

SPECIAL REQUIREMENTS

APPROVED METHODS TO ALLOW PASSAGE OF ITEMS INSTALLED UNDER THIS SECTION.

ELECTRICAL LEGEND

- GFM** GROUND FAULT MONITORING SYSTEM W/ AUDIBLE AND VISIBLE ALARM.
- E** EXISTING FLOATING DOCK RACEWAY HANDHOLE. SPLICE EXISTING PEDESTAL TAP CONDUCTORS TO FEEDER CONDUCTORS AS INDICATED USING APPROVED METHOD.
- PP** EXISTING POWER PEDESTAL
-  ELECTRICAL PANELBOARD WITH NEMA 3R/SS WITH POWDERCOAT FINISH, SEE PANEL SCHEDULES FOR ADDITIONAL INFORMATION
- PAD MOUNTED UTILITY TRANSFORMER COORDINATE WITH LOCAL UTILITY COMPANY
- SPD** SURGE PROTECTION DEVICE - SEE SPECIFICATIONS

- 1** — DETAIL NUMBER
- E101** — DRAWING NUMBER WHERE DRAWN

PART 1 - GENERAL

1.01 AUXILIARIES AND ACCESSORIES

- A. INCLUDE ALL AUXILIARIES AND ACCESSORIES FOR COMPLETE AND PROPERLY OPERATING SYSTEMS.
- B. PROVIDE AND INSTALL ALL ELECTRICAL SYSTEMS AND ANY NECESSARY ACCESSORIES AS PER THE NATIONAL ELECTRICAL CODE (NEC) EDITION AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION AND LOCAL CODES WHETHER OR NOT SPECIFIED HEREIN OR SHOWN ON DRAWINGS. THE CONTENT OF THESE SPECIFICATIONS (DIVISION 16) AND CONTRACT DOCUMENTS IN GENERAL ONLY REFERS TO WORK REQUIRED ABOVE AND BEYOND THE REQUIREMENTS OF THE NEC AND APPLICABLE LOCAL CODES.

1.02 LAYOUT OF WORK

- A. DRAWINGS ARE DIAGRAMMATIC. CORRELATE FINAL EQUIPMENT LOCATIONS WITH GOVERNING ARCHITECTURAL AND STRUCTURAL DRAWINGS. LAY OUT BEFORE INSTALLATION SO THAT ALL TRADES MAY INSTALL EQUIPMENT IN SPACES AVAILABLE. PROVIDE COORDINATION AS REQUIRED FOR INSTALLATION IN A NEAT AND WORKMANLIKE MANNER.

1.03 INVESTIGATION OF SITE

- A. CHECK SITE AND EXISTING CONDITIONS THOROUGHLY BEFORE BIDDING. ADVISE ENGINEER OF DISCREPANCIES OR QUESTIONS NOTED.

1.04 SUPERVISION OF THE WORK

- A. PROVIDE FIELD SUPERINTENDENT WHO HAS HAD A MINIMUM OF FOUR (4) YEARS PREVIOUS SUCCESSFUL EXPERIENCE ON PROJECTS OF COMPARABLE SIZE AND COMPLEXITY. SUPERINTENDENT SHALL BE PRESENT AT ALL TIMES THAT WORK UNDER THIS DIVISION IS BEING INSTALLED OR AFFECTED. SUPERINTENDENT SHALL HAVE PASSED A PROCTORED H.H. BLOCK JOURNEYMAN EXAM AND SHALL BE A LICENSED JOURNEYMAN. AT LEAST ONE MEMBER OF THE ELECTRICAL CONTRACTING FIRM SHALL HOLD A STATE MASTER CERTIFICATE OF COMPETENCY.

1.05 COORDINATION

- A. PROVIDE ALL REQUIRED COORDINATION AND SUPERVISION WHERE WORK CONNECTS TO OR IS AFFECTED BY WORK OF OTHERS, AND COMPLY WITH ALL REQUIREMENTS AFFECTING THIS DIVISION. WORK REQUIRED UNDER OTHER DIVISIONS, SPECIFICATIONS OR DRAWINGS TO BE PERFORMED BY THIS DIVISION SHALL BE COORDINATED WITH THE CONTRACTOR AND SUCH WORK PERFORMED AT NO ADDITIONAL COST TO OWNER.
- B. LOCATE ALL OPENINGS REQUIRED FOR WORK PERFORMED UNDER THIS SECTION. PROVIDE SLEEVES, GUARDS OR OTHER

1.06 BASIS FOR WIRING DESIGN

- A. THE DRAWINGS AND SPECIFICATIONS DESCRIBE SPECIFIC SIZES OF SWITCHES, BREAKERS, CONDUITS, CONDUCTORS, AND OTHER ITEMS OF WIRING EQUIPMENT. THESE SIZES ARE BASED ON SPECIFIC ITEMS OF POWER CONSUMING EQUIPMENT. WHEREVER THE CONTRACTOR PROVIDES POWER CONSUMING EQUIPMENT WHICH DIFFERS FROM DRAWINGS AND SPECIFICATIONS, THE WIRING AND ASSOCIATED CIRCUIT COMPONENTS FOR SUCH EQUIPMENT SHALL BE CHANGED TO MATCH AT NO ADDITIONAL EXPENSE TO THE OWNER.

1.07 PROTECTION AND CLEAN UP

- A. SUITABLY PROTECT ALL EQUIPMENT FURNISHED UNDER THIS DIVISION DURING CONSTRUCTION. RESTORE ALL DAMAGED SURFACES AND ITEMS TO "LIKE NEW" CONDITION BEFORE A REQUEST FOR SUBSTANTIAL COMPLETION INSPECTION.

1.08 MATERIALS

- A. REFERENCE: "GENERAL CONDITIONS OF THE CONTRACT".
- B. WHERE A MANUFACTURER'S MODEL NUMBER IS LISTED, THIS MODEL SHALL SET THE STANDARD OF QUALITY AND PERFORMANCE REQUIRED. WHERE NO BRAND NAME IS SPECIFIED, THE SOURCE AND QUALITY SHALL BE SUBJECT TO ENGINEER'S REVIEW AND ACCEPTANCE.

1.09 SUBSTITUTIONS

- A. EACH BIDDER REPRESENTS THAT HIS BID IS BASED UPON THE EQUIPMENT AND MATERIALS DESCRIBED IN DIVISION 16 OF THE SPECIFICATIONS.
- B. SUBSTITUTION SUBMITTALS SHALL INCLUDE THE NAME OF THE MATERIAL OR EQUIPMENT FOR WHICH IT IS TO BE SUBSTITUTED, DRAWINGS, CUTS, PERFORMANCE AND TEST DATA AND ANY OTHER INFORMATION NECESSARY FOR THE ENGINEER TO DETERMINE THAT THE EQUIPMENT MEETS ALL SPECIFICATIONS AND REQUIREMENTS. PRE-APPROVAL OF PROPOSED SUBSTITUTIONS IS REQUIRED FOR EQUIPMENT SUPPLIED UNDER THIS DIVISION AND MUST BE SUBMITTED 10 DAYS PRIOR TO BID OPENING.
- C. SUBSTITUTED EQUIPMENT OR OPTIONAL EQUIPMENT WHERE PERMITTED AND APPROVED, MUST CONFORM TO SPACE REQUIREMENTS. ANY SUBSTITUTED EQUIPMENT THAT CANNOT MEET SPACE REQUIREMENTS, WHETHER APPROVED OR NOT, SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE. ANY MODIFICATIONS OF RELATED SYSTEMS AS A RESULT OF SUBSTITUTIONS SHALL BE MADE AT THE CONTRACTOR'S EXPENSE.

1.10 TECHNICAL INFORMATION BROCHURES AND SUBMITTALS

- A. SUBMIT TECHNICAL INFORMATION BROCHURES AT START OF CONSTRUCTION OR WITHIN 30 DAYS AFTER AWARD OF THE CONTRACT. EACH BROCHURE SHALL CONSIST OF AN ADEQUATELY SIZED, HARD-COVER, 3-RING BINDER FOR 8-1/2" X 11" SHEETS. PROVIDE CORRECT DESIGNATION ON OUTSIDE COVER AND ON END OF BROCHURE. WHEN, IN THE JUDGMENT OF THE ENGINEER, ONE BINDER IS NOT ENOUGH TO ADEQUATELY CATALOG ALL DATA, AN ADDITIONAL BINDER WILL BE REQUIRED AND DATA SPLIT AS DIRECTED BY THE ENGINEER.

- B. THE FIRST SHEET IN THE BROCHURE SHALL BE AN INDEX PAGE LISTING ALL EQUIPMENT CONTAINED IN THE BROCHURE WHICH PERTAINS TO THE PROJECT. THE SECOND SHEET SHALL BE PREPARED BY THE CONTRACTOR, AND SHALL LIST MANUFACTURER'S AUTHORIZED REPRESENTATIVE FOR THIS PROJECT. THE THIRD SHEET SHALL LIST MANUFACTURER'S AUTHORIZED MAINTENANCE COMPANY ADDRESSES FOR EQUIPMENT ON THIS PROJECT.
- C. PROVIDE REINFORCED SEPARATION SHEETS TABBED WITH THE APPROPRIATE SPECIFICATION REFERENCE NUMBER AND TYPED INDEX FOR EACH SECTION.
- D. TECHNICAL INFORMATION CONSISTING OF MARKED CATALOG SHEETS OR SHOP DRAWINGS SHALL BE INSERTED IN THE BROCHURE IN PROPER ORDER ON ALL ITEMS HEREIN SPECIFIED OR SHOWN ON DRAWINGS.
- E. THE GENERAL CONTRACTOR SHALL REVIEW THE BROCHURES BEFORE SUBMITTING TO THE ENGINEER. NO REQUEST FOR PAYMENT WILL BE CONSIDERED UNTIL THE BROCHURE HAS BEEN REVIEWED AND SUBMITTED FOR CHECKING.
- F. SHOP DRAWINGS

1. DRAWINGS SHALL INCLUDE IDENTIFICATION OF PROJECT AND NAMES OF ARCHITECT, ENGINEER, GENERAL CONTRACTOR, SUBCONTRACTOR AND/OR SUPPLIER AS APPLICABLE. DATA SHALL BE NUMBERED SEQUENTIALLY AND INDICATE IN GENERAL.

- A. FABRICATION AND ERECTION DIMENSIONS.
- B. ARRANGEMENTS AND SECTIONAL VIEWS.
- C. NECESSARY DETAILS, INCLUDING COMPLETE INFORMATION FOR MAKING CONNECTIONS WITH OTHER WORK.
- D. KINDS OF MATERIALS AND FINISHES.
- E. DESCRIPTIVE NAMES OF EQUIPMENT.
- F. MODIFICATIONS AND OPTIONS TO STANDARD EQUIPMENT REQUIRED BY THE CONTRACT.
- G. LEAVE BLANK AREA, SIZE APPROXIMATELY 4 BY 2-1/2 INCHES, NEAR TITLE BLOCK (FOR ENGINEER'S STAMP IMPRINT).
- H. IN ORDER TO FACILITATE REVIEW OF DRAWINGS, INSOFAR AS PRACTICABLE, THEY SHALL BE NOTED, INDICATING BY CROSS REFERENCE THE CONTRACT DRAWINGS, NOTE, AND/OR SPECIFICATIONS PARAGRAPH NUMBERS WHERE ITEM(S) OCCUR IN THE CONTRACT DOCUMENTS.
- I. SEE SPECIFIC SECTIONS OF SPECIFICATIONS FOR FURTHER REQUIREMENTS.



Project No.: 5220-02-00 Date: July 24, 2012

eFile Name: 52200200KF-E001.dwg

Designed By: RMR Drawn By: RMR

Checked By: CDH

Engineer: Chad D. Huff, P.E. Florida 55440



HANS WILSON & ASSOC., INC.
1938 Hill Ave. Ft. Myers, Florida 33901
Tel: 239-334-6870 Fax: 239-334-7810
MARINE and ENVIRONMENTAL CONSULTANTS

7-24-12

Kingfish Pier Not To Scale
Specifications - Electrical

City of Key West

SHEET
E001

G. PRODUCT DATA

1. SUBMIT TECHNICAL DATA VERIFYING THAT THE ITEM SUBMITTED COMPLIES WITH THE REQUIREMENTS OF THE SPECIFICATIONS. TECHNICAL DATA SHALL INCLUDE MANUFACTURER'S NAME AND MODEL NUMBER, DIMENSIONS, WEIGHTS, ELECTRICAL CHARACTERISTICS, AND CLEARANCES REQUIRED. INDICATE ALL OPTIONAL EQUIPMENT AND CHANGES FROM THE STANDARD ITEM AS CALLED FOR IN THE SPECIFICATIONS. FURNISH DRAWINGS, OR DIAGRAMS, DIMENSIONED AND IN CORRECT SCALE, COVERING EQUIPMENT, SHOWING ARRANGEMENT OF COMPONENTS AND OVERALL COORDINATION.
2. IN ORDER TO FACILITATE REVIEW OF PRODUCT DATA, INSOFAR AS PRACTICABLE, THEY SHALL BE NOTED, INDICATING BY CROSS REFERENCE THE CONTRACT DRAWINGS, NOTE, AND/OR SPECIFICATION PARAGRAPH NUMBERS WHERE ITEM(S) OCCUR IN THE CONTRACT DOCUMENTS.
3. SEE SPECIFIC SECTIONS OF SPECIFICATIONS FOR FURTHER REQUIREMENTS.

H. PROCESSING SUBMITTALS

1. PRODUCT DATA: FOR STANDARD MANUFACTURED MATERIALS, PRODUCTS AND ITEMS SUBMIT COPIES AS REQUIRED UNDER DIVISION 1 SPECIFICATIONS. IF SUBMITTAL IS REJECTED, RESUBMIT COPIES OF NEW DATA.
2. REFERENCE: "GENERAL CONDITIONS OF THE CONTRACT".
3. NOTE THAT THE REVIEW OF SHOP DRAWINGS, OR OTHER INFORMATION SUBMITTED IN ACCORDANCE WITH THE REQUIREMENTS HEREINBEFORE SPECIFIED, DOES NOT ASSURE THAT THE ENGINEER, ARCHITECT, OR ANY OTHER OWNER'S REPRESENTATIVE, ATTESTS TO THE DIMENSIONAL ACCURACY OR DIMENSIONAL SUITABILITY OF THE MATERIAL OR EQUIPMENT INVOLVED, THE ABILITY OF THE MATERIAL OR EQUIPMENT INVOLVED OR THE MECHANICAL/ELECTRICAL PERFORMANCE OF EQUIPMENT. REVIEW OF SHOP DRAWINGS DOES NOT INVALIDATE THE PLANS AND SPECIFICATIONS IF IN CONFLICT, UNLESS A LETTER REQUESTING SUCH CHANGE IS SUBMITTED AND APPROVED ON THE ENGINEER'S LETTERHEAD.

I. DELAYS

1. CONTRACTOR IS RESPONSIBLE FOR ANY DELAYS IN JOB PROGRESS ACCRUING DIRECTLY OR INDIRECTLY FROM LATE SUBMISSIONS OR RESUBMISSIONS OF SHOP DRAWINGS, PRODUCT DATA, OR SAMPLES.

1.11 PROGRESS AND RECORD DRAWINGS

- A. KEEP TWO SETS OF BLACK OR BLUE ON WHITE PRINTS AT THE JOB SITE. NEATLY MARK UP DESIGN DRAWINGS EACH DAY AS COMPONENTS ARE INSTALLED TAKING CARE TO REFLECT ANY VARIATIONS. DIFFERENT COLORED PENCILS SHALL BE USED FOR DIFFERENT SYSTEMS. ALL ITEMS ON PROGRESS DRAWINGS SHALL BE SHOWN IN ACTUAL LOCATION INSTALLED. CHANGE ANY EQUIPMENT SCHEDULES TO AGREE WITH ITEMS ACTUALLY FURNISHED.
- B. PRIOR TO REQUEST FOR FINAL PAYMENT FURNISH A SET OF "AS BUILT" REPRODUCIBLES AND TWO SETS OF PRINTS TO THE ENGINEER, UNLESS OTHERWISE SPECIFIED.

1.12 OPERATING INSTRUCTIONS

- A. SUBMIT FOR CHECKING A SPECIFIC SET OF WRITTEN OPERATING INSTRUCTIONS ON EACH ITEM WHICH REQUIRE INSTRUCTIONS TO OPERATE. AFTER APPROVAL, PROVIDE ONE COPY FOR INSERTION IN EACH TECHNICAL INFORMATION BROCHURE.

1.13 MAINTENANCE INSTRUCTIONS

- A. SUBMIT FOR APPROVAL MAINTENANCE INFORMATION CONSISTING OF MANUFACTURER'S PRINTED INSTRUCTIONS AND PARTS LISTS FOR EACH MAJOR ITEM OR EQUIPMENT. AFTER APPROVAL, INSERT INFORMATION IN EACH TECHNICAL INFORMATION BROCHURE.

1.14 SYSTEMS GUARANTEE

- A. THE WORK REQUIRED UNDER THIS DIVISION SHALL INCLUDE A ONE-YEAR GUARANTEE. THIS GUARANTEE SHALL BE BY THE CONTRACTOR TO THE OWNER FOR ANY DEFECTIVE WORKMANSHIP OR MATERIAL WHICH HAS BEEN FURNISHED UNDER THIS CONTRACT AT NO COST TO THE OWNER FOR A PERIOD OF ONE YEAR FROM THE DATE OF SUBSTANTIAL COMPLETION OF THE SYSTEM. THIS GUARANTEE SHALL NOT INCLUDE LIGHT BULBS IN SERVICE AFTER ONE MONTH FROM DATE OF SUBSTANTIAL COMPLETION OF THE SYSTEM. EXPLAIN THE PROVISIONS OF GUARANTEE TO THE OWNER AT THE "DEMONSTRATION OF COMPLETED SYSTEM".

1.15 FINAL INSPECTION

- A. ALL WORK ON THE PROJECT SHALL BE COMPLETED, AND ALL FORMS AND OTHER INFORMATION SHALL BE SUBMITTED FOR APPROVAL ONE WEEK BEFORE THE REQUEST FOR FINAL INSPECTION.

1.16 EQUIPMENT TO BE OF SINGLE MANUFACTURER

- A. IN GENERAL, ALL LIKE EQUIPMENT SHALL BE SUPPLIED AND MANUFACTURED BY SAME MANUFACTURER.

1.17 GENERAL

- A. WHERE THE REQUIREMENTS OF ANOTHER DIVISION, SECTION, OR PART OF THESE SPECIFICATIONS EXCEED THE REQUIREMENTS OF THIS DIVISION, THOSE REQUIREMENTS SHALL GOVERN.

SECTION 16020

WORK INCLUDED

PART 1 - GENERAL

1.01 DESCRIPTION OF SYSTEM

- A. THE WORK REQUIRED UNDER THIS DIVISION SHALL INCLUDE ALL MATERIALS, LABOR AND AUXILIARIES REQUIRED TO INSTALL A COMPLETE AND PROPERLY OPERATING ELECTRICAL SYSTEM. THE ELECTRICAL SYSTEM REQUIRED UNDER THIS DIVISION CONSISTS BASICALLY OF, BUT IS NOT LIMITED TO THE FOLLOWING.
 1. COMPLETE DISTRIBUTION SYSTEM FOR MARINE SHORE POWER INCLUDING FEEDERS FROM UTILITY COMPANY TRANSFORMER TO MAIN SWITCHGEAR AND CONNECTIONS TO POWER PEDESTALS.
 2. A SECONDARY GROUNDING SYSTEM AS INDICATED AND SPECIFIED.
 3. POWER DISTRIBUTION PANELBOARDS.
 4. MAIN POWER/SURGE PROTECTION SYSTEMS.

END OF SECTION

SECTION 16025

CODES, FEES, AND STANDARDS

PART 1 - GENERAL

1.01 CODES AND FEES

- A. INSTALL IN ACCORDANCE WITH LATEST EDITION OF THE NATIONAL ELECTRIC CODE AND THE REGULATIONS OF GOVERNING LOCAL, AND OTHER APPLICABLE CODES, INCLUDING THE UTILITY COMPANY. PAY FOR ALL REQUIRED LICENSES, FEES AND INSPECTIONS.
- B. ALL WORK AND EQUIPMENT UNDER THIS DIVISION SHALL BE IN STRICT COMPLIANCE WITH THE APPLICABLE PROVISIONS OF THE LATEST EDITIONS OF THE FOLLOWING CODES AND STANDARDS INFORCE AT THE TIME OF CONSTRUCTION.
 1. FLORIDA BUILDING CODE
 2. NATIONAL ELECTRICAL CODE (NEC)
 3. REQUIREMENTS OF LOCAL POWER COMPANY

1.02 STANDARDS

- A. ALL MATERIALS SHALL BE NEW AND FREE OF DEFECTS, AND SHALL BE UL LISTED, BEAR THE UL LABEL OR BE LABELED OR LISTED WITH AN APPROVED, NATIONALLY RECOGNIZED ELECTRICAL TESTING AGENCY. WHERE NO LABELING OR LISTING SERVICE IS AVAILABLE FOR CERTAIN TYPES OF EQUIPMENT, TEST DATA SHALL BE SUBMITTED TO PROVE TO THE ENGINEER THAT EQUIPMENT MEETS OR EXCEEDS AVAILABLE STANDARDS.

1.03 UTILITY COMPANY FEES, CHARGES, COSTS

- A. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE REQUIRED UTILITY COMPANY TO DETERMINE IF ANY FEES, CHARGES OR COSTS WILL BE DUE THE UTILITY COMPANY. FEES FOR TEMPORARY POWER SHALL BE INCLUDED IN THIS CONTRACTOR'S BID PRICE. FEES FOR PERMANENT POWER WILL BE PAID BY THE OWNER.

END OF SECTION

SECTION 16110

RACEWAYS AND CONDUIT

PART 1 - GENERAL

1.01 DESCRIPTION

A. DESCRIPTION OF SYSTEM

1. THE ENTIRE INSTALLATION SHALL BE IN PVC PLASTIC CONDUIT, UNLESS SPECIFICALLY NOTED OTHERWISE. ONLY SCHEDULE 40 PVC SHALL BE USED FOR ALL RACEWAYS TRAPPED UNDERGROUND OR UNDER DOCK STRUCTURE. MINIMUM CONDUIT SIZE SHALL BE 3/4" UNLESS NOTED OTHERWISE ON DRAWINGS. ALL CONDUIT SHALL BE UL LISTED AND LABELED. CONDUIT SIZES SHOWN ON THE DRAWINGS ARE TO AID THE CONTRACTOR IN BIDDING ONLY; THE CONTRACTOR IS RESPONSIBLE FOR CONDUIT SIZES AS REQUIRED BY NEC FILL TABLES.

1.02 SUBMITTALS

A. PRODUCT DATA

1. PRODUCT DATA SHALL BE SUBMITTED ON CONDUIT AND CONDUIT FITTINGS. PRODUCT DATA SHALL SHOW COMPLIANCE WITH THIS SECTION OF THE SPECIFICATIONS, INCLUDING UL LABEL, MANUFACTURER, AND MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.

PART 2 - PRODUCTS

2.01 PVC CONDUIT

- A. PVC CONDUIT SHALL BE COMPOSED OF HIGH IMPACT PVC (POLYVINYL CHLORIDE C-200 COMPOUND), AND SHALL CONFORM TO INDUSTRY STANDARDS, AND BE UL LISTED IN ACCORDANCE WITH ARTICLE 352 OF NATIONAL ELECTRICAL CODE FOR UNDERGROUND AND EXPOSED USE. MATERIALS MUST HAVE TENSILE STRENGTH OF 55 PSI, AT 70°F, FLEXURAL STRENGTH OF 11,000 PSI, COMPRESSION STRENGTH OF 8600 PSI. MANUFACTURER SHALL HAVE FIVE YEARS' EXTRUDING PVC EXPERIENCE.



HSA
ENGINEERS & SCIENTISTS
A member of the CRA Family of Companies
Certificate Of Authorization #7098
1520 ROYAL PALM SQUARE BOULEVARD SUITE 260
FORT MYERS, FLORIDA 33919
PHONE: (239) 936-4003 FAX: (239) 936-0819

Project No.: 5220-02-00 Date: July 24, 2012

eFile Name: 52200200KF-E002.dwg

Designed By: RMR Drawn By: RMR

Checked By: CDH

Engineer: Chad D. Huff, P.E. Florida 55440



HANS WILSON & ASSOC., INC.
1938 Hill Ave. Ft. Myers, Florida 33901
Tel: 239-334-6870 Fax: 239-334-7810
MARINE and ENVIRONMENTAL CONSULTANTS

7-24-12

Kingfish Pier
Specifications - Electrical
Not To Scale

City of Key West

SHEET
E002

2.02 EXPANSION FITTINGS

- A. CONDUIT EXPANSION FITTINGS SHALL BE SCHEDULE 40 PVC SHALL HAVE AN EXPANSION CHAMBER TO ALLOW APPROXIMATELY TWO-INCH MOVEMENT PARALLEL TO CONDUIT RUN IN EITHER DIRECTION FROM NORMAL. THEY SHALL HAVE FACTORY-INSTALLED PACKING. EXPANSION FITTINGS SHALL BE SPACED AS RECOMMENDED BY THE MANUFACTURER.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. ALL RACEWAYS SHALL BE RUN IN NEAT AND WORKMAN LIKE MANNER AND SHALL BE PROPERLY SUPPORTED IN ACCORDANCE WITH LATEST EDITION OF NEC WITH APPROVED STAINLESS STEEL CONDUIT CLAMPS, HANGER RODS AND STRUCTURAL FASTENERS.
- B. ALL RACEWAY RUNS, WHETHER TERMINATED IN BOXES OR NOT, SHALL BE CAPPED DURING THE COURSE OF CONSTRUCTION AND UNTIL WIRES ARE PULLED IN, AND COVERS ARE IN PLACE. NO CONDUCTORS SHALL BE PULLED INTO RACEWAYS UNTIL CONSTRUCTION WORK WHICH MIGHT DAMAGE THE RACEWAYS HAS BEEN COMPLETED.
- C. ALL RACEWAYS SHALL HAVE AN INSULATED COPPER SYSTEM GROUND CONDUCTOR THROUGHOUT THE ENTIRE LENGTH OF CIRCUIT INSTALLED WITHIN CONDUIT IN STRICT ACCORDANCE WITH NEC. GROUNDING CONDUCTOR SHALL BE INCLUDED IN TOTAL CONDUIT FILL DETERMINING CONDUIT SIZES, EVEN THOUGH NOT INCLUDED OR SHOWN ON DRAWINGS. GROUNDING CONDUCTORS RUN WITH FEEDERS SHALL BE BONDED TO PORTIONS OF CONDUIT THAT ARE METAL BY APPROVED GROUND BUSHINGS.
- D. RACEWAYS WHICH DO NOT HAVE CONDUCTORS FURNISHED UNDER THIS DIVISION OF THE SPECIFICATIONS SHALL BE LEFT WITH AN APPROVED NYLON PULLCORD IN RACEWAY.

END OF SECTION
SECTION 16120
WIRES AND CABLES

PART 1 - GENERAL

1.01 GENERAL PROVISIONS

- A. CONDUCTORS
 - 1. ALL CONDUCTORS SHALL BE COPPER TYPE THHN/THWN. DOCK POWER CONDUCTORS SHALL BE TYPE "DLO" AS INDICATED ON DRAWINGS. NO ALUMINUM WIRING SHALL BE PERMITTED. ALL WIRE SHALL BE SIZED AS SHOWN ON THE DRAWINGS.

- 2. WIRING AT THE TRANSITION TO THE FLOATING DOCK(S) AND WITHIN FLOATING DOCK(S) SHALL BE TYPE "DLO" OR "W" CABLE SINGLE CONDUCTOR OR "G" CABLE MULTI-CONDUCTOR CABLE.

B. TAPS AND SPLICES

- 1. ALL TAPS AND SPLICES IN HANDHOLES OR IN GROUND PULL BOXES SHALL BE SUBMERSIBLE TYPE CONNECTORS. BASIS OF DESIGN: CMC TYPE SSBC-S RUBBER INSULATED SECONDARY CONNECTORS. INSTALL SLEEVE KITS AS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

C. COLOR CODING

- 1. ALL POWER FEEDERS SHALL BE WIRED WITH INDUSTRY STANDARD COLOR-CODED WIRE OR SHALL HAVE BLACK INSULATION AND BE SIMILARLY COLOR-CODED WITH TAPE OR PAINT IN ALL JUNCTION BOXES AND PANELS. TAPE OR PAINT SHALL COMPLETELY COVER THE FULL LENGTH OF CONDUCTOR INSULATION WITHIN THE BOX OR PANEL.

1.02 SUBMITTALS

- A. SUBMIT MANUFACTURER'S DATA SHEETS ON ALL MAJOR TYPES OF WIRES AND CABLES INCLUDING SPLICING TAPE, AND TERMINATING/SPLICING LUGS OR CONNECTORS AND CABLE SLEEVES.

END OF SECTION
SECTION 16410
ELECTRIC SERVICE

1 - GENERAL

DESCRIPTION

- A. DESCRIPTION OF SYSTEM
 - 1. THE ELECTRICAL UTILITY COMPANY WILL PROVIDE THE ELECTRICAL SERVICE OF THE CHARACTERISTICS AS SHOWN ON THE DRAWINGS. THE CONTRACTOR'S WORK WILL BEGIN WHERE THE UTILITY COMPANY'S WORK ENDS.
 - 2. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, ETC., NECESSARY FOR A COMPLETE APPROVED ELECTRICAL SERVICE AS REQUIRED FOR THIS PROJECT, INCLUDING INSPECTION AND APPROVAL BY THE UTILITY AND LOCAL INSPECTION DEPARTMENTS.
 - 3. THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANY IN WRITING, WITH TWO COPIES TO THE ENGINEER, NO LATER THAN TEN (10) DAYS AFTER SIGNING CONTRACTS AS TO WHEN THIS CONTRACTOR ANTICIPATES THE BUILDING POWER SERVICE WILL BE REQUIRED.

B. CONSTRUCTION FACILITIES

- 1. THE FACILITIES AND EQUIPMENT REQUIRED TO PROVIDE ALL ELECTRICAL POWER CONSUMED FOR CONSTRUCTION, LIGHTING AND BALANCING AND TESTING PRIOR TO FINAL ACCEPTANCE OF THE PROJECT SHALL BE PROVIDED UNDER THIS SECTION OF THE SPECIFICATIONS. ALL WIRING, OUTLETS AND OTHER WORK REQUIRED TO PROVIDE THIS POWER AT THE SITE AND WITHIN THE BUILDING FOR ALL TRADES SHALL BE ARRANGED FOR, FURNISHED AND INSTALLED UNDER THIS SECTION OF THE SPECIFICATIONS INCLUDING ANY FEE, CHARGE OR COST DUE THE UTILITY COMPANY FOR TEMPORARY POWER INSTALLATION OR HOOK-UPS.

- 2. FACILITIES SHALL BE FURNISHED IN A NEAT AND SAFE MANNER IN COMPLIANCE WITH GOVERNING CODES, GOOD WORKING PRACTICES AND OSHA REGULATIONS.

C. ELECTRICAL SERVICE

- 1. FURNISH AND INSTALL SECONDARY 120/240V, 1PH,3W SERVICE FROM UTILITY XFMR AS INDICATED. TERMINATION AT THE UTILITY TRANSFORMER WILL BE BY UTILITY COMPANY.
- 2. FURNISH AND INSTALL ALL MISCELLANEOUS ELECTRICAL CONNECTIONS, DEVICES, SUPPORTING DEVICES, CONDUIT, ETC., AS REQUIRED BY UTILITY COMPANY FOR A COMPLETE ELECTRICAL SERVICE.

D. SURGE PROTECTION

- 1. PROVIDE AND INSTALL SURGE SUPPRESSORS AS SPECIFIED IN SECTION 16610.

END OF SECTION
SECTION 16450
SECONDARY GROUNDING

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. POWER SYSTEM GROUNDING.
- B. COMMUNICATION SYSTEM GROUNDING.
- C. ELECTRICAL EQUIPMENT AND RACEWAY GROUNDING AND BONDING.

1.02 SYSTEM DESCRIPTION

- A. GROUND THE ELECTRICAL SERVICE SYSTEM NEUTRAL AT SERVICE ENTRANCE EQUIPMENT TO METALLIC WATER SERVICE, BUILDING STEEL, CONCRETE REINFORCING STEEL, AND TO SUPPLEMENTARY GROUNDING ELECTRODES.
- B. PROVIDE COMMUNICATIONS SYSTEM GROUNDING CONDUCTOR AT POINT OF SERVICE ENTRANCE AND CONNECT TO NEAREST EFFECTIVELY GROUNDED METALLIC WATER PIPE AND NEAREST EFFECTIVELY GROUNDED BUILDING STRUCTURAL STEEL MEMBER.
- C. BOND TOGETHER SYSTEM NEUTRALS, SERVICE EQUIPMENT ENCLOSURES, EXPOSED NON-CURRENT CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT, METAL RACEWAY SYSTEMS, GROUNDING CONDUCTOR IN RACEWAYS AND CABLES, RECEPTACLE GROUND CONNECTORS, AND PLUMBING SYSTEMS.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. GROUND RODS: COPPER-ENCASED STEEL, 3/4 INCH DIAMETER, MINIMUM LENGTH 10 FEET.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. PROVIDE A SEPARATE, INSULATED EQUIPMENT GROUNDING CONDUCTOR WITH EACH FEEDER AND BRANCH CIRCUIT. TERMINATE EACH END ON A GROUNDING LUG, BUS, OR BUSHING.
- B. CONNECT GROUNDING ELECTRODE CONDUCTORS TO METAL WATER PIPE USING AN APPROVED GROUND CLAMP. MAKE CONNECTIONS TO FLANGED PIPING AT STREET SIDE OF FLANGE. PROVIDE BONDING JUMPER AROUND WATER METER.
- C. USE MINIMUM 6 AWG COPPER CONDUCTOR FOR COMMUNICATIONS SERVICE GROUNDING CONDUCTOR. LEAVE 10 FEET SLACK CONDUCTOR AT TERMINAL BOARD.
- D. ALL GROUND CONNECTIONS AT GROUND RODS, BUILDING STEEL, AND CONCRETE REINFORCING STEEL SHALL BE THERMOFUSION TYPE.

3.02 FIELD QUALITY CONTROL

- A. INSPECT GROUNDING AND BONDING SYSTEM CONDUCTORS AND CONNECTIONS FOR TIGHTNESS AND PROPER INSTALLATION.

END OF SECTION
SECTION 16470
PANELBOARD

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. MAIN SERVICE, LIGHTING, AND APPLIANCE BRANCH CIRCUIT PANELBOARD WITH RATINGS AS INDICATED.

1.02 SUBMITTALS

- A. SUBMIT SHOP DRAWINGS FOR EQUIPMENT AND COMPONENT DEVICES.
- B. INCLUDE OUTLINE AND SUPPORT POINT DIMENSIONS, VOLTAGE, MAIN BUS AMPACITY, INTEGRATED SHORT CIRCUIT AMPERE RATING, CIRCUIT BREAKER AND FUSIBLE SWITCH ARRANGEMENT AND SIZES.



HSA
ENGINEERS & SCIENTISTS
A member of the CRA Family of Companies
Certificate Of Authorization #7098
1520 ROYAL PALM SQUARE BOULEVARD SUITE 260
FORT MYERS, FLORIDA 33919
PHONE: (239) 936-4003 FAX: (239) 936-0819

Project No.: 5220-02-00	Date: July 24, 2012
eFile Name: 52200200KF-E003.dwg	
Designed By: RMR	Drawn By: RMR
Checked By: CDH	
Engineer: Chad D. Huff, P.E.	Florida 55440



HANS WILSON & ASSOC., INC.
1938 Hill Ave. Ft. Myers, Florida 33901
Tel: 239-334-6870 Fax: 239-334-7810
MARINE and ENVIRONMENTAL CONSULTANTS

7-24-12

Kingfish Pier
Specifications - Electrical

Not To Scale

City of Key West

SHEET
E003

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS – PANELBOARDS

- A. EATON
- B. SQUARE D
- C. G.E.
- D. SIEMENS
- E. OR EQUAL

2.02 PANELBOARDS

- A. PANELBOARDS SHALL BE CIRCUIT BREAKER TYPE.
- B. ENCLOSURE SHALL BE NEMA 3R STAINLESS STEEL W/WHITE POWDER COATED PAINT FINISH, RAINPROOF.
- C. PROVIDE PANELBOARDS WITH BUS RATINGS AS SCHEDULED.
- D. ALL PANELBOARDS SHALL BE FULLY RATED WITH MINIMUM INTEGRATED SHORT CIRCUIT RATING AS INDICATED ON DRAWINGS.
- E. MOLDED CASE CIRCUIT BREAKERS: BOLT-ON TYPE THERMAL/MAGNETIC TRIP CIRCUIT BREAKERS, WITH COMMON TRIP HANDLE FOR ALL POLES. PROVIDE CIRCUIT BREAKERS UL LISTED AS TYPE SWD FOR LIGHTING CIRCUITS.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. INSTALL PANELBOARDS PLUMB AND FLUSH WITH SUPPORTING STRUCTURE.
- B. HEIGHT: 6 FT. TO TOP.
- C. PROVIDE FILLER PLATES FOR UNUSED SPACES IN PANELBOARDS.
- D. PROVIDE TYPED CIRCUIT DIRECTORY FOR EACH BRANCH CIRCUIT PANELBOARD. REVISE DIRECTORY TO REFLECT CIRCUITING CHANGES REQUIRED TO BALANCE PHASE LOADS.

3.02 FIELD QUALITY CONTROL

- A. VISUAL AND MECHANICAL INSPECTION: INSPECT FOR PHYSICAL DAMAGE, PROPER ALIGNMENT, ANCHORAGE, AND GROUNDING. CHECK PROPER INSTALLATION AND TIGHTNESS OF CONNECTIONS FOR CIRCUIT BREAKERS, FUSIBLE SWITCHES, AND FUSES.

END OF SECTION

SECTION 16610

SURGE PROTECTIVE DEVICE (SPD)

PART 1 – GENERAL

1.01 DESCRIPTION

- A. THIS SECTION DESCRIBES THE MATERIALS AND INSTALLATION REQUIREMENTS FOR SURGE PROTECTIVE DEVICES (SPD) FOR THE PROTECTION OF ALL AC ELECTRICAL CIRCUITS FROM THE EFFECTS OF LIGHTNING INDUCED CURRENTS, SUBSTATION SWITCHING TRANSIENTS AND INTERNALLY GENERATED TRANSIENTS RESULTING FROM INDUCTIVE AND/OR CAPACITIVE LOAD SWITCHING.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. GENERAL ELECTRICAL REQUIREMENTS.
- B. RACEWAYS, BOXES, AND FITTINGS.
- C. WIRE AND CABLE.
- D. GROUNDING.

1.03 SUBMITTALS

- A. SUBMIT SHOP DRAWINGS, PRODUCT DATA AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- B. THE SURGE SUPPRESSION SUBMITTALS SHALL ALSO INCLUDE

- 1. DIMENSIONAL DRAWING OF EACH SUPPRESSOR TYPE INDICATING THE FOLLOWING.

- A. SERVICE ENTRANCE SUPPRESSORS
 - COPPER BUS BARS FOR INTERNAL CONNECTIONS
 - REPLACEABLE MODULES ON EACH PHASE
 - REPLACEABLE 200,000 AIC FUSES ON EACH MODULE
- B. DOWNSTREAM SUPPRESSORS
 - LINE TO NEUTRAL, LINE TO GROUND, AND NEUTRAL TO GROUND SUPPRESSION PATHS

- 2. IEEE C62.41-1991 CATEGORY C3 (20 KV, 10 KA, 8/20 μS WAVEFORM) CLAMP VOLTAGE TEST RESULTS FROM AN INDEPENDENT TEST LAB.

1.04 MANUFACTURERS

- A. ALL SUPPRESSORS FOR AC DISTRIBUTION AND BRANCH CIRCUIT PROTECTION WITHIN A SINGLE FACILITY SHALL BE PROVIDED BY A SINGLE MANUFACTURER. THE SAME MANUFACTURER WHO PROVIDES MAIN PANEL SUPPRESSORS SHALL PROVIDE SUPPRESSORS FOR DISTRIBUTION AND BRANCH PANELS.

PART 2 – PRODUCTS

2.01 MAIN SERVICE SUPPRESSORS AT DISTRIBUTION PANEL

- A. SUPPRESSORS SHALL BE LISTED IN ACCORDANCE WITH UL 1449, STANDARD FOR SAFETY, TRANSIENT VOLTAGE SURGE SUPPRESSORS, AND UL 1283 ELECTROMAGNETIC INTERFERENCE FILTERS.
- B. THE UNIT SHALL PROVIDE THE FOLLOWING SUPPRESSION PATHS: LINE TO GROUND, LINE TO NEUTRAL, AND NEUTRAL TO GROUND.
- C. SUPPRESSORS SHALL MEET OR EXCEED THE FOLLOWING CRITERIA SET FORTH IN C.U.L.
- D. SUPPRESSORS SHALL BE MADE OF SOLID-STATE COMPONENTS AND OPERATE BIDIRECTIONALLY.
- E. THE SUPPRESSOR SHALL HAVE A RESPONSE TIME NO GREATER THAN FIVE NANoseconds FOR ANY OF THE INDIVIDUAL PROTECTION MODES.
- F. SUPPRESSORS SHALL BE DESIGNED TO WITHSTAND A MAXIMUM CONTINUOUS OPERATING VOLTAGE (MCOV) OF NOT LESS THAN 115% OF NOMINAL RMS VOLTAGE.
- G. VISIBLE INDICATION OF PROPER SUPPRESSOR CONNECTION AND OPERATION SHALL BE PROVIDED.
- H. THE SUPPRESSOR MANUFACTURER SHALL PROVIDE CERTIFIED TEST DATA CONFIRMING A "FAIL-SHORT" FAILURE MODE.
- I. SUPPRESSORS SHALL BE MANUFACTURED IN THE UNITED STATES. ALL MAJOR COMPONENTS SHALL ALSO BE OF AMERICAN MANUFACTURE.
- J. SUPPRESSORS SHALL HAVE A FIVE-YEAR WARRANTY, INCORPORATING UNLIMITED REPLACEMENTS OF SUPPRESSORS IF THEY ARE DESTROYED BY TRANSIENTS WITHIN THE WARRANTY PERIOD.
- K. SUPPRESSORS SHALL BE AN INTEGRAL PART OF THE MAIN POWER DISTRIBUTION PANEL AND SHALL BE AS MANUFACTURED BY ADVANCED PROTECTION TECHNOLOGIES, INC., XTE/XHP SERIES; OR APPROVED EQUAL BY SQUARE D, SIEMENS, OR G.E.

PART 3 – EXECUTION

3.01 MAIN DISTRIBUTION PANEL

- A. CONDUCTORS BETWEEN SUPPRESSOR AND POINT OF ATTACHMENT SHALL BE KEPT SHORT AND STRAIGHT.
- B. NEUTRAL AND GROUND SHALL NOT BE BONDED TOGETHER AT SECONDARY PANELBOARD LOCATION.

END OF SECTION

SECTION 16620

GROUND MONITORING SYSTEM

PART 1 – GENERAL

1.01 DESCRIPTION

- A. THIS SECTION DESCRIBES THE MATERIALS AND INSTALLATION REQUIREMENTS FOR GROUND MONITORING EQUIPMENT TO MEASURE "LEAKAGE" CURRENT TO GROUND.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. GENERAL ELECTRICAL REQUIREMENTS.
- B. RACEWAYS, BOXES, AND FITTINGS.
- C. WIRE AND CABLE.
- D. MOTOR CONTROLS.
- E. GROUNDING.

1.03 SUBMITTALS

- A. SUBMIT SHOP DRAWINGS, PRODUCT DATA AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- B. THE GROUND MONITOR SUBMITTALS SHALL ALSO INCLUDE
 - 1. DIMENSIONAL DRAWINGS OF EACH MONITOR TYPE.
 - 2. PANELBOARD MOUNTING DETAIL.

1.04 MANUFACTURERS

- A. ALL MONITORS FOR AC DISTRIBUTION AND BRANCH CIRCUIT PROTECTION WITHIN A SINGLE FACILITY SHALL BE PROVIDED BY A SINGLE MANUFACTURER.

PART 2 – PRODUCTS

2.01 MAIN SERVICE MONITORS AT DISTRIBUTION PANELS

- A. MONITORS SHALL BE LISTED IN ACCORDANCE WITH U.L. FILE #E173157.
- B. THE GROUND FAULT MONITORS SHALL BE BENDER MODEL RCM470LY-13-MA/RCMS460-D OR APPROVED EQUAL. THESE DEVICES SHALL MONITOR THE INSULATION LEVEL OF GROUNDED SINGLE PHASE MARINA POWER SYSTEM BY MEASURING THE GROUND FAULT LEAKAGE CURRENT.
- C. THE MONITORS SHALL PROVIDE ADVANCED WARNING OF DEVELOPING FAULTS WITHOUT THE PROBLEMS ASSOCIATED WITH HIGH SENSITIVITY NUISANCE TRIPPING. THE MONITORS SHALL BE AN IEC755 TYPE A GROUND FAULT MONITOR THAT CAN DETECT SINUSOIDAL AC GROUND FAULT CURRENTS AND PULSATING DC GROUND FAULT CURRENTS.
- D. THE RESPONSE VALUE CURRENT SHALL BE STEPLESSLY ADJUSTABLE BETWEEN 10MA AND 10 A AND THE DELAY TIME SHALL BE ADJUSTABLE BETWEEN 0 AND 10 S. THE RELAY SHALL BE EQUIPPED WITH AN LED BAR GRAPH INDICATOR. AN EXTERNAL ANALOG METER SHALL BE CAPABLE OF BEING CONNECTED AND BY USING AN OPTIONAL EXTERNAL TRANSDUCER, A 4 TO 20MA SIGNAL SHALL BE AVAILABLE. METER INDICATION SHALL BE FROM 10 TO 100% WHERE 100% IS EQUAL TO THE ALARM SET-POINT VALUE.
- E. THE RCM470LY-13-MA SHALL BE DESIGNED FOR USE WITH EXTERNAL SPECIAL U.L. LISTED CURRENT TRANSFORMERS DESIGNED TO PREVENT NUISANCE TRIPPING.



HSA
ENGINEERS & SCIENTISTS
A member of the CRA Family of Companies
Certificate Of Authorization #7098
1520 ROYAL PALM SQUARE BOULEVARD SUITE 260
FORT MYERS, FLORIDA 33919
PHONE: (239) 936-4003 FAX: (239) 936-0819

Project No.: 5220-02-00	Date: July 24, 2012
eFile Name: 52200200KF-E004.dwg	
Designed By: RMR	Drawn By: RMR
Checked By: CDH	
Engineer: Chad D. Huff, P.E. Florida 55440	



HANS WILSON & ASSOC., INC.
1938 Hill Ave. Ft. Myers, Florida 33901
Tel: 239-334-6870 Fax: 239-334-7810
MARINE and ENVIRONMENTAL CONSULTANTS

7-24-12

Kingfish Pier *Not To Scale*
Specifications - Electrical

City of Key West

SHEET
E004

- F. MONITORS SHALL BE SUITABLE FOR INSTALLATION INTO STANDARD DISTRIBUTION PANELS.
- G. GROUND FAULT CURRENT SHALL BE EVALUATED BY SPECIAL CURRENT TRANSFORMERS AND CONVERTED INTO MEASURING SIGNAL.
- H. WHEN A GROUND FAULT CURRENT EXCEEDS THE ALARM SETUP POINT VALUE, THE ALARM LED ILLUMINATES AND THE ALARM RELAY SWITCHES AFTER THE ADJUSTED TIME DELAY. THE ALARM RELAY SHELL BE SELECTABLE TO BE IN THE NORMALLY ENERGIZED OR NORMALLY DE-ENERGIZED MODE AND WITH OR WITHOUT LATCHING.
- I. THE FAULT MEMORY SHALL BE RESET BY PUSHING A TEST/RESET BUTTON LOCATED AT THE FRONT PLATE, PROVIDED THAT THE GROUND LEAKAGE CURRENT IS 25% BELOW THE ALARM SET-POINT VALUE.
- J. GROUND LEAKAGE CURRENT SHALL BE INDICATED ON THE LED BAR GRAPH INDICATOR AND THE EXTERNAL METER IN PERCENT RELATED TO THE ALARM SET-POINT VALUE.
- K. CONNECTION TO THE EXTERNAL CURRENT TRANSFORMER SHALL BE CONTINUOUSLY MONITORED. AN OPEN CIRCUIT WITHIN THE CURRENT TRANSFORMER SHALL BE INDICATED BY A FLASHING ALARM LED AND ALARM RELAY. THE FUNCTION OF THE CURRENT TRANSFORMER AND MEASURING CIRCUIT AS WELL AS THE ALARM LED AND THE ALARM RELAY SHALL BE CHECKED BY PUSHING THE TEST BUTTON.
- L. MONITOR SHALL INDIVIDUALLY MONITOR EACH FEEDER CIRCUIT LEAVING THE PANEL IN LIEU OF THE INCOMING MAIN. ALARM RELAY SHALL BE CONNECTED TO SHUNT TRIP OF ASSOCIATED CIRCUIT BREAKER.

PART 3 - EXECUTION

3.01 MAIN DISTRIBUTION PANEL

- A. CONDUCTORS BETWEEN THE MONITOR AND POINT OF ATTACHMENT SHALL BE KEPT SHORT AND STRAIGHT.

END OF SECTION

SECTION 16750 - ENCLOSED CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

- A. THIS SECTION INCLUDES THE FOLLOWING INDIVIDUALLY MOUNTED CIRCUIT BRKRS:

- 1. MOLDED-CASE CIRCUIT BREAKERS.
- 2. ENCLOSURES.

1.2 SUBMITTALS

- A. PRODUCT DATA: FOR EACH TYPE OF ENCLOSED CIRCUIT BREAKER, ACCESSORY, AND COMPONENT INDICATED.
- B. SHOP DRAWINGS: DIAGRAM POWER, SIGNAL, AND CONTROL WIRING.
- C. FIELD QUALITY-CONTROL TEST REPORTS.
- D. OPERATION AND MAINTENANCE DATA.

1.3 QUALITY ASSURANCE

- A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. IN OTHER PART 2 ARTICLES WHERE TITLES BELOW INTRODUCE LISTS, THE FOLLOWING REQUIREMENTS APPLY TO PRODUCT SELECTION:

- 1. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, MANUFACTURERS SPECIFIED.
- 2. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE MANUFACTURERS SPECIFIED.

COMPO

2.2 MOLDED-CASE CIRCUIT BREAKERS AND SWITCHES

A. MANUFACTURERS:

- 1. EATON CORPORATION; CUTLER-HAMMER PRODUCTS.
- 2. GENERAL ELECTRIC CO.; ELECTRICAL DISTRIBUTION & CONTROL DIVISION.
- 3. MOELLER ELECTRIC CORPORATION.
 - 4. SIEMENS ENERGY & AUTOMATION, INC.
 - 5. SQUARE D/GROUP SCHNEIDER.

B. MOLDED-CASE CIRCUIT BREAKER: 65KAIC INTERRUPTING CAPACITY.

- 1. THERMAL-MAGNETIC CIRCUIT BREAKERS: INVERSE TIME-CURRENT ELEMENT FOR LOW-LEVEL OVERLOADS AND INSTANTANEOUS MAGNETIC TRIP ELEMENT FOR SHORT CIRCUITS. ADJUSTABLE MAGNETIC TRIP SETTING FOR CIRCUIT-BREAKER FRAME SIZES 250 A AND LARGER.
- 2. ADJUSTABLE INSTANTANEOUS-TRIP CIRCUIT BREAKERS: MAGNETIC TRIP ELEMENT WITH FRONT-MOUNTED, FIELD-ADJUSTABLE TRIP SETTING.
- 3. CURRENT-LIMITING CIRCUIT BREAKERS: FRAME SIZES 400 A AND SMALLER AND LET-THROUGH RATINGS LESS THAN NEMA FU 1, RK-5.

C. MOLDED-CASE CIRCUIT-BREAKER FEATURES AND ACCESSORIES:

- 1. STANDARD FRAME SIZES, TRIP RATINGS, AND NUMBER OF POLES.
- 2. LUGS: MECHANICAL STYLE WITH COMPRESSION LUG KITS SUITABLE FOR NUMBER, SIZE, TRIP RATINGS, AND CONDUCTOR MATERIAL.

2.3 ENCLOSURES

- 1. ENCLOSURE SHALL BE WEATHER RESISTANT, NEMA 4X

PART 3 - EXECUTION

3.1 INSTALLATION

- A. MOUNT INDIVIDUAL CIRCUIT BREAKERS WITH TOPS AT UNIFORM HEIGHT, UNLESS OTHERWISE INDICATED.
- B. COMPLY WITH MOUNTING AND ANCHORING REQUIREMENTS SPECIFIED BY MANUFACTURER.
- C. TEMPORARY LIFTING PROVISIONS: REMOVE TEMPORARY LIFTING EYES, CHANNELS, AND BRACKETS AND TEMPORARY BLOCKING OF MOVING PARTS FROM ENCLOSURES AND COMPONENTS.
- D. IDENTIFY FIELD-INSTALLED CONDUCTORS, INTERCONNECTING WIRING, AND COMPONENTS; PROVIDE WARNING SIGNS AS REQUIRED.

3.2 FIELD QUALITY CONTROL

- A. INSPECT MECHANICAL AND ELECTRICAL CONNECTIONS.

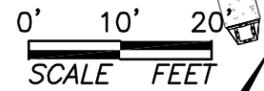
END OF SECTION

 <p>HSA ENGINEERS & SCIENTISTS A member of the CRA Family of Companies Certificate Of Authorization #7098 1520 ROYAL PALM SQUARE BOULEVARD SUITE 260 FORT MYERS, FLORIDA 33919 PHONE: (239) 936-4003 FAX: (239) 936-0819</p>	Project No.: 5220-02-00 Date: July 24, 2012
	eFile Name: 52200200KF-E005.dwg
	Designed By: RMR Drawn By: RMR
	Checked By: CDH
Engineer: Chad D. Huff, P.E. Florida 55440	

 <p>HANS WILSON & ASSOC., INC. 1938 Hill Ave. Ft. Myers, Florida 33901 Tel: 239-334-6870 Fax: 239-334-7810 MARINE and ENVIRONMENTAL CONSULTANTS</p>	7-24-12
---	---------

Kingfish Pier *Not To Scale*
Specifications - Electrical

City of Key West SHEET
E005

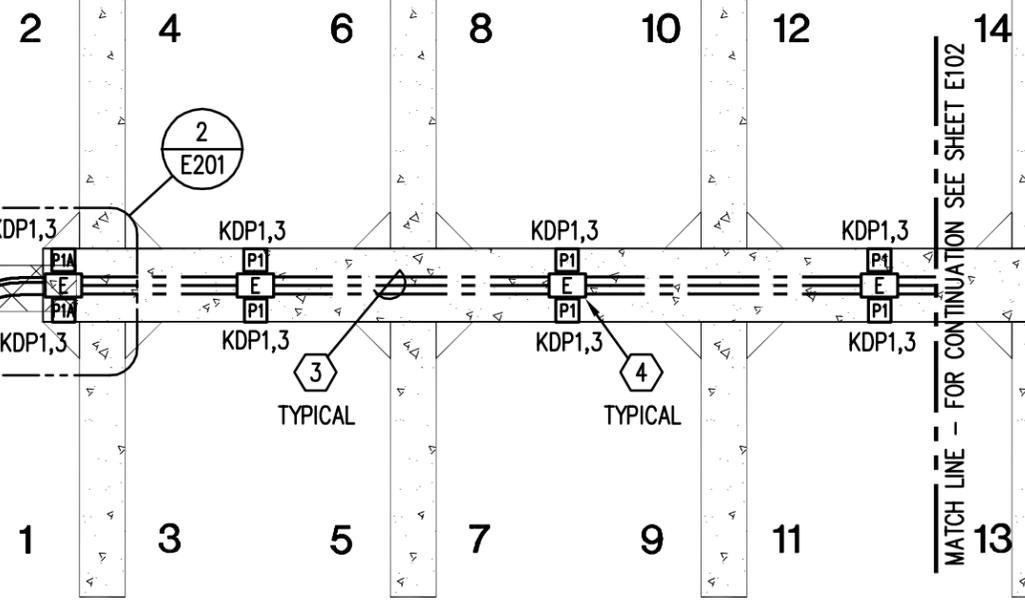


EXISTING PAD MOUNTED UTILITY TRANSFORMER

REPLACE EXISTING SERVICE AND REPLACE WITH NEW ENCLOSED CIRCUIT BREAKER. SEE RISER DIAGRAM

PEDESTAL NOTES

- P1 - EXISTING (2) 30A. 120V CIRCUIT BREAKERS AND OUTLETS TO REMAIN. NO MODIFICATIONS REQUIRED. RECONNECT TO NEW FEEDER. SEE PANEL SCHEDULES FOR CIRCUIT AND FEEDER DETAILS.
- P1A - SAME AS P1 EXCEPT (1) 30A. CIRCUIT BREAKER AND OUTLET.



PANEL "KDP"

KEYED NOTES (SHEETS E101 & E102):

- ① UNDERGROUND FEEDER TO KDP, FROM NEW ENCLOSED CIRCUIT BREAKER. SEE KINGFISH RISER DIAGRAM FOR DETAILS.
- ② PEDESTAL FEEDERS IN CONDUIT BELOW FIXED DOCK. SEE PANEL SCHEDULES FOR WIRE AND CONDUIT SIZES.
- ③ EXISTING (3) 4" RACEWAYS IN EXISTING CONCRETE FLOATING DOCK.
- ④ EXISTING FLOATING DOCK RACEWAY ACCESS HANDHOLE.

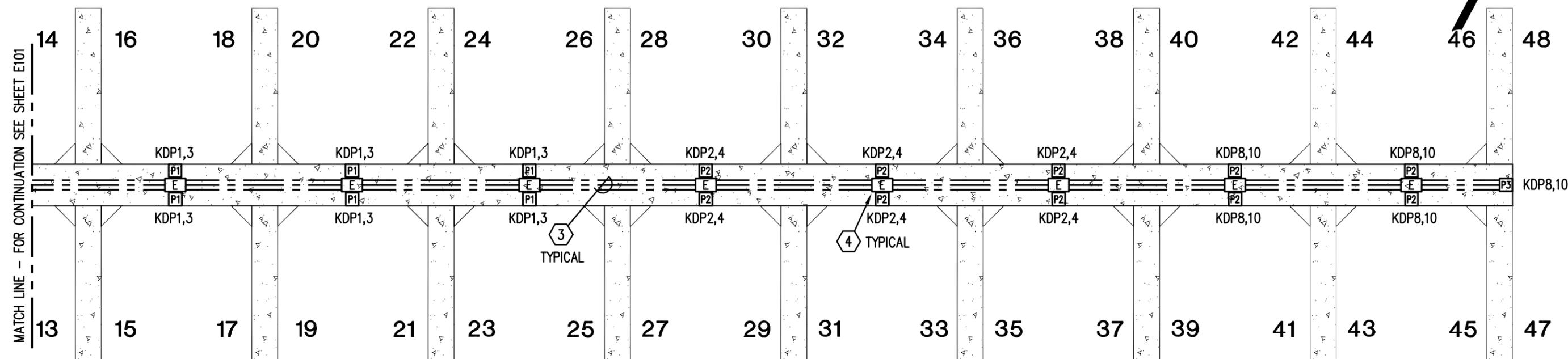
Project No.: 5220-02-00	Date: July 24, 2012
eFile Name: 52200200KF-E101.dwg	
Designed By: SML	Drawn By: RMR
Checked By: CDH	
Engineer: Chad D. Huff, P.E. Florida 55440	

① E101 **Kingfish Pier** Scale 1" = 20'
Partial Site Plan - Electrical

City of Key West

SHEET
E101

0' 10' 20'
SCALE FEET



* SEE SHEET E101 FOR KEYED NOTES.

PEDESTAL NOTES

- P1 - EXISTING (2) 30A. 120V CIRCUIT BREAKERS AND OUTLETS TO REMAIN. NO MODIFICATIONS REQUIRED. RECONNECT TO NEW FEEDER, SEE PANEL SCHEDULE FOR CIRCUIT AND FEEDER DETAILS.
- P2 - SAME AS P1 EXCEPT ADD NEW 50A., 240V, 1PH. CIRCUIT BREAKER AND 50A., 240V., 1PH. 4 WIRE GROUNDING TYPE RECEPTACLE. RECONNECT TO NEW FEEDER. SEE PANEL SCHEDULES FOR CIRCUIT AND FEEDER DETAILS.
- P3 - EXISTING PEDESTAL TO REMAIN. RECONNECT TO NEW FEEDER. SEE PANEL SCHEDULES FOR CIRCUIT AND FEEDER DETAILS.



HSA
ENGINEERS & SCIENTISTS
A member of the CRA Family of Companies
Certificate Of Authorization #7098
1520 ROYAL PALM SQUARE BOULEVARD SUITE 260
FORT MYERS, FLORIDA 33919
PHONE: (239) 936-4003 FAX: (239) 936-0819

Project No.: 5220-02-00 Date: July 24, 2012
eFile Name: 52200200KF-E102.dwg
Designed By: SML Drawn By: RMR
Checked By: CDH
Engineer: Chad D. Huff, P.E. Florida 55440



HANS WILSON & ASSOC., INC.
1938 Hill Ave. Ft. Myers, Florida 33901
Tel: 239-334-6870 Fax: 239-334-7810
MARINE and ENVIRONMENTAL CONSULTANTS

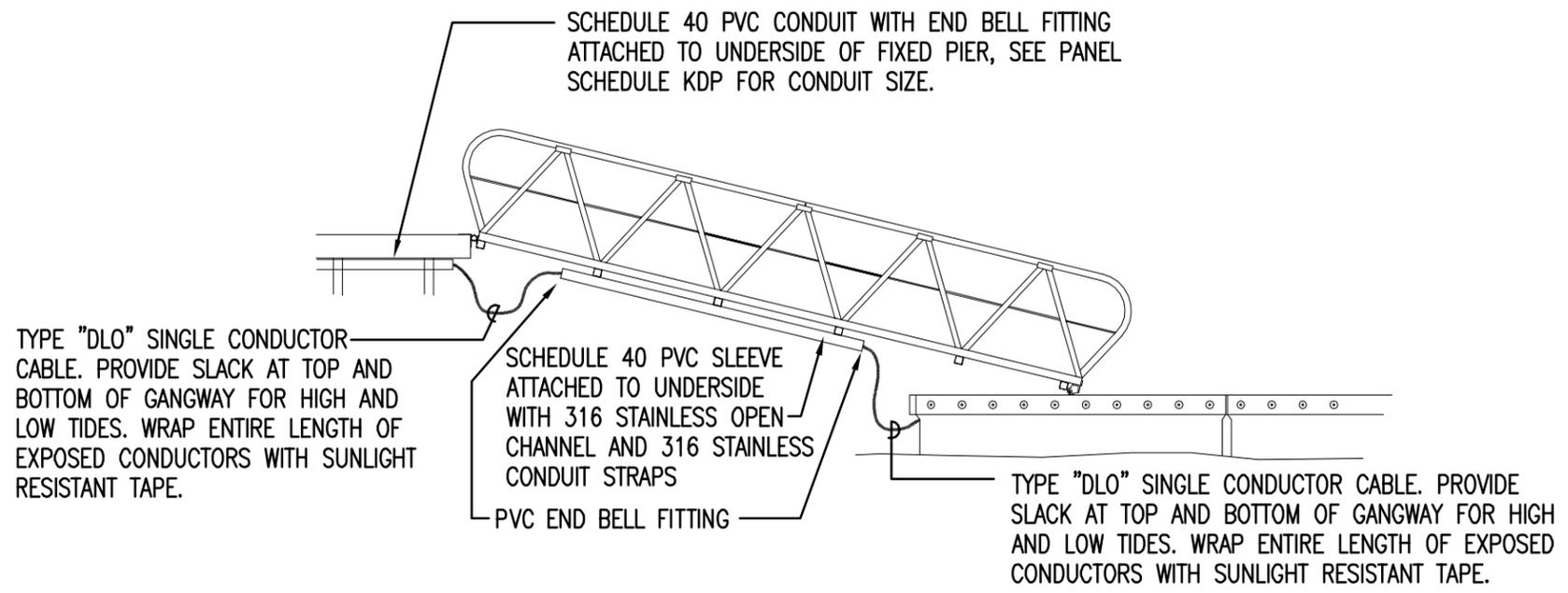
7-24-12



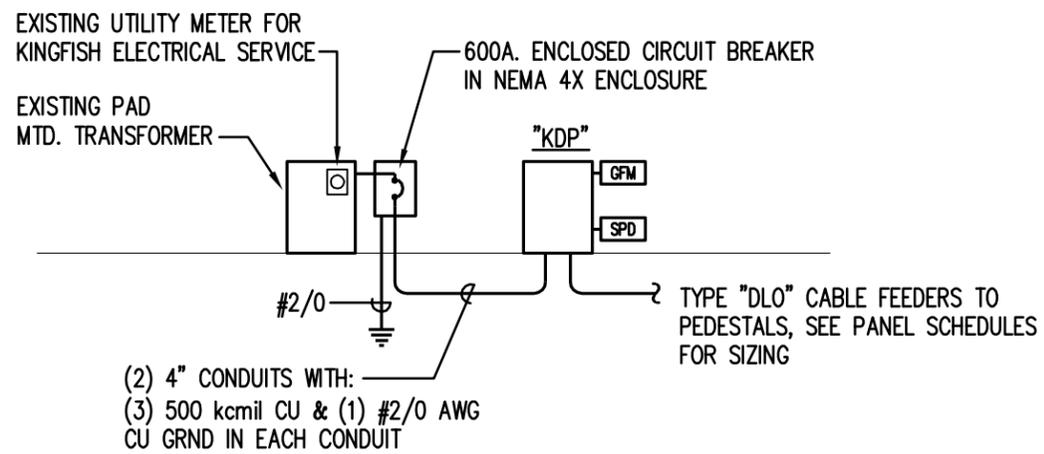
Kingfish Pier Scale 1" = 20'
Partial Site Plan - Electrical

City of Key West

SHEET
E102



2 KINGFISH GANGWAY FLEXIBLE CONNECTION
 NOT TO SCALE



1 KINGFISH PIER ELECTRICAL RISER DIAGRAM
 NOT TO SCALE

HSA
ENGINEERS & SCIENTISTS
 A member of the CRA Family of Companies
 Certificate Of Authorization #7098
 1520 ROYAL PALM SQUARE BOULEVARD SUITE 260
 FORT MYERS, FLORIDA 33919
 PHONE: (239) 936-4003 FAX: (239) 936-0819

Project No.: 5220-02-00	Date: July 24, 2012
eFile Name: 52200200KF-E201.dwg	
Designed By: SML	Drawn By: RMR
Checked By: CDH	
Engineer: Chad D. Huff, P.E.	Florida 55440



HANS WILSON & ASSOC., INC.
 1938 Hill Ave. Ft. Myers, Florida 33901
 Tel: 239-334-6870 Fax: 239-334-7810
 MARINE and ENVIRONMENTAL CONSULTANTS

7-24-12

Kingfish Pier Not To Scale
Diagrams - Electrical

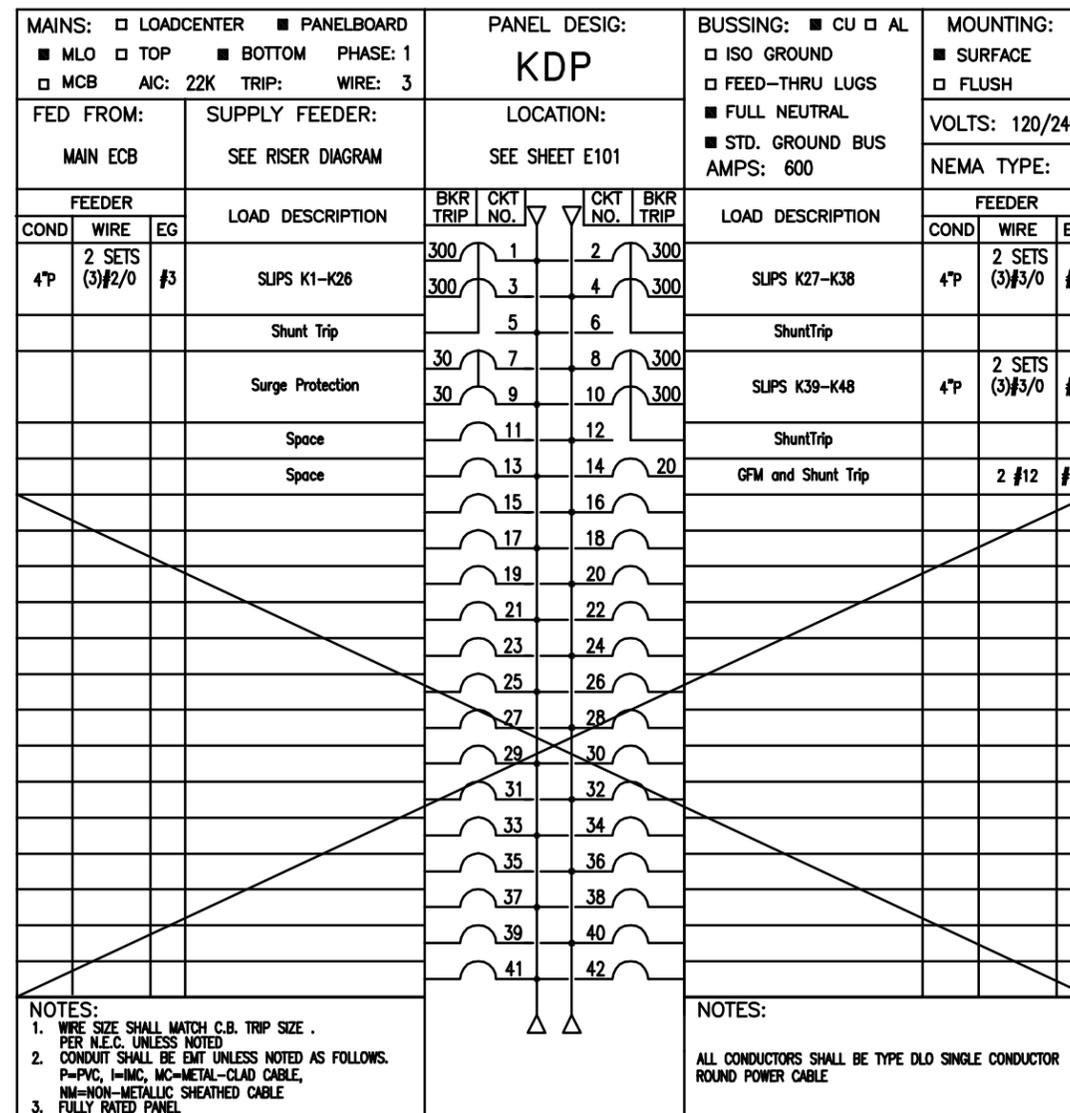
City of Key West

SHEET
E201

PANEL "KDP" (LOADS AND VOLTAGE DROP CALCS)

Description	Voltage	Phase	Amps	HP	Connected Load (VA)	Load VA	Amps	Load Factor	Conduit Type	Wire Type	Sizing Method	Power Factor	Length of Run	Conduit Size	Breaker Size	Number of Conductors	Wire Size	Grounding Conductor	VOLTAGE DROP	% VOLTAGE DROP	Conductors/Phase
SLIPS K39-K48	240	1			72000	64800	270.0	100%	SCH 40	CU	Voltage Drop	90%	460	4	300	3	#3/0	#2	9.45	3.94%	2
SLIPS K27-K38	240	1			72000	64800	270.0	100%	SCH 40	CU	Voltage Drop	90%	385	4	300	3	#3/0	#2	9.11	3.79%	2
SLIPS K1-K26	240	1			93600	65520	273.0	100%	SCH 40	CU	Voltage Drop	90%	285	4	300	3	#2/0	#2	8.46	3.53%	2
PANEL KDP (CONNECTED)	240	1			237600	0	990.0	NA	SCH 40	CU	Ampacity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PANEL KDP (DEMAND)	240	1	TOTAL AFTER NEC			142560	594.0	100%	SCH 40	CU	Ampacity	90%	100	1 1/4	600	3	500KCM	#2/0	2.45	1.02%	2

Amps 594 A 240V, 1PH



HSA
ENGINEERS & SCIENTISTS
 A member of the CRA Family of Companies
 Certificate Of Authorization #7098
 1520 ROYAL PALM SQUARE BOULEVARD SUITE 260
 FORT MYERS, FLORIDA 33919
 PHONE: (239) 936-4003 FAX: (239) 936-0819

Project No.: 5220-02-00 Date: July 24, 2012

eFile Name: 52200200KF-E301.dwg

Designed By: SML Drawn By: RMR

Checked By: CDH

Engineer: Chad D. Huff, P.E. Florida 55440

HANS WILSON & ASSOC., INC.
 1938 Hill Ave. Ft. Myers, Florida 33901
 Tel: 239-334-6870 Fax: 239-334-7810
 MARINE and ENVIRONMENTAL CONSULTANTS

7-24-12

Schedules - Kingfish Pier Electrical

Not To Scale

City of Key West

SHEET
E301