

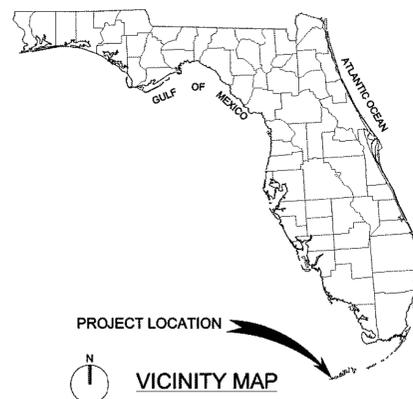
CITY OF KEY WEST

DENNIS STREET STORMWATER PUMP STATION

CITY OF KEY WEST PROJECT NO.: 193108

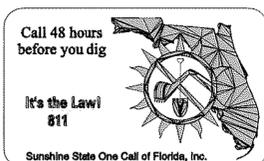
CITY OF KEY WEST ITB NO.:

MARCH 2019



DRAWING INDEX

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| 4 | C-102 | MANHOLE INSTALLATION PLAN AND PROFILE |
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| 37 | I-101 | P&ID - PUMP STATION |
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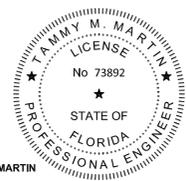


Black & Veatch Corporation
 2855 N. University Drive, Suite 210
 Coral Springs, FL 33065 Certificate No. 8132

**ISSUED FOR CONSTRUCTION
 FINAL SUBMITTAL**



Date:
 Engineer of Record: TAMMY M. MARTIN
 Florida License No. 73892



193108
 SHEET
 1 OF 39



| NO. | DATE | REVISIONS AND RECORD OF USE | BY |
|-----|------|-----------------------------|----|
| | | | |
| | | | |
| | | | |
| | | | |

T. MARTIN
 PROFESSIONAL ENGINEER
 STATE OF FLORIDA
 License No. 73882
 Date: _____
 Engineer of Record:
 TAMMY M. MARTIN
 Florida License No.:
 No. 73892

BLACK & VEATCH
 Black & Veatch Corporation
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 Coral Springs, FL 33065 Certificate No. 8132

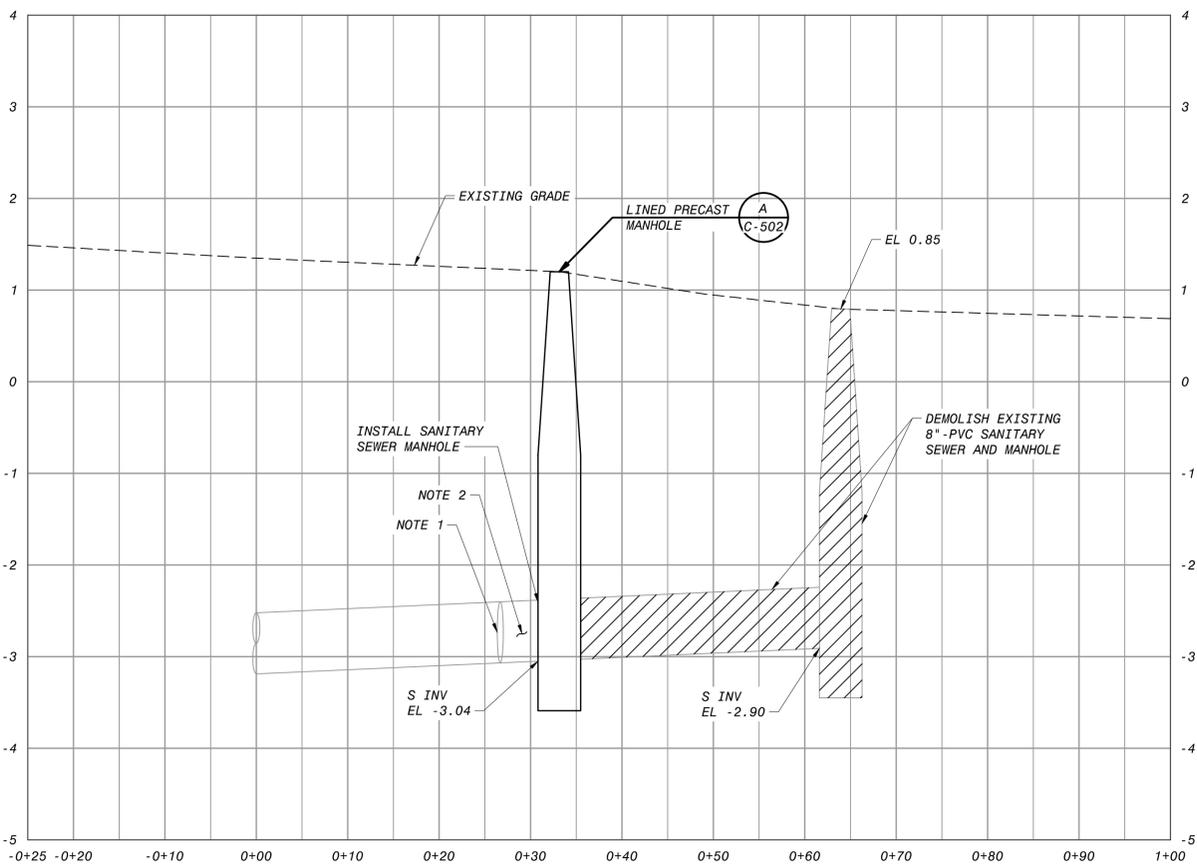
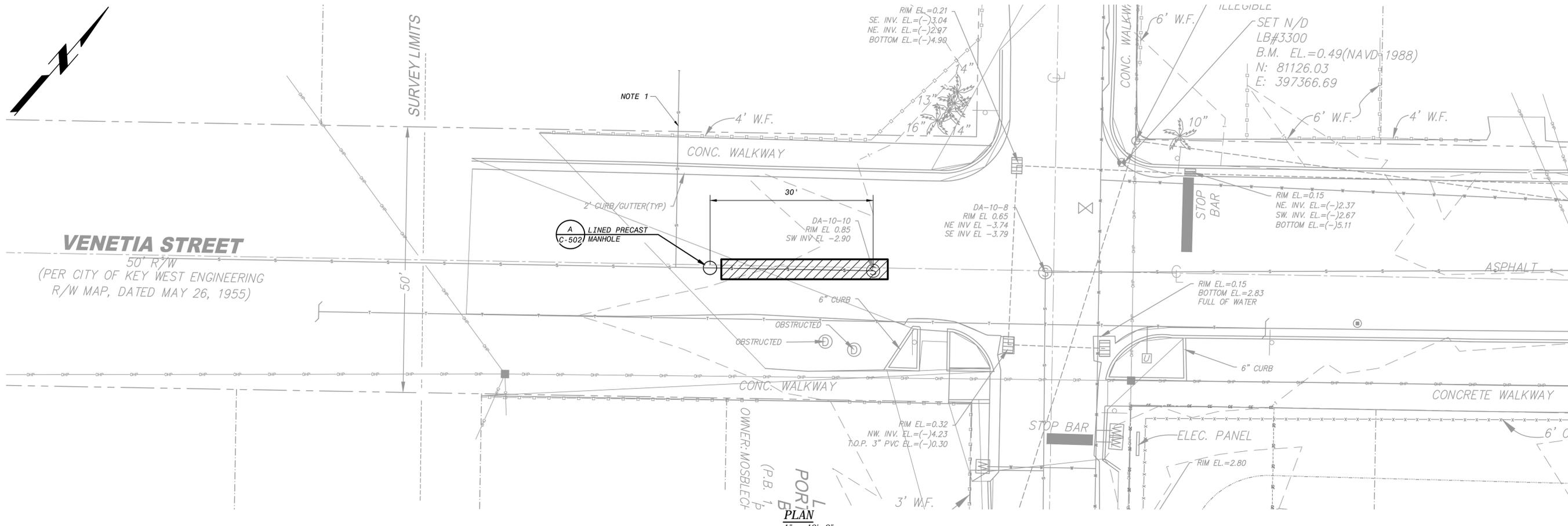
CITY OF KEY WEST
DENNIS STREET STORMWATER
PUMP STATION
 CIVIL
 OVERALL SITE PLAN

DESIGNED: MLM
 DETAILED: NGH
 CHECKED: ICB
 APPROVED: TMM
 DATE: MARCH 2019

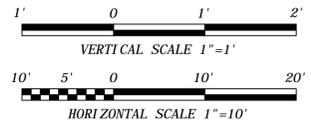
0 1/2 1
 IF THIS BAR DOES NOT
 MEASURE 1" THEN DRAWING IS
 NOT TO FULL SCALE

PROJECT NO.
 193108
C-101
 SHEET
 3 OF 39

ISSUED FOR CONSTRUCTION



- NOTES:**
1. LOCATION OF LATERAL FOR REFERENCE ONLY, CONTRACTOR SHALL LOCATE ALL EXISTING LATERALS PRIOR TO CONSTRUCTION.
 2. CONTRACTOR TO PROVIDE MEANS OF ISOLATION OF EXISTING SEWER GRAVITY MAIN UPSTREAM OF EXISTING LATERAL.
 3. DEMOLITION WORK AND NEW MANHOLE INSTALLATION REQUIRED PRIOR TO PUMP STATION AND VALVE VAULT CONSTRUCTION.



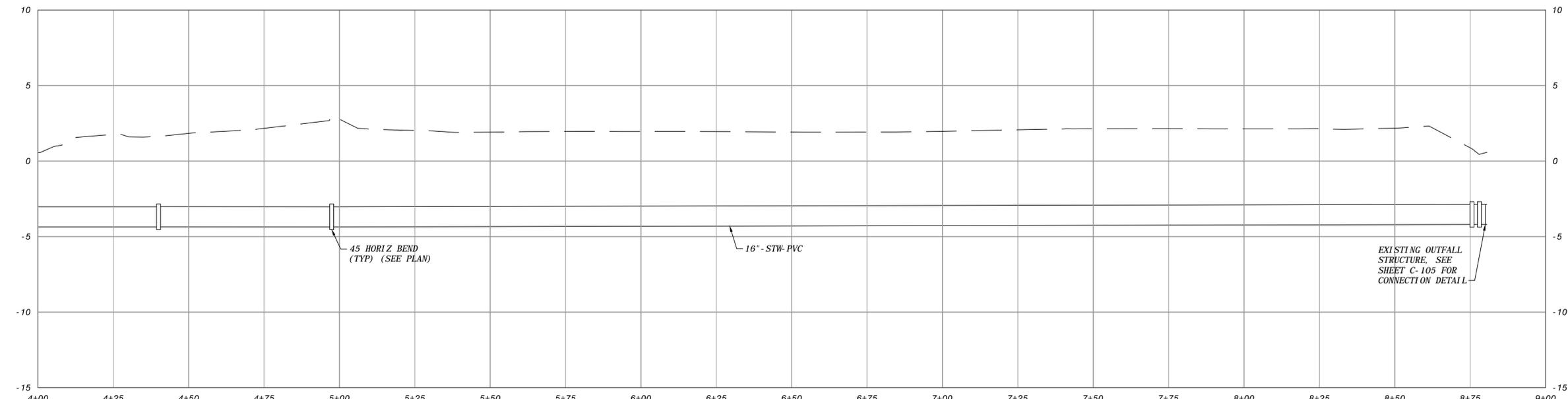
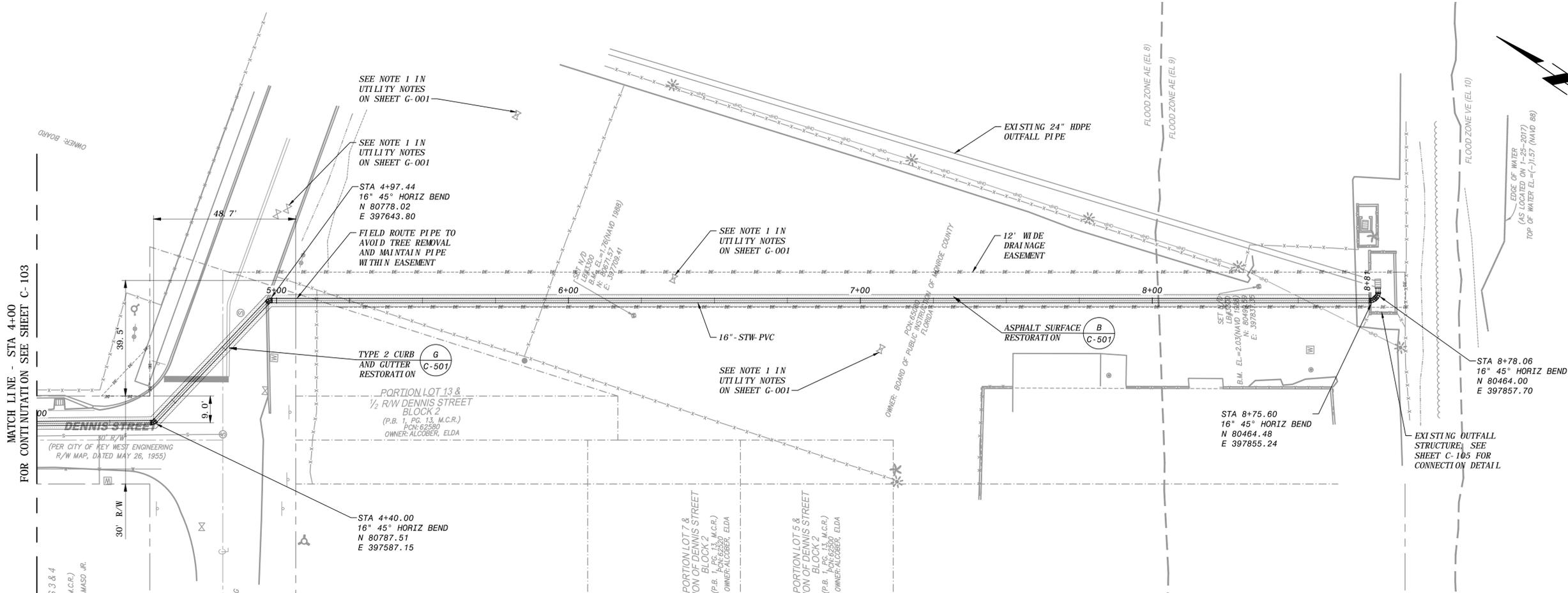
ISSUED FOR CONSTRUCTION

C-104.dwg
 VAN16643, 9/11/2017 7:40:44 AM
 VAN16643, 9/11/2017 7:38:44 AM
 5/15/2018
 D3000

| <p>CITY OF KEY WEST DENNIS STREET STORMWATER PUMP STATION</p> | <p>CIVIL MANHOLE INSTALLATION PLAN AND PROFILE</p> | | | | | | |
|--|--|------|----|--|--|--|-------------|
| <p>BLACK & VEATCH</p> <p>Black & Veatch Corporation 2855 N. University Drive, Suite 210 Coral Springs, FL 33065 Certificate No. 8132</p> | | | | | | | |
| <p>DESIGNED: MLM DETAILED: NGH CHECKED: ICB APPROVED: TMM DATE: MARCH 2019</p> | | | | | | | |
| <p>PROJECT NO. 193108</p> <p>C-102 SHEET 4 OF 39</p> | | | | | | | |
| <p>REVISIONS AND RECORD OF USE</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>DATE</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> | NO. | DATE | BY | | | | <p>DATE</p> |
| NO. | DATE | BY | | | | | |
| | | | | | | | |



Date: _____
 Engineer of Record:
TAMMIE M. MARTIN
 Florida License No.:
 No. 73892



- NOTES:**
- FOR CURB AND GUTTER RESTORATION NOT CALLED OUT ON DRAWING USE TYPE C CURB AND GUTTER. DETAIL ON SHEET C-501.
 - FOR EMBEDMENT DETAIL AND TRENCH WIDTHS SEE SPECIFICATION 02202 TRENCHING AND BACKFILLING.
 - CALL BEFORE YOU DIG. CONTRACTOR SHALL VERIFY PRECISE LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STRUCTURES, WHETHER INDICATED ON THE DRAWINGS OR NOT, IN THE FIELD IN ADVANCE OF EXCAVATION. THE CONTRACTOR SHALL CONTACT FLORIDA SUNSHINE ONE TO VERIFY UNDERGROUND UTILITIES WITHIN THE PROJECT SITE. THE FLORIDA SUNSHINE ONE TELEPHONE NUMBER IS 811.
 - CONTRACTOR SHALL MAINTAIN MIN 12" SEPERATION BETWEEN EXISTING UTILITIES AND NEW PIPE.
 - CONTRACTOR SHALL MAINTAIN A MINIMUM OF 3' OF PIPE COVER.



REVISIONS AND RECORD OF USE

| NO. | DATE | BY |
|-----|------|----|
| | | |

DATE: _____

BY: CHK/APP

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Engineer of Record:
 TAMMY M. MARTIN
 Florida License No. 73882

CITY OF KEY WEST
 DENNIS STREET STORMWATER
 PUMP STATION

CIVIL
 PLAN AND PROFILE 2 OF 2

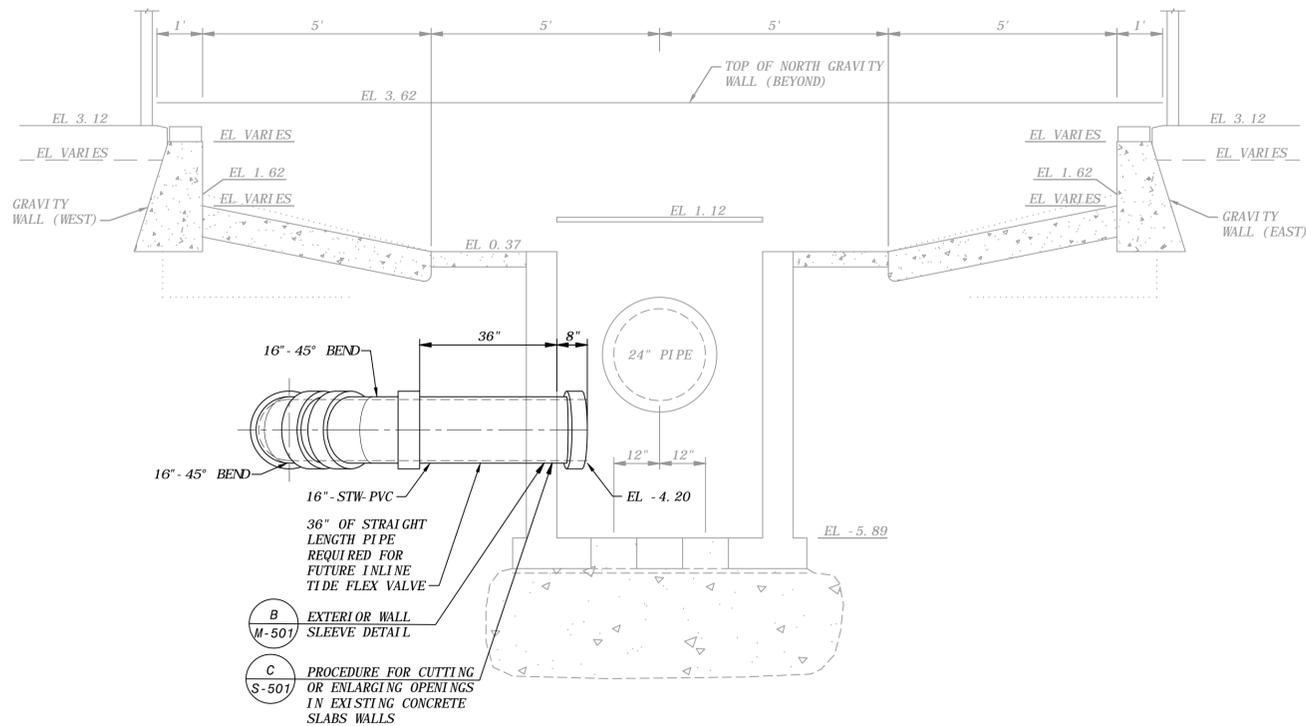
DESIGNED: MLM
 DETAILED: NGH
 CHECKED: ICB
 APPROVED: TMM
 DATE: MARCH 2019

PROJECT NO.
 193108

C-104
 SHEET
 6 OF 39

ISSUED FOR CONSTRUCTION

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 5/13/08
 D3000

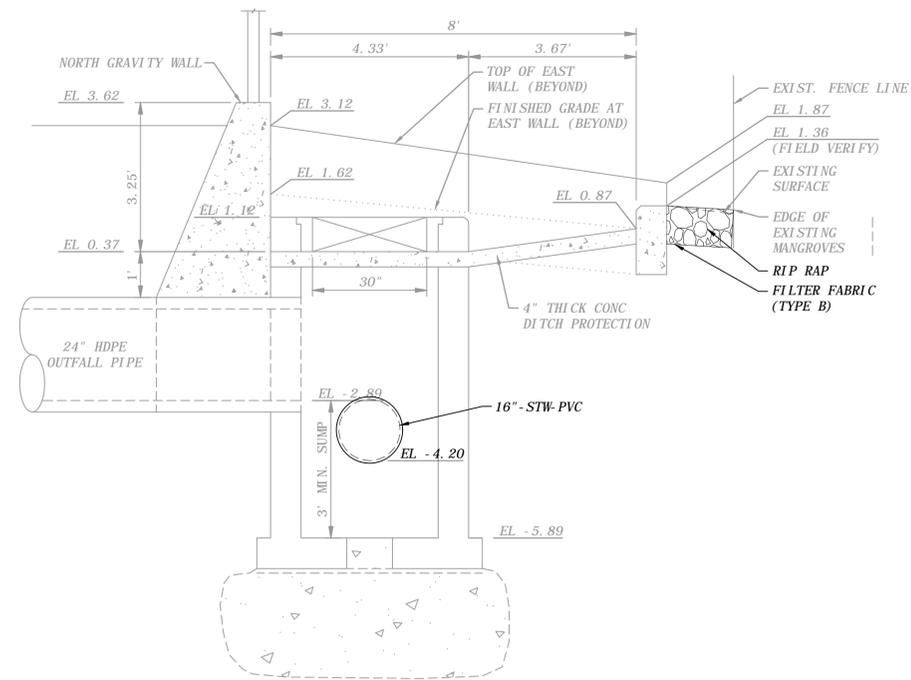


01 EXISTING OUTFALL SECTION
SCALE 1"=2"

NOTE:

- ELEVATIONS ARE BASED OFF SFWMD ERP PERMIT NO. 44-00281-P DRAWINGS FOR INSTALLATION OF EXISTING OUTFALL AND SURVEY REPORT FROM 1/25/2017.
- IF EXISTING OUTFALL STRUCTURE IS DAMAGED BY CONTRACTOR, IT SHALL BE REPAIRED IN KIND.

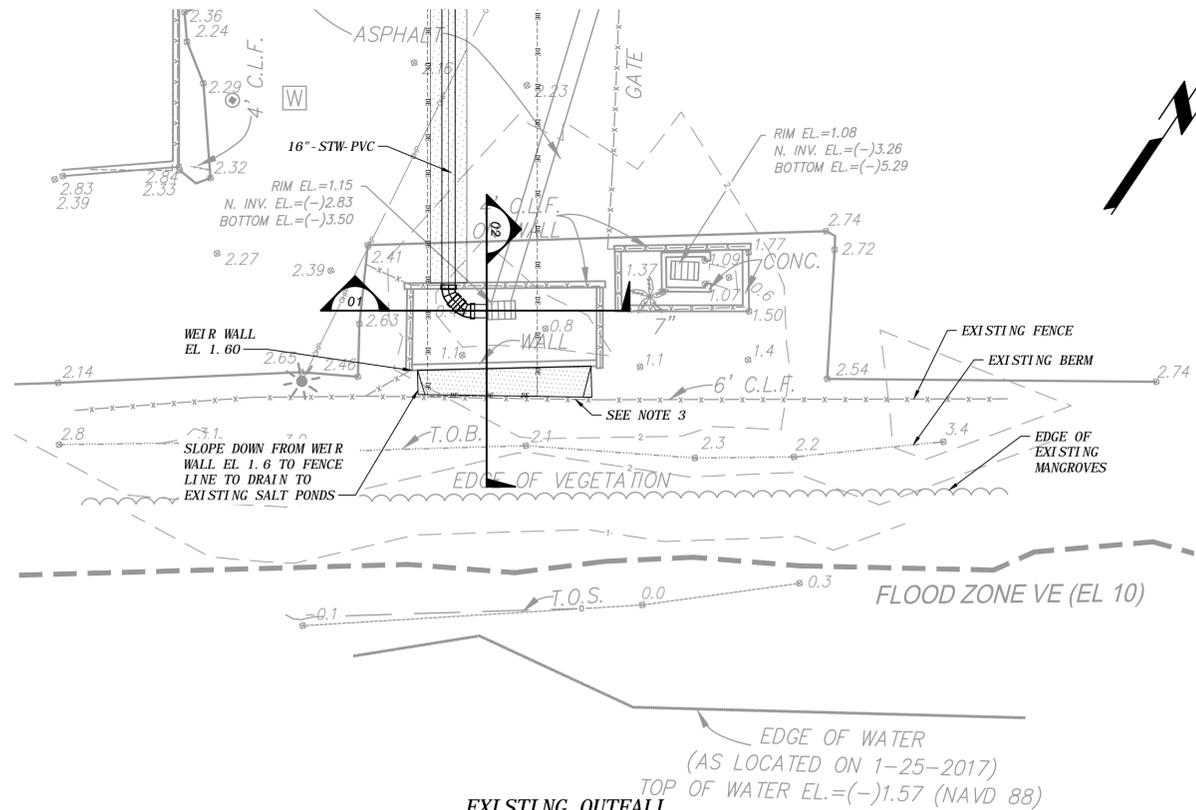
- B** EXTERIOR WALL SLEEVE DETAIL
- C** PROCEDURE FOR CUTTING OR ENLARGING OPENINGS IN EXISTING CONCRETE SLABS WALLS



02 EXISTING OUTFALL SECTION
SCALE 1"=2"

NOTE:

- ELEVATIONS ARE BASED OFF SFWMD ERP PERMIT NO. 44-00281-P DRAWINGS FOR INSTALLATION OF EXISTING OUTFALL AND SURVEY REPORT FROM 1/25/2017.
- MANGROVES CANNOT BE DISTURBED OR REMOVED DURING CONSTRUCTION.



04 EXISTING OUTFALL ENLARGED PLAN VIEW
SCALE 1"=10"

NOTE:

- MANGROVES CANNOT BE DISTURBED OR REMOVED DURING CONSTRUCTION.
- ELEVATIONS FROM SURVEY REPORT DATED 1/25/2017.
- FENCING SHOULD NOT BE DISTURBED.



EXISTING OUTFALL PHOTO

NOTE:

- MANGROVES CANNOT BE DISTURBED OR REMOVED DURING CONSTRUCTION.

| NO. | REVISIONS AND RECORD OF USE | DATE | BY |
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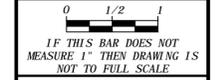


Date:
 Engineer of Record:
 TAMMIE M. MARTIN
 Florida License No.:
 No. 73882

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Black & Veatch Corporation
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Coral Springs, FL 33065 Certificate No. 8132

CITY OF KEY WEST
DENNIS STREET STORMWATER
PUMP STATION
CIVIL
EXISTING OUTFALL STRUCTURE
PLAN, SECTION AND DETAILS

DESIGNED: MLM
DETAILS: NGH
CHECKED: ICB
APPROVED: TMM
DATE: MARCH 2019

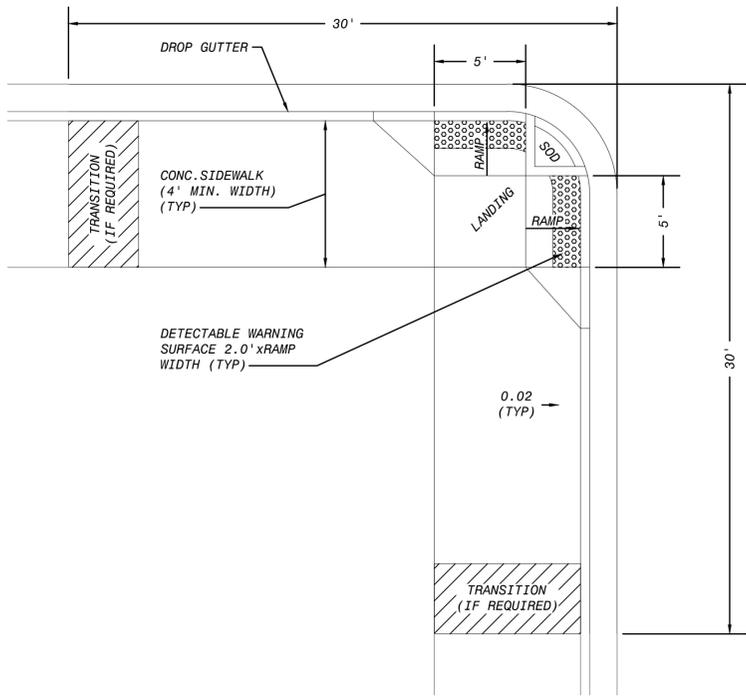


PROJECT NO.
193108
C-105
SHEET
7 OF 39

ISSUED FOR CONSTRUCTION

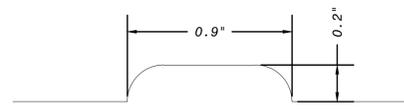
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8/23/2018
D3000

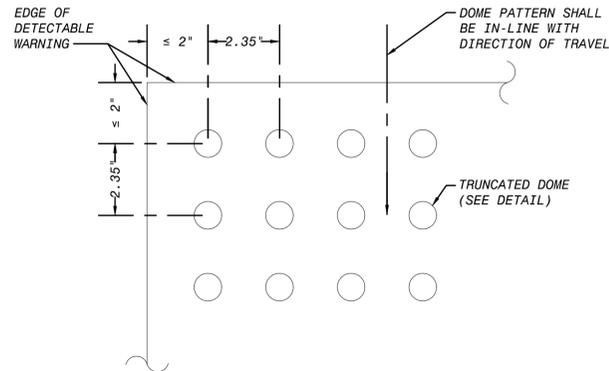


NOTES:

- ALL SIDEWALK ACCESS RAMPS SHALL BE IN ACCORDANCE WITH THIS DETAIL AND IN ACCORDANCE WITH FDOT INDEX 304. PUBLIC SIDEWALK CURB RAMPS, ACCESS RAMPS MUST COMPLY WITH THE AMERICANS WITH DISABILITIES ACT (ADA).
- EXCEPTIONS TO THE DETAIL AND THE PLAN SHEETS SHALL BE PRE-APPROVED BY THE CITY OF KEY WEST ENGINEER.
- CURB RAMP RUNNING SLOPES SHALL NOT BE STEEPER THAN 1:12 AND CROSS SLOPE SHALL BE 2% OR FLATTER. TRANSITION SLOPES SHALL NOT BE STEEPER THAN 1:12.
- WHERE A CURB RAMP IS CONSTRUCTED WITHIN EXISTING CURB, CURB AND GUTTER AND/OR SIDEWALK, THE EXISTING CURB OR CURB AND GUTTER SHALL BE REMOVED TO THE NEAREST JOINT BEYOND THE CURB TRANSITIONS OR TO THE EXTENT THAT NO REMAINING SECTION OF CURB OR CURB AND GUTTER IS LESS THAN 5 FT LONG. THE EXISTING SIDEWALK SHALL BE REMOVED TO THE NEAREST JOINT BEYOND THE TRANSITION SLOPE OR WALK AROUND OR TO THE EXTENT THAT NO REMAINING SECTION OR SIDEWALK IS LESS THAN 5FT LONG.



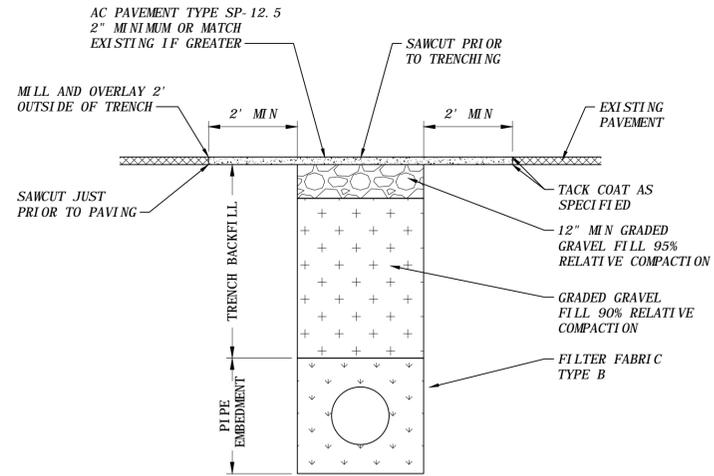
TRUNCATED DOME
NTS



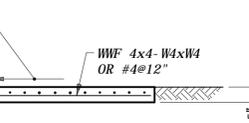
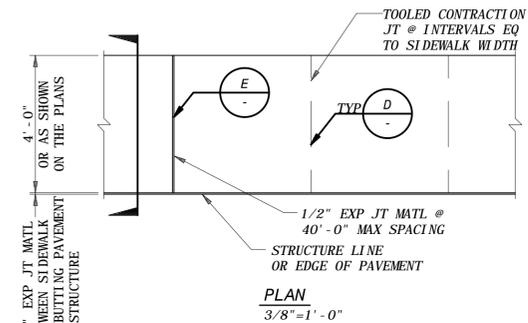
NOTES:

- ALL SIDEWALK CURB RAMPS SHALL HAVE DETECTABLE WARNING SURFACES THAT EXTEND THE FULL WIDTH OF THE RAMP AND IN THE DIRECTION OF TRAVEL 24 INCHES (610mm) FROM THE BACK OF CURB.
- ALL RAMPS SHALL BE CONSTRUCTED IN ACCORDANCE WITH FDOT DESIGN STANDARDS, LATEST EDITION, INDEX 304.
- ALL RAMP FINISHES SHALL MATCH EXISTING DESIGN.

DETECTABLE WARNING SURFACE DETAIL
NTS

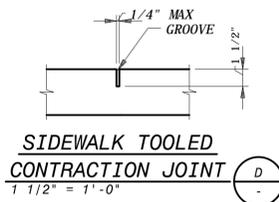


ASPHALT SURFACE RESTORATION
NTS

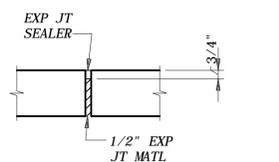


SECTION
1/2" = 1'-0"
SIDEWALK
SCALES AS SHOWN

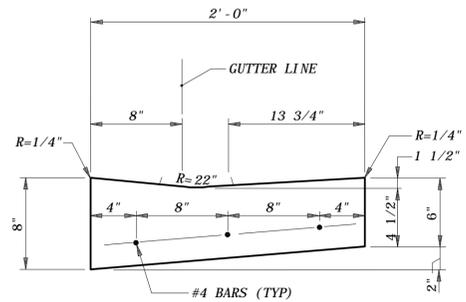
SIDEWALK ACCESS RAMPS
NTS



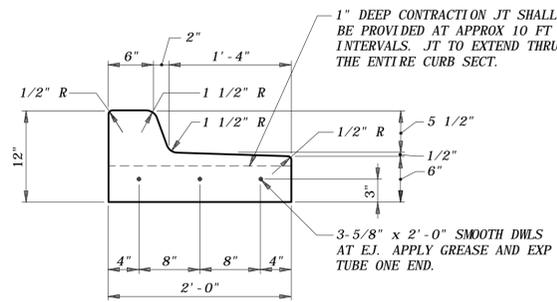
SIDEWALK TOOLED CONTRACTION JOINT
1/2" = 1'-0"



SIDEWALK EXPANSION JOINT
1/2" = 1'-0"



TYPE C CURB AND GUTTER
1" = 1'-0"



TYPE 2 CURB AND GUTTER
1" = 1'-0"

| | | | |
|------|-----------------------------|-----|---------|
| DATE | REVISIONS AND RECORD OF USE | NO. | BY |
| | | | CHK/APP |

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Engineer of Record:
 TAMMY M. MARTIN
 Florida License No. 73892

CITY OF KEY WEST
DENNIS STREET STORMWATER PUMP STATION

CIVIL
 STANDARD DETAILS 1 OF 2

| |
|------------------|
| DESIGNED: MLM |
| DETAILED: NGH |
| CHECKED: ICB |
| APPROVED: TMM |
| DATE: MARCH 2019 |

PROJECT NO.
 193108

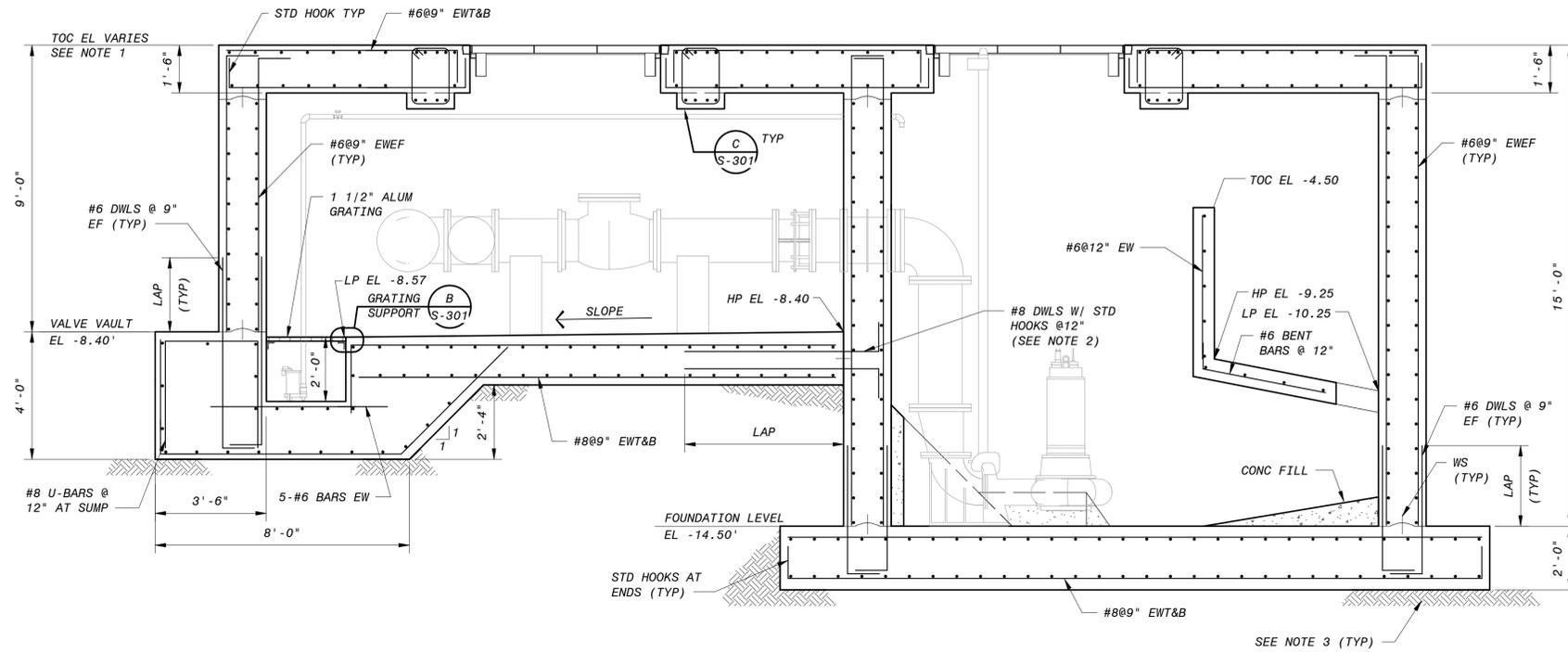
C-501
 SHEET
 10 OF 39

ISSUED FOR CONSTRUCTION

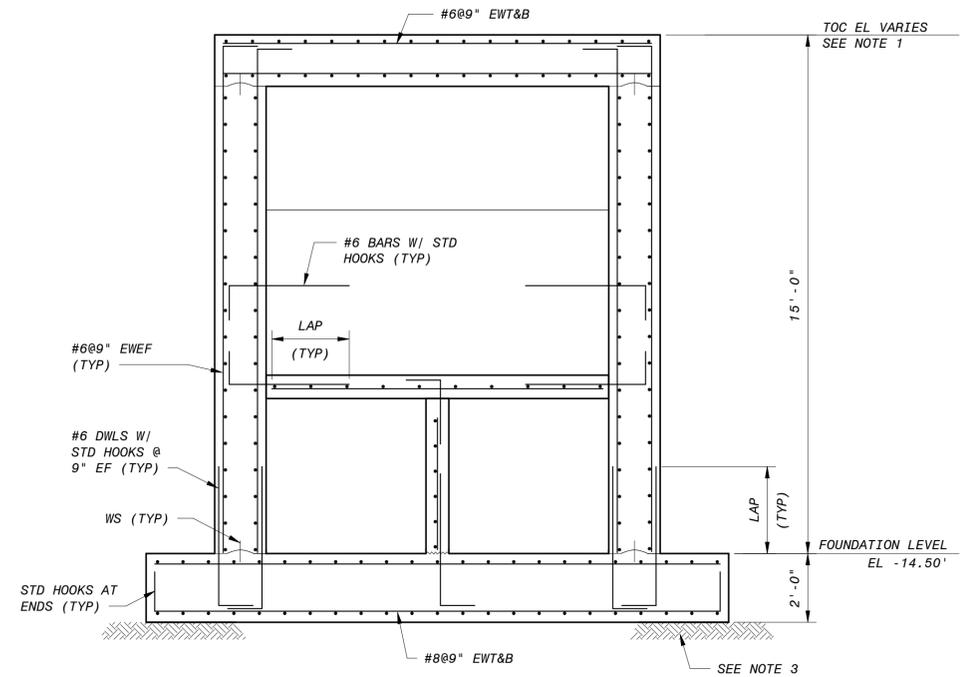
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 5/15/2018
 D3000

NOTES:

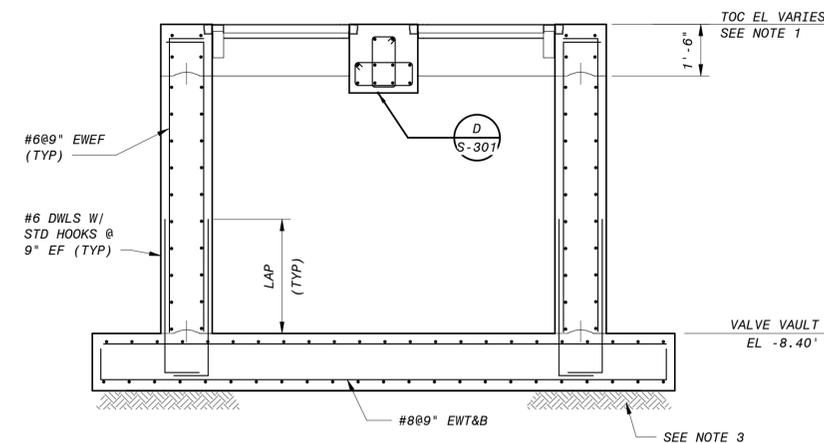
1. TOC EL TO MATCH SLOPING OF ADJACENT ROAD WHILE MAINTAINING 1'-6" MINIMUM TOP SLAB THICKNESS. REFER TO CIVIL DRAWINGS.
2. THREADED MECHANICAL INSERTS MAY BE USED AT CONTRACTOR'S OPTION.
3. 6" DEEP STRUCTURAL FILL COMPACTED 98%. SUBGRADE PREPARED IN ACCORDANCE WITH SPECIFICATIONS.



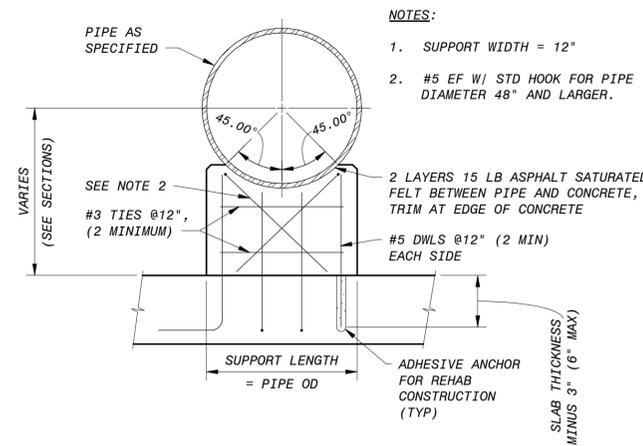
SECTION 1
S-101 3/8" = 1'-0"



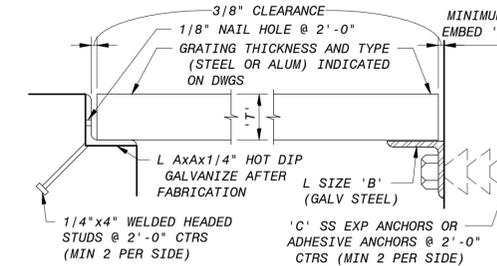
SECTION 2
S-101 3/8" = 1'-0"



SECTION 3
S-101 3/8" = 1'-0"



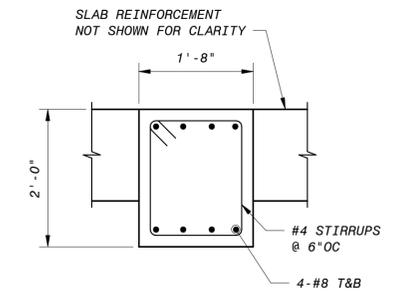
SECTION A
CONCRETE PIPE SUPPORT SADDLE
NO SCALE



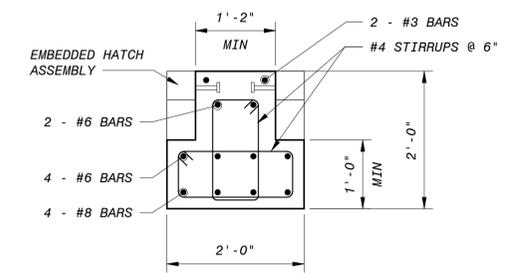
| GRATING THICKNESS ('T') | L SIZE AxAx1/4 | L SIZE 'B' | 'C' EXP ANCHOR DIA | 'C' EXP ANCHOR MIN 'E' |
|-------------------------|----------------|-----------------|--------------------|------------------------|
| 1 1/2 | 1 3/4 x 1 3/4 | 2 1/2x2 1/2x1/4 | 1/2" | 3 1/4" |

* TRIM AND BEVEL UPSTANDING LEG TO FIT

SECTION B
S-301 12" = 1'-0"



SECTION C
S-301 3/4" = 1'-0"



SECTION D
S-301 3/4" = 1'-0"

| NO. | BY | CHK | APP |
|-----|----|-----|-----|
| | | | |

ELIAS A. POURLADAN
No. 86809
STATE OF FLORIDA
PROFESSIONAL ENGINEER
Date: _____
Engineer of Record
ELIAS POURLADAN
2855 N. University Drive, Suite 210
Coral Springs, FL 33065
Florida License No.: 8132

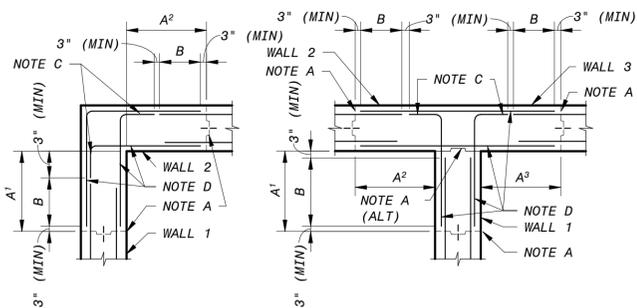
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Black & Veatch Corporation
2855 N. University Drive, Suite 210
Coral Springs, FL 33065
Certificate No. 8132

**CITY OF KEY WEST
DENNIS STREET STORMWATER
PUMP STATION
STRUCTURAL
PUMP STATION SECTIONS AND DETAILS**

DESIGNED: AT/JE/JHD
 DETAILED: TSH
 CHECKED: EAP
 APPROVED: EAP
 DATE: MARCH 2019

PROJECT NO.
193108
S-301
SHEET
15 OF 39

ISSUED FOR CONSTRUCTION



A = VERTICAL CONSTRUCTION JOINT NEAREST TO WALL CORNER.

A (ALT) = ALTERNATE VERTICAL CONSTRUCTION JOINT NEAREST TO WALL CORNER IN T WALL JOINT WHICH DOES NOT REQUIRE WATERSTOP.

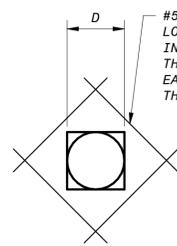
A^x = DISTANCE FROM INSIDE CORNER FACE TO NEAREST VERTICAL CONSTRUCTION JOINT IN SIMILARLY NUMBERED WALL. A^x SHALL NOT BE LESS THAN DIMENSIONS INDICATED BY THESE DETAILS; NOR GREATER THAN INDICATED ON PLAN DRAWINGS; BUT IN ANY CASE SHALL NOT EXCEED 30 FEET IN LIQUID CONTAINMENT STRUCTURES OR 40 FEET IN OTHER STRUCTURES. IN T WALL JOINTS WHICH DO NOT REQUIRE WATERSTOP, A1 MAY BE ZERO.

MAIN REINFORCEMENT FOR ALL STRUCTURES

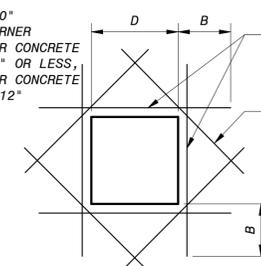
TYPICAL HORIZONTAL CORNER REINFORCING DETAILS

NOTES:

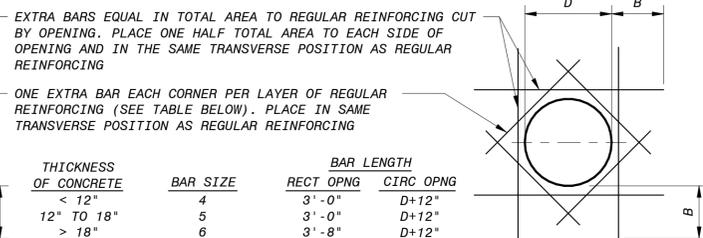
1. VERTICAL REINFORCING NOT SHOWN.
2. THESE DETAILS SHALL BE APPLICABLE TO ALL WALL CORNERS UNLESS NOTED OTHERWISE ON THE DRAWINGS.



FOR OPENINGS
12" <= D <= 21"



FOR RECTANGULAR OPENINGS
21" < D <= 72"



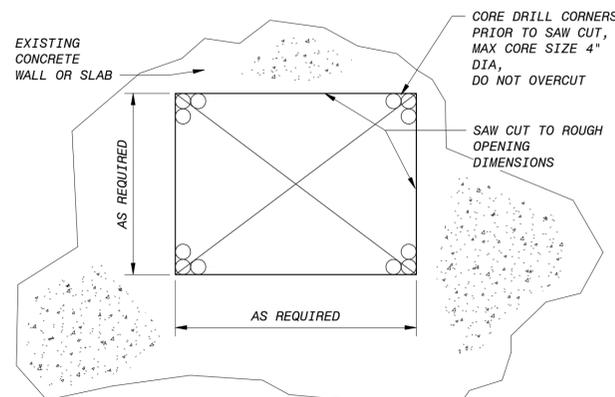
B = THE REQUIRED LENGTH FOR LAPPED SPLICE FOR TOP BARS AS SHOWN ON THIS SHEET

FOR CIRCULAR OPENINGS
21" < D <= 54"

TYPICAL EXTRA REINFORCING AT OPENINGS 12" TO <= 72"

(TYPICAL REQUIRED UNLESS ADDITIONAL REINFORCEMENT SPECIFICALLY INDICATED AT OPENINGS ON DRAWINGS)

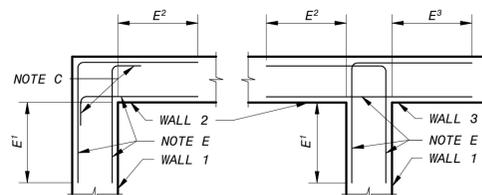
REINFORCEMENT AT OPENINGS DETAILS
NO SCALE



- NOTE:
1. SIZES AND LOCATIONS OF ALL OPENINGS MUST BE APPROVED BY ENGINEER PRIOR TO BEGINNING CUTTING OPERATION

PROCEDURE FOR CUTTING OR ENLARGING OPENINGS IN EXISTING CONCRETE SLABS OR WALLS

NO SCALE



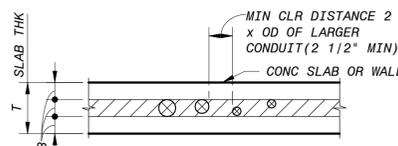
E = WHERE SPECIFICALLY NOTED ON THE DRAWINGS, ADDITIONAL CORNER REINFORCEMENT SHALL BE PLACED IN BOTH FACES OF THE INDICATED CORNER OVER THE FULL HEIGHT. ADDITIONAL CORNER REINFORCEMENT SHALL BE OF THE SAME SIZE AND SPACING AS THE MAIN CORNER REINFORCEMENT. PLACE ADDITIONAL REINFORCEMENT ALTERNATELY WITH, AND EQUAL DISTANCE BETWEEN, MAIN CORNER REINFORCEMENT.

E^x = DISTANCE FROM INSIDE CORNER FACE TO TERMINATION OF ADDITIONAL CORNER REINFORCEMENT IN SIMILARLY NUMBERED WALL. E^x SHALL NOT BE LESS THAN 0.20 THE CLEAR SPAN DISTANCE MEASURED HORIZONTALLY BETWEEN THIS CORNER AND THE NEXT OR 0.40 THE CLEAR SPAN DISTANCE OR CANTILEVERED DISTANCE MEASURED VERTICALLY, WHICHEVER IS SMALLER, BUT NOT LESS THAN 3'-0".

CONTRACTORS OPTION: E BAR TAILS MAY BE SPLICED USING LAPPED SPLICE LENGTHS FOR TOP BARS. SPLICES SHALL NOT BE LOCATED IN THE CORNER AREA COMMON TO BOTH WALLS AND SHALL CLEAR HOOK ENDS BY 3" MIN.

ADDITIONAL REINFORCEMENT WHERE SPECIFICALLY NOTED ON THE DRAWINGS

TYPICAL REINFORCEMENT DETAILS
NO SCALE

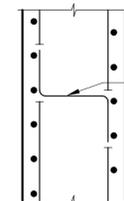


NOTES:

1. PLACE CONDUIT ONLY IN SHADED AREA.
2. FOR CONDUIT REQUIREMENTS SEE THE ELECTRICAL DRAWINGS AND SPECIFICATIONS.

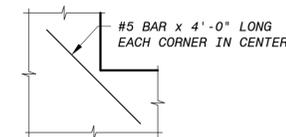
CONDUIT PLACING DETAIL
NO SCALE

| NOTES | |
|-------|---|
| 1. | DETAILS ON THIS DRAWING APPLY TO ALL DRAWINGS UNLESS OTHERWISE NOTED. |
| 2. | WORK THIS DRAWING WITH THE STANDARD CONCRETE JOINT DETAILS. |



SPACERS FOR WALL REINFORCEMENT

Z-BAR SPACERS AT 8' CENTERS EACH DIRECTION. MINIMUM ONE ROW. FABRICATE FROM #2 OR HEAVIER BARS. TIE TO OUTSIDE LAYER OF REINFORCING



TYPICAL EXTRA REINFORCING AT ISOLATED RE-ENTRANT CORNERS

(TYPICAL REQUIRED UNLESS ADDITIONAL REINFORCEMENT SPECIFICALLY INDICATED AT OPENINGS ON DRAWINGS)

| LENGTH OF LAPPED SPLICES FOR REINFORCEMENT (INCHES) | | | | | CONCRETE COVER FOR REINFORCEMENT | |
|---|-----------------|--------|---------------|--------|----------------------------------|---|
| (f'c=4000 PSI) | | | | | LOCATION | |
| (UNLESS NOTED OTHERWISE ON THE DRAWINGS) | | | | | MINIMUM COVER | |
| BAR SIZE | BEAMS & COLUMNS | | WALLS & SLABS | | BAR SIZE | LOCATION |
| | *TOP BARS | OTHERS | *TOP BARS | OTHERS | | |
| 3 | 16 | 16 | 16 | 16 | 3 | UNFORMED SURFACES ADJACENT TO EXCAVATION |
| 4 | 19 | 16 | 19 | 16 | 4 | SURFACES INSIDE OF OZONE CONTACTORS EXPOSED TO OZONE IN WATER OR AIR |
| 5 | 24 | 18 | 24 | 18 | 5 | FORMED OR TOP SURFACES EXPOSED TO WEATHER OR SATURATED AIR, SUBMERGED OR IN CONTACT WITH EARTH, INCLUDING STIRRUPS, TIES OR SPIRALS |
| 6 | 33 | 26 | 29 | 22 | 6 | OTHER LOCATIONS: |
| 7 | 55 | 42 | 48 | 37 | 7 | BARS IN BEAMS OR GIRDERS, INCLUDING STIRRUPS AND COLUMN SPIRALS OR TIES |
| 8 | 69 | 53 | 60 | 46 | 8 | SLABS, WALLS AND JOISTS |
| 9 | 84 | 65 | 74 | 57 | 9 | #6 AND LARGER |
| 10 | 103 | 79 | 91 | 70 | 10 | #5 AND SMALLER |
| 11 | 122 | 94 | 108 | 83 | 11 | |

* TOP BARS ARE HORIZONTAL BARS SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR. HORIZONTAL BARS IN WALLS ARE TO BE PROVIDED WITH LAP LENGTHS AS REQUIRED FOR TOP BARS. VERTICAL BARS MAY BE CONSIDERED AS OTHER BARS

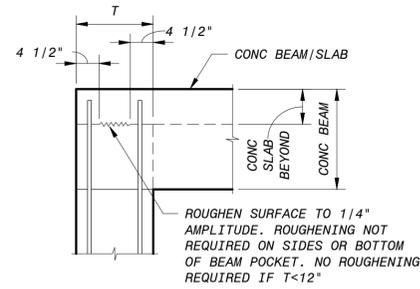
| NO. | DATE | REVISIONS AND RECORD OF USE | BY | CHK | APP |
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| | | | | | |

ELIAS A. POURLADAN
 PROFESSIONAL ENGINEER
 No. 86809
 STATE OF FLORIDA
 License No. 8132
 Certificate No. 86809
 Date:

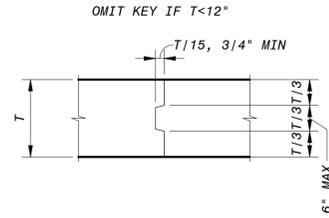
BLACK & VEATCH
 Black & Veatch Corporation
 2855 N. University Drive, Suite 210
 Coral Springs, FL 33065
 City of Key West
 Dennis Street Stormwater Pump Station
 Structural
 Standard Concrete Reinforcing and Miscellaneous Details

DESIGNED: AT/EJHD
 DETAILED: TSH
 CHECKED: EAP
 APPROVED: EAP
 DATE: MARCH 2019
 0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE
 PROJECT NO. 193108
S-501
 SHEET 17 OF 39

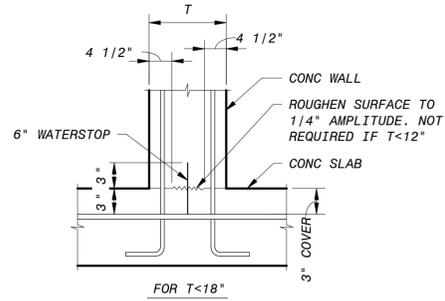
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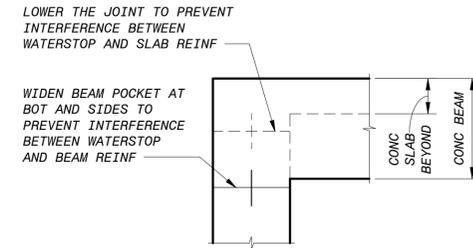
TOP OF WALL TO BEAM/SLAB



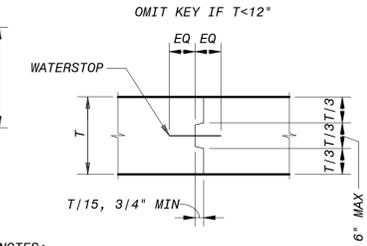
SLAB TO SLAB



SLAB TO BOTTOM OF WALL



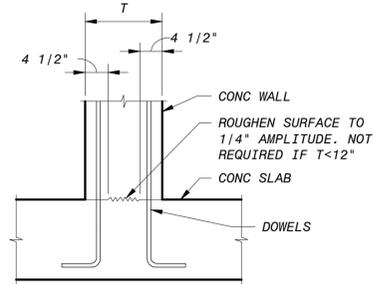
TOP OF WALL TO BEAM/SLAB



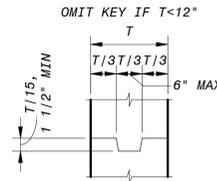
NOTES:

1. UNLESS NOTED OTHERWISE, WATERSTOPS MAY BE STEEL OR PVC.
2. WATERSTOP SIZE SHALL BE 6" FOR WALLS AND SLABS 18" OR LESS IN THICKNESS, AND SHALL BE 9" FOR WALLS AND SLABS THICKER THAN 18".

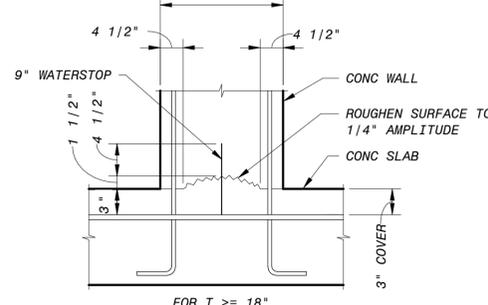
SLAB TO SLAB



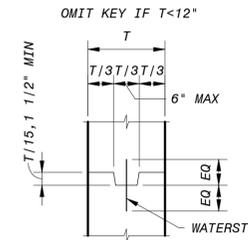
SLAB TO BOTTOM OF WALL



WALL TO WALL



SLAB TO BOTTOM OF WALL



WALL TO WALL

SEE "SLAB TO BOTTOM OF WALL" DETAIL

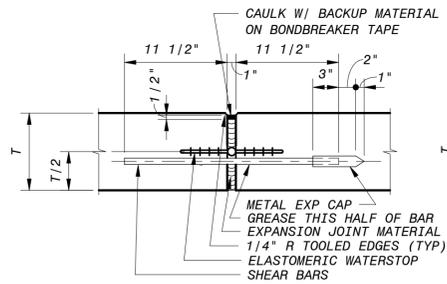
LOWER JOINT TO PREVENT INTERFERENCE BETWEEN WATERSTOP AND SLAB REINF

SLAB TO WALL AT INTERMEDIATE ELEVATION

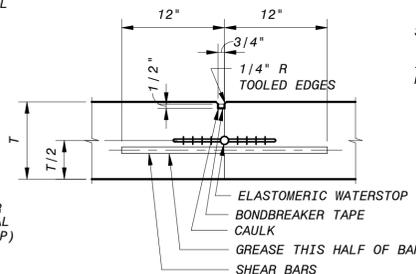
JOINTS WITHOUT WATERSTOPS

TYPICAL CONSTRUCTION JOINTS

- NOTES:
1. REINFORCING STEEL IS CONTINUOUS THROUGH ALL CONSTRUCTION JOINTS
 2. "CSJ W/WS" - WITH WATERSTOP
 3. "CSJ" - WITHOUT WATERSTOP

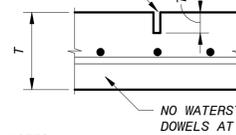


SLABS



SLABS

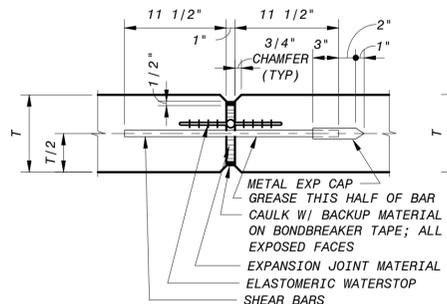
SAWED JOINT (1/8" ± 1/16") (W/ CAULK IF SPECIFICALLY NOTED ON DRAWINGS)



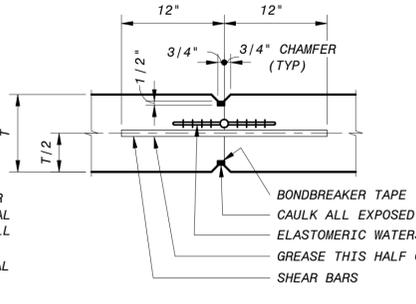
NOTES:

1. TYPICAL CONTROL JOINT NOTES NOT APPLICABLE FOR SAWED CONTRACTION JOINT.
2. "SJ" - NO WATERSTOP
3. JOINT FORMED WITH TOOL OR INSERT STRIP MAY BE SUBSTITUTED FOR SAWED TYPE ONLY WITH PRIOR ACCEPTANCE BY THE ENGINEER.
4. IF SINGLE LAYER REINFORCEMENT, EVERY OTHER BAR IS DISCONTINUOUS AT JOINT. IF 2 LAYER REINFORCEMENT, TOP LAYER IS COMPLETELY DISCONTINUOUS AT JOINT.

SAWED CONTRACTION JOINT SLAB-ON-GRADE



WALLS



WALLS

NOTE:
"EJ" W/ WS - WITH ELASTOMERIC WATERSTOP
"EJ" - WITHOUT ELASTOMERIC WATERSTOP

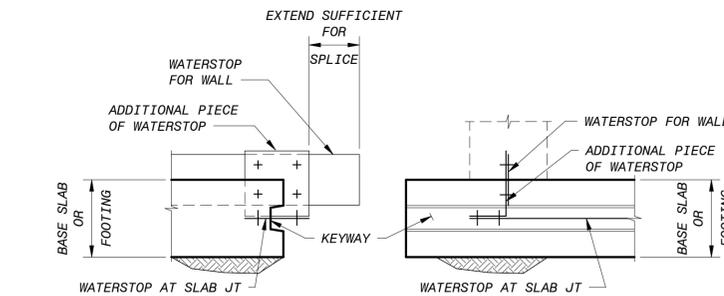
EXPANSION JOINTS

NOTE:
"CJ" W/ WS - WITH ELASTOMERIC WATERSTOP
"CJ" - WITHOUT ELASTOMERIC WATERSTOP

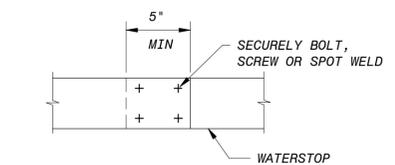
CONTRACTION JOINTS

TYPICAL CONTROL JOINTS

- NOTES:
1. PROVIDE 3/4" SHEAR BARS @ 1'-6" CTRS ACROSS JOINT UNLESS NOTED OTHERWISE.
 2. REINFORCING STEEL SHALL NOT BE EXTENDED ACROSS JOINT UNLESS NOTED OTHERWISE.
 3. SHEAR BARS SHALL BE SMOOTH FREE FROM RUST OR SCALE, AND GREASED TO PREVENT BOND (ONE HALF OF BAR ONLY).
 4. WATERSTOP SIZE SHALL BE 6" FOR WALLS AND SLABS 18" OR LESS IN THICKNESS, AND SHALL BE 9" FOR WALLS AND SLABS THICKER THAN 18".



METAL WATERSTOP INTERSECTION AT BASE SLAB CONSTRUCTION JOINT



METAL WATERSTOP SPLICE

NOTES

1. DETAILS ON THIS DRAWING APPLY TO ALL DRAWINGS UNLESS OTHERWISE NOTED.
2. WORK THIS DRAWING WITH THE STANDARD CONCRETE REINFORCING DETAILS.
3. AT WALL JOINTS AND AT WALL BASE JOINTS, SECURE ALL ELASTOMERIC WATERSTOPS IN THE CORRECT POSITION USING HOG RINGS OR GROMMETS SPACED AT 12 INCHES ALONG THE LENGTH OF THE WATERSTOP AND WIRE TIE TO ADJACENT REINFORCING STEEL.
4. AT SLAB JOINTS AND FOOTING JOINTS, ENSURE SPACE BENEATH AND AROUND WATERSTOP IS COMPLETELY FILLED WITH CONSOLIDATED CONCRETE. DURING OPERATION MAKE VISUAL INSPECTION OF ENTIRE WATERSTOP AREA. LIMIT CONCRETE PLACEMENT TO ELEVATION OF WATERSTOP IN FIRST LIFT. RAISE ELASTOMERIC WATERSTOPS TO CONFIRM FULL CONSOLIDATION WITHOUT VOIDS. PLACE REMAINING CONCRETE TO FULL DEPTH OF SLAB.



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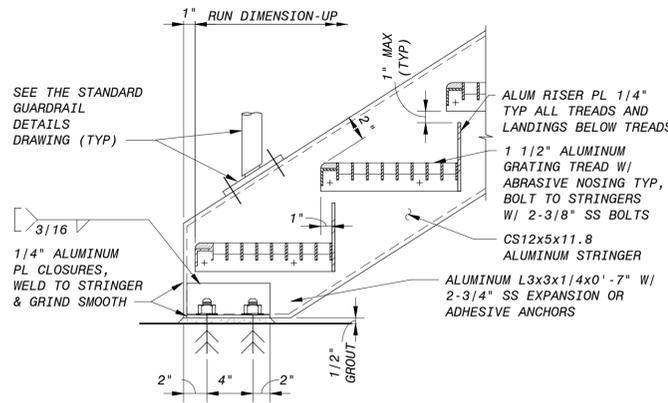
CITY OF KEY WEST
DENNIS STREET STORMWATER
PUMP STATION
STRUCTURAL
STANDARD CONCRETE JOINT DETAILS

DESIGNED: AT/EJ/HD
 DETAILED: TSH
 CHECKED: EAP
 APPROVED: EAP
 DATE: MARCH 2019

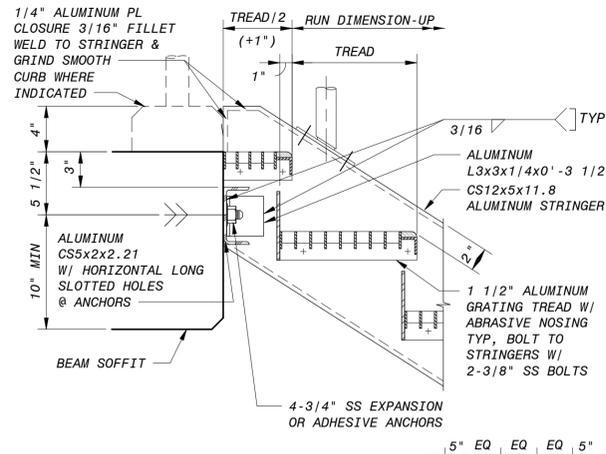
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 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
193108
S-502
 SHEET
 18 OF 39

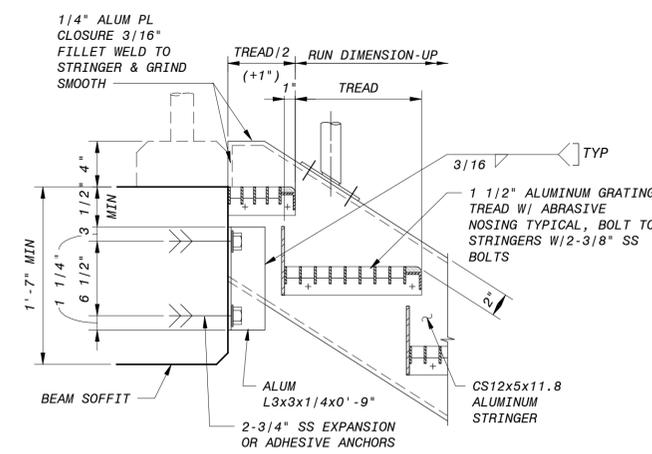
ISSUED FOR CONSTRUCTION



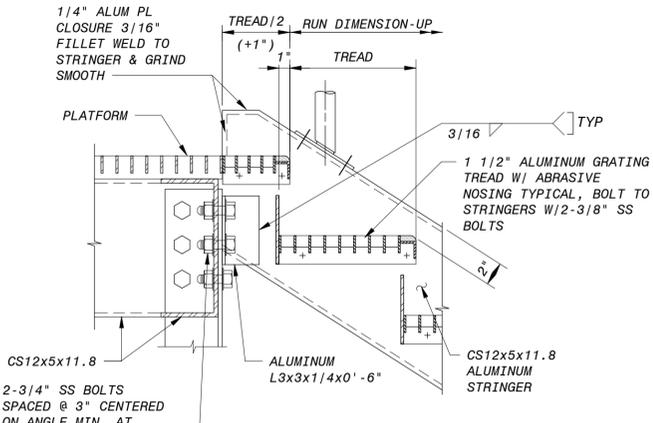
DETAIL A
1 1/2" = 1'-0"



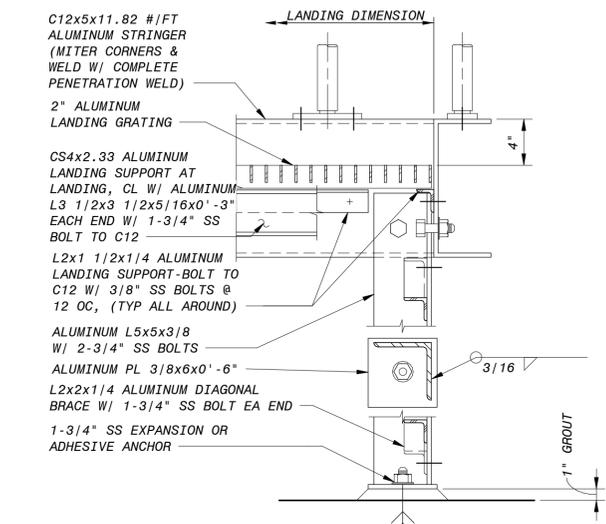
DETAIL B
1 1/2" = 1'-0"



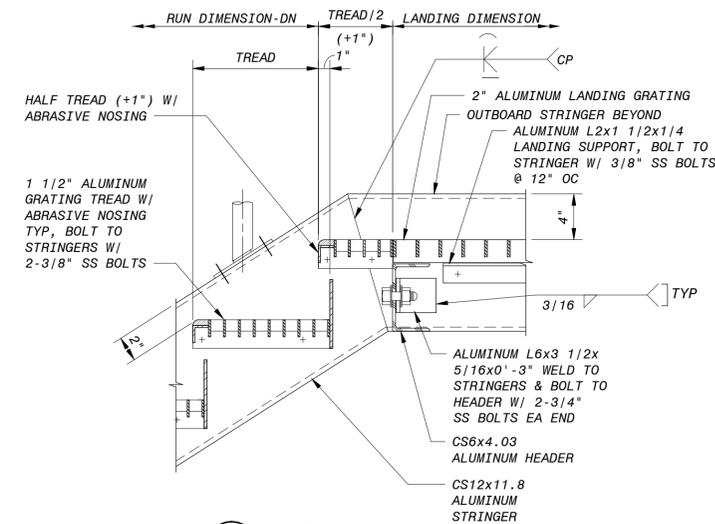
ALTERNATE DETAIL B
1 1/2" = 1'-0"



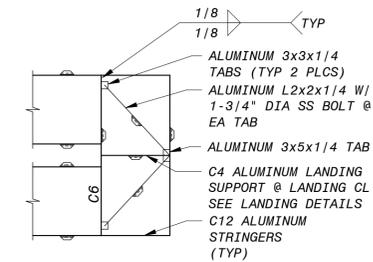
DETAIL C
1 1/2" = 1'-0"



DETAIL D
1 1/2" = 1'-0"



DETAIL E
1 1/2" = 1'-0"



TYPICAL LANDING BRACING
NO SCALE

ALUMINUM GRATING STAIR NOTES:

- ALL ALUMINUM SHAPES SHALL BE ALUMINUM ASSOCIATION STANDARD STRUCTURAL SHAPES.
- DESIGNATION LEGEND FOR ALUMINUM SHAPES:

| | |
|---------------|------------------|
| CHANNEL | CS 12 x 5 x 11.8 |
| DEPTH | |
| WIDTH | |
| MEMBER WEIGHT | |
| LB/FT | |
| ANGLE | L 5 x 5 x 3/8 |
| LEG LENGTH | |
| LEG LENGTH | |
| LEG THICKNESS | |
- WELDS NOT DIMENSIONED ON THE DRAWINGS SHALL BE SIZED TO DEVELOP THE FULL STRENGTH OF THE LEAST STRENGTH COMPONENT OF THE CONNECTION.

STAIR DESIGN NOTES:

- STAIRS SHALL BE DESIGNED BY THE SUPPLIER IN GENERAL ACCORDANCE WITH DETAILS INDICATED ON THESE DESIGN DRAWINGS. THE DESIGN SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF THE LOCAL BUILDING CODE, ANSI A117.1 AND OSHA.
- THE DESIGN SHALL BE SEALED BY AN ENGINEER REGISTERED IN THE STATE OF THE PROJECT. IF REQUESTED, CALCULATIONS SHALL BE SUBMITTED FOR REVIEW.
- THE COMPLETED FABRICATIONS SHALL SUPPORT THE LOADS AND DEFLECTION CRITERIA INDICATED IN THE STRUCTURAL AND METALS SPECIFICATION.
- THE STAIR DESIGN AND DETAILS SHALL BE COORDINATED WITH THE HANDRAILING AND GUARDRAILING SUPPLIED. STAIR MEMBERS SHALL BE ADEQUATE TO ACCEPT LOADS FROM THE RAIL POSTS BASED UPON THE CRITERIA INDICATED IN THE RAILING SPECIFICATIONS.
- CONNECTIONS TO THE SUPPORTING STRUCTURE SHALL BE ADEQUATE TO TRANSFER ALL LOADINGS, AND SHALL BE DESIGNED IN ACCORDANCE WITH ALL APPLICABLE PROVISIONS OF THE AISC MANUAL AND ACI 318 APPENDIX D. THE NUMBER AND TYPE OF CONNECTIONS SHALL COMPLY AT A MINIMUM, WITH THESE DESIGN DRAWINGS. ALL NECESSARY BRACKETS, BOLTS, AND ANCHORS SHALL BE PROVIDED.

REVISIONS AND RECORD OF USE

| NO. | DATE | BY | CHK | APP |
|-----|------|----|-----|-----|
| | | | | |

ELIAS A. POURLADAN
 LICENSE NO. 88809
 STATE OF FLORIDA
 PROFESSIONAL ENGINEER

Date: _____
 Engineer of Record:
 ELIAS POURLADAN
 Florida License No.: _____
 Certificate No. 81332
 No. 88809

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 Coral Springs, FL 33065
 Certificate No. 81332

CITY OF KEY WEST
DENNIS STREET STORMWATER
PUMP STATION
STRUCTURAL
STANDARD ALUMINUM GRATING STAIR
DETAILS

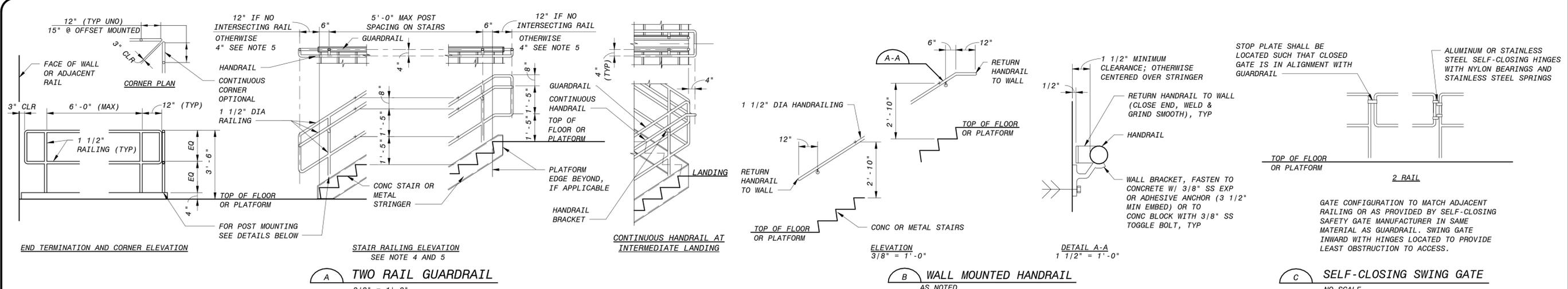
DESIGNED: ATJ/EJHD
 DETAILED: TSH
 CHECKED: EAP
 APPROVED: EAP
 DATE: MARCH 2019

0 1/2 1
 IF THIS BAR DOES NOT
 MEASURE 1" THEN DRAWING IS
 NOT TO FULL SCALE

PROJECT NO.
 193108

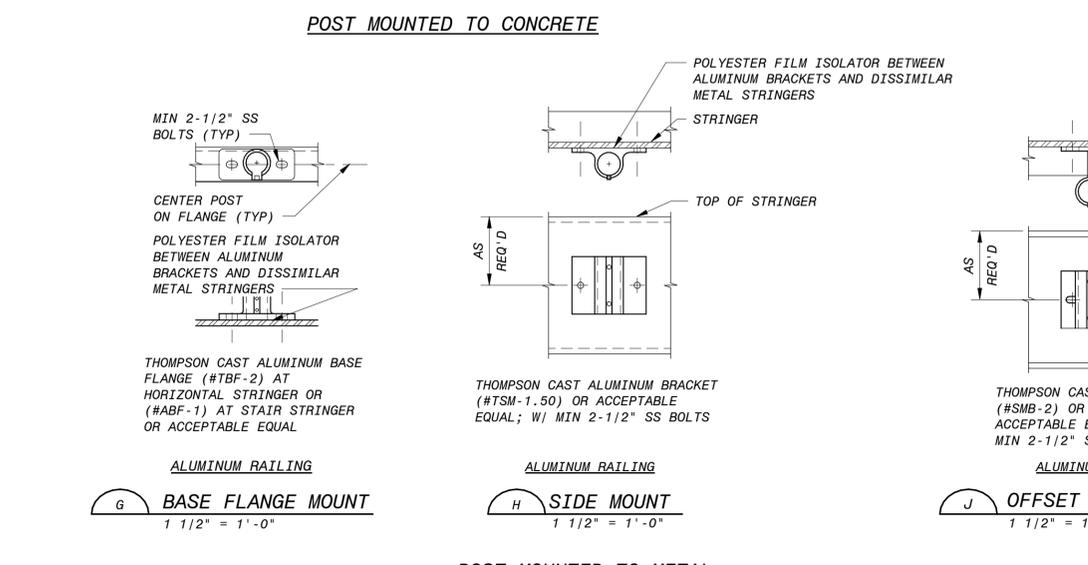
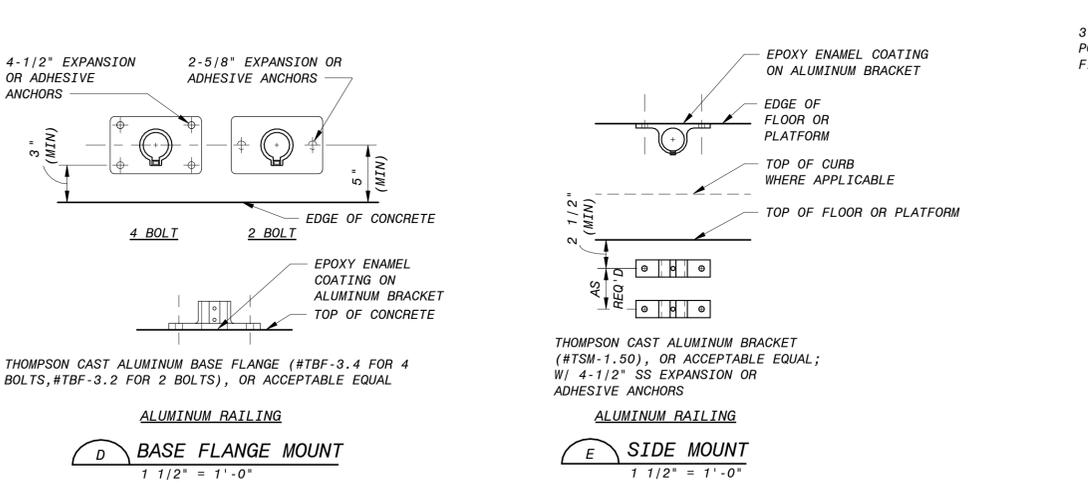
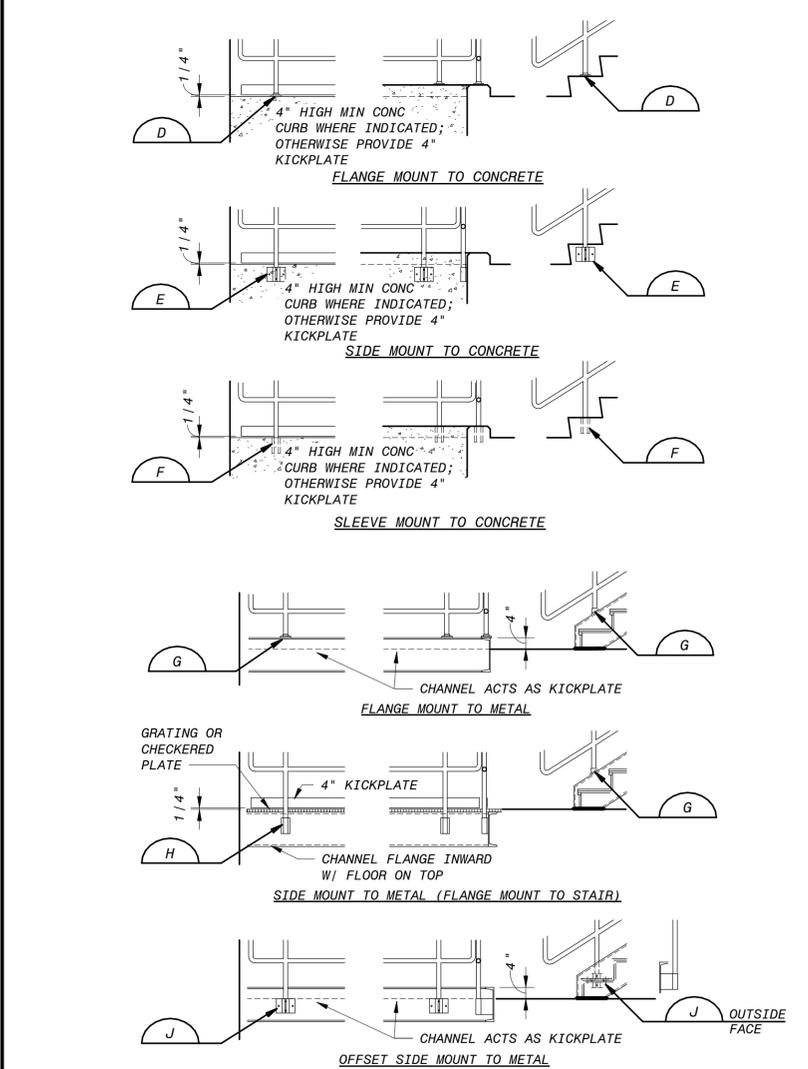
S-503
 SHEET
 19 OF 39

ISSUED FOR CONSTRUCTION



NOTES:

- RAILING MATERIAL AND FABRICATION SHALL BE AS INDICATED ON THE DESIGN DRAWINGS AND IN THE PROJECT SPECIFICATIONS FOR HANDRAILING AND GUARDRAILING.
- ALL RAILING AND MOUNTINGS SHALL BE DESIGNED AND FABRICATED IN COMPLIANCE WITH THE MOST STRINGENT REQUIREMENTS OF THE RAILING SPECIFICATIONS, THE APPLICABLE LOCAL BUILDING CODE AND ALL PERTINENT OSHA AND LOCAL SAFETY REGULATIONS.
- GUARDRAIL AND HANDRAIL SHALL BE DESIGNED AND FABRICATED IN CONFIGURATIONS REQUIRED TO FIT THE LOCATIONS INDICATED ON THE DESIGN DRAWINGS. CONTRACTOR SHALL VERIFY FINAL DIMENSIONS BEFORE FABRICATION.
- GUARDRAIL MAY BE REPLACED WITH WALL MOUNTED HANDRAIL AT STAIR EDGES AND STRINGERS LOCATED ADJACENT TO WALLS. IF THE OUTSIDE EDGE OF THE STAIR STRINGER IS MORE THAN 3" FROM THE WALL FACE, GUARDRAIL SHALL BE USED.
- THE INBOARD HANDRAILING AT SWITCHBACK STAIR LANDINGS MUST BE CONTINUOUS FROM ONE STAIR RUN TO THE NEXT. ADJUST INDICATED DIMENSION AS REQUIRED TO ALIGN AND CONNECT RAILINGS OVER THE LANDING EDGE.
- THE GUARDRAIL AND HANDRAIL CONFIGURATIONS ON THIS SHEET WILL NOT SATISFY ADA REQUIREMENTS FOR HANDICAPPED ACCESSIBILITY. AT LOCATIONS ON THE DESIGN DRAWINGS WHERE CONFORMANCE WITH ADA REQUIREMENTS IS SPECIFICALLY NOTED, THE RAILING SUPPLIER SHALL MODIFY THE CONFIGURATIONS TO COMPLY WITH THE MOST STRINGENT REQUIREMENTS OF ANSI 117.1 UNIFORM FEDERAL ACCESSIBILITY STANDARDS AND THE ACCESSIBILITY STANDARDS OF THE AMERICANS WITH DISABILITIES ACT (ADA).
- AT LOCATIONS SPECIFICALLY INDICATED AS REMOVABLE RAILING, GUARDRAILING AND MOUNTING DETAILS SHALL BE MODIFIED AS FOLLOWS:
 - * RAILING SHALL BE DETAILED IN SHORT LENGTHS THAT WEIGH NO MORE THAN 50 LBS. EACH PIECE SHALL INCLUDE AT LEAST 2, BUT NOT MORE THAN 3 POSTS. RAIL ENDS SHALL BE TERMINATED SIMILAR TO THE END TERMINATION DETAILS THIS SHEET.
 - * MOUNTING DETAILS SHALL BE MODIFIED TO PERMIT RAILING PIECES TO BE REMOVED AND REINSTALLED WITHOUT USE OF TOOLS.



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ELIAS POURLADAN
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 Coral Springs, FL 33065
 Certificate No. 8132

CITY OF KEY WEST
 DENNIS STREET STORMWATER PUMP STATION
 STRUCTURAL
 STANDARD 2 RAIL IBC GUARDRAIL DETAILS

DESIGNED: AT/IE/HD
 DETAILED: TSH
 CHECKED: EAP
 APPROVED: EAP
 DATE: MARCH 2019

0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO. 193108
S-504
 SHEET 20 OF 39

ISSUED FOR CONSTRUCTION

3/11/2019 7:39:26 AM
 D7000

PROCESS MECHANICAL ABBREVIATIONS & GENERAL NOTES

GENERAL ABBREVIATIONS

| | | | | | |
|---|------------------------|--------------------------------|------------------------|-----------------------|------------------------------|
| A | ABV ABOVE | G | GA GAGE | S | S SOUTH, SILENCER, SLOPE |
| ACC AREA CONTROL CENTER | GALV GALVANIZED | SCH SCHEDULE | GEN GENERAL, GENERATOR | SCH SECTION | SHT SHEET |
| AD ASBESTOS CEMENT PIPE | GEN GALLONS PER DAY | GRM GALLONS PER MINUTE | GM GRADE | SIM SIMILAR | SL SLOPE |
| ADWF AVERAGE DRY WEATHER FLOW | GRM GALLONS PER MINUTE | GM GRADE | SO2 SULFUR DIOXIDE | SPEC SPECIFICATION(S) | SPG SPACING |
| AFC ABOVE FINISHED FLOOR | H | HDPE HIGH DENSITY POLYETHYLENE | HDR HEADER | HOR HORIZONTAL | HP HIGH POINT, HIGH PRESSURE |
| AFG ABOVE FINISHED GRADE | HT HEAT RESERVOIR | HT HT HEIGHT | HWTR HIGH WATER | I | TBD TO BE DETERMINED |
| AL ALUMINUM | HT HT HEIGHT | HWTR HIGH WATER | I | TD TANK DRAIN | THD THREADED |
| ALT ALTERNATE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| AN ANAEROBIC | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| APPROX APPROXIMATE(LY) | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| ASSY ASSEMBLY | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| AUTO AUTOMATIC | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| AUX AUXILIARY | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| AVG AVERAGE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| AX ANOXIC | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| B | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| BET BETWEEN | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| BF BLIND FLANGE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| BFF BELOW FINISH FLOOR | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| BL BOTTOM LEVEL | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| BLDG BUILDING | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| BLW BELOW | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| BNR BIOLOGICAL NUTRIENT REMOVAL | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| BOD BOTTOM OF DUCT ELEVATION, BIOCHEMICAL OXYGEN DEMAND | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| BOF BOTTOM OF FOOTING | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| C | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| C-C CENTER TO CENTER | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| C/C CENTER TO CENTER | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| C/L CENTERLINE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CAP CAPACITY | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CB CATCH BASIN | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CCP CONCRETE CYLINDER PIPE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CCSP CONCRETE LINED AND COATED STEEL PIPE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CF CUBIC FEET | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CI CAST IRON | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CIP CAST IRON PIPE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CIRC CIRCUMFERENCE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CL2 CHLORINE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CLR CHLORINATOR | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CMC CEMENT MORTAR COATED | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CML CEMENT MORTAR LINED | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CNTL CONTROL | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CO CLEANOUT | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CO2 CARBON DIOXIDE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| COD CHEMICAL OXYGEN DEMAND | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CONT CONTINUED(OUS) | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CP COMPRESSOR | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CPLG COUPLING | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CPVC CHLORINATED POLYVINYL CHLORIDE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CRN CRANE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CSP CORRUGATED STEEL PIPE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CTF CENTRIFUGE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CTR CENTER | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CS CORROSION/CATHODIC TEST STATION | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CU CUBIC | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| CY CUBIC YARD | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| D | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| DET DETAIL | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| DI DUCTILE IRON | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| DIA DIAMETER | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| DIAG DIAGRAM | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| DIFF DIFFERENTIAL | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| DIR DUCTILE IRON PIPE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| DISM DISMANTLING JOINT | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| DN DOWN | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| DO DISSOLVED OXYGEN | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| DWG DRAWING | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| E | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| EA EAST, EASTING | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| ECC ECCENTRIC | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| EE EACH END | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| EFF EFFICIENCY, EFFLUENT | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| EJ EXPANSION JOINT | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| EL ELEVATION | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| ELC ELECTRICAL | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| ELB ELBOW | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| EO ELECTRICALLY OPERATED | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| EPWF EQUALIZED PEAK WET WEATHER FLOW | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| EQ EQUAL | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| EQUIP EQUIPMENT | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| EXIST EXISTING | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| F | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| FAB FABRICATE(D) (TION) | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| FL FLOW LINE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| FLEX FLEXIBLE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| FLG FLANGE(D) | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| FM FORCE MAIN | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| FPC FLEXIBLE PIPE COUPLING | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| FR FLOW RATE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| FRP FIBERGLASS REINFORCED PIPE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| FSL FACULTATIVE SLUDGE LAGOON | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| FT FEET | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |
| FUT FUTURE | HT HT HEIGHT | HWTR HIGH WATER | I | TO TOP OF | TYP TYPICAL |

PIPING SYSTEM ABBREVIATIONS

| | | | |
|------------------------------------|---|--|--|
| A | AERATION AIR | P | PRE-AERATION AIR |
| AA AGITATION AIR | PAS PRIMARY AND ACTIVATED SLUDGE | PCH HIGH PRESSURE PROCESS CONDENSATE | PCL LOW PRESSURE PROCESS CONDENSATE |
| ASH ASH PNEUMATIC | PCR PROCESS CONDENSATE RETURN | PD PUMPED DRAINAGE | PE PRIMARY EFFLUENT |
| B | BD BOILER BLOWDOWN | PEJ PRIMARY EFFLUENT JETTING | PERM PERMEATE |
| BF BOILER FEEDWATER | PF PRESSURIZED FLOW | POL POLYELECTROLYTE | PRS PROCESS SAMPLING |
| BSC BIOLOGICAL SCUM | PS PRIMARY SLUDGE | PSC PRIMARY SCUM | PSCS PRIMARY SLUDGE/CIRCULATING SLUDGE |
| C | CAA CHANNEL AERATION AIR | PSG PRIMARY SLUDGE AND GRIT | PSO POLYMER SOLUTION |
| CC CENTRIFUGE CAKE | PSR PRIMARY SLUDGE RECIRCULATION | PSR PROCESS STEAM SUPPLY | R |
| CD CHEMICAL DRAIN | RAS RETURN ACTIVATED SLUDGE | RG REFRIGERANT GAS | RL REFRIGERANT LIQUID |
| CEN CENTRATE | RS RAW SEWAGE | RWL RAIN WATER LEADER | RSIP RAIN WATER PIPE |
| CF CENTRIFUGE FEED | CSO CAUSTIC SODA | CSO CHEMICAL VENT | S |
| CFA CONDENSATE FOUL AIR | SA SERVICE AIR | SBIS SODIUM BISULFITE | SCD SCUM DECANT |
| CFC CHLORINATED FINAL EFFLUENT | SCLS SODIUM HYPOCHLORITE SOLUTION | SCO SCUM OVERFLOW | SCR STEAM CLEAN RINSE |
| CL LOW PRESSURE CONDENSATE | SCS STEAM CLEAN SUPPLY | SD SANITARY DRAIN | SE SECONDARY EFFLUENT |
| CLG CHLORINE GAS | SG SLUDGE GAS | SHS SODIUM HYDROXIDE SOLUTION | SME SAMPLE-EFFLUENT |
| CLL CHLORINE LIQUID | SMI SAMPLE-INFLUENT | SMLL SAMPLE MIXED LIQUOR | SMO SAMPLE OXYGEN |
| CLS CHLORINE SOLUTION | SMP SAMPLE-PRIMARY EFFLUENT | SMS SLUDGE SAMPLE-SLUDGE | SN SUPERNATANT |
| CLV CHLORINE VACUUM | SOG SULFUR DIOXIDE GAS | SOL SULFUR DIOXIDE LIQUID | SOS SULFUR DIOXIDE SOLUTION |
| CPA MEDIUM PRESSURE CONDENSATE | SOV SULFUR DIOXIDE VACUUM | SPC SUPPLEMENTAL CARBON SCREENINGS | SR SCUM REMOVAL AIR |
| CSO CAUSTIC SODA | SRA SRA | SRF SCREENINGS FEED | SRO SCREENINGS OVERFLOW |
| CV VITRIFIED CLAY PIPE | SGC GAS RECIRCULATION COMPRESSOR | STD STORM DRAIN | SWAS SAMPLE-WASTE ACTIVATED SLUDGE |
| D | DRAIN | H | HOIST |
| DFE DECHLORINATED FINAL EFFLUENT | DIZ DIGESTED WATER | DZG DIGESTED SLUDGE | DZSG DIGESTED SLUDGE/SLUDGE GAS |
| E | ESG EQUIPMENT DRAIN | ESB ESB WASHDOWN SYSTEM | F |
| F | FAE FOUL AIR EXHAUST | FBW FILTERED BACKWASH WATER | FC FERRIC CHLORIDE |
| FE FINAL EFFLUENT | FILT FILTRATE | FOAM SUPPRESSING CHEMICAL | FATS, OILS, AND GREASE |
| FTE FILTERED EFFLUENT | GC GAS CIRCULATION | GLYCOL/WATER COOLANT | GRIT |
| G | GRC GAS RECIRCULATION COMPRESSOR | GRO GRIT OVERFLOW | H |
| H | HCL HYDROCHLORIC ACID | HNG HIGH PRESSURE NATURAL GAS | HOH HIGH PRESSURE HYDRAULIC OIL |
| HOL LOW PRESSURE HYDRAULIC OIL | HRR HEAT RESERVOIR RETURN | HSS HEAT RESERVOIR SUPPLY | HS HARVESTED SLUDGE |
| HSL SULFURIC ACID | HT HIGH TEMPERATURE VENT | I | INSTRUMENT AIR |
| L | LSG LOW PRESSURE SLUDGE GAS | M | MIXED GAS |
| M | MIXED LIQUOR | MFL MIXED LIQUOR FERMENTER | MRL MIXED LIQUOR RECYCLE |
| MS MIXED SLUDGE | MSCS MIXED SLUDGE/CIRCULATING SLUDGE | MSDS MIXED SLUDGE/DIGESTER SLUDGE | MSG MEDIUM PRESSURE SLUDGE GAS |
| O | OCA ODOR CONTROL AIR | ODG OXYGEN DRY GAS | OF OVERFLOW |
| OLPD OXYGEN LOW PRESSURE DISCHARGE | OLPS OXYGEN LOW PRESSURE SUCTION | P | POTABLE WATER |
| R | RCP REINFORCED CONCRETE PIPE | RCCP REINFORCED CONCRETE CYLINDER PIPE | RED REDUCE(R) |
| REG REGULATOR | REQ REQUIRED | RH RIGHT HAND | RL REDUCED LEVEL |
| RT RIGHT | S | SILENCER | SBR SCRUBBER |
| T | TANK DRAIN | TE THICKENER EFFLUENT | THICKENED SLUDGE |
| U | UTILITY AIR | UD UNDER DRAIN | V |
| V | VACUUM | VS STEAM VENT | W |
| W | WASTE ACTIVATED SLUDGE | FBW FILTERED BACKWASH WATER | WFP WATER FIRE PROTECTION |
| WFSW FILTERED SURFACE WASH WATER | WHWC WASTE HEAT COOLING WATER RETURN-COOL | WHWR WASTE HEAT COOLING WATER RETURN | WHWS WASTE HEAT COOLING WATER SUPPLY |
| WI WETLANDS INFLUENT | WML WASTE MIXED LIQUOR | WN NON-POTABLE WATER | WNM NON-POTABLE WATER, MONITORING |
| WNS NON-POTABLE WATER SOFT | WP POTABLE WATER | WPS POTABLE WATER SOFT | WR RECLAIMED WATER |
| WRH RECLAIMED WATER HIGH PRESSURE | WRL RECLAIMED WATER LOW PRESSURE | WRS FOAM SUPPRESSING SPRAY WATER | WS SERVICE WATER |

NOT ALL PIPING SYSTEMS LISTED ARE USED IN THIS DESIGN.

EQUIPMENT PREFIXES

| | | | |
|---|--------------------------------------|--|--|
| A | AA ATOMIC ABSORPTION UNIT | M | MC MAGNETIC CLUTCH |
| ACC AREA CONTROL CENTER | MD MOTORIZED DAMPER | MBR MEMBRANE BIO REACTOR | MME MISCELLANEOUS MECHANICAL EQUIPMENT |
| AE ANALYZER ELEMENT | MW MONITOR WELL | MV MUD VALVE | MVU MOBILE VENTILATION UNIT |
| AHF ACTIVE HARMONIC FILTER | MX MIXER | N | NT NEUTRALIZATION TANK |
| AMD AIR MONITORING DEVICE | O | OCU ODOR CONTROL UNIT | ORF ORFICE (PIPING) |
| ARV AIR RELEASE VALVE | ORP ODOR REMOVAL FILTER | ORP ODOR REDUCTION | ORP POTENTIAL |
| AV ANGLE VALVE | ORP ODOR REDUCTION UNIT | P | P PUMP |
| B | B BLOWER | PCHV PINCH VALVE | PDIT PRESSURE DIFFERENTIAL INDICATOR TRANSMITTER |
| BFP BACKFLOW PREVENTER, BELT FILTER PRESS | BKHD BULKHEAD BREAKER | PG PRESSURE GAUGE | PMH PROCESS MANHOLE |
| BFV BUTTERFLY VALVE | BSN BAR SCREEN | POP PNEUMATIC OPERATOR | PRV PRESSURE REDUCING STATION |
| BKHD BULKHEAD BREAKER | BV BALL VALVE | PRV PRESSURE REGULATING VALVE, PRESSURE RELIEF | S |
| C | CAV COMBINATION AIR VALVE | CFR CHEMICAL FEEDER | COM COMMUNICATOR |
| CON CONVEYOR | CP COMPRESSOR | CPNL CONTROL PANEL | CSN COMMUNITING SCREEN |
| CENT CENTRIFUGE | CTS CATHODIC PROTECTION TEST STATION | CV CHECK VALVE | DL CYLINDER |
| DE DENSITY METER | DRP DAMPER | DRIVE UNIT | S |
| FDK FILTER, DISK | FG FLAP GATE | FLOC FLOCCULATOR | FLP FLUID POWER UNIT |
| FLT FILTER | FM FLOW METER | FM FLASH MIXER | FAN FAN |
| FP FILTER PRESS | G | GLOBE VALVE | GRINDER |
| H | GEN GENERATOR | GV GATE VALVE | T |
| I | HOIST | HEX HEAT EXCHANGER | K |
| K | INCINERATOR | IR INLET RELIEF | W |
| W | WEIR | WG WEIR GATE | WRP WEIR, ROTATING PIPE |

NOT ALL EQUIPMENT LISTED IS USED IN THIS DESIGN.

GENERAL NOTES

- LEGEND & ABBREVIATION SHEETS ARE GENERAL. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
- LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED ELEVATION POINTS.
- SIZE OF FITTINGS SHOWN ON DRAWINGS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.
- ALL REQUIRED HANGERS, SUPPORTS, BRACES, INSERTS, AND ACCESSORIES ARE NOT SHOWN ON THE DRAWINGS. PIPE SUPPORTS FOR 12-INCH DIAMETER AND SMALLER PIPES SHALL BE DESIGNED AND FURNISHED BY THE CONTRACTOR IN ACCORDANCE WITH THE SPECIFICATIONS AND UTILIZING CONTRACTOR SELECTED SUPPORTS FROM THE SUPPORT DETAILS, OR THE SPECIFIC DETAIL CALLED FOR BY THE DRAWINGS.
- ALL JOINTS SHALL BE WATERTIGHT.
- ALL FLEXIBLE CONNECTORS AND COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST PROTECTION AS SPECIFIED, UNLESS OTHERWISE NOTED. THRUST PROTECTION SHALL BE ADEQUATE FOR TEST PRESSURES SPECIFIED.
- ALL BURIED PIPING SPECIFIED TO BE PRESSURE TESTED, EXCEPT FLANGED, WELDED, OR SREWED PIPING, SHALL BE PROVIDED WITH THRUST PROTECTION AS SPECIFIED, UNLESS OTHERWISE NOTED.
- NUMBER AND LOCATION OF UNIONS AND COUPLINGS SHOWN ON DRAWINGS IS ONLY APPROXIMATE. CONTRACTOR SHALL PROVIDE ALL UNIONS AND COUPLINGS REQUIRED BY THE SPECIFICATIONS AND NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
- WHERE A GROOVED END COUPLING IS SHOWN, IT SHALL BE THE RIGID JOINT TYPE, UNLESS OTHERWISE SPECIFIED. WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE JOINED TO THE COUPLING ADAPTER. CONTRACTOR SHALL ORIENT VALVES AS SHOWN ON DRAWINGS AND IN ACCORDANCE WITH VALVE SPECIFICATIONS.



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CITY OF KEY WEST
 DENNIS STREET STORMWATER
 PUMP STATION IMPROVEMENTS
 MECHANICAL
 ABBREVIATIONS & GENERAL NOTES

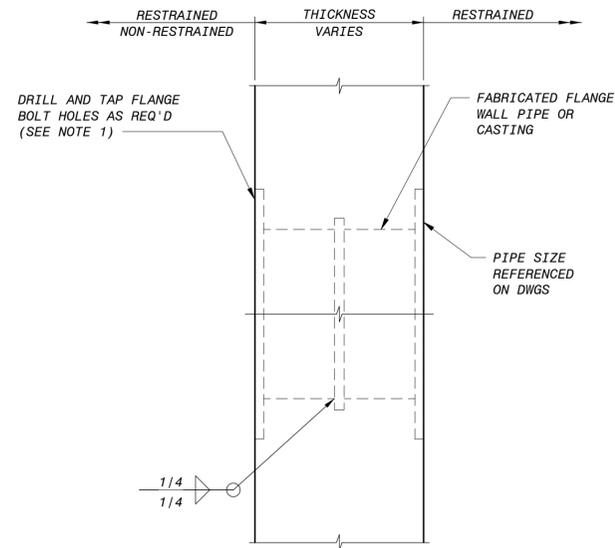
DESIGNED: Designer
 DETAILED: Author
 CHECKED: Checker
 APPROVED: Approver
 DATE: MARCH 2019

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PROJECT NO.
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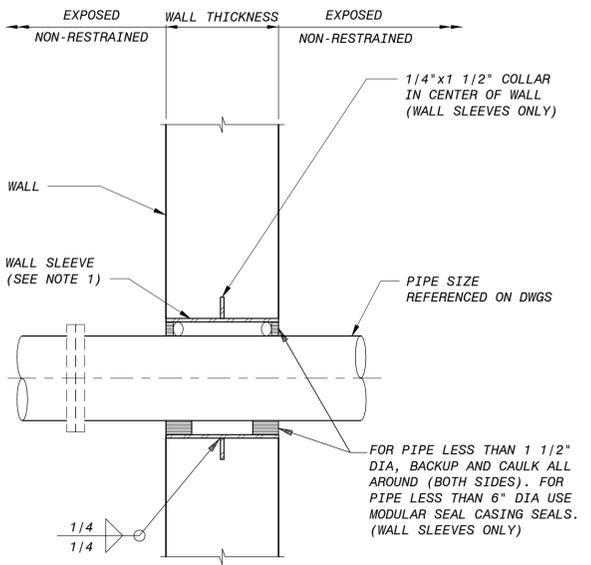
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 21 OF 39

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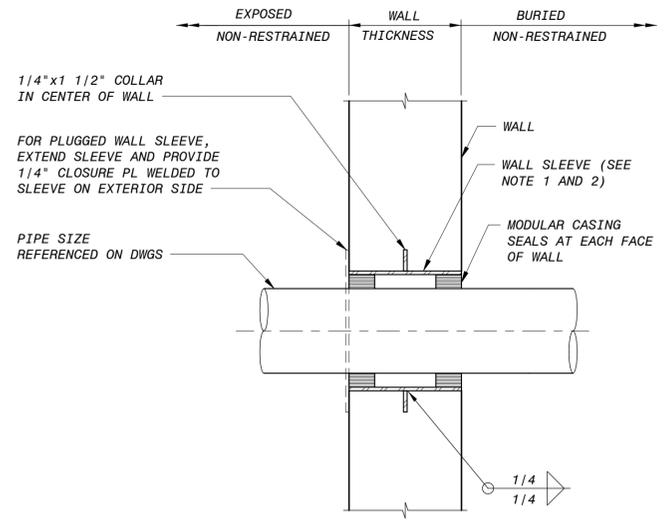
- NOTES :**
1. WALL PIPE MATERIAL SHALL BE DUCTILE IRON, STEEL OR AS INDICATED ON THE DRAWINGS. STEEL PIPE SHALL BE SCHEDULE 40 FOR PIPE 20 INCHES AND SMALLER, 3/8" FOR PIPE LARGER THAN 20", AND COATINGS SAME AS CONNECTING PIPE.
 2. IF CONNECTING STEEL PIPE THICKNESS IS GREATER THAN 3/8", STEEL WALL PIPE THICKNESS SHALL BE INCREASED TO MATCH CONNECTING PIPE.
 3. ANNULAR COLLAR SHALL BE SAME MATERIAL AS PIPE, 1/4" X 2" FOR PIPE 20" AND SMALLER, AND 3/8" X 3" FOR PIPE LARGER THAN 20".
 4. WALL PIPE SHALL BE FLUSH WITH FACE OF WALL.
 5. WALL PIPE SHALL BE ORIENTED SO THAT THE BOLT HOLES STRADDLE THE TOP CENTERLINE.

A FLANGED WALL PIPE
NO SCALE



FOR PIPE SMALLER THAN 6 INCH DIAMETER

D CONCRETE WALL SLEEVE
NO SCALE

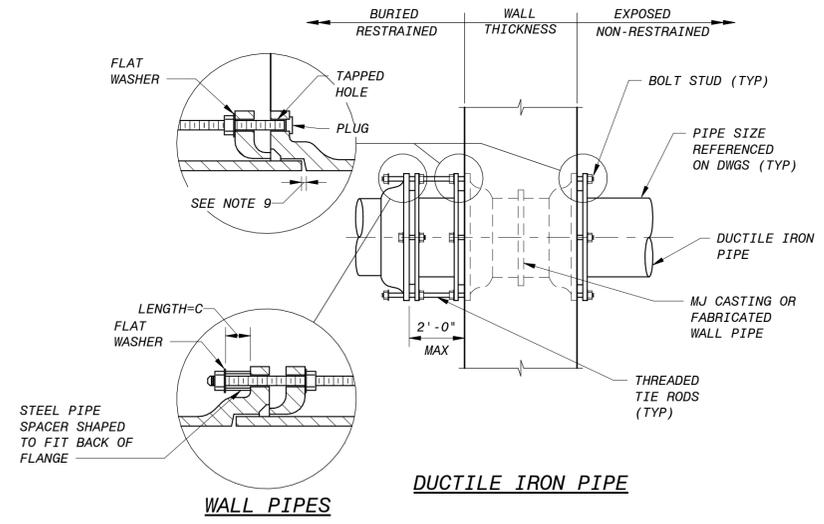


- NOTE:**
1. MATERIAL SHALL BE STEEL OR STAINLESS STEEL.

C AIR RELEASE AND VACUUM RELIEF VALVE ASSEMBLY
NO SCALE

FOR PIPE DIAMETER LARGER THAN 6 INCH

B EXTERIOR WALL SLEEVE FOR PLASTIC PIPE
NO SCALE

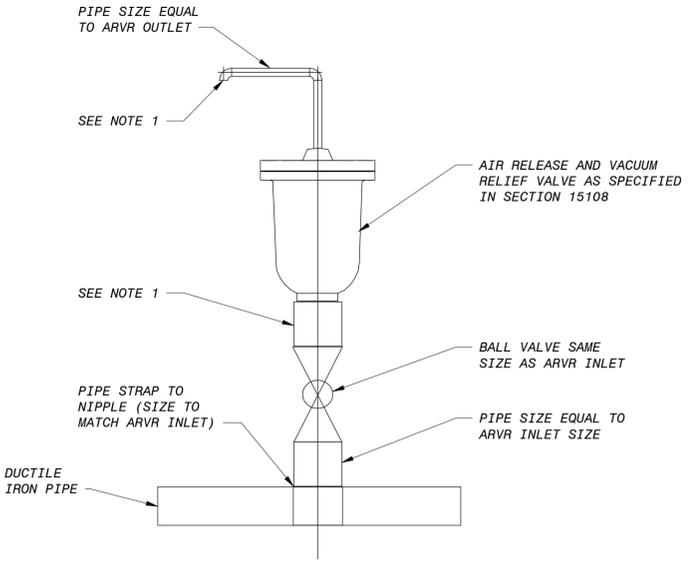


- NOTES:**
1. MECHANICAL JOINT OR PUSH-ON STYLE FITTINGS MAY BE FURNISHED WHERE RESTRAINED JOINTS ARE NOT CALLED FOR ON THE DRAWINGS OR PIPE SCHEDULE.
 2. PRESSURE SHALL BE THE PRESSURE AT WHICH THE PIPE IS HYDROSTATICALLY TESTED, OR IF THERE IS NO HYDROSTATIC FIELD TEST, IT SHALL BE THE SPECIFIED SHOP TEST PRESSURE.
 3. UNLESS OTHERWISE INDICATED, TIE RODS SHALL BE SPACED UNIFORMLY AROUND THE PIPE, BEGINNING WITH THE FIRST TWO AT THE HORIZONTAL CENTERLINE OF THE PIPE, SUBJECT TO THE APPROVAL OF THE ENGINEER.
 4. EXCEPT WHERE TIE RODS ARE REQUIRED, BOLTS FOR FOLLOWER RINGS SHALL BE BOLT-STUDS ON WALL PIPE. ALL BOLT HOLES IN WALL PIPE SHALL BE TAPPED. WALL PIPES SHALL BE ORIENTED SO THAT THE BOLT HOLES STRADDLE THE TOP CENTERLINE.
 5. AT CONTRACTOR'S OPTION, 4" THROUGH 48" MAY BE FURNISHED AS MECHANICAL JOINT STYLE TIE RODS, OR POSITIVE LOCKING SEGMENTS AND/OR RINGS SUCH AS AMERICAN JOINT STYLE PIPE 14" THROUGH 36" SIZE MAY BE FURNISHED AS FLEX RING STYLE RESTRAINED JOINTS AND 42" THROUGH 64" SIZE MAY BE FURNISHED AS LOC RING STYLE RESTRAINED JOINTS, OR U.S. PIPE "TR-FLEX", OR GRIFFIN PIPE "SNAP-LOCK".
 6. FOR BURIED PIPING, CONTRACTOR SHALL PROVIDE AN ADDITIONAL FIELD JOINT AS CLOSE AS PRACTICAL TO FACE OF WALL, BUT NO MORE THAN 5 FEET.
 7. USE WAX TAPE TO PROTECT ALL BURIED FERROUS SURFACES, INCLUDING PAINTED SURFACES. FOR PROTECTION OF ADJACENT PIPE BARREL SURFACES, SHRINK WRAP MAY BE USED IN LIEU OF WAX TAPE. SEE SPECIFICATIONS.
 8. WHERE PIPE IS REQUIRED ON ONE SIDE ONLY, PROVIDE MJxPE WALL PIPE.
 9. FOR PIPING FLEXIBILITY, PROVIDE GAP LARGE ENOUGH TO FACILITATE PIPE ASSEMBLY AND DISASSEMBLY AT ASSOCIATED FLANGE PIPE JOINTS.

E HARNESSING MECHANICAL JOINTS WITH TIE RODS
NO SCALE

MECHANICAL JOINT TIE ROD SCHEDULE

| NOMINAL PIPE SIZE (INCHES) | MAX PRESSURE (PSI) (NOTE 2) | TIE BOLTS | | PIPE SPACERS | | |
|----------------------------|-----------------------------|----------------------|----------------------|--------------|-----------------|---------------|
| | | NO. OF RODS (NOTE 3) | DIA OF RODS (INCHES) | DIA (INCHES) | LENGTH (INCHES) | PIPE SCHEDULE |
| 16 | 150 OR LESS 250 | 4 6 | 3/4 | 1 | 3 1/2 | 80 |



| NO. | BY | CHK | APP |
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REVISIONS AND RECORD OF USE

DATE

TAMMY M. MARTIN
No. 73892
PROFESSIONAL ENGINEER
STATE OF FLORIDA

Date:
Engineer of Record
TAMMY M. MARTIN
Florida License No.:
No. 73892

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CITY OF KEY WEST
DENNIS STREET STORMWATER PUMP STATION

MECHANICAL
DETAILS 1 OF 2

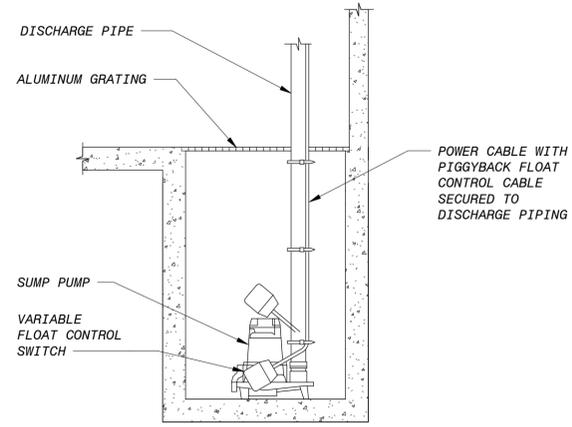
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CHECKED: TMM
APPROVED: ICB
DATE: MARCH 2019

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M-501
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25 OF 39

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SECTION

A SUBMERSIBLE SUMP PUMP
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TAMMY M. MARTIN
No. 73892
STATE OF FLORIDA
PROFESSIONAL ENGINEER

Date:
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TAMMY M. MARTIN
Florida License No.:
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CITY OF KEY WEST
DENNIS STREET STORMWATER
PUMP STATION

MECHANICAL
DETAILS 2 OF 2

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 APPROVED: ICB
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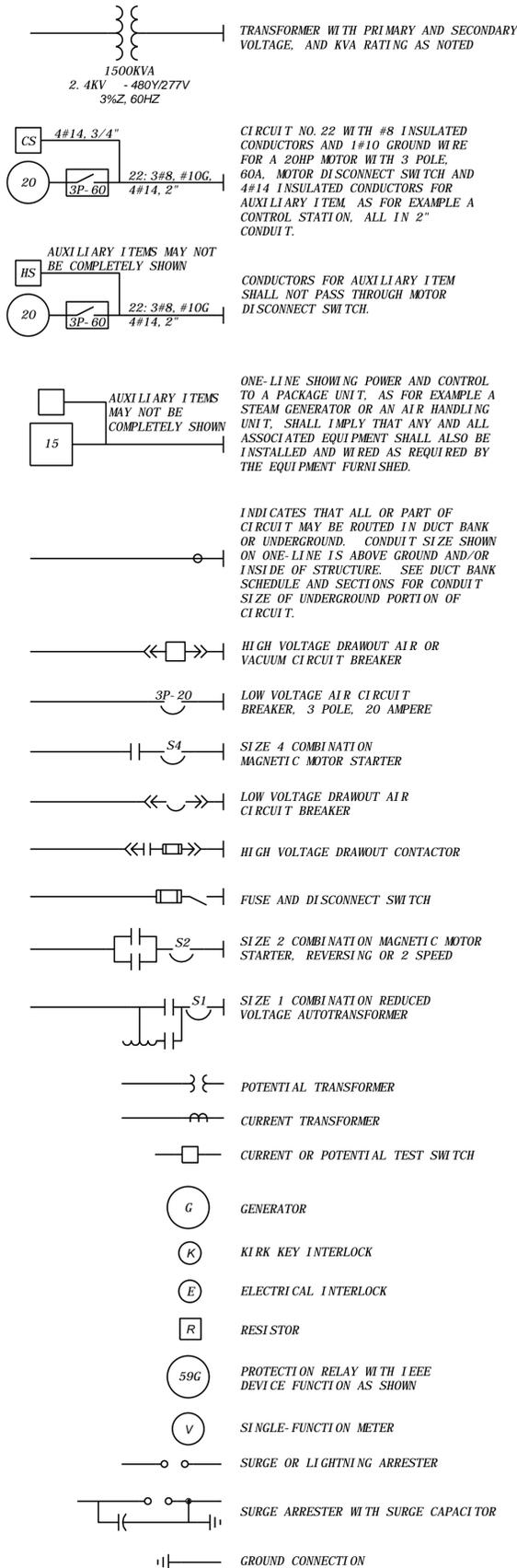
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M-502
SHEET
26 OF 39

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ELECTRICAL LEGENDS

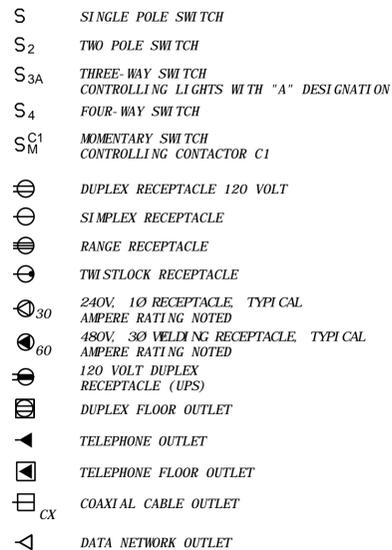
ONE-LINE DIAGRAM LEGEND



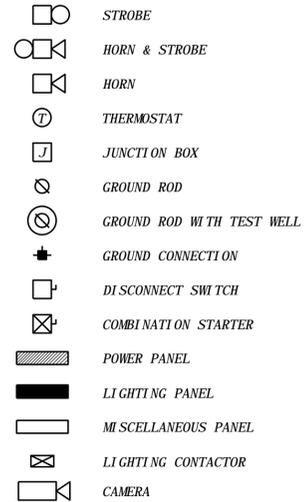
SCHEMATIC SYMBOLS



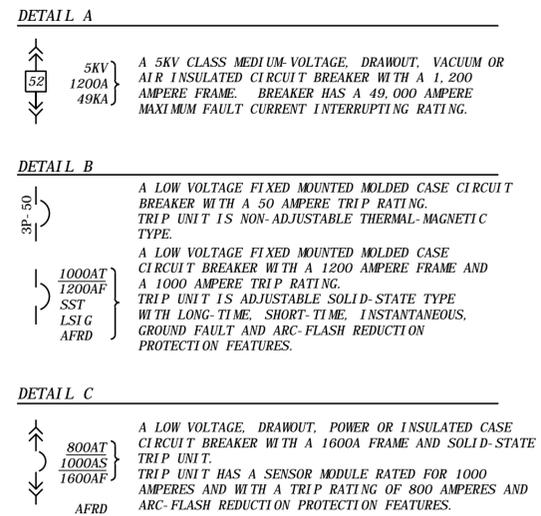
SWITCH & OUTLET SYMBOLS



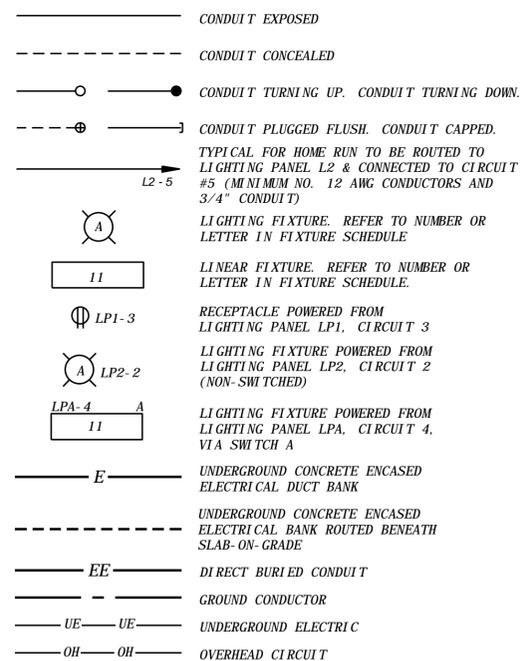
MISCELLANEOUS SYMBOLS



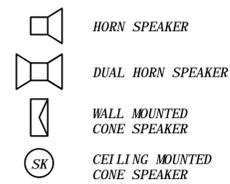
BREAKER DETAILS



CONDUIT & WIRING INSTALLATION LEGEND

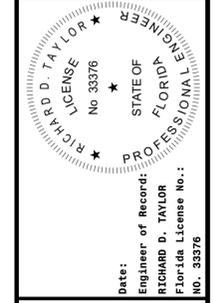


COMMUNICATION SYMBOLS



PROTECTION/RELAY DEVICE NUMBERS

- 25 - SYNCHRONIZING OR SYNCHRONISM-CHECK DEVICE
- 27 - UNDERVOLTAGE RELAY
- 32 - DIRECTIONAL POWER RELAY
- 37 - UNDERCURRENT OR UNDERPOWER RELAY
- 46 - REV. PHASE OR PHASE-BAL. CURRENT RELAY
- 47 - PHASE SEQ. OR PHASE BAL. VOLTAGE RELAY
- 49 - MACHINE OR TRANSFORMER THERMAL RELAY
- 50 - INSTANTANEOUS OVERCURRENT
- 51 - AC TIME OVERCURRENT RELAY
- 52 - AC CIRCUIT BREAKER
- 59 - OVERVOLTAGE RELAY
- 63 - PRESSURE SWITCH
- 64 - GROUND DETECTOR RELAY
- 67 - AC DIRECTIONAL OVERCURRENT RELAY
- 71 - LIQUID OR GAS LEVEL RELAY
- 81 - FREQUENCY RELAY
- 83 - AUTOMATIC SELECTIVE CONTROL OR TRANSFER RELAY
- 86 - LOCKOUT RELAY
- 87 - DIFFERENTIAL PROTECTIVE RELAY



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Certificate No. 0132

**CITY OF KEY WEST
DENNIS STREET STORMWATER
PUMP STATION IMPROVEMENTS**
ELECTRICAL
LEGENDS

DESIGNED: RNL
DETAILED: AJP
CHECKED: MAR
APPROVED: RTD
DATE: FEBRUARY 2019

PROJECT NO.
193108
E-001
SHEET
27 OF 39

ISSUED FOR CONSTRUCTION

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PUB1927, 2/28/2019 3:54:27 PM
E0108
D3000

BY: CHK/APP
NO. DATE
REVISONS AND RECORD OF USE

ELECTRICAL ABBREVIATIONS & NOTES

ELECTRICAL GENERAL NOTES

- SOLID LINES (—————) INDICATE NEW WORK OR EQUIPMENT.
- SCREENED LINES (————) INDICATE EXISTING WORK OR EQUIPMENT.
- DASHED LINES (- - - - -) INDICATE FUTURE WORK OR EQUIPMENT.
- REFER TO INDIVIDUAL DISCIPLINE CONTRACT DRAWINGS FOR ADDITIONAL ABBREVIATIONS, DETAILS, AND GENERAL DESIGN NOTES.
- LEGEND SHEETS ARE GENERAL. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
- INFORMATION RELATED TO CIRCUIT IDENTIFICATION, WIRE & CONDUIT SIZES, AND ROUTING, IS ON THE FOLLOWING DRAWING TYPES:
 - ONE-LINE DIAGRAMS SHOW CIRCUIT IDENTIFICATION, WIRE QUANTITY AND SIZES, AND CONDUIT SIZE WITHIN STRUCTURES. ONE-LINE DIAGRAMS ALSO INDICATE ORIGIN AND DESTINATION OF CIRCUITS, AND IDENTIFY CIRCUITS ROUTED UNDERGROUND.
 - FOR CIRCUITS WITHOUT UNDERGROUND PORTIONS, BUILDING FLOOR PLANS SHOW LOCATION OF EQUIPMENT FOR DETERMINING CIRCUIT LENGTH WITHIN THE STRUCTURE. FOR CIRCUITS WITH UNDERGROUND PORTIONS, ANTICIPATED PENETRATION OF UNDERGROUND CONDUITS ARE SHOWN ON STRUCTURE PLANS FOR DETERMINING THE LENGTH OF THE IN-STRUCTURE PORTIONS OF CIRCUITS. BUILDING FLOOR PLANS MAY ALSO SHOW HOME RUNS FOR LIGHTING, RECEPTACLE, AND OTHER MISCELLANEOUS EQUIPMENT CIRCUITS.
 - SITE PLANS INDICATE THE GENERAL ROUTING OF UNDERGROUND CONDUITS AND DUCT BANKS. CIRCUITS ROUTED IN UNDERGROUND CONDUITS OR DUCT BANKS ARE INDICATED IN DUCT BANK SECTIONS REFERENCED ON THE SITE PLAN.
 - DUCT BANK SECTIONS AND SCHEDULES IDENTIFY CONDUIT SIZE, CONDUIT MATERIAL, ARRANGEMENT OF THE UNDERGROUND CONDUITS, AND CIRCUITS ROUTED IN EACH UNDERGROUND CONDUIT.

AREA DESIGNATIONS

THE SPECIAL AREA DESIGNATION BOXES, AS DEFINED BELOW, ARE LOCATED ON THE PLAN DRAWINGS TO DEFINE ELECTRICAL INSTALLATION REQUIREMENTS. DESIGNATION BOXES ARE LOCATED WITHIN ROOM OR BELOW ROOM NUMBER. ALL INDOOR AREAS NOT INDICATED OTHERWISE ARE AREA TYPE 1 AND MINIMUM NEMA TYPE 1 ENCLOSURES.

- AREA TYPE 1A** CORROSIVE CHEMICAL FEED AND STORAGE ROOMS. CONDUIT SYSTEM SHALL BE EXPOSED SCHEDULE 80 PVC RIGID NON-METALLIC CONDUIT WITH PVC FITTINGS, BOXES AND ACCESSORIES.
- AREA TYPE 4** INDOOR WET LOCATIONS SUCH AS VAULTS, HOSEDOWN AREAS, BASEMENTS, ETC. MINIMUM NEMA TYPE 4 ENCLOSURE FOR EQUIPMENT AND GASKETED FITTINGS IN A CONDUIT SYSTEM.
- AREA TYPE 7A** CLASS 1, DIVISION 1 AREA AS DEFINED BY NEC. ALL EQUIPMENT AND CONDUIT SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.
- AREA TYPE 7B** CLASS 1, DIVISION 2, GROUP C AND D (METHANE, GASOLINE) AS DEFINED BY NEC. EQUIPMENT AND CONDUITS SYSTEMS SHALL BE RATED FOR USE IN THIS AREA.
- AREA TYPE 12** INDOOR, DRY, DIRTY AREA. REQUIRES MINIMUM NEMA TYPE 12 GASKETED ENCLOSURES FOR ALL EQUIPMENT AND GASKETED FITTINGS IN CONDUIT SYSTEMS.

GENERAL REQUIREMENTS

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS NOT SHOWN ON THE PLANS. THIS SHALL INCLUDE ALL CONDUITS SHOWN ON THE ONE-LINES AND HOME-RUNS SHOWN ON THE PLAN DRAWINGS. CONDUITS SHALL BE ROUTED AS DEFINED IN THE SPECIFICATION.
- SPARE WIRES SHALL BE TAPED AND COILED AND LABELED TO INDICATE WHERE OTHER END OF SPARE WIRE IS LOCATED.
- IF EQUIPMENT SUPPLIED BY MANUFACTURER HAS A LARGER LOAD THAN VALUE SHOWN, THE CABLE CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE ENLARGED, AS REQUIRED, TO ACCOMMODATE THE HIGHER VALUE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING PROPERLY SIZED STARTER OVERLOADS FOR EQUIPMENT FURNISHED.
- LIGHTING AND RECEPTACLE CIRCUITS DESIGNATED ON THE FLOOR PLANS ARE NOT SHOWN ON THE ONE-LINES. CONDUCTORS FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM NO. 12AWG. CONDUIT FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS 120VAC CIRCUITS SHALL BE MINIMUM 3/4".
- IN AREAS WHERE THERE ARE OVERHEAD BRIDGE CRANES, HOISTS, ETC. NO CONDUITS SHALL BE RUN OVERHEAD THAT WILL INTERFERE WITH THE OPERATION OF THE EQUIPMENT.

ELECTRICAL ABBREVIATIONS

A

A AMBER, AMPERE, ALARM
 AC ALTERNATING CURRENT
 ACB AIR CIRCUIT BREAKER
 ACR ACCESS CARD READER
 AF AMPERE FRAME
 AFD ADJUSTABLE FREQUENCY DRIVE
 AFRD ARC-FLASH REDUCTION DEVICE
 AM AMMETER
 ANN ANNUNCIATOR
 AR ALARM RELAY
 AS AMMETER SWITCH, AMPERE SENSOR
 AT AMPERE TRIP
 ATS AUTOMATIC TRANSFER SWITCH
 AUX AUXILIARY
 AWG AMERICAN WIRE GAUGE

B

B BUS
 BC BATTERY CHARGER
 BKR BREAKER
 BR BRAKE
 BT BEARING TEMPERATURE

C

C CLOSE, COUNTER, CONTACTOR, CONTROL, CCTV CAMERA
 CAP CAPACITOR
 CB CIRCUIT BREAKER
 CB"A" CIRCUIT BREAKER AUXILIARY CONTACT (OPEN WHEN BREAKER IS OPEN)
 CB"B" CIRCUIT BREAKER AUXILIARY CONTACT (CLOSED WHEN BREAKER IS OPEN)
 CD CONTROL DAMPER
 CI CELL INTERLOCK
 CKT CIRCUIT
 CL2 CHLORINE
 COS CABLE OPERATED SWITCH
 CP CONTROL PANEL
 CPT CONTROL POWER TRANSFORMER
 CR CURRENT OF CONTROL RELAY, CARD READER
 CS CONTROL STATION
 CT CYCLE TIMER OR CURRENT TRANSFORMER
 CTC CYCLE TIMER CLUTCH
 CTM CYCLE TIMER MONITOR
 2/C 2 CONDUCTOR
 4"C 4" CONDUIT

D

DC DIRECT CURRENT, DOOR CONTACT
 DI DOOR INTERLOCK
 DM DAMPER MOTOR, DEMAND METER, DIMMER SWITCH
 DPDT DOUBLE POLE DOUBLE THROW
 DPST DOUBLE POLE SINGLE THROW
 DPR DIFFERENTIAL PRESSURE REGULATOR
 DPS DIFFERENTIAL PRESSURE SWITCH
 DS DISCONNECT SWITCH, DOOR SWITCH, DESKTOP STATION
 DVLS DISCHARGE VALVE LIMIT SWITCH

E

E ELECTRIC OPERATOR FOR CONTROL DAMPER OR VALVE
 EC EMPTY CONDUIT
 EDS ELECTRICAL DOOR STRIKE
 EL ELEVATION, EMERGENCY LIGHT
 EMH ELECTRICAL MANHOLE
 ER ELECTRODE RELAY
 ES END SWITCH, REQUEST TO EXIT SENSOR
 E-STOP EMERGENCY STOP
 ETM ELAPSED TIME METER
 EX EXISTING
 EXP EXPLOSION PROOF

F

F FORWARD, FIELD
 FO FIBER OPTIC
 FPR FEEDER PROTECTION RELAY
 FS FLOW SWITCH

G

G GREEN, GROUND, GENERATOR, GROUND FAULT
 GD GROUND DETECTOR
 GEN GENERATOR
 GFI GROUND FAULT INTERRUPTOR
 GLS GEARED LIMIT SWITCH
 GPR GENERATOR PROTECTION RELAY
 GND GROUND
 #8G #8 GROUND WIRE

H

H HIGH, HUMIDITY
 HH HANDHOLE
 HMT HIGH MOTOR TEMPERATURE
 HOA HAND-OFF-AUTO
 HOR HAND-OFF-REMOTE
 HP HORSEPOWER
 HS HAND STATION
 HWC HIGH WATER CUTOFF
 HZ HERTZ (CYCLE)

I

I/O INPUT/OUTPUT
 I INSTANTANEOUS
 IJB INTERCOM JUNCTION BOX

J

J, JB JUNCTION BOX

K

K KEY INTERLOCK
 KAIC THOUSAND AMPERES INTERRUPTING CURRENT
 KCMIL THOUSAND CIRCULAR MIL
 KO KEY OPERATED
 KV KILOVOLT
 KVA KILOVOLT AMPERE
 KVAR KILOVAR
 KW KILOWATT
 KWH KILOWATT HOUR

L

L LOW LEVEL, LONG-TIME LIGHTNING ARRESTER
 LA LOCAL AREA NETWORK
 LC LIGHTING CONTRACTOR
 LCP LOCAL CONTROL PANEL
 LCS LOCAL CONTROL STATION
 LOA LOCAL-OFF-AUTO
 LOR LOCAL-OFF-REMOTE
 LOS LOCK OUT STOP
 LP LIGHTING PANEL
 LS LIMIT OR LEVEL SWITCH
 LTG LIGHTING
 LWCO LOW WATER CUTOFF

M

M MAGNETIC MOTOR STARTER
 MA MILLIAMPERE
 MCB MAIN CIRCUIT BREAKER
 MCC MOTOR CONTROL CENTER
 MCLU MOTOR CONTROL LINEUP
 MD MOISTURE DETECTOR, MOTION DETECTOR
 MDL MAGNETIC DOOR LOCK
 MFR MANUFACTURER
 MH MANHOLE, MOUNTING HEIGHT
 MOV MOTOR OPERATED VALVE
 MPR MOTOR PROTECTION RELAY
 MS MANUAL MOTOR STARTER
 MSH MOTOR SPACE HEATER
 MTS MANUAL TRANSFER SWITCH
 MV MLLI VOLT, MEDIUM VOLTAGE
 MVA MEGAVOLT AMPERE

N

N NEUTRAL
 NGR NEUTRAL GROUNDING RESISTOR
 NGT NEUTRAL GROUNDING TRANSFORMER
 NC NORMALLY CLOSED
 NO NORMALLY OPEN, NUMBER

O

O OPEN
 OL OVERLOAD
 OOA ON-OFF-AUTO
 OOR ON-OFF-REMOTE
 O/U OVER/UNDER

P

P PRIMARY, POWER, POLE
 PCS PLANT CONTROL SYSTEM
 PB PUSH BUTTON, PULL BOX
 PF POWER FACTOR
 PFCC POWER FACTOR CORRECTION CAPACITOR
 PH PHASE
 PL PILOT LIGHT
 PLC PROGRAMMABLE LOGIC CONTROLLER
 PMR POWER MONITORING RELAY
 PP POWER PANEL
 PR PAIR
 PRS PROXIMITY SWITCH
 PS PRESSURE SWITCH
 PT POTENTIAL TRANSFORMER, PROGRAM TIMER

Q

NOT USED

R

R RED, RAISE, RELAY, REVERSE
 RECP RECEPTACLE
 RES RESISTOR
 RH REMOTE HANDSET
 RT REPEATING TIMER
 RTD RESISTANCE TEMPERATURE DETECTOR
 RTU REMOTE TERMINAL UNIT
 RVSS REDUCED VOLTAGE SOLID STATE STARTER

S

S SHORT-TIME, SHIELDED, STARTER
 SA SURGE ARRESTER, SPEAKER AMPLIFIER
 SCADA SUPERVISORY CONTROL AND DATA ACQUISITION
 SF6 SULFUR HEXAFLUORIDE
 SH SPACE HEATER
 SN SOLID NEUTRAL
 SO SOLENOID OILER
 SP SINGLE POLE
 SPD SURGE PROTECTION DEVICE
 SPDT SINGLE POLE DOUBLE THROW
 SPST SINGLE POLE SINGLE THROW
 SS SELECTOR SWITCH, START/STOP
 SSM SOLID-STATE METERING
 SSS SOLID-STATE STARTER
 SST SOLID-STATE TRIP
 SUPV SUPERVISORY CONTROL
 SV SOLENOID VALVE
 SWB SWBD SWITCHBOARD
 SWG SWGR SWITCHGEAR

T

T THERMOSTAT, TIMER, TOTALIZER, TRANSFORMER
 TACH TACHOMETER
 TB TERMINAL BLOCK
 TC TIMER CLUTCH
 TD TIME DELAY RELAY
 TEMP TEMPERATURE
 TM TIMER MOTOR
 TQ TORQUE
 TR TIMER RELAY, TRIAD
 TS TEMPERATURE SWITCH
 TTB TELEPHONE TERMINAL BOARD

U

UG UNDERGROUND
 UPS UNINTERRUPTIBLE POWER SUPPLY

V

V VOLTS, VOLTAGE RESTRAINED
 VA VOLT AMPERE
 VAR VARMIETER
 VFD VARIABLE FREQUENCY DRIVE
 VI VACUUM INTERRUPTER
 VLS VALVE LIMIT SWITCH
 VM VOLTMETER
 VPI VALVE POSITION INDICATOR
 VS VOLTMETER SWITCH

W

W WHITE, WATTS
 WH WATTHOUR METER
 WM WATT METER
 WP WEATHERPROOF
 WPI WEATHERPROOF IN-USE
 WS WALL STATION

X

X AUXILIARY RELAY
 XFMR TRANSFORMER
 XP EXPLOSION PROOF

Y

YELLOW

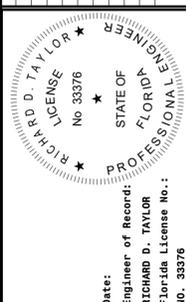
Z

Z AUXILIARY RELAY, IMPEDANCE
 ZS POSITION SWITCH
 ZSS ZERO SPEED SWITCH

1-1PR#16S ONE, SINGLE PAIR, TWISTED SHIELDED #16 CABLE
 3-7/C#14 THREE, SINGLE, SEVEN CONDUCTOR #14 MULTICONDUCTOR CONTROL CABLES

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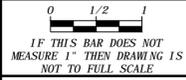
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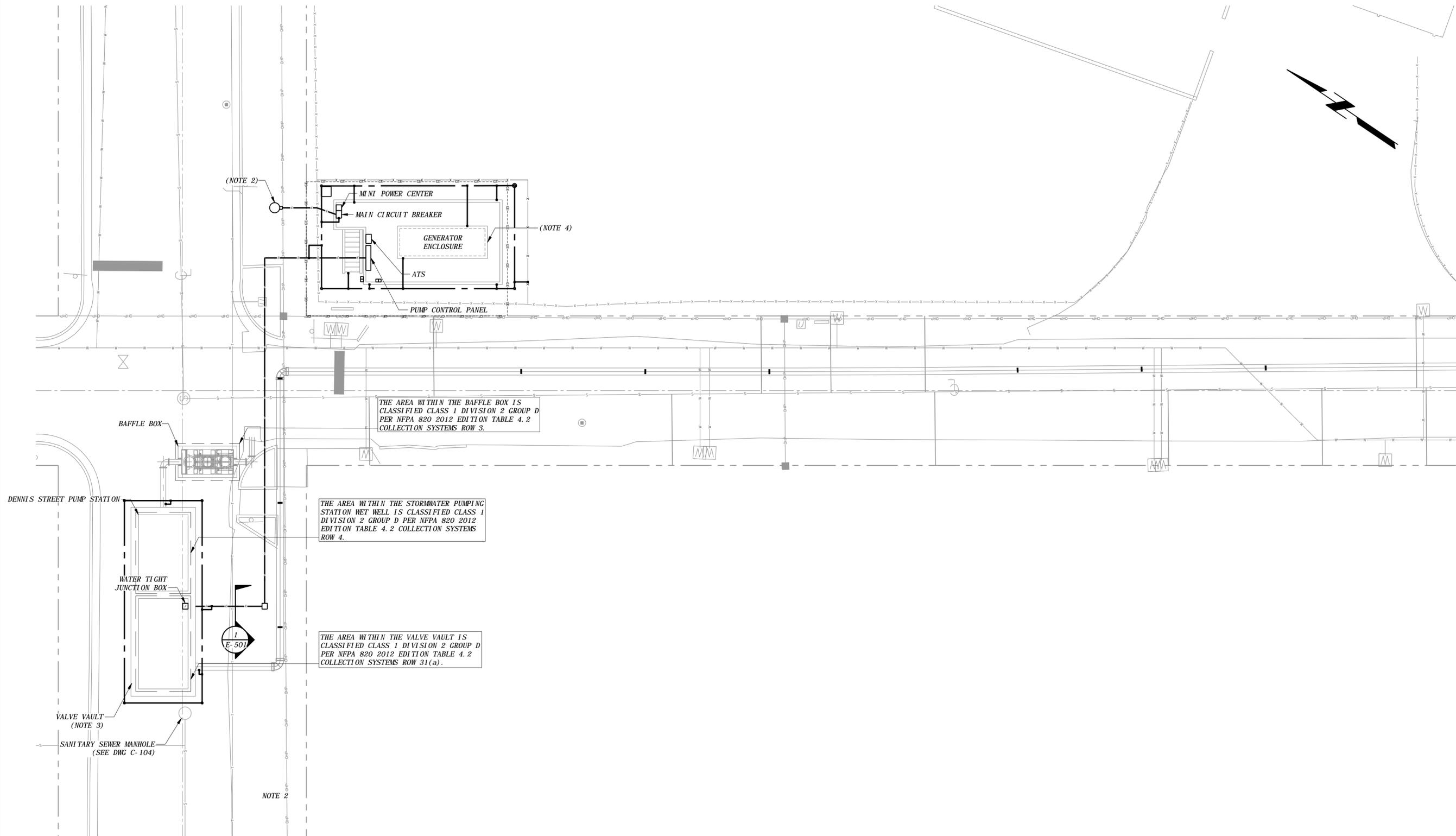
CITY OF KEY WEST
 DENNIS STREET STORMWATER
 PUMP STATION IMPROVEMENTS
 ELECTRICAL
 ABBREVIATIONS AND NOTES

DESIGNED: RNL
 DETAILED: AJP
 CHECKED: MAR
 APPROVED: RTD
 DATE: FEBRUARY 2019



PROJECT NO.
 193108
E-002
 SHEET
 28 OF 39

ISSUED FOR CONSTRUCTION



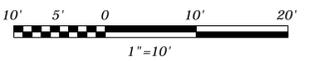
THE AREA WITHIN THE BAFFLE BOX IS CLASSIFIED CLASS 1 DIVISION 2 GROUP D PER NFPA 820 2012 EDITION TABLE 4.2 COLLECTION SYSTEMS ROW 3.

THE AREA WITHIN THE STORMWATER PUMPING STATION WET WELL IS CLASSIFIED CLASS 1 DIVISION 2 GROUP D PER NFPA 820 2012 EDITION TABLE 4.2 COLLECTION SYSTEMS ROW 4.

THE AREA WITHIN THE VALVE VAULT IS CLASSIFIED CLASS 1 DIVISION 2 GROUP D PER NFPA 820 2012 EDITION TABLE 4.2 COLLECTION SYSTEMS ROW 31(a).

- NOTES:**
- SEE DRAWINGS E-001 AND E-002 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
 - A NEW 480V, 3P, 4W UTILITY FEED WILL BE INSTALLED BY KEY WEST ENERGY ELECTRICAL UTILITY.
 - SEE DRAWINGS E-102 AND E-103 FOR ENLARGED VIEWS OF THE VALVE VAULT AND AND WETWELL.
 - SEE DRAWING E-102 FOR ENLARGED VIEW OF THE GENERATOR PLATFORM

SITE PLAN
1" = 10'-0"



| NO. | DATE | REVISIONS AND RECORD OF USE | BY | CHK/APP |
|-----|------|-----------------------------|----|---------|
| | | | | |

Date: _____
 Engineer of Record:
 RICHARD D. TAYLOR
 Florida License No.: 33376
 PROFESSIONAL ENGINEER

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CITY OF KEY WEST
 DENNIS STREET STORMWATER
 PUMP STATION IMPROVEMENTS
 ELECTRICAL
 SITE PLAN

DESIGNED: RNL
 DETAILED: AJP
 CHECKED: MAR
 APPROVED: RTD
 DATE: FEBRUARY 2019

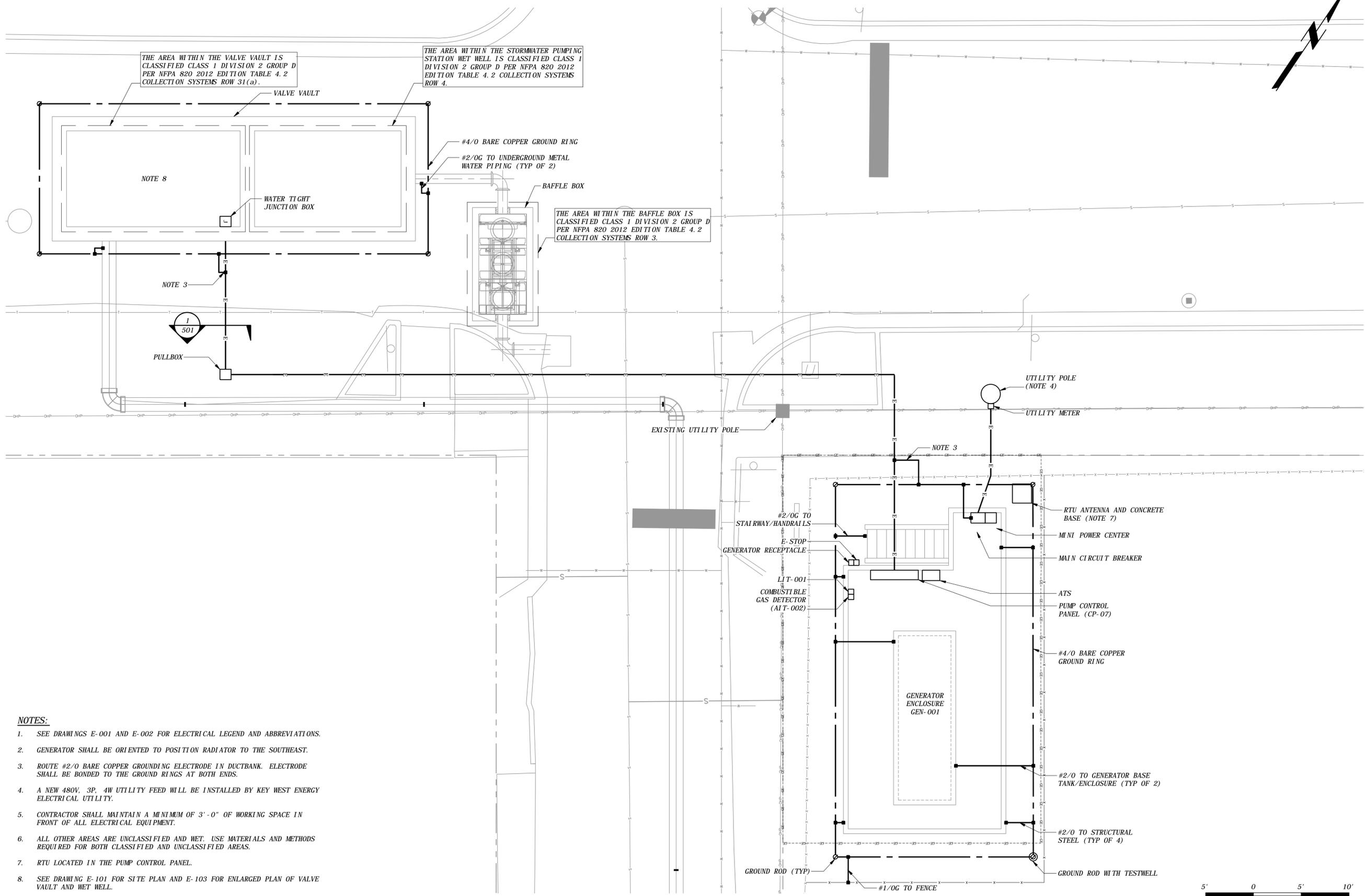
PROJECT NO.
 193108

E-101
 SHEET
 29 OF 39

ISSUED FOR CONSTRUCTION

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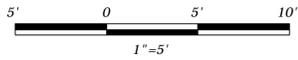
THE AREA WITHIN THE VALVE VAULT IS CLASSIFIED CLASS 1 DIVISION 2 GROUP D PER NFPA 820 2012 EDITION TABLE 4.2 COLLECTION SYSTEMS ROW 31(a).

THE AREA WITHIN THE STORMWATER PUMPING STATION WET WELL IS CLASSIFIED CLASS 1 DIVISION 2 GROUP D PER NFPA 820 2012 EDITION TABLE 4.2 COLLECTION SYSTEMS ROW 4.

THE AREA WITHIN THE BAFFLE BOX IS CLASSIFIED CLASS 1 DIVISION 2 GROUP D PER NFPA 820 2012 EDITION TABLE 4.2 COLLECTION SYSTEMS ROW 3.

- NOTES:**
- SEE DRAWINGS E-001 AND E-002 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.
 - GENERATOR SHALL BE ORIENTED TO POSITION RADIATOR TO THE SOUTHEAST.
 - ROUTE #2/0 BARE COPPER GROUNDING ELECTRODE IN DUCTBANK. ELECTRODE SHALL BE BONDED TO THE GROUND RINGS AT BOTH ENDS.
 - A NEW 480V, 3P, 4W UTILITY FEED WILL BE INSTALLED BY KEY WEST ENERGY ELECTRICAL UTILITY.
 - CONTRACTOR SHALL MAINTAIN A MINIMUM OF 3'-0" OF WORKING SPACE IN FRONT OF ALL ELECTRICAL EQUIPMENT.
 - ALL OTHER AREAS ARE UNCLASSIFIED AND WET. USE MATERIALS AND METHODS REQUIRED FOR BOTH CLASSIFIED AND UNCLASSIFIED AREAS.
 - RTU LOCATED IN THE PUMP CONTROL PANEL.
 - SEE DRAWING E-101 FOR SITE PLAN AND E-103 FOR ENLARGED PLAN OF VALVE VAULT AND WET WELL.

SITE PLAN
1" = 5'-0"



| NO. | DATE | REVISIONS AND RECORD OF USE | BY |
|-----|------|-----------------------------|----|
| | | | |

RICHARD D. TAYLOR
 LICENSE No. 33376
 STATE OF FLORIDA
 PROFESSIONAL ENGINEER
 Date: _____
 Engineer of Record:
 RICHARD D. TAYLOR
 Florida License No.: 33376

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CITY OF KEY WEST
DENNIS STREET STORMWATER
PUMP STATION IMPROVEMENTS
ELECTRICAL
POWER AND GROUNDING PLAN

DESIGNED: RNL
 DETAILED: AJP
 CHECKED: MAR
 APPROVED: RTD
 DATE: FEBRUARY 2019

0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

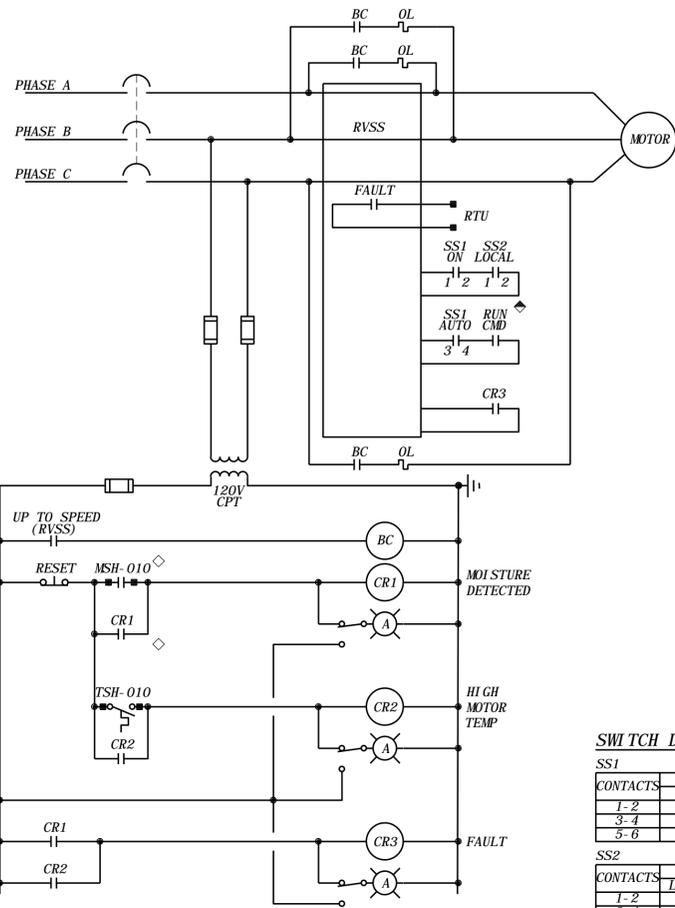
PROJECT NO. 193108

E-102
 SHEET
 30 OF 39

ISSUED FOR CONSTRUCTION

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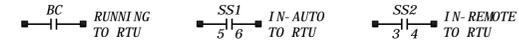
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SWITCH DEVELOPMENT:

| CONTACTS | POSITION | | |
|----------|----------|-----|------|
| | ON | OFF | AUTO |
| 1-2 | × | | |
| 3-4 | | | × |
| 5-6 | | | × |

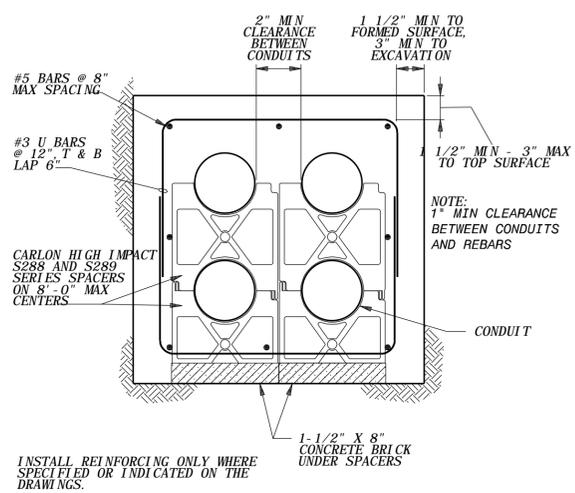
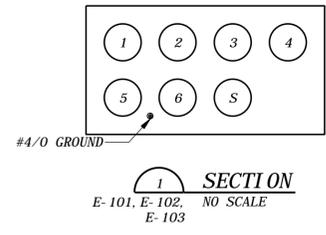
| CONTACTS | POSITION | |
|----------|----------|--------|
| | LOCAL | REMOTE |
| 1-2 | × | |
| 3-4 | | × |



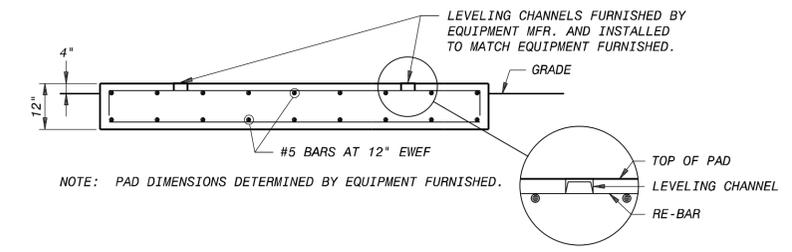
**SUBMERSIBLE PUMP
RVSS SCHEMATIC**
TYP FOR P-010 AND P-020

SYMBOL LEGEND:
◇ AT DRIVEN EQUIPMENT
◆ FROM RTU

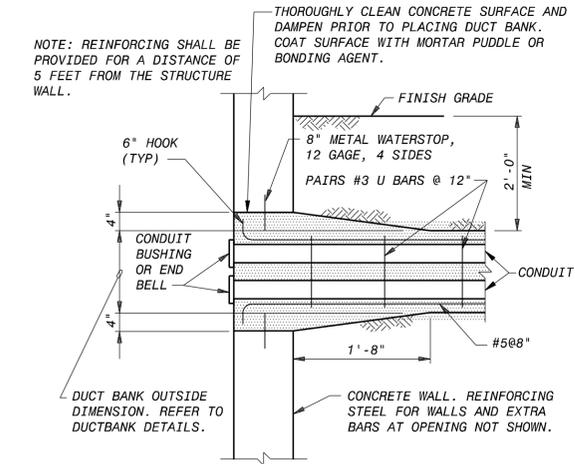
| DUCT BANK SCHEDULE | | | |
|--------------------|------|--------------------------------|--|
| COND. NO. | SIZE | CIRCUIT NUMBER | REMARKS |
| 1 | 2" | PCP7-2, PCP7-4, PCP7-6, PCP7-9 | CONTROL WIRING FROM CP-07 TO VALVE VAULT |
| 2 | 2" | PCP7-3 | 480V POWER FROM CP-07 TO P-010 |
| 3 | 2" | PCP7-5 | 480V POWER FROM CP-07 TO P-020 |
| 4 | 2" | MPC-4 | 120V POWER FROM MPC TO PSP-003 |
| 5 | 2" | BUBBLER AIR TUBING | AIR TUBING FROM BUBBLER CP-07 TO WETWELL |
| 6 | 2" | SAMPLER TUBING | SAMPLER TUBING FROM AIT-002 TO WETWELL |
| S | 2" | | SPARE |



TYPICAL DUCT BANK SECTION
NO SCALE



TYPICAL EQUIPMENT PAD DETAIL
NO SCALE



TYPICAL UNDERGROUND DUCT BANK ENTRANCE DETAIL
NO SCALE

NOTES:
1. SEE DRAWINGS E-001 AND E-002 FOR ELECTRICAL LEGEND AND ABBREVIATIONS.

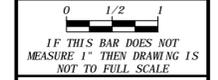
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|-----|----|-----|-----|
| | | | |

DATE: _____
 ENGINEER OF RECORD:
 RICHARD D. TAYLOR
 FLORIDA LICENSE NO. 33376
 PROFESSIONAL ENGINEER

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**CITY OF KEY WEST
DENNIS STREET STORMWATER
PUMP STATION IMPROVEMENTS**
 ELECTRICAL
 SCHEMATIC AND DETAILS

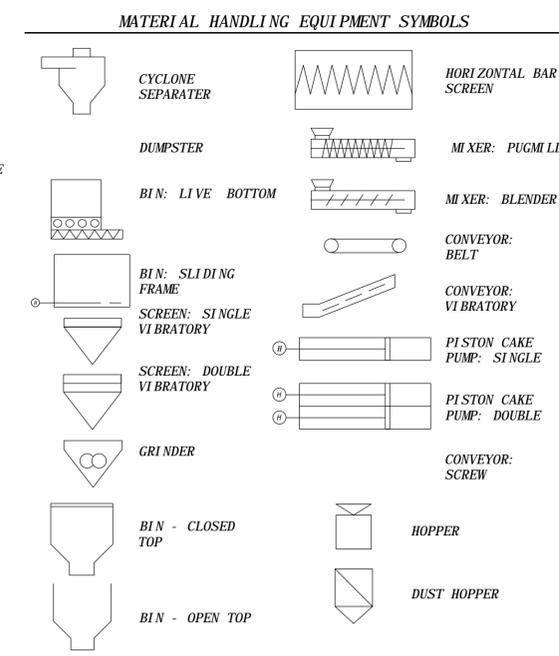
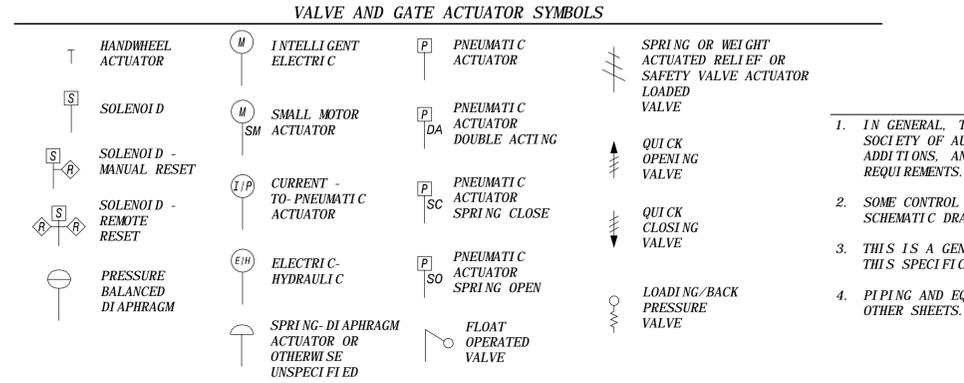
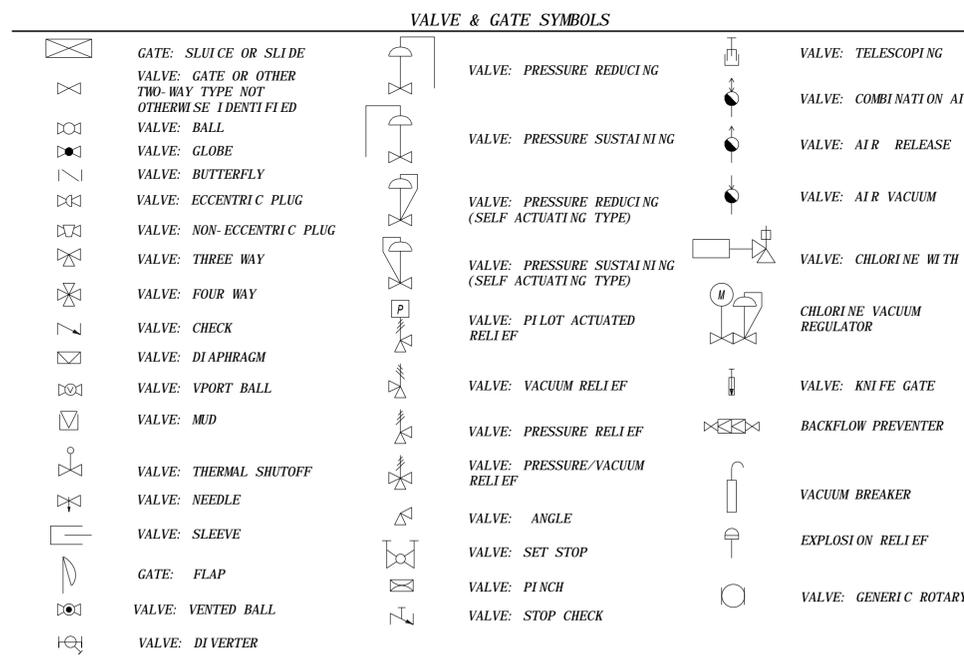
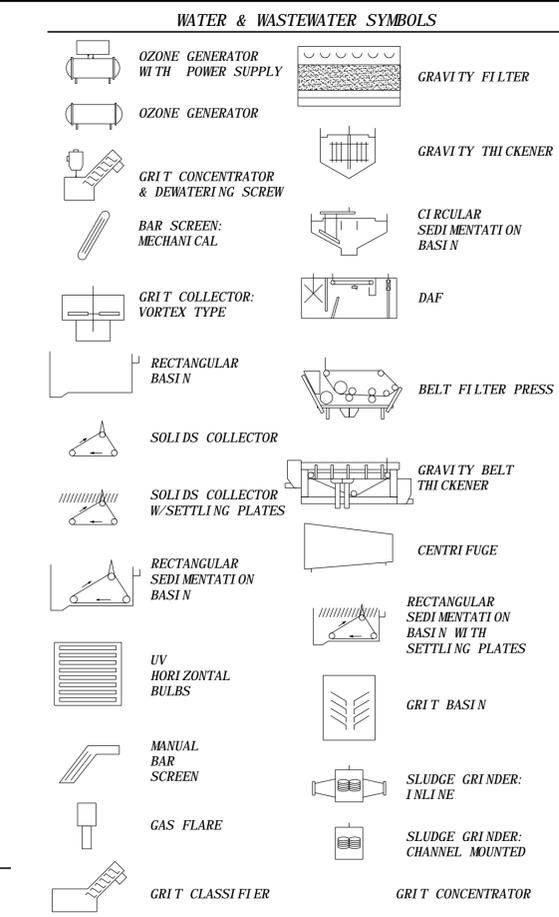
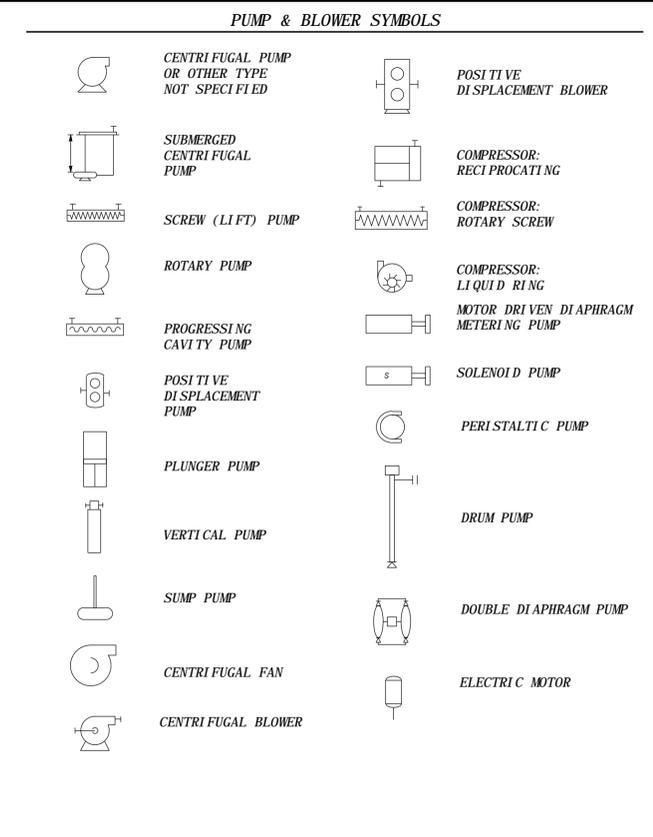
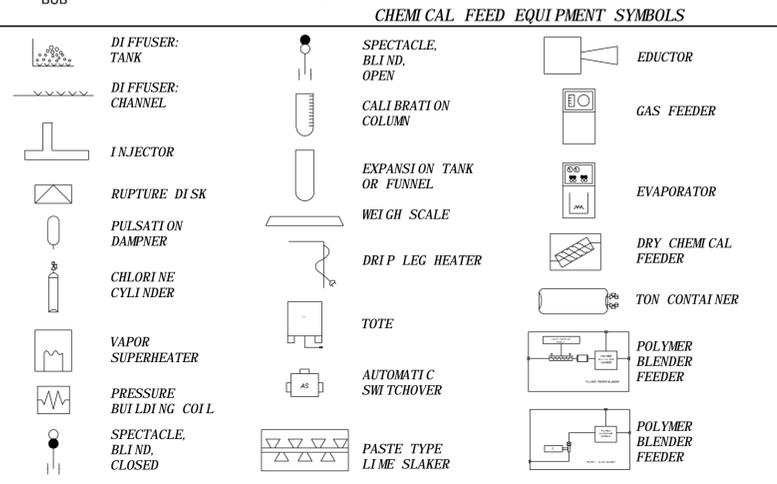
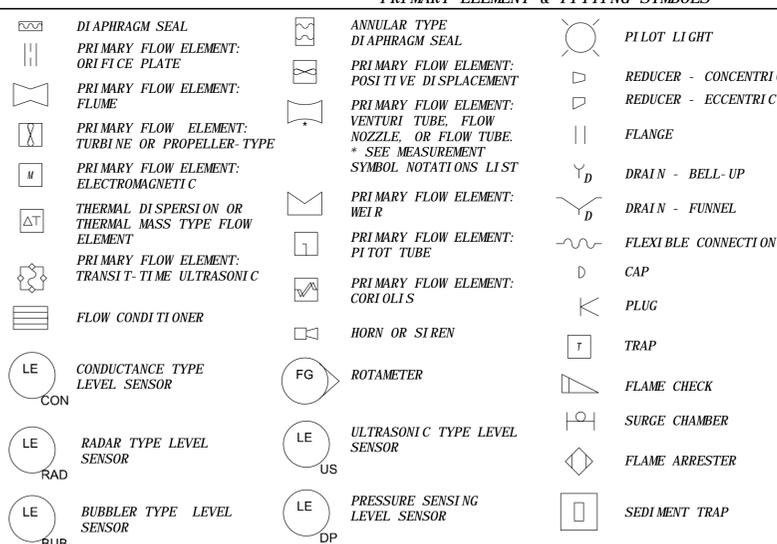
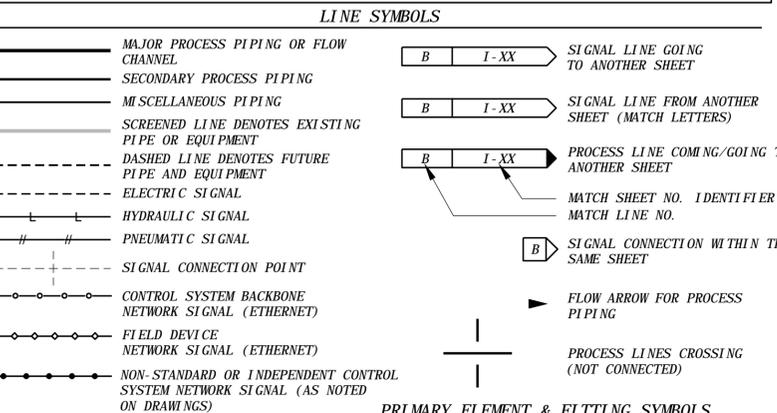
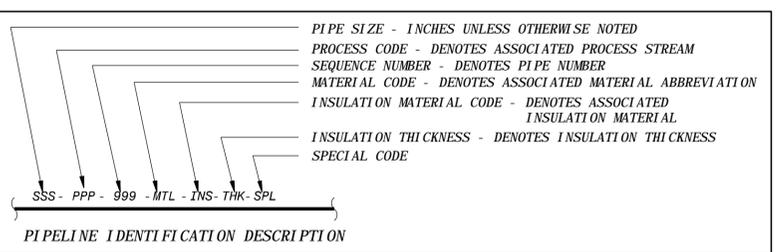
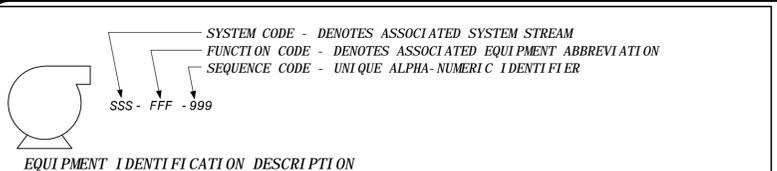
DESIGNED: RNL
 DETAILED: AJP
 CHECKED: MAR
 APPROVED: RDT
 DATE: FEBRUARY 2019



PROJECT NO.
193108
E-501
 SHEET
 32 OF 39

ISSUED FOR CONSTRUCTION

E-501.dwg
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 P18181927, 2/28/2019 3:52:09 PM



GENERAL NOTES

- IN GENERAL, THE P&ID SYMBOLS AND DEVICE IDENTIFICATIONS ARE BASED ON INTERNATIONAL SOCIETY OF AUTOMATION, STANDARD PRACTICE ANSI/ISA-5.1 (2009). SOME MODIFICATIONS, ADDITIONS, AND ALTERATIONS HAVE BEEN MADE AS NEEDED TO ACCOMMODATE THE PROJECT REQUIREMENTS.
- SOME CONTROL AND INTERLOCK REQUIREMENTS WHICH CAN BE MORE CLEARLY ILLUSTRATED ON SCHEMATIC DRAWINGS HAVE BEEN OMITTED FROM THE P&ID DRAWINGS.
- THIS IS A GENERAL LEGEND SHEET. SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE UTILIZED ON THIS SPECIFIC PROJECT.
- PIPING AND EQUIPMENT LEGEND APPLIES TO P&ID SHEETS ONLY AND MAY DIFFER FROM LEGENDS FOR OTHER SHEETS.

DESIGNED: BLB
 DETAIL: MPR
 CHECKED: LJB
 APPROVED: LJB
 DATE: MARCH 2019

0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
193108
 SHEET
I-001
 34 OF 39

CITY OF KEY WEST
 DENNIS STREET STORMWATER
 PUMP STATION

INSTRUMENTATION
 LEGEND AND ABBREVIATIONS 1 OF 3

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 LAWRENCE BROUILLETTE
 Florida License No.:
 No. 57973

REVISIONS AND RECORD OF USE

| NO. | DATE | DESCRIPTION | BY |
|-----|------|-------------|----|
| | | | |
| | | | |

INSTRUMENT AND I/O ABBREVIATIONS
MEANINGS OF IDENTIFICATION LETTERS

| LETTER | FIRST LETTER | | SUCCEEDING LETTERS | | |
|--------|----------------------------------|-----------------------|-----------------------------------|---------------------------------------|------------------------|
| | MEASURED OR INITIATING VARIABLE | VARIABLE MODIFIER | READOUT OR PASSIVE FUNCTION | OUTPUT OR ACTIVE FUNCTION | FUNCTION MODIFIER |
| A | ANALYSIS | | ALARM | | |
| B | BURNER, COMBUSTION | | USER'S CHOICE | USER'S CHOICE | USER'S CHOICE |
| C | USER'S CHOICE | | | CONTROL | CLOSE |
| D | USER'S CHOICE | DIFFERENTIAL | | | DEVIATION |
| E | VOLTAGE (EMF) | | SENSOR, PRIMARY ELEMENT | | |
| F | FLOW, FLOW RATE | RATIO (FRACTION) | | | |
| G | USER'S CHOICE | | GLASS, GAUGE, VIEWING DEVICE | | |
| H | HAND (MANUALLY INITIATED) | | | | HIGH |
| I | CURRENT (ELECTRICAL) | | INDICATE | | |
| J | POWER | | SCAN | | |
| K | TIME OR TIME-SCHEDULE | TIME RATE OF CHANGE | | CONTROL STATION | |
| L | LEVEL | | LIGHT | | LOW |
| M | USER'S CHOICE | MOMENTARY | | | MIDDLE OR INTERMEDIATE |
| N | USER'S CHOICE | | USER'S CHOICE | USER'S CHOICE | USER'S CHOICE |
| O | TORQUE | | ORIFICE (RESTRICTION) | | OPEN |
| P | PRESSURE OR VACUUM | | POINT (TEST CONNECTION) | | |
| Q | QUANTITY | INTEGRATE OR TOTALIZE | INTEGRATE OR TOTALIZE | | |
| R | RADIATION | | RECORD | | RUN |
| S | SPEED OR FREQUENCY | SAFETY | | SWITCH | STOP |
| T | TEMPERATURE | | | TRANSMIT | |
| U | MULTI VARIABLE | | MULTI FUNCTION | MULTI FUNCTION | |
| V | VIBRATION OR MECHANICAL ANALYSIS | | | VALVE, DAMPER OR LOUVER | |
| W | WEIGHT OR FORCE | | WELL, PROBE | | |
| X | UNCLASSIFIED | X-AXIS | ACCESSORY DEVICES OR UNCLASSIFIED | UNCLASSIFIED | UNCLASSIFIED |
| Y | EVENT, STATE, OR PRESENCE | Y-AXIS | | AUXILIARY DEVICES | |
| Z | POSITION, DIMENSION | Z-AXIS | | DRIVE, ACTUATOR OR FINAL CTRL ELEMENT | |

GENERAL NOTES

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PIPELINE MATERIAL CODE ABBREVIATIONS

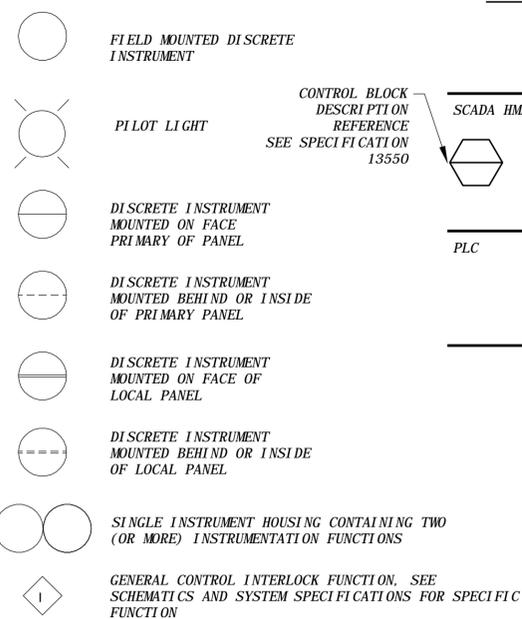
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|---------|----------------|--|
| PCCP | SECTION 02612. | PRESTRESSED CONCRETE CYLINDER PIPE |
| CBWS | SECTION 02614. | CONCRETE BAR-WRAPPED, STEEL CYLINDER PIPE |
| LHCPP | SECTION 02616. | LOW HEAD CONCRETE PRESSURE PIPE |
| RCP | SECTION 02618. | CONCRETE PIPE |
| PVC | SECTION 15061. | POLYVINYL CHLORIDE PIPE |
| DIP | SECTION 15061. | DUCTILE IRON PIPE |
| SP | SECTION 15062. | STEEL PIPE |
| LMS-XX | SECTION 15063. | LIGHT WALL STEEL PIPE |
| SS-XX1 | SECTION 15064. | STAINLESS STEEL PIPE, TUBING, AND ACCESSORIES |
| CSG-XX | SECTION 15065. | MISCELLANEOUS STEEL PIPE, TUBING, AND ACCESSORIES |
| CS-XX | SECTION 15065. | MISCELLANEOUS STEEL PIPE, TUBING, AND ACCESSORIES |
| FRPE-XX | SECTION 15066. | FIBERGLASS REINFORCED PLASTIC PIPE (EXHAUST AIR SERVICE) |
| FRP-XX | SECTION 15067. | MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES |
| PVC-XX | SECTION 15067. | MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES |
| CPVC-XX | SECTION 15067. | MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES |
| PE-XX | SECTION 15067. | MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES |
| PP-XX | SECTION 15067. | MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES |
| PVDF-XX | SECTION 15067. | MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES |
| RPT-XX | SECTION 15067. | MISCELLANEOUS PLASTIC PIPE, TUBING, AND ACCESSORIES |
| SS | SECTION 15068. | AWMA STAINLESS STEEL PIPE |
| CI-XX | SECTION 15069. | CAST IRON SOIL PIPE AND ACCESSORIES |
| CU-XX | SECTION 15070. | COPPER TUBING AND ACCESSORIES |
| BR-XX | SECTION 15060. | MISCELLANEOUS PIPING AND PIPE ASSEMBLY |
| HS-XX | SECTION 15060. | MISCELLANEOUS PIPING AND PIPE ASSEMBLY |
| TG-XX | SECTION 15060. | MISCELLANEOUS PIPING AND PIPE ASSEMBLY |
| CRP-XX | SECTION 15060. | MISCELLANEOUS PIPING AND PIPE ASSEMBLY |

1. XX= numbers 01-20

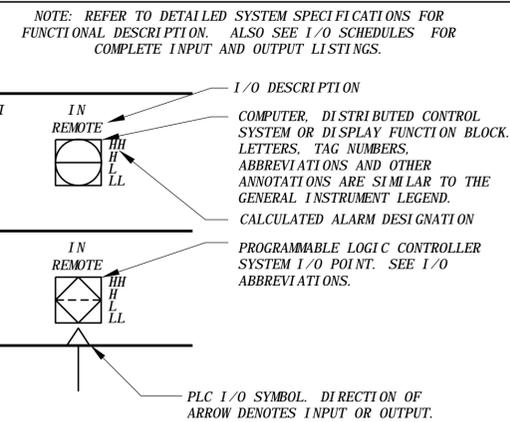
INSTRUMENT AND I/O ABBREVIATION DEFINITIONS

| | | | |
|------|---|-------|--|
| AAH | ANALYZER ALARM HIGH | PDI | DIFFERENTIAL PRESSURE INDICATING TRANSMITTER |
| AAHH | ANALYZER ALARM HIGH-HIGH | PDH | DIFFERENTIAL PRESSURE ALARM HIGH |
| AAL | ANALYZER ALARM LOW | PDHH | DIFFERENTIAL PRESSURE ALARM HIGH-HIGH |
| AALL | ANALYZER ALARM LOW-LOW | PDSH | DIFFERENTIAL PRESSURE SWITCH HIGH |
| AAX | ALARM HORN | PDSHH | DIFFERENTIAL PRESSURE SWITCH HIGH-HIGH |
| AAL | STROBE ALARM LIGHT | AE | ANALYZER SENSOR |
| AI | ANALYZER INDICATION | PDSL | DIFFERENTIAL PRESSURE SWITCH LOW |
| AIT | ANALYZER INDICATING TRANSMITTER | PDSLL | DIFFERENTIAL PRESSURE SWITCH LOW-LOW |
| ASH | ANALYZER SWITCH HIGH | PE | PRESSURE SENSOR |
| ASHH | ANALYZER SWITCH HIGH-HIGH | PG | PRESSURE GAUGE |
| CB | CONTROL BLOCK REFERENCE (SCADA LEVEL) | PI | PRESSURE INDICATOR (LED OR SCREEN) |
| FAL | FLOW ALARM LOW | PIT | PRESSURE INDICATING TRANSMITTER |
| FAH | FLOW ALARM HIGH | PSL | PRESSURE SWITCH LOW |
| FC | FLOW CONTROLLER | PSH | PRESSURE SWITCH HIGH |
| FI | FLOW DIGITAL INDICATOR (LED OR SCREEN) | SI | SPEED INDICATION (LED OR SCREEN) |
| FIC | FLOW INDICATING CONTROLLER | SC | SPEED CONTROL |
| FE | PRIMARY FLOW ELEMENT/SENSOR | SIT | SPEED INDICATING TRANSMITTER |
| FG | FLOW SIGHT GAUGE | SSL | SPEED SWITCH LOW |
| FIT | FLOW INDICATING TRANSMITTER | SIT | SPEED INDICATING TRANSMITTER |
| FQG | FLOW TOTALIZING GAUGE | TAH | TEMPERATURE ALARM HIGH |
| FQHT | FLOW TOTALIZING INDICATING TRANSMITTER | TAHH | TEMPERATURE ALARM HIGH-HIGH |
| FSH | FLOW SWITCH HIGH | TAL | TEMPERATURE ALARM LOW |
| FSL | FLOW SWITCH LOW | TDI | DIFFERENTIAL TEMPERATURE INDICATOR (LED OR SCREEN) |
| FY | FLOW SIGNAL CONVERTER, REPEATER, OR ISOLATOR | TDIT | DIFFERENTIAL TEMPERATURE TRANSMITTER |
| HC | HAND INDICATING CONTROLLER | TE | TEMPERATURE SENSOR/RESISTANCE |
| HMS | MOMENTARY PUSHBUTTON OR SELECTOR SWITCH | TSH | TEMPERATURE SWITCH HIGH |
| HS | HAND SWITCH | TSHH | TEMPERATURE SWITCH HIGH-HIGH |
| IE | CURRENT ELEMENT/SENSOR | TSL | TEMPERATURE SWITCH LOW |
| IAH | CURRENT ALARM HIGH (MOTOR OVERLOAD) | TG | TEMPERATURE GAUGE |
| ISH | CURRENT SWITCH HIGH USED TO DETECT HIGH TORQUE | TI | TEMPERATURE INDICATOR (LED OR SCREEN) |
| JA | POWER FAILURE ALARM | TIT | TEMPERATURE INDICATING TRANSMITTER |
| JL | POWER INDICATING LIGHT | UA | MULTI VARIABLE/Common Alarm/Common Fault |
| JIT | POWER INDICATING TRANSMITTER | UCR | RUN COMMAND |
| KQI | TIME TOTALIZING INDICATOR | UCS | STOP COMMAND |
| LAL | LEVEL ALARM LOW | VAH | VIBRATION ALARM HIGH |
| LALL | LEVEL ALARM LOW-LOW | WE | PRIMARY WEIGHT SENSOR/LOAD CELL |
| LAH | LEVEL ALARM HIGH | WG | WEIGHT GAUGE |
| LAHH | LEVEL ALARM HIGH-HIGH | WT | WEIGHT INDICATING TRANSMITTER |
| LE | PRIMARY LEVEL ELEMENT/SENSOR | YA | GENERAL ALARM EVENT |
| LG | LEVEL SIGHT GAUGE | YI | EVENT INDICATION (LED OR SCREEN) |
| LI | LEVEL INDICATOR (LED OR SCREEN) | YR | STOPPED INDICATION |
| LSL | LEVEL SWITCH LOW | YL | EVENT INDICATING LIGHT |
| LSLL | LEVEL SWITCH LOW-LOW | YLR | RUNNING INDICATING LIGHT |
| LSH | LEVEL SWITCH HIGH | YLS | STOPPED INDICATING LIGHT |
| LSHH | LEVEL SWITCH HIGH-HIGH | ZI | POSITION INDICATOR |
| LY | LEVEL SIGNAL CONVERTER, ISOLATOR, OR REPEATER | ZIC | CLOSED INDICATION |
| OAH | TORQUE ALARM HIGH | ZIO | OPEN INDICATION |
| OAHH | TORQUE ALARM HIGH-HIGH | ZLC | CLOSED INDICATING LIGHT |
| OSH | TORQUE SWITCH HIGH | ZLO | OPEN INDICATING LIGHT |
| OSHH | TORQUE SWITCH HIGH-HIGH | ZSC | CLOSED POSITION SWITCH |
| PAL | PRESSURE ALARM LOW | ZSO | OPEN POSITION SWITCH |
| PALL | PRESSURE ALARM LOW-LOW | ZIT | POSITION INDICATING TRANSMITTER |
| PAH | PRESSURE ALARM HIGH | ZT | POSITION TRANSMITTER |
| PAHH | PRESSURE ALARM HIGH-HIGH | | |
| PDG | DIFFERENTIAL PRESSURE GAUGE | | |
| PDI | DIFFERENTIAL PRESSURE INDICATOR (LED OR SCREEN) | | |

GENERAL INSTRUMENT SYMBOLS

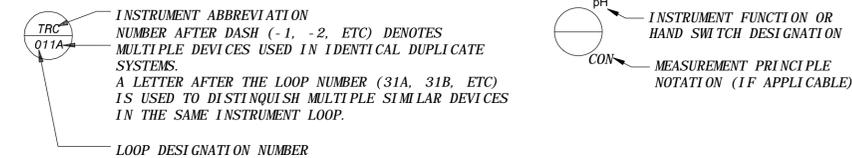


DIGITAL SYSTEMS INTERFACE SYMBOLS



- △ DISCRETE INPUT
- ▽ DISCRETE OUTPUT
- ▲ ANALOG INPUT
- ▼ ANALOG OUTPUT
- ▲ PULSE INPUT

INSTRUMENTATION SYMBOLOGY AND DESIGNATIONS



FUNCTION DESIGNATIONS AND ABBREVIATIONS

| MEASUREMENT PRINCIPLE NOTATIONS | INSTRUMENT FUNCTIONS | HAND SWITCH DESIGNATIONS |
|----------------------------------|-------------------------------------|--------------------------|
| CON CONDUCTANCE | K GAIN OR ATTENUATE (INPUT: OUTPUT) | FR FORWARD-REVERSE |
| DP DIFFERENTIAL PRESSURE SENSING | -K GAIN AND REVERSE | HOA HAND-OFF-AUTO |
| FLN FLOW NOZZLE | Σ ADD OR SUM (ADD AND SUBTRACT) | HOR HAND-OFF-REMOTE |
| FLT FLOW TUBE | Δ SUBTRACT (DIFFERENCE) | LOA LOCAL-OFF-AUTO |
| GWR GUIDED WAVE RADAR | √ EXTRACT SQUARE ROOT | LOR LOCAL-OFF-REMOTE |
| RAD RADAR | ÷ DIVIDE | LR LOCAL REMOTE |
| US ULTRASONIC | F(X) CHARACTERIZE SIGNAL | OCA OPEN-CLOSE-AUTO |
| VENT VENTURI TUBE | > HIGH-SELECT | OAA ON-OFF-AUTO |
| | < LOW-SELECT | OC OPEN-CLOSE |
| | × MULTIPLY | OO ON-OFF |
| | ∫ INTEGRATE (TIME INTEGRAL) | OOR ON-OFF-REMOTE |
| | CH4 METHANE | OSC OPEN-STOP-CLOSE |
| | CL2 CHLORINE RESIDUAL | RST RESET |
| | CO2 CARBON DIOXIDE | SIL SILENCE |
| | DO DISSOLVED OXYGEN | |
| | H2S HYDROGEN SULFIDE | |
| | LEL LOWER EXPLOSIVE LIMIT | |
| | MCC MOTOR CONTROL CENTER | |
| | MLSS MIXED LIQUOR SUSPENDED SOLIDS | |
| | O2 OXYGEN (PURITY) | |
| | O3 OZONE | |
| | pH pH | |
| | TURB TURBIDITY | |

TRANSDUCER & CONVERTER DESIGNATION

| | |
|-----|-------------------------|
| F | VOLTAGE |
| FSK | FREQUENCY SHIFT KEYING |
| H | HYDRAULIC |
| I | CURRENT |
| P | PNEUMATIC PULSE |
| PD | PULSE DURATION |
| PF | PULSE FREQUENCY |
| R | RESISTANCE (ELECTRICAL) |

EXAMPLE: I/P = CURRENT TO PNEUMATIC TRANSDUCER

POWER SUPPLY ABBREVIATIONS

| | |
|------|------------------|
| AS | AIR SUPPLY |
| ES | ELECTRIC SUPPLY |
| GS | GAS SUPPLY |
| HS | HYDRAULIC SUPPLY |
| NS | NITROGEN SUPPLY |
| SS | STEAM SUPPLY |
| MS | WATER SUPPLY |
| 120V | 120VAC |

120V — POWER SUPPLY SOURCE LABEL. USED ONLY WHERE NECESSARY TO HELP CLARIFY AN INSTRUMENT OR SYSTEM FUNCTION.

ISSUED FOR CONSTRUCTION

CHK: JPP

REV: 1

DATE: _____

NO. 57973

STATE OF FLORIDA

LAWRENCE BROUILLETTE

Professional Engineer

No. 57973

Date: _____

Engineer of Record:

LAWRENCE BROUILLETTE

Professional Engineer

No. 57973

Certificate No. 8132

Coral Springs, FL 33065

BLACK & VEATCH

Black & Veatch Corporation
2855 N. University Drive, Suite 210
Coral Springs, FL 33065

CITY OF KEY WEST
DENNIS STREET STORMWATER
PUMP STATION

INSTRUMENTATION
LEGEND AND ABBREVIATIONS 2 OF 3

DESIGNED: BLB

DETAILS: MPR

CHECKED: LJB

APPROVED: LJB

DATE: MARCH 2019

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.
193108

I-002
SHEET
35 OF 39

SYSTEM CODE ABBREVIATIONS

| | | | | | |
|------|---------------------------------------|------|--------------------------------|------|----------------------------------|
| ACE | ACETIC ACID | FLC | FLOCCULATION | RES | RESIDUALS |
| ACT | ACETYLENE | GOX | GASEOUS OXYGEN | RAS | RETURN ACTIVATED SLUDGE |
| GAC | ACTIVATED CARBON - GRANULAR | GSL | GASOLINE | ROS | REVERSE OSMOSIS |
| AIR | AERATION AIR/PROCESS AIR | GRS | GREASE | SCR | SCREENINGS |
| AER | AERATION SYSTEM | GRT | GRIT | SCL | SECONDARY CLARIFICATION |
| ARW | AIR WASH | HEL | HELIUM | SSC | SECONDARY SCUM |
| ALS | ALUMINUM SULFATE | HFL | HYDRAULIC FLUID | SEP | SEPTAGE |
| NSO4 | AMMONIUM SULFATE | HCL | HYDROCHLORIC ACID | SET | SETTLED WATER |
| NH3 | ANHYDROUS AMMONIA | HFS | HYDROFLUOSILIC ACID (FLUORIDE) | SEW | SEWAGE |
| AS | ANTI-SEALANT | HYD | HYDROGEN | NAC | SODA ASH |
| NHOH | AQUA AMMONIA | PER | HYDROGEN PEROXIDE | NAL | SODIUM ALUMINATE |
| ARG | ARGON | INC | INCINERATION | NAM | SODIUM ALUMINATE |
| ASH | ASH | INFP | INFLUENT PUMPING | NBC | SODIUM BICARBONATE |
| BWH | BACKWASH - MEMBRANE/FILTER | INT | INTAKE | NHS | SODIUM BISULFITE |
| BAL | BALLASTED FLOCCULATION | LAG | LAGOON STORAGE | NCL | SODIUM CHLORIDE |
| B10 | BIOSOLIDS | LAP | LAND APPLICATION | NCL2 | SODIUM CHLORITE |
| BIT | BIOTOWER | CAH | LIME - HYDRATED | NAF | SODIUM FLUORIDE |
| BLS | BLENDED SLUDGE | CAO | LIME - QUICKLIME | NAX | SODIUM HEXAMETAPHOSPHATE |
| BNR | BNR | LIM | LIME STABILIZATION | NAOH | SODIUM HYDROXIDE |
| BRN | BRINE | LOX | LIQUID OXYGEN | NOCL | SODIUM HYPOCHLORITE |
| CACL | CALCIUM HYPOCHLORITE | LPG | LP GAS OR PROPANE GAS | NASF | SODIUM SILICOFLUORIDE |
| CATS | CALCIUM THIOSULFATE | MGOH | MAGNESIUM HYDROXIDE | STM | STEAM |
| CO2 | CARBON DIOXIDE | MEM | MEMBRANE | STS | STORM SEWER |
| CAS | CARBON SLURRY | MEG | METHANE GAS | STW | STORM WATER |
| HCO3 | CARBONIC ACID | MTH | METHANOL | SO2 | SULFUR DIOXIDE |
| CEN | CENTRATE | MXL | MIXED LIQUOR | HSO4 | SULFURIC ACID |
| CEB | CHEMICAL ENHANCED BACKWASH - MEMBRANE | NG | NATURAL GAS | SW | SURFACE WASH |
| CL2 | CHLORINE | NIT | NITROGEN | TERT | TERTIARY TREATMENT |
| CLO2 | CHLORINE DIOXIDE | NIO | NITROUS OXIDE | TPRS | THICKENED PRIMARY SLUDGE |
| CA | CITRIC ACID | ODC | ODOR CONTROL | ODC | THICKENED WASTE ACTIVATED SLUDGE |
| CIP | CLEAN IN PLACE | OIL | OIL | THCK | THICKENING |
| COA | COAGULATION | FO | OIL - FUEL | TW | TREATED WATER |
| CAI | COMPRESSED AIR - INSTRUMENT | OZN | OZONE | TF | TRICKLING FILTER |
| CMS | COMPRESSED AIR - SERVICE | OZD | OZONE DESTRUCT | UV | ULTRAVIOLET |
| CUS | COPPER SULFATE | PPP | PHOSPHATE | VAC | VACUUM |
| CI | CORROSION INHIBITOR | PO4 | PHOSPHORIC ACID | WW | WASH WATER |
| DCL | DECHLORINATION | PCL | POLYALUMINUM CHLORIDE | WAS | WASTE ACTIVATED SLUDGE |
| DET | DETERGENT | POLF | POLYMER | WWW | WASTE WASH WATER |
| DWT | DEWATERING | KMW | POTASSIUM PERMANGANATE | WW | WATER - CONDENSATE |
| FUE | DIESEL FUEL | PAC | POWDERED ACTIVATED CARBON | COLW | WATER - COOLING |
| DGG | DIGESTER GAS | PAR | PRE-AERATION | DW | WATER - DISTILLED WATER |
| DM | DIGESTER GAS MIXING | PSD | PRESEDIMENTATION | FW | WATER - FIRE |
| DGS | DIGESTER SLUDGE | PRC | PRIMARY CLARIFICATION | IRW | WATER - IRRIGATION |
| DGA | DIGESTION - AEROBIC | PSC | PRIMARY SCUM | OZW | WATER - OZONATED |
| DTG | DIGESTION - ANAEROBIC | PRS | PRIMARY SLUDGE | SWT | WATER - SEAL |
| DCB | DISINFECTION CONTACT BASIN | WWP | RAW WASTEWATER PUMPING | HW | WATER - WATER HEATING |
| DAF | DISSOLVED AIR FLOTATION | RWP | RAW WATER PUMPING | DEIW | WATER DEIONIZED |
| DRN | DRAINAGE | RWS | RAW WATER STORAGE | NPW | WATER NON-POTABLE |
| EPF | EFFLUENT PUMPING | RCS | RECIRCULATED SLUDGE | PEW | WATER PLANT EFFLUENT |
| EXH | ENGINE EXHAUST | RCW | RECLAIMED WATER | PW | WATER POTABLE |
| EOB | EQUALIZATION BASIN | REF | REFRIGERANT | RW | WATER RAW |
| FEC | FERRIC CHLORIDE | WWT | WET WEATHER TREATMENT | WWT | WET WEATHER TREATMENT |
| FES | FERRIC SULFATE | ZOP | ZINC ORTHOPHOSPHATE | ZOP | ZINC ORTHOPHOSPHATE |
| FRC | FERROUS CHLORIDE | | | | |
| FRS | FERROUS SULFATE | | | | |
| FLT | FILTRATION | | | | |

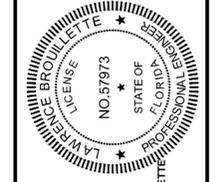
PROCESS CODE ABBREVIATIONS

| | | | | | |
|--------|---------------------------------------|--------|--------------------------------|--------|----------------------------------|
| ACE_X | ACETIC ACID | FLC_X | FLOCCULATION | RES_X | RESIDUALS |
| ACT_X | ACETYLENE | GOX_X | GASEOUS OXYGEN | RAS_X | RETURN ACTIVATED SLUDGE |
| GAC_X | ACTIVATED CARBON - GRANULAR | GSL_X | GASOLINE | ROS_X | REVERSE OSMOSIS |
| AIR_X | AERATION AIR/PROCESS AIR | GRS_X | GREASE | SCR_X | SCREENINGS |
| AER_X | AERATION SYSTEM | GRT_X | GRIT | SCL_X | SECONDARY CLARIFICATION |
| ARW_X | AIR WASH | HEL_X | HELIUM | SSC_X | SECONDARY SCUM |
| ALS_X | ALUMINUM SULFATE | HFL_X | HYDRAULIC FLUID | SEP_X | SEPTAGE |
| NSO4_X | AMMONIUM SULFATE | HCL_X | HYDROCHLORIC ACID | SET_X | SETTLED WATER |
| NH3_X | ANHYDROUS AMMONIA | HFS_X | HYDROFLUOSILIC ACID (FLUORIDE) | SEW_X | SEWAGE |
| AS_X | ANTI-SEALANT | HYD_X | HYDROGEN | NAC_X | SODA ASH |
| NHOH_X | AQUA AMMONIA | PER_X | HYDROGEN PEROXIDE | NAL_X | SODIUM ALUMINATE |
| ARG_X | ARGON | INC_X | INCINERATION | NAM_X | SODIUM ALUMINATE |
| ASH_X | ASH | INFP_X | INFLUENT PUMPING | NBC_X | SODIUM BICARBONATE |
| BWH_X | BACKWASH - MEMBRANE/FILTER | INT_X | INTAKE | NHS_X | SODIUM BISULFITE |
| BAL_X | BALLASTED FLOCCULATION | LAG_X | LAGOON STORAGE | NCL_X | SODIUM CHLORIDE |
| BNR_X | BIOSOLIDS | LAP_X | LAND APPLICATION | NCL2_X | SODIUM CHLORITE |
| BIT_X | BIOTOWER | CAH_X | LIME - HYDRATED | NAF_X | SODIUM FLUORIDE |
| BLS_X | BLENDED SLUDGE | CAO_X | LIME - QUICKLIME | NAX_X | SODIUM HEXAMETAPHOSPHATE |
| BNR_X | BNR | LIM_X | LIME STABILIZATION | NAOH_X | SODIUM HYDROXIDE |
| BRN_X | BRINE | LOX_X | LIQUID OXYGEN | NOCL_X | SODIUM HYPOCHLORITE |
| CACL_X | CALCIUM HYPOCHLORITE | LPG_X | LP GAS OR PROPANE GAS | NASF_X | SODIUM SILICOFLUORIDE |
| CATS_X | CALCIUM THIOSULFATE | MGOH_X | MAGNESIUM HYDROXIDE | STM_X | STEAM |
| CO2_X | CARBON DIOXIDE | MEM_X | MEMBRANE | STS_X | STORM SEWER |
| CAS_X | CARBON SLURRY | MEG_X | METHANE GAS | STW_X | STORM WATER |
| HCO3_X | CARBONIC ACID | MTH_X | METHANOL | SO2_X | SULFUR DIOXIDE |
| CEN_X | CENTRATE | MXL_X | MIXED LIQUOR | HSO4_X | SULFURIC ACID |
| CEB_X | CHEMICAL ENHANCED BACKWASH - MEMBRANE | NG_X | NATURAL GAS | SW_X | SURFACE WASH |
| CL2_X | CHLORINE | NIT_X | NITROGEN | TERT_X | TERTIARY TREATMENT |
| CLO2_X | CHLORINE DIOXIDE | NIO_X | NITROUS OXIDE | TPRS_X | THICKENED PRIMARY SLUDGE |
| CA_X | CITRIC ACID | ODC_X | ODOR CONTROL | ODC_X | THICKENED WASTE ACTIVATED SLUDGE |
| CIP_X | CLEAN IN PLACE | OIL_X | OIL | THCK_X | THICKENING |
| COA_X | COAGULATION | FO_X | OIL - FUEL | TW_X | TREATED WATER |
| CAI_X | COMPRESSED AIR - INSTRUMENT | OZN_X | OZONE | TF_X | TRICKLING FILTER |
| CMS_X | COMPRESSED AIR - SERVICE | OZD_X | OZONE DESTRUCT | UV_X | ULTRAVIOLET |
| CUS_X | COPPER SULFATE | PPP_X | PHOSPHATE | VAC_X | VACUUM |
| CI_X | CORROSION INHIBITOR | PO4_X | PHOSPHORIC ACID | WW_X | WASH WATER |
| DCL_X | DECHLORINATION | PCL_X | POLYALUMINUM CHLORIDE | WAS_X | WASTE ACTIVATED SLUDGE |
| DET_X | DETERGENT | POLF_X | POLYMER | WWW_X | WASTE WASH WATER |
| DWT_X | DEWATERING | KMW_X | POTASSIUM PERMANGANATE | COLW_X | WATER - COOLING |
| FUE_X | DIESEL FUEL | PAC_X | POWDERED ACTIVATED CARBON | DW_X | WATER - DISTILLED WATER |
| DGG_X | DIGESTER GAS | PAR_X | PRE-AERATION | FW_X | WATER - FIRE |
| DM_X | DIGESTER GAS MIXING | PSD_X | PRESEDIMENTATION | IRW_X | WATER - IRRIGATION |
| DGS_X | DIGESTER SLUDGE | PRC_X | PRIMARY CLARIFICATION | OZW_X | WATER - OZONATED |
| DGA_X | DIGESTION - AEROBIC | PSC_X | PRIMARY SCUM | SWT_X | WATER - SEAL |
| DTG_X | DIGESTION - ANAEROBIC | PRS_X | PRIMARY SLUDGE | HW_X | WATER - WATER HEATING |
| DCB_X | DISINFECTION CONTACT BASIN | WWP_X | RAW WASTEWATER PUMPING | DEIW_X | WATER DEIONIZED |
| DAF_X | DISSOLVED AIR FLOTATION | RWP_X | RAW WATER PUMPING | NPW_X | WATER NON-POTABLE |
| DRN_X | DRAINAGE | RWS_X | RAW WATER STORAGE | PEW_X | WATER PLANT EFFLUENT |
| EPF_X | EFFLUENT PUMPING | RCS_X | RECIRCULATED SLUDGE | PW_X | WATER POTABLE |
| EXH_X | ENGINE EXHAUST | REF_X | REFRIGERANT | RW_X | WATER RAW |
| EOB_X | EQUALIZATION BASIN | WWT_X | WET WEATHER TREATMENT | WWT_X | WET WEATHER TREATMENT |
| FEC_X | FERRIC CHLORIDE | ZOP_X | ZINC ORTHOPHOSPHATE | ZOP_X | ZINC ORTHOPHOSPHATE |
| FES_X | FERRIC SULFATE | | | | |
| FRC_X | FERROUS CHLORIDE | | | | |
| FRS_X | FERROUS SULFATE | | | | |
| FLT_X | FILTRATION | | | | |

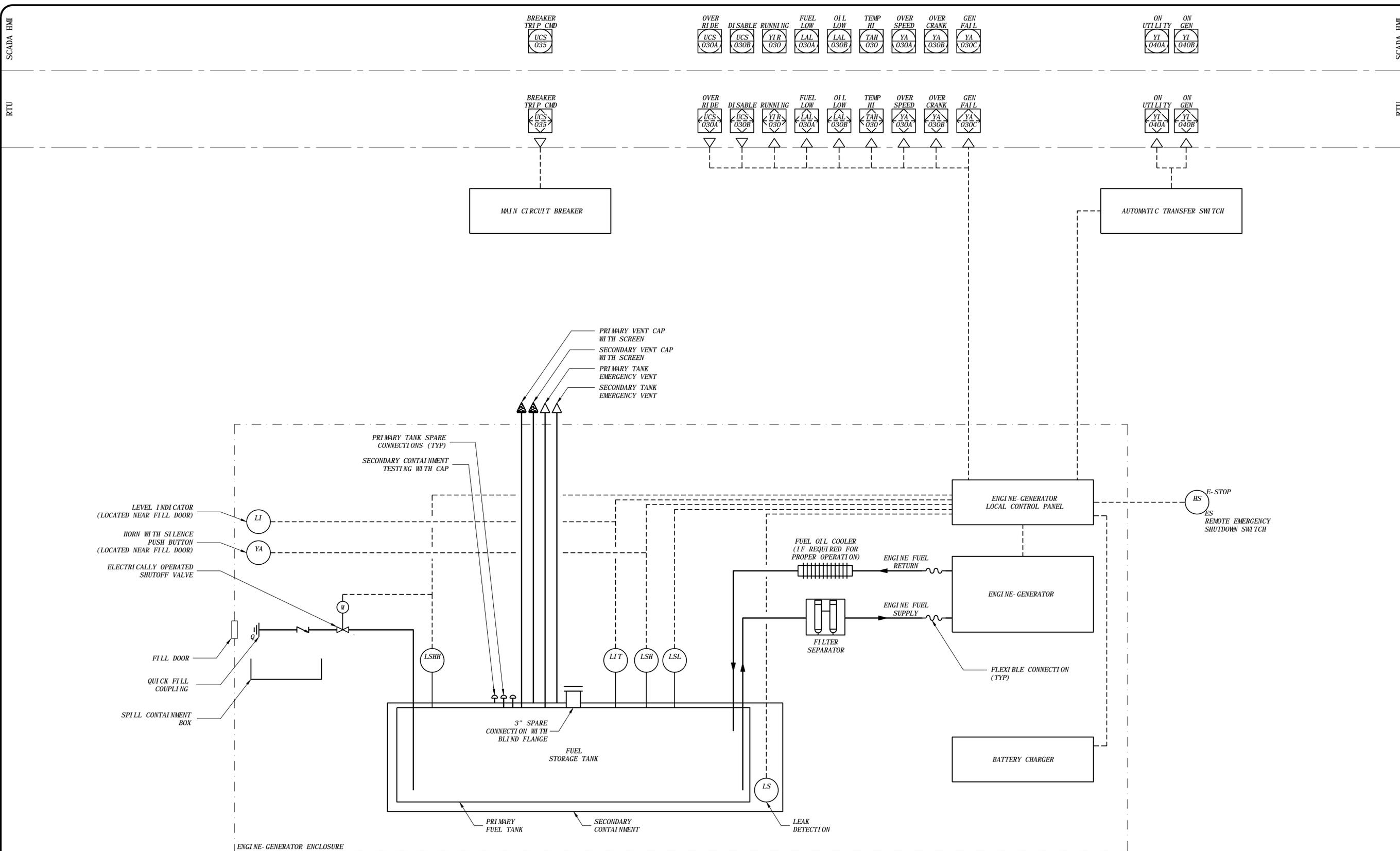
X = PROCESS CODE SUFFIX USED TO FURTHER SPECIFY A PROCESS STREAM (I.E. CL2_G FOR CHLORINE GAS OR CL2_S FOR CHLORINE SOLUTION)

FUNCTION CODE ABBREVIATIONS

| | | | | | | | | | |
|------|----------------------------------|-------|-----------------------------------|------|---|-------|------------------------------------|------|---------------------------------|
| ACMB | ACTIVATION CHAMBER | DWS | DEWATERING SCREW | HSC | HOIST, CHAIN | RSV | RESERVOIR | VB | VACUUM BREAK |
| AFD | ADJUSTABLE FREQUENCY DRIVE | DPS | DIAPHRAGM SEAL | HSE | HOIST, WIRE ROPE | RCO | RESIDUAL COLLECTOR | VRG | VACUUM REGULATOR |
| ACD | AERATOR, COARSE BUBBLE DIFFUSED | DIF | DIFFUSER, CHANNEL | HYDF | HYDRANT, FIRE | RM | ROTAMETER | AVR | VALVE, AIR RELEASE |
| Aefd | AERATOR, FINE PORE DIFFUSED | DFB | DIFFUSER BANK | HYDW | HYDRANT, WALL | RD | RUPTURE DISK | AVRV | VALVE, AIR-VACUUM |
| AFS | AERATOR, FLOATING SURFACE | DIP | DIFFUSER, PIPELINE | HYC | HYDROCYCLONE | SAMP | SAMPLER | VAG | VALVE, ANGLE |
| AES | AERATOR, SURFACE | DIR | DIFFUSER, TANK | INJ | INJECTOR, CHEMICAL | SCL | SCALE | VBM | VALVE, AIRWA BALL |
| APC | AFTERCOOLER | DGE | DIGESTER, AEROBIC | LS | LIME SLAKER | SC | SCALE, WEIGHT | VBF | VALVE, AIRWA BUTTERFLY |
| AD | AIR DRYER | DGAP | DIGESTER, ANAEROBIC PRIMARY | MF | MEMBRANE | SCRHT | SCREEN, HORIZONTAL | VBFP | VALVE, BACKFLOW PREVENTER |
| AF | AIR FILTER | DGAS | DIGESTER, ANAEROBIC SECONDARY | MBMF | MEMBRANE, MICROFILTRATION | SCRI | SCREEN, INLINE SLUDGE | VBM | VALVE, BALL MISCELLANEOUS |
| AR | AIR RECEIVER OR REGULATOR | DSUV | DISINFECTION UNIT, UV | MBNF | MEMBRANE, NANOFILTRATION | SCRM | SCREEN, MANUAL OR MECH CLEANED BAR | VBC | VALVE, CHECK |
| AS | AIR SEPARATOR | DAF | DISSOLVED AIR FLOTATION THICKENER | MBRO | MEMBRANE, REVERSE OSMOSIS | SCRS | SCREEN, STEP | VCN | VALVE, CONE |
| AST | AIR STRIPPER | DUC | DUST COLLECTOR | MBUF | MEMBRANE, ULTRAFILTRATION | SCV | SCREEN, TRAVELLING WATER | VGD | VALVE, DIAPHRAGM OPERATED |
| BFP | BACKFLOW PREVENTER | EDC | EDUCTOR | MXC | MIXER, CARBON | SCR | SCREEN, VIBRATORY | VGD | VALVE, DOUBLE DISC GATE |
| BSNA | BASIN, AERATION | EOPE | ELECTRICAL EQUIPMENT, GENERAL | FLM | MIXER, FLOCCULATION | SCU | SCRUBBER | VPE | VALVE, ECCENTRIC PLUG |
| BSNX | BASIN, ANOXIC/OXIC | EWSH | EMERGENCY EYE WASH FOUNTAIN | M | MOTOR | SMC | SCUM COLLECTOR | VER | VALVE, EXPLOSION RELIEF |
| BMR | BASIN, BNR | ESHR | EMERGENCY SHOWER | MXI | MIXER, IN-LINE | SCW | SCUM WEIR - ROTATING | VFW | VALVE, FOUR WAY |
| BSNC | BASIN, CHLORINE CONTACT | EMEW | EMERGENCY SHOWER & EYEWASH | MXPG | MIXER, PUGMILL | SEP | SEPARATOR, MOISTURE OR CYCLONE | VG | VALVE, GATE |
| BSNO | BASIN, OXIC | EQPB | EQUIPMENT, BUILDING SERVICES | MXR | MIXER, RAPID | SGT | SIGHT GLASS - TALL | V | VALVE, GENERAL OR UNSPECIFIED |
| RBSN | BASIN, RECTANGULAR SEDIMENTATION | EQPT | EQUIPMENT, GENERAL OR UNSPECIFIED | MXS | MIXER, STATIC | SG | SIGHT GAUGE | VGL | VALVE, GLOBE |
| BFPS | BELT FILTER PRESS | EV | EVAPORATOR | MXP | MIXER, SUBMERSIBLE, PROP OR BLENDER | SIL | SILENCER | VBI | VALVE, INDUSTRIAL BUTTERFLY |
| B | BIN (STORAGE - ALL TYPES) | EXC | EXPANSION CHAMBER | MM | MUFFIN MONSTER | SLC | SLUDGE COLLECTOR, CIRCULAR | VKG | VALVE, KNIFE GATE |
| BA | BIN ACTIVATOR | FAX | FAN, AXIAL FLOW | ORD | OVERFLOW ROOF DRAIN | GCLR | SLUDGE COLLECTOR, CROSS | VMR | VALVE, MATERIAL HANDLING ROTARY |
| BLC | BLOWER, CENTRIFUGAL | FAN | FAN, CENTRIFUGAL | ODU | OZONE DESTRUCT UNIT | SFC | SLUDGE COLLECTOR, FLOC-CLARIFYING | VMD | VALVE, MUD |
| BL | BLOWER, POSITIVE DISPLACEMENT | FST | FENCE STIRRER | OGEN | OZONE GENERATOR | SCS | SLUDGE COLLECTOR, SEC CLARIFIERS | VND | VALVE, NEEDLE |
| BLR | BOILER | FTSP | FILTER GAS PARTICULATE | PSU | OZONE POWER SUPPLY UNIT | SSC | SLUDGE COLLECTOR, SOLIDS CONTACT | PTV | VALVE, PILOT |
| BDZ | BULLDOZER | FLC | FILTER, CARTRIDGE TYPE | PP | PACKAGED PLANT | SLCS | SLUDGE COLLECTOR, STRAIGHT LINE | VPN | VALVE, PINCH |
| CCLM | CALIBRATION COLUMN | FLT | FILTER, UNDERDRAINS OR PRESSURE | PCN | PARTICLE COUNTER | GRD | SLUDGE GRINDER, INLINE OR CHANNEL | VPO | VALVE, PISTON OPERATED |
| CFG | CENTRIFUGE | FSW | FILTER, SURFACE WASH EQUIPMENT | PLT | PELLLETIZER | SBL | SOLIDS BLENDER-INLINE | VPL | VALVE, NON-ECCENTRIC PLUG |
| CHF | CHEMICAL FEEDER | FTTNG | FITTING, MISCELLANEOUS | PS | PENSTOCK | STR | STRAINER | VPC | VALVE, PRESSURE REDUCING |
| COS | CHLORINE GAS SCRUBBER | FAR | FLAME ARRESTER | PIPE | PIPE | STRB | STRAINER BASKET TYPE | VSP | VALVE, PRESSURE SUSTAINING |
| PCLR | CLARIFIER, PRIMARY | FLCH | FLAME CHECK | PSE | PLATE SETTLER | STRY | STRAINER Y TYPE | VSP | VALVE, PRESSURE RELIEF |
| SCLR | CLARIFIER, SECONDARY | FLOC | FLOCCULATOR, HORIZONTAL | INJ | POLYMER INJECTOR RING | SRCH | SURGE CHAMBER | VSPV | VALVE, PRESSURE/VACUUM RELIEF |
| CCR | CLASSIFIER, GRIT | FLCV | FLOCCULATOR, VERTICAL | PBC | PRESSURE BUILDING COIL | TSK | TANK, ABOVE GROUND STORAGE | VP | VALVE, PROCESS |
| CM | CLEARWELL | FD | FLOOR DRAIN | PD | PULSATIION DAMPER | TON | TANK, AMMONIA STORAGE | VGR | VALVE, RESILIENT SEATED GATE |
| CMP | COMPRESSOR | FS | FLOW SPLITTER | PAD | PUMP, AIR DIAPHRAGM | TCR | TANK, CRYOGENIC STORAGE | VS | VALVE, SAFETY |
| CMB | COMPRESSOR, LIQUID RING | FE | FLUME, PARSHALL | PCL | PUMP, CENTRIFUGAL | DWT | TANK, DOUBLE WALL | VSLV | VALVE, SLEEVE |
| CMR | COMPRESSOR, ROTARY SCREW | FMSP | FOAM SEPARATOR | PDM | PUMP, DIAPHRAGM METERING | TSE | TANK, ELEVATED STORAGE | VSL | VALVE, SOLENOID |
| CMPS | COMPRESSOR, STEAM | FL | FORKLIFT | PHW | PUMP, HEATING WATER | TX | TANK, EXPANSION | VTV | VALVE, TELESCOPING |
| CTR | CONTAINER, PROCESS | CHF | GAS FEEDER | PHE | PUMP, HORIZONTAL END SUCTION | TNK | TANK, FRP CHEMICAL STORAGE | VTS | VALVE, THERMAL SHUTOFF |
| COB | CONVEYOR, BELT | GF | GAS FLARE | PSC | PUMP, HORIZONTAL SPLIT CASE | TNK | TANK, GENERAL OR UNSPECIFIED | VTW | VALVE, THREE WAY |
| COS | CONVEYOR, SCREW | GWH | GAS WATER HEATER | PPS | PUMP, PERISTALTIC | TCP | TANK, METHANOL | VVB | VALVE, VACUUM BREAKER |
| CFA | COVER, ALUMINUM DOME BASIN | GFL | GATE, FLAP | PPL | PUMP, PLUNGER | SMT | TANK, METHANOL | VSV | VALVE, VACUUM RELIEF |
| CFD | COVER, FIXED DIGESTER | GSD | GATE, SLIDE | PPC | PUMP, PROGRESSING CAVITY | TCS | TANK, CHLORINE CONTACTOR | VVP | VALVE, V-PORT BALL |
| CFL | COVER, FLOATING DIGESTER | GSC | GATE, SLUICE | PSE | PUMP, SCREW ENCLOSED | TSW | TANK, FLAT TOP STEEL WATER | VAP | VAPORIZER |
| DCG | COVER, GAS HOLDER | G | GATE, WEIR | PSE | PUMP, SCREW OPEN | TRP | TRAP, DRIP | VSLB | VESSEL, BOOT |
| DCM | COVER, MEMBRANE | GEN | GENERATOR, ENGINE (BACKUP POWER) | PCL | PUMP, SUBMERSIBLE | TRPS | TRAP, SEDIMENT | WC | WEIR, CIPOLETTI |
| CRN | CRANE | GBT | GRAVITY BELT THICKENER | PCH | PUMP, SUBMERSIBLE CHOPPER | TRK | TRUCK | WR | WEIR, RECTANGULAR |
| CRG | CRANE, GANTRY | GVT | GRAVITY THICKENER | PSS | PUMP, SUBMERSIBLE SUMP | TB | TURBINE | WW | WEIR, V-NOTCH |
| CRJ | CRANE, JIB | GRD | GRINDER PULVERIZER | PSP | PUMP, SUMP | TBC | TURBINE COMPRESSOR | WLHC | WELL, HORIZONTAL COLLECTOR |
| CRP | CRANE, PORTABLE GANTRY | GRB | GRIT BASIN, VORTEX TYPE | P | PUMP, POSITIVE DISPLACEMENT, ROTARY, DRUM OR BELL MOUNTED | TBG | TURBINE ENGINE | WLW | WELL, VERTICAL |
| CRT | CRANE, TRAVELLING BRIDGE | GRV | GRIT SCREW CONCENTRATOR | PVD | PUMP, VERTICAL DIFFUSION VANE | UPS | UNINTERRUPTABLE POWER SUPPLY | | |
| CYL | CYLINDER, CHLORINE | HEX | HEAT EXCHANGER | PVE | PUMP, VERTICAL END SUCTION | UVE | UV REACTOR | | |
| CYG | CYLINDER, GAS | HST | HOIST | PVV | PUMP, VERTICAL WET PIT | UVL | UV REACTOR, HORIZONTAL OR VERTICAL | | |

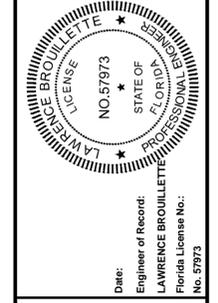


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- NOTES:**
1. SEE LEGEND ON DRAWING I-001, I-002, AND I-003
 2. SYSTEM CODE IS GEN UNLESS OTHERWISE NOTED.
 3. LOCAL CONTROL DEVICES SUCH AS INDICATING LIGHTS AND SWITCHES LOCATED ON MCCs OR AT EQUIPMENT, MAY NOT BE INDICATED ON THIS P&ID.
 4. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL FLEXIBLE CONNECTORS AND EXPANSION JOINTS.
 5. SEE ELECTRICAL DRAWINGS FOR ADDITIONAL DETAILS.

| NO. | REVISIONS AND RECORD OF USE | DATE | BY | CHK | APP |
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CITY OF KEY WEST
 DENNIS STREET STORMWATER
 PUMP STATION
 INSTRUMENTATION
 ENGINE GENERATOR

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|-----------------------------------|
| DESIGNED: BLB |
| DETAILED: MPR |
| CHECKED: LJB |
| APPROVED: LJB |
| DATE: MARCH 2019 |
| PROJECT NO. 193108 |
| I-102 SHEET 38 OF 39 |

ISSUED FOR CONSTRUCTION

