BIRD CONTROLLER DETAIL



TRENCH DETAIL

Bermello Ajamil & Partners
Architecture Engineering Planning
Interior Design Landscape Architecture
2601 South Bayshore Drive
Suite 1000
Miami, Florida 33133
(305) 859-2050
Fax (305) 860-3700

PREPARED FOR/OWNER:
CITY OF KEY WEST, FL
1300 WHITE STREET
KEY WEST, FL 33040

PROJECT NAME:

TRUMAN WATERFRONT PARK FRUIT TREE GROVE

PROJECT LOCATION/ADDRESS:

TRUMAN WATERFRONT PARK
EAST QUAY ROAD
KEY WEST, FLORIDA 33040

SUB-CONSULTANT INFORMATION:

IRRIGATION DESIGNER:
Dixie Landscape
12950 NW 113 Ct
Miami, FL 33178
Tel: 305-884-5700
Fax: 305-882-7043
www.dixielandscape.com

PROFESSIONAL SEAL:

NAME: DIEGO J. VANDERBIEST
FLORIDA REGISTERED LANDSCAPE
LA LICENSE No.: 6667355

SUBMITTAL DESCRIPTION / MILESTONE:

100% CD'S
NOVEMBER 22, 2017

REVISIONS:

DRAWING SHEET INFORMATION

BA PROJECT NO.:	17073.000
SCALE:	N/A
DATE:	OCTOBER 09, 2017
DRAWN BY:	EH
CHECKED BY:	EH

DRAWING TITLE:

IRRIGATION DETAILS

SHEET NO.

IR-02