GENERAL SPECIFICATIONS

REPLACEMENT OF TARPON PIER

Additional Requirements:

1. This Work must be completed according to the plans and these specifications in the contract, and within compliance with the conditions of the Florida Department of Environmental Protection (DEP), US Army Corps of Engineers (COE), and local authorizations. All work shall be performed in accordance with Occupational and Safety Health Administration (OSHA) standards for work in or over waters of the United States. Contractor will provide the OWNER with a Safety Plan detailing compliance.

2. It is the CONTRACTOR'S responsibility to ensure that the layout of the Work will reuse as many of the existing piling locations as possible. The Contractor will provide a stakeout by a Professional Surveyor of the existing mooring piling locations. These locations will be coordinated with the floating dock manufacturer to ensure that the proposed dock installation reuses as many of the previous locations as possible while adhering to the design parameters. Upon completion of construction, the Contractor will provide a post-construction record drawing, signed and sealed by a Professional Surveyor. The CONTRACTOR will furnish such stakes, equipment, tools, and qualified City of Key West Tarpon Pier personnel as may be required for any additional layout of the Work, and for maintaining such staking as necessary for completion of the Work.

3. The project site is at the City Marina in Garrison Bight, Key West, Florida. The site is a public city marina with concrete seawall. Two areas on the uplands will be available to the CONTRACTOR for staging or construction operations, as shown on the construction plans. The CONTRACTOR will install fencing and lighting around the base of Tarpon Pier to provide security and storage for all dock materials (Contractor Staging Area 2). The CONTRACTOR will make provisions for safe pedestrian access from Kingfish Pier, around Area 2, to upland support facilities via the existing sidewalk. The CONTRACTOR will be provided access to Contractor Staging Area 1 for offloading of floating docks and placement in the water. The CONTRACTOR is responsible for being familiar with existing site conditions, to take them under consideration in the cost of the Work, and to take appropriate precautions to insure that partially completed work is not subject to displacement or damage due to natural site conditions or vessel traffic within Garrison Bight. Should any such damage or displacement of partially completed work occur, the CONTRACTOR is responsible for repairing any such damage

4. The geotechnical report indicates the potential for a hard substrate shallower than the pile embedment depth. Due to this subsurface condition, pre-drilling of the pile may be required in order to obtain the full embedment of the piles without cutting or splicing. The CONTRACTOR will perform any additional investigations that the CONTRACTOR deems necessary to determine the conditions of the substrate for the construction.

5. The upland site is easily accessible via Palm Avenue Causeway. The northern side of the upland parking area (one way traffic) has vertical access restricted by the bridge. The north side parking area is also accessible by means of barge, but limited

nearshore depths must be accounted for in the planning process. It will be up to the contractor to make any additional arrangements for access.

6. Special measures will be taken to prevent bilge pumpage or effluent, chemicals, fuels, oils, greases, and bituminous materials from entering the water.

7. Disposal of any demolition debris, materials, wastes, effluent, trash, garbage, oil, grease, chemical, etc., in and adjacent to the project site will not be permitted. If any waste materials are dumped in unauthorized areas the CONTRACTOR will remove the material and restore the area to the original condition before being disturbed. If necessary, contaminated ground will be excavated, disposed of as directed by the ENGINEER, and replaced with suitable fill material.

8. Permit drawings will be used in conjunction with technical specifications and site drawings. Consult these permit drawings and the existing permits for other details not shown on the construction drawings. All dimensions and conditions must be verified in the field. Any discrepancies will be brought to the attention of the ENGINEER before proceeding with the affected part of the work. All structures are designed to be self supporting and stable after completion. It is the CONTRACTOR's responsibility to determine erection procedures and sequencing to insure safety of the structure and its components during erection. This includes the addition of necessary shoring, sheeting, temporary bracing, guys, and/or tie downs.

9. The CONTRACTOR will restore or replace, when and as directed by the ENGINEER, any public or private property damaged by his work, equipment or employees, to a condition is at least equal to that existing immediately prior to the beginning of operation. To this end, the CONTRACTOR will do all necessary landscaping work, as required.

10. Starting on the first day of work, and during its progress, all the work and the adjacent area will be clean of all rubbish and surplus materials. Damages incurred during the work will be repaired so that the public and property OWNER will be inconvenienced as little as possible.

11. Where material or debris has washed or flowed into, or has been placed in water courses, or other areas as a result of the CONTRACTOR'S operations, such material or debris will be entirely removed and satisfactorily disposed of during the progress of the work, and all areas will be kept in a clean and neat condition.

12. The CONTRACTOR will comply with the provision of Chapters 253 and 403, Florida Statutes regarding control of air and water pollution and with all rules and regulations of the Department of Environmental Protection.

13. In order to ensure that manatees are not adversely affected by the construction activities as described in these specifications, the CONTRACTOR is required to strictly adhere to the July 2011 Standard Manatee Construction Conditions.

14. In order to ensure that sea turtle and the smalltooth sawfish are not adversely affected by the construction activities as described in these specifications, the CONTRACTOR is required to strictly adhere to the March 2006 Sea Turtle and Smalltooth Sawfish Construction Conditions.

15. The CONTRACTOR will conduct operations required for the construction of the facilities in such a manner as to prevent the disturbing of submerged lands. Incidental bottom scouring from equipment deployment / movement such that a visible turbidity plume is generated is forbidden and subject to the provisions of F.S.403.121(1)(b).

16. The CONTRACTOR will comply with the water quality standards under section 401 of the Clean Water Act, 33 U.S.C. 1341. If the water quality within the project site ever exceeds State water quality standards, the CONTRACTOR will follow Rule 62-302 of the Florida Administrative Code.

17. All necessary state and federal permits will be made available to the selected CONTRACTOR. The CONTRACTOR will immediately notify the ENGINEER in writing of any observed non-compliance with the aforementioned Federal, State, or local laws or regulations. The CONTRACTOR, after giving such notice, will immediately inform the ENGINEER of the proposed corrective action. The CONTRACTOR must get the action approved before continuing. If the CONTRACTOR fails or refuses to comply promptly, the OWNER, through the ENGINEER, may notify the appropriate regulatory agencies and issue an order stopping all, or part, of the work until satisfactory corrective action has been taken. The CONTRACTOR will make no part of the time lost due to any such stop orders the subject of a claim for extension of time or for excess costs or damages. Any costs incurred by the OWNER as a result of such actions may be deducted from the Contract amount due the CONTRACTOR.

    BUILDING PERMITS: Prior to issuance of a “Notice of Award” permits from the ACOE and the FDEP will have been obtained. Contractor will be responsible for obtaining required Building Permits from the City. Contractor shall include the costs of these permits in his bid

    CORAL RELOCATION: The permit issued by the ACOE/FDEP requires coral relocation. This work will be undertaken by the subcontractor of the Designer. Contractor shall coordinate his work efforts and cooperate during coral relocation.

18. If, within one year after the date of acceptance of the Work, any of the Work (exclusive of acts of God/weather) is found to be defective, incomplete or otherwise not in accordance with the requirements of the Contract Documents, the CONTRACTOR shall correct it promptly after receipt of written notice from the OWNER or ENGINEER to do so. If the CONTRACTOR fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the OWNER or Engineer, the OWNER may correct it at CONTRACTOR’s expense. Floating Dock manufacturer shall provide a minimum Ten Year Warranty on all dock materials.

TECHNICAL SPECIFICATIONS
August 3, 2012

CITY OF KEY WEST
REPLACEMENT OF TARPON PIER AT CITY MARINA

TS-1.0 Mobilization and Demobilization

TS-1.1 Mobilization will include all activities and costs for transportation of personnel, equipment, and supplies/materials to the site, establishment of offices and other necessary facilities for the Contractor's operations at the site. Mobilization alone will not be considered as work in fulfilling the contract requirement for commencement of work.

TS-1.2 Demobilization will include all activities and costs for transportation of personnel, equipment, and supplies/materials not used in the Contract, including the disassembly, removal, and site cleanup of any offices or other facilities assembled on the site for the construction. Upon demobilization, the Contractor will restore all access areas to the same condition as prior to mobilization.

TS-1.3 This line item includes mobilization and demobilization required by the project at the time of award. If additional mobilization and demobilization is required during the performance of the work due to changed, deleted, or added items of work, compensation for such costs will be awarded to the Contractor by the Owner. Additional mobilization and demobilization resulting from an error on the Contractor's part will be solely the responsibility of the Contractor.

TS-1.4 All equipment and materials will be mobilized and demobilized in accordance with all local, state, and federal laws related to transportation and safety.

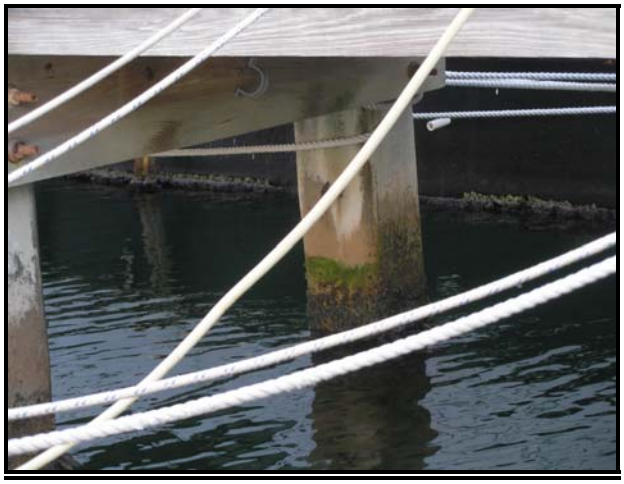
TS-2.0 Demolition and Disposal

TS-2.1 Demolition will include the WORK as shown in the permit and construction drawings. All piling must be removed at, or below, the mudline. All demolition material will be removed from the site and disposed of properly. Proper disposal is the responsibility of the Contractor. Demolition is subject to the coral relocation plan and permit.

TS-2.2 As a matter of project staging, removal of the finger piers located at the Kingfish Pier will be completed first to allow for the vessels moored at the Tarpon Pier to be relocated to the Kingfish Pier. Upon relocation of these vessels, demolition of Tarpon Pier can commence.

TS-2.2 Contractor should be aware that the existing pier is entirely concrete pile supported. In addition, sections of the pier consist of concrete decking with a wood decking overlay. Remaining sections of the pier are entirely wood decking with wood sub framing. Refer to the following photos for a depiction of the existing conditions.

Photo of wood deck and wood substructure resting on concrete deck supported by concrete pilings encased on a concrete cap.



Wood deck and framing on concrete piles.

TS-3.0 Professional Surveyor Stakeout and Record Drawings

TS-3.1 The Contractor will provide a stakeout by a Professional Surveyor of the existing mooring piling locations. These locations will be coordinated with the floating finger pier installation to ensure that the proposed finger pier alignment "shadows" the outboard mooring piling to prevent intrusion of the mooring piling into the slip mooring space.

TS-3.2 Upon completion of construction, the Contractor will provide a post-construction record drawing, signed and sealed by a Professional Surveyor. In addition, Contractor will provide two sets of all Operations/Maintenance manuals and warranty certificates in a three ringed binder and two sets on a flash drive.

TS-4.0 Floating Docks Construction, Materials, and Testing

TS-4.1 General Materials to be used for the construction of the floating docks are outlined as follows:

Dock Piling	18" or 24" (depending upon plan selected by client) diameter, 0.5" thick epoxy coated steel tubular piles as specified on the Construction Drawings
Floating Docks	Aluminum floating docks will be installed as manufactured by GatorDocks (gatordock.com), TechnoMarine (technomarine.com), Crane Materials International (gatordock.com), or StructurMarine (structurmarine.com). Alternate manufacturers may be quoted at the Contractor's option
Freeboard	24" for main dock and finger piers
Piling Guides	External to the floating system

Chases	Minimum 6” deep by 12” both sides

TS-4.2 The design conditions for the floating docks will be as follows and assume that the facility is occupied:

Basin Design Depth	-7.5’ NAVD
Pile Elevation	+10.0’ NAVD
Pile Embedment	-28.0’ NAVD
Storm Surge	+5.6’ NAVD
Elevation of Applied Loads	+7.6’ NAVD
Wave Conditions	Negligible
Currents	Negligible
Live load	50 psf. – Distributed load 400lb – Point load
Dead load	Based on specific system components and should account for utilities, marine growth, and all other support features

TS-4.3 The floating dock plans and material specifications will be submitted to the Engineer for approval prior to manufacturing of the aluminum floating docks. If the Engineer requires additional clarification of the methods or calculations, in order to satisfy himself of general conformance, the floating dock manufacturer will promptly provide the requested information. Delays in the project schedule due to inadequate or non-conforming floating dock and anchorage designs will not be grounds for project extension. The plans will include a dimensional layout of floating dock system with pilings, typical sections and details showing flotation, framing, decking, and connections, connection of gangway to the upland, and a signed and sealed letter of design compliance by a Professional Engineer registered in the State of Florida.

TS-4.4 The plastic pontoons will be linear low-density polyethylene such as Permafloat Floatation Drum as Manufactured by Cellofoam, or Engineer’s approved equivalent. The base material for all polyethylene shells will conform to the following minimum requirements: minimum density 0.937 g/cc per ASTM D-1505; minimum ultimate tensile strength of 2,560 psi per ASTM D-638; and minimum flexural modulus of 96,000 psi per ASTM D-790. They will be designed for a freeboard under dead load will be 24 inches (+/- 1 inch). The dead load plus a concentrated live load of 400 lbs applied vertically at any location on the main dock surface will not tilt the dock more than six degrees from horizontal or overstress the framing members. Dead load freeboard will be maintained within two inches of that identified in these specifications for a period of five years following installation.

TS-4.5 The dock structure will be constructed using aluminum alloy 6061-T6 and will be in accordance with AA "Specification for Aluminum Structures." All welds will be in accordance with AA "Specifications for Aluminum Structures". All bolts, nuts, and washers will be set square with connecting structural members and the nuts will be drawn tight. All screws, bolts, nuts, and lock washers will conform to ASTM A307 and will be Type 304 Stainless Steel. Lock washers or other devices or techniques will be used to prevent nuts from loosening after being properly tightened. High strength bolts will be used where required in accordance with the American Institute of Steel Construction specifications “Structural Joints Using ASTM A325 or A490 Bolts.” Finished metal members will be free from twists, bends, distortions, open joints, sharp edges, and burrs. Ends of exposed metal members will be rounded or beveled. All coping and mitering will be done with care.

TS-4.6 Any lumber used for mounting hardware, fendering, or other applications will be counter-bored wherever projecting bolt heads or nuts may damage boats or provide a hazard to pier users. Counter-boring will be sufficiently deep to permit installation of the bolts and nuts with washers well below the surface of the wood. The heads of dome head bolts may project above the surface. All exterior (visible) structural wood and wood fendering in the splash zone will be Southern Yellow Pine No. 1 (or approved equivalent) hand selected - no downgrades allowed - with a minimum CCA (Chromated Copper Arsenate) content equal to 0.6 pcf moisture content not to exceed 19% after treatment, KDAT or S-Dry. All submerged wood members will be treated to 2.5 pcf CCA. Interior (non-visible) structural wood will be minimum Southern Yellow Pine No. 2 (or approved equivalent) and will comply to the treatment and moisture requirements mentioned herein. Timber for decking will be naturally decay-resistant exotic wood species (IPE) or plastic composite manufactured by AZEK (weathered gray color). All IPE boards will be air dried to less than 16% moisture content prior to installation. Deck fasteners will be corrosion resistant stainless steel screws. All decking will be predrilled to prevent cracking or splitting of boards. Connections between floating pier modules or other elements such as lifting rings will not protrude above the level of the deck. Gaps between deck boards will be no less than 1/16 inch and no more than 1/4 inch. There will not be any gap in the walking surface of the floating piers that exceeds 1/2 inch. All deck surfaces will be level and properly drained so that water will not puddle on the deck surface. Adjacent dock modules will have less than 1/8-inch difference in elevation.

TS-4.7 Connections will be designed to permit removal and replacement of connectors without the necessity of removing other components for access. Connectors will be of materials that are easily available and will be positively contained so as to prevent their working free under normal conditions. All connections must be capable of transmitting all loads and forces imposed upon the structure. Any potential corrosive installation of dissimilar materials will be properly insulated to minimize or eliminate corrosion in the marine environment.

TS-4.8 Contractor will submit detailed record drawings for floating docks (including all floating docks, piles, accessories, and utilities), warranty, operations and maintenance manual(s), and listing of typical replacement parts, part numbers, and manufacturer contact information where applicable.

TS-5.0 Gangway Construction, Materials, and Testing

TS-5.1 The aluminum gangway is to be a low profile design with an integral hand railing system meeting ADA requirements and a 36” landing plate. It will be constructed using 6061-T6 aluminum with non-skid surfaces. The aluminum bolts, nuts, and washers will conform to the Federal Specification QQ-A-270a (1) as amended for aluminum alloy 6061-T6. Stainless steel bolts, nuts, washers, and screws where used will be type 18-8 (300 Series). A wear plate will be installed between the landing plate and the floating dock decking. Rollers for gangways will be UHMW polyurethane with black ultra-violet light inhibitor added. The gangway will be securely fastened to the floating dock and allowed to roll on a platform attached to the existing seawall cap.

TS-5.2 The gangway and transition plates will be designed to withstand a minimum uniform live load of 50 psf. applied vertically. Minimum loads for handrail and toe rail will be 250 lbs according to requirements of ADAAG Section 15.2. Gangways will be designed to incorporate the dead load weights of all utilities that traverse the gangway (see utility plans for additional detail and coordinate with utilities Contractor(s)). Additional dead load weight of gangway will be coordinated with the dock manufacturer to ensure adequate flotation under the gangway

landing so that the landing area maintains the same freeboard as the rest of the floating docks. All connection and utility routes will be incorporated into the gangway design. Cable, hose, and pipe hangars will be of similar metal to the gangway and designed to support the maximum loaded condition of the utilities to minimize chafing, etc. Appropriate dielectric materials will be used to insulate dissimilar metals.

TS-6.0 Tubular Steel Piling

TS-6.1 Dock piling will be 18" or 24" (depending upon plan selected by client) diameter 0.5" thick epoxy coated steel piles as shown on the Construction Drawings. Piling tops will be set no lower than 9.0' NAVD, and embedment depth will be as shown on the Construction Drawings. Cutting, splicing, and extending of steel piling will not be allowed.

TS-6.2 Steel piles will be tubular steel minimum ASTM A252 Grade 50 seamless steel pipe. New steel piles will be 100% cleaned of biological growth, unsound coatings and rust, surface contamination (oils, grease, dirt), surface chloride contamination, and blasted in accordance with SSPC-SP 10, Near White Blast Cleaning. Coal tar epoxy coating will extend from the top of the pile to 2 feet below the mudline. In the event that the epoxy coating is damaged during handling or installation the Contractor will repair the epoxy coating in accordance with manufacturer's specifications. The pile coating will be a Two-Coat Coal Tar Epoxy-Polyamide System, in accordance with FDOT specification 560. Apply each coat at a dry film thickness of not less than 8 mils. Provide total system minimum dry film thickness of 16mils. Prior to coating the steel pile the surface will be prepared with a near white SP10 sand blast or better. The Contractor will grind all steel pile tops 0.5 ft on the inside and paint with a matching protective coating prior to attaching pile cones. After the epoxy coating has cured per the manufacturers specifications the epoxy coated pile shall be painted with two coats of a Two-Part Linear Polyurethane (LP) Coating with gray pigmentation. Prior to coating the piles the Contractor will provide the Engineer specification sheets for proposed product and a dry sample to verify coloring is to the satisfaction of the Owner.

TS-6.3 The Contractor will provide the Engineer with a pile installation plan that includes the methodology, equipment used, and schedule.

TS-6.4 The geotechnical report indicates the potential for a hard substrate shallower than the pile embedment depth. Due to this subsurface condition, pre-drilling of the pile may be required in order to obtain the full embedment of the piles without cutting or splicing. All costs associated with the need to pre-drill in order to reach the prescribed embedment depth will be borne by the Contractor.

TS-6.5 The Contractor will keep accurate record of each pile driven which will include pile location, diameter, original length, ground elevation, final tip elevation, penetration in blows per foot for the last ten feet (if applicable), hammer data including make, type, and size (if applicable), any unusual pile behavior or circumstances experienced during installation. Within 15 days of completion, records will be turned over to the Engineer.

TS-6.6 Any pile which is cracked or broken because of internal defects or by improper handling or driving, or which is otherwise injured such that their structural capacity to withstand or transfer the design load to the foundation is impaired, or any pile driven out of proper location, will be removed and replaced. All work of removal and cost of replacement will be borne by the Contractor at no additional expense to the Owner.

TS-7.0 Dock Accessories

TS-7.1 Pile guides for floating docks will allow free vertical movement of the dock at all elevations, while minimizing damage due to normal dock movement caused by tides, boat wakes, water fluctuation, and seasonal winds. Piles and external pile guides will be installed in the locations as noted on the Construction Drawings. Where dock manufacturer does not require gussets for structural purposes, exposed pile guides will be framed with bumper and rub rail to protect vessels from impact damage. Finger pier end pile guides, where required for fingers, will be inset to the pier and not extend into the clear fairways indicated on the Construction Drawings. Pile guides will be of a multiple roller type and allow full vertical movement of the pier system without inducing binding or torsion into the system. Guide pile rollers and rub blocks be made of ultra-high molecular weight plastic. Rollers will be mounted on a stainless steel axle. The mounting bracket will be galvanized after fabrication. Rollers and rub blocks will be configured for simple replacement and be adjustable.

TS-7.2 Bumper strips will be extruded, non-marring, marine grade vinyl, white in color and similar or same as the fendering on Marline Dock. Each strip will have a minimum height of four inches, minimum thickness of 1/8 inch, and a minimum weight of 1.6 lb/lf. Outside corners will be protected with corner bumpers molded of marine grade vinyl. The bumper strip and corner bumper will be installed with stainless steel screws or aluminum ring shank nails on 4-inch centers along both flanges.

TS-7.3 Dock utilities will be supplied and installed as described in the Construction Drawings. Floating dock manufacturer shall provide a minimum of 12” wide chases below the dock deck, one on each side of the main access pier for installation of piping and conduits. Stub-up locations, access panels, and junction boxes will be provided in accordance with the plans to accommodate all required utility services to, and on, the docks. Contractor will coordinate requirements of dock utilities with dock manufacturer during design and fabrication process, including access/routing and dead loads. Utility access panels will allow for easy access at regular intervals along the deck surface and provide direct access at all indicated valves, expansion joints, flexible piping connections, etc. as indicated on the plans.

TS-7.4 The electrical, water, fire suppression and sewage pumpout system has been prepared by HSA. The Contractor, or Subcontractor(s) is responsible for the constructing the infrastructure design in conformance the engineering, plans, and specifications provide with this package.

TS-7.5 Cleats will be made of 12” galvanized steel or non-corroding alloys. Almag "S" cleats are prohibited. Cleats will be securely bolted to the dock framework with through bolts rather than lag bolts. The cleats will be placed 10’ on center along the finger piers (3 per side/6 per finger), as well as along the main dock just inside the knee bracing as shown on the Construction Drawings. Some type of isolating membrane will be installed between the cleats and the deck boards to avoid any reaction between the materials.

TS-7.6 All exposed piling tops will be fitted with conical PVC / HDPE piling caps. Piling caps will be black in color and sized to within ½” of piling diameter. Piling caps to be held in place with a commercial grade adhesive.

TS-7.8 The Contractor will provide the Engineer with a Materials Submittal List that includes specifications and details (cut sheets) on all products to be installed. Engineer will review and provide recommendations to the Owner for approval of all items prior to purchase and installation. All materials and workmanship shall be free from defects for a period of ten years.

TS-8.0 Turbidity Monitoring

TS-8.1 Turbidity monitoring in accordance with state and federal permits is the responsibility of the Contractor. Turbidity may not exceed 29 NTU's above the background. The Contractor will be responsible for testing, reporting, and compliance with the permit conditions for turbidity monitoring.

TS-9.0 Permits and Authorizations

TS-9.1 The Contractor will comply will all conditions of the State, the Federal, and all necessary Local authorizations.

TS-9.2 The permits and authorizations relating to the proposed work include the following. It is the responsibility of the Contractor to make sure they have all necessary copies.

- FL Department of Environmental Protection
- US Army Corps of Engineers
- Florida Keys National Marine Sanctuary
- Easements if any
- City, County Building Permits

TS-10.0 Confirmation of Work

TS-10.1 The Engineer will conduct a pre-construction, on-site meeting with the Contractor, City staff, and appropriate agency representatives to discuss the proposed construction, permits, operating conditions, and day to day monitoring responsibilities. The Engineer will make occasional site visits at construction milestones to observe progress and confirm compliance with the permits, plans, and specifications.

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SUBMITTAL REQUIREMENTS

CITY OF KEY WEST
REPLACEMENT OF TARPON PIER AT CITY MARINA

SR-1.0 Prior to Construction
SR-2.0 During Construction
SR-3.0 Post Construction

The following is a list of required submittals for the above project. This list represents typical required submittals for this type of work and is subject to change.

SR-1.0 Prior to Construction

The following shall be submitted a minimum of two weeks prior to the pre-construction meeting. Onsite work shall not commence until all the following submittals have been approved in writing. Submittals may be rejected for not complying with plans and specifications. Allow two weeks for the initial review of each submittal. Allow 10 days for the review of each re-submittal if necessary.

SR-1.1 Aluminum Gangway

SR-1.1.1 Shop Drawings showing complete fabrication details, including the hanger for the utility lines and the connection to the seawall, shall be submitted for approval before the production of docks begins. All drawings and calculations shall bear the seal of a Registered Professional Engineer. (three copies)
SR-1.1.2 Complete set of gangway hardware samples (one example each)
SR-1.1.3 Complete set of gangway hardware manufacturer's data sheets (three copies)
SR-1.1.4 Gangway rollers sample (one example)
SR-1.1.5 Wear (transition) plate material plate sample (one example)
SR-1.1.6 Gangway manufacturer's data sheet with loading certification (three copies)

SR-1.2 Floating Docks

SR-1.2.1 Shop Drawings showing complete fabrication details, including connections between the dock units, shall be submitted for approval before the production of docks begins. Bolt diameter, lengths and strength shall be shown. All drawings and calculations, including loading and floating, shall bear the seal of a Registered Professional Engineer. (three copies)
SR-1.2.2 Stakeout by a Professional Surveyor of the existing mooring piling (three copies)

SR-1.2.3 Plastic pontoon product sample (one example)
SR-1.2.4 Plastic pontoon manufacturer's data sheet (three copies)
SR-1.2.5 Aluminum dock structure product sample (one example)
SR-1.2.6 Aluminum dock structure certification (three copies)
SR-1.2.7 Welding certifications (three copies)
SR-1.2.8 Complete set of floating dock hardware samples (one example each)
SR-1.2.9 Complete set of floating dock hardware manufacturer's data sheets (three copies)
SR-1.2.10 Decking and other lumber, composite, SYP, and/or IPE options, samples (one example each)
SR-1.2.11 Decking and other lumber, composite, SYP and/or IPE options, manufacturer's/supplier's data sheets (three copies)
SR-1.2.12 Decking and other lumber treatments manufacturer's data sheets (three copies)
SR-1.2.13 Dielectric material manufacturer's data sheets (three copies)

SR-1.3 Steel Pilings

SR-1.3.1 Shop Drawings showing complete fabrication details shall be submitted for approval before the production of docks begins. All drawings and calculations shall bear the seal of a Registered Professional Engineer. (three copies)
SR-1.3.2 Two-Coat Coal Tar Epoxy-Polyamide System manufacturer's data sheet (three copies)
SR-1.3.3 Two-Part Linear Polyurethane (LP) Coating with gray pigmentation manufacturer's data sheet (three copies)
SR-1.3.4 Pile installation plan with methodology and equipment (three sets)
SR-1.3.5 Pile guide manufacturer's data sheet (three copes)
SR-1.3.6 Pile guide roller and/or rub block sample (one example)

SR-1.4 Accessories

SR-1.4.1 Bumper strip manufacturer's data sheet (three copies)
SR-1.4.2 Bumper strip sample (one example)
SR-1.4.3 Cleat manufacturer's data sheet (three copies)
SR-1.4.4 Cleat sample (one example)
SR-1.4.5 Piling cap manufacturer's data sheet (three copies)
SR-1.4.6 Piling cap sample (one example)

SR-1.4 Miscellaneous

SR-1.4.1 Written authorization from property owner or manager of a commercial disposal site accepting the materials to be disposed and a written release holding harmless the Owner, City, Engineer, and their consultants and employees from responsibility for all negative actions that result from the disposal of materials at the site. (three copies)
SR-1.4.2 Construction summary and schedule (three copies)
SR-1.4.3 Best management practices summary including turbidity controls (three copies)

SR-2.0 During Construction

The following shall be submitted weekly throughout construction.

SR-2.1 Miscellaneous

SR-2.1.1 Pile driving reports (three copies)

SR-2.1.2 Turbidity monitoring reports as required by permits (three copies)

SR-3.0 Post Construction

The following shall be submitted within two weeks of the final walk through.

SR-3.1 Miscellaneous

SR-3.1.1 Post-construction record drawings (11”x17”), signed and sealed by a Professional Surveyor (three copies)

SR-3.1.2 Two sets of all Operations/Maintenance Manuals and Warranty Certificates in a three ringed binder and two sets on a flash drive (three copies)

SR-3.1.3 List of typical replacement parts, parts numbers, and manufacturer contact information (three copies)

REPORT OF
GEOTECHNICAL EXPLORATION

TARPON PIER
GARRISON BIGHT
INTERSECTION OF NORTH ROOSEVELT AND PALM AVENUE
KEY WEST, FLORIDA

FOR

CH2M HILL
6410 5TH STREET, SUITE 2A
KEY WEST, FLORIDA 33040

PREPARED BY

NUTTING ENGINEERS OF FLORIDA, INC.
2051 NW 112TH AVE, SUITE 126
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ORDER NO. 126.21.5

FEBRUARY 2012

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Email: asmyth@ch2m.com

Subject: Report of Geotechnical Exploration
Tarpon Pier
Garrison Bight
Intersection of North Roosevelt and Palm Avenue
Key West, Florida

Dear Mr. Smyth:

Nutting Engineers of Florida, Inc. (NE), has performed a Geotechnical Exploration for the pier replacement at the above referenced site in Key West, Florida. The purpose was to obtain information regarding subsurface conditions at specific test locations in order to provide engineering parameters for the soils as part of the foundation design process. This report presents our findings and a brief geotechnical report based upon the information obtained.

PROJECT INFORMATION

We understand that project plans call for the replacement of the existing Tarpon Pier at Garrison Bight. The existing pier is approximately 400 feet long and consists of an elevated concrete deck supported on concrete piles. Plans include replacing the pier with a floating dock system, similar to the adjacent piers. NE should be notified in writing by the client of any changes in the proposed construction along with a request to amend our foundation analysis and/or recommendations within this report as appropriate.

GENERAL SUBSURFACE CONDITIONS

Subsurface Exploration

NUTTING ENGINEERS OF FLORIDA, INC. was requested to perform two Standard Penetration Test (SPT) borings (ASTM D-1586) to an elevation of -60 feet NGVD. The locations of the test borings are indicated on the individual test boring reports as well as the Test Boring Location Plan presented in the Appendix of this report. The boring locations were identified in the field using approximate methods; namely, GPS coordinates and available surface controls. As such the soil boring locations should be considered to be approximate.

Test Boring Results

In general, the test borings revealed water depths of approximately eight to ten feet, followed by two feet of soft gray silt, underlain by very dense sand and porous coralline limestone to depths of approximately twenty to twenty two feet below water surface. Below this layer, the borings recorded soft to very hard limestone to sixty-one feet, the maximum depth explored.

One of the most important characteristics of the limestone formation encountered in this area is the degree of solution. The limestone is often times solufied and filled with unconsolidated sand or silt forming pockets during the geologic past. A detailed description of the soil/rock interlayering is given on the test boring logs in the Appendix.

Generalized Soil Parameters

In order to analyze the lateral and axial loading conditions of foundation alternatives, the study of soil parameters for each stratum was conducted and obtained from the empirical correlations and our experiences based on the review of the field and lab test data. The parameters obtained include N value, internal friction angle (ϕ), total unit weight, and subgrade reaction modulus.

The following table, Table 1, presents the soil parameters for each stratum as well as generalized subsurface soil profiles as encountered at the proposed structure location. Details regarding the relatively complex interlayering of the subsoils are shown on the Soil Profile Sheet in the Appendix. A detailed description for the site is presented as follows:

General Subsurface Profiles and Soil Parameters
(B-1 & B-2)

Approx. Depth* (Feet)	Soil Description	N-Values (Blows/ft)	Internal Friction Angle ϕ (degrees)	Submerged Unit Weight (pcf)	Consistency and Relative Density
8-12	SILT	0-2	28	27	Soft
12-22	Fine to coarse SAND and LIMESTONE	50-130	32-38	47	Dense
22-61	LIMESTONE, some fine to coarse sand	6-100+	-	62-67	Soft to Very Hard

*measured from water surface

ANALYSIS AND RECOMMENDATIONS

We understand that precast concrete piles are the preferred foundation alternative for the project. Therefore, we have presented recommendation for said piles. If other alternatives are desired, we are available for discussions with the design team to evaluate other pile systems.

Square precast concrete driven piles are a widely used and proven foundation system in South Florida. Precast prestressed piles are readily available and generally have a lower cost per ton of capacity than other pile types. Because of the dense subsoil conditions found at some of the boring locations, it is our opinion that driving of the piles to the recommended depths may be difficult, and induce high driving stresses which could potentially damage the piles. However, these concerns of driving through dense soils can be minimized through the use of pre-drilled pile holes to achieve the recommended penetration.

CONSTRUCTION RECOMMENDATIONS

Pile installation procedures should be conducted in accordance with the FDOT standard specification A455. Pile driving should be as continuous an operation as possible and should proceed without stopping over the last 10 feet of penetration.

Pile Installation

The FDOT Standard Specifications Section A455 shall be used as a guideline for pile driving requirements. In addition, the following items emphasize concerns that the structural engineer may need to consider in preparing the construction plans.

1. A Wave Equation Analyses (WEA) should be performed to assess the drivability of the prestressed concrete piles in the type of subsurface conditions encountered at the site, for the contractor's proposed hammer, hammer cushion, and pile cushion. In addition, the results of the WEA should be used to predict the driving tensile and compressive stresses developed in the pile and estimate the delivered energy for assessing hammer performance during pile driving operations.

2. A dynamic load test should be performed using a Pile Driving Analyzer (PDA) in order to confirm pile capacities.

3. Pile spacing center to center shall be at least (3) times the least width of the pile.

4. The hammer should be capable of driving the pile to 3.0 times the design load in less than 120 blows per foot material without overstressing the pile in tension or compression. Allowable compression and tension capacity within the pile section during driving can be assessed according to FDOT Standard Specification Section A455. At all times, the hammer should be operated at the chamber pressure, speed, etc. recommended by the manufacturer.

5. During pile installation, the contractor should exercise caution as not to overstress the piles. Piles shall not be driven beyond practical refusal (as defined in the FDOT Standard Specifications) to meet the bearing requirements. Penetration aids such as performed pile holes will be required when piles cannot be driven to the required penetration without reaching practical refusal. We recommend that jetting should not be allowed as a method of predrilling. Some variations in length should be expected due to normal variations in soil conditions.

6. The contractor should exercise caution in pile driving so that the effects of heave are minimized. Careful monitoring by the contractor for possible heave during driving should be exercised. All piles that heave ¼ inch or more should be re-driven unless otherwise instructed by the Geotechnical Engineer.

7. Driven piles should be monitored during installation for penetration, blow counts during driving, and hammer action.

8. We recommend that the precast concrete piles be provided with an appropriate pile top cushion consisting of a minimum thickness of 6 inches of soft wood during driving in

order to minimize pile top damage. This cushion should be changed frequently since it becomes compressed and hardened under repeated use.

GENERAL INFORMATION

Our client for this geotechnical evaluation was:

CH2M Hill
6410 5th Street, Suite 2A
Key West, Florida 33040

The contents of this report are for the exclusive use of the client and the City of Key Westfor the purpose of the design package. Information conveyed in this report shall not be used or relied upon by other parties or for other projects without the expressed written consent of Nutting Engineers of Florida, Inc. This report discusses geotechnical considerations for this site based upon observed conditions and our understanding of proposed construction for foundation support. Environmental issues including (but not limited to), soil and/or groundwater contamination are beyond our scope of service for this project. As such, this report should not be used or relied upon for evaluation of environmental issues.

If conditions are encountered which are not consistent with the findings presented in this report, or if proposed construction is moved from the location investigated, this office shall be notified immediately so that the condition or change can be evaluated and appropriate action taken.

The pile installation may cause vibrations that could be felt by persons within nearby buildings and could potentially induce structural settlements. Additionally, preexisting settlements may exist within these structures that could be construed to have been caused or worsened by the proposed vibratory compaction after the fact. Pre- and post conditions surveys of these structures along with the vibration monitoring during piling installation could be performed to better evaluate this concern. The contractor should exercise due care during the performance of the piling operations with due consideration of potential impacts on existing structures. If potential vibrations and impacts are not considered tolerable, then alternate foundation modification techniques should be considered.

Nutting Engineers of Florida, Inc. shall bear no liability for the implementation of recommended inspection and testing services as described in this report if implemented by others. Nutting has no ability to verify the completeness, accuracy or proper technique of such procedures if performed by others.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein, have been presented after being prepared in accordance with general accepted professional practice in the field of foundation engineering, soil mechanics and engineering geology. No other warranties are implied or expressed.

We appreciate the opportunity to provide these services for you. If we can be of any further assistance, or if you need additional information, please feel free to contact us.

Sincerely,
NUTTING ENGINEERS OF FLORIDA, INC.

2/16/12

Paul C. Catledge, P.E. #68448
Senior Engineer

Richard C. Wohlfarth, P.E.
Director of Engineering

Appendix: Boring Location Plan
Soil Profiles
Test Boring Logs
Limitations of Liability
Soil Classification Criteria

NUTTING ENGINEERS OF FLORIDA, INC.
ESTABLISHED 1967

TARPON PIER
GARRISON BIGHT
INTERSECTION OF N. ROOSEVELT & PALM AVE.
KEY WEST, FLORIDA

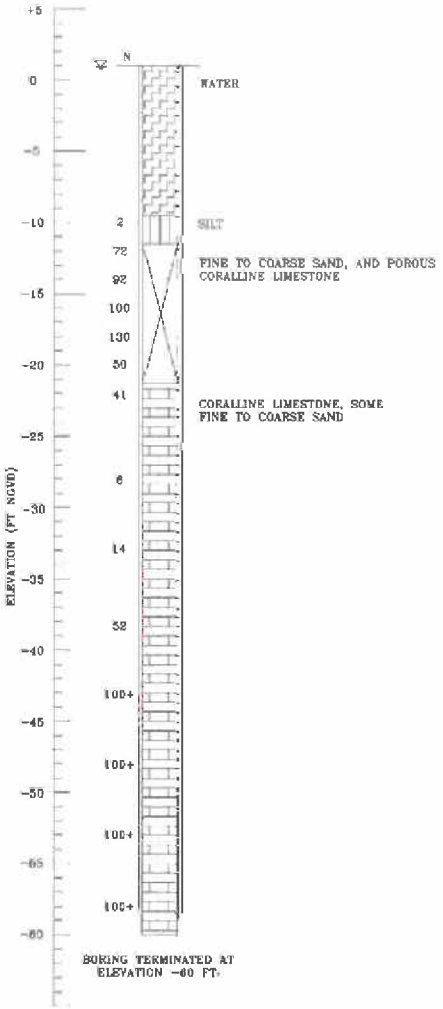
APPROXIMATE
TEST LOCATIONS

NOT TO SCALE

FIGURE 1

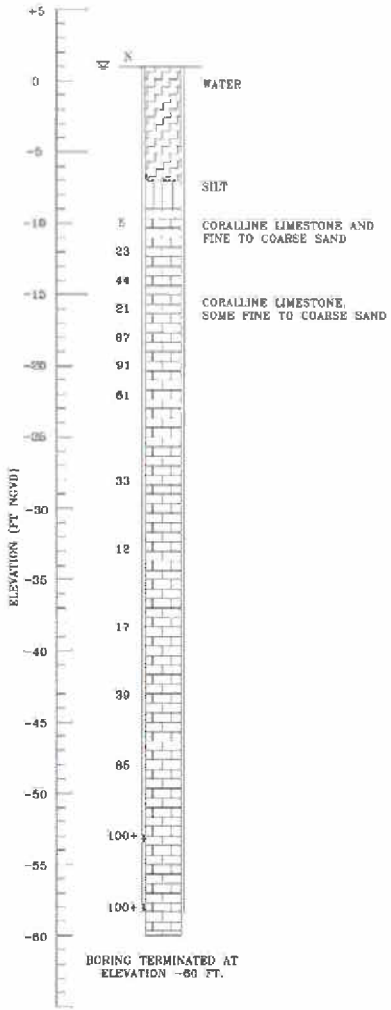
TEST BORING B-1

LAT 24.56105, LONG. 81.78273
APPROX. WATER DEPTH: 10.5 FT



TEST BORING B-2

LAT 24.5602, LONG. 81.78367
APPROX. WATER DEPTH: 5.0 FT



NOTES:

WT WATER TABLE AT TIME OF DRILLING

7 NUMBERS TO THE LEFT OF BORINGS INDICATE SPT VALUES FOR 1 FOOT PENETRATION

CASING USED

LEGEND

WATER

SAND (SP)

SILT (MP)

PEAT (OP)

LIMESTONE

NOT TO SCALE
PROJECT NO. 126.21.5

SOIL PROFILES

TARPON PIER SITE
KEY WEST, FLORIDA

FIGURE 2

NUTTING ENGINEERS OF FLORIDA, INC. ESTABLISHED 1967

Nutting Engineers of Florida Inc. | Established 1967
Your Project is Our Commitment
1310 Neptune Drive
Boynton Beach, FL 33426
Telephone: 561-736-4900
Fax: 561-737-9975

BORING NUMBER B-1

PROJECT NUMBER 126.21.5
CLIENT CH2M Hill
PROJECT NAME Site 5 - Tarpon Pier
PROJECT LOCATION Key West, FL

DATE STARTED 1/12/12 COMPLETED 1/12/12
SURFACE ELEVATION REFERENCE
DRILLING METHOD Standard Penetration Boring
GROUND WATER LEVELS:
LOGGED BY T. Simmons CHECKED BY C. Gworek
AT TIME OF DRILLING ---
APPROXIMATE LOCATION OF BORING Lt. 24.56105 · Lng. 81.78273

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲ 10 20 30 40 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
0		WATER				
10		Gray SILT	SS 1	1/18"-2		▲
15		Lt. tan fine to coarse SAND and porous coralline LIMESTONE	SS 2	9-28-44-35	72	>>▲
			SS 3	30-49-43-46	92	>>▲
			SS 4	34-49-51-50	100	>>▲
20			SS 5	47-63-67-58	130	>>▲
		Lt. tan porous coralline LIMESTONE, some fine to coarse sand	SS 6	40-32-18-23	50	▲
			SS 7	31-20-21	41	▲
25		Lt. tan coralline LIMESTONE, some tan fine to coarse sand				
30		Lt. tan coralline LIMESTONE, some fine to coarse sand	SS 8	2-2-4	6	▲
35			SS 9	7-7-7	14	▲
40			SS 10	29-25-27	52	>>▲

TEST NUTTING BOREHOLE 2-126.21.5 CH2M HILL - SITE 5 TARPON PIER.GPJ GINT US.GDT 2/17/12

(Continued Next Page)

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Boynton Beach, FL 33426
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Fax: 561-737-9975

BORING NUMBER B-1

PROJECT NUMBER 126.21.5

CLIENT CH2M Hill

PROJECT NAME Site 5 - Tarpon Pier

PROJECT LOCATION Key West, FL

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value	▲ SPT N VALUE ▲ 10 20 30 40 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
40		Lt. tan coralline LIMESTONE, some fine to coarse sand *(continued)*				
45			SS 11	33-50/5"	100+	>>
50			SS 12	37-50/0"	100+	>>
55			SS 13	50/4"	100+	>>
60			SS 14	50/5"	100+	>>
		Boring terminated at -60' NGVD				

TEST NUTTING BOREHOLE 2-126.21.5 CH2M HILL - SITE 5 TARPON PIER.GPJ GINT US.GDT 2/17/12

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Boynton Beach, FL 33426
Telephone: 561-736-4900
Fax: 561-737-9975

BORING NUMBER B-2

PROJECT NUMBER 126.21.5
CLIENT CH2M Hill
PROJECT NAME Site 5 - Tarpon Pier
PROJECT LOCATION Key West, FL

DATE STARTED 1/13/12 COMPLETED 1/13/12
SURFACE ELEVATION REFERENCE
DRILLING METHOD Standard Penetration Boring
GROUND WATER LEVELS:
LOGGED BY T. Simmons CHECKED BY C. Gworek
AT TIME OF DRILLING ---
APPROXIMATE LOCATION OF BORING Lt. 24.5602 - Lng. 81.78387

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N-Value
0		WATER			
10		Gray SILT	SS 1	1-2-4-4	6
		Lt. tan coralline LIMESTONE and fine to coarse SAND	SS 2	6-12-11-20	23
			SS 3	21-25-19-22	44
15			SS 4	11-5-16-35	21
		Lt. tan coralline LIMESTONE and gray silty fine to coarse SAND	SS 5	31-41-46-44	87
		Lt. tan coralline LIMESTONE, some fine to coarse SAND	SS 6	36-43-48-26	91
20					
25			SS 7	35-27-34	61
30			SS 8	18-22-11	33
35			SS 9	5-8-4	12
40			SS 10	6-6-11	17

▲ SPT N VALUE ▲
10 20 30 40
PL MC LL
20 40 60 80
□ FINES CONTENT (%) □
20 40 60 80

TEST NUTTING BOREHOLE 2-126.21.5 CH2M HILL - SITE 5 TARPON PIER.GPJ CINT US.GDT 2/17/12

(Continued Next Page)

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Boynton Beach, FL 33426
Telephone: 561-736-4900
Fax: 561-737-9975

BORING NUMBER B-2

PROJECT NUMBER 126.21.5

CLIENT CH2M Hill

PROJECT NAME Site 5 - Tarpon Pier

PROJECT LOCATION Key West, FL

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	Blows	N Value	▲ SPT N VALUE ▲ 10 20 30 40 / PL MC LL 20 40 60 80 / ☐ FINES CONTENT (%) ☐ 20 40 60 80
40		Lt. tan coralline LIMESTONE, some fine to coarse SAND *(continued)*				
45			SS 11	13-14-25	39	▲
		Lt. tan coralline LIMESTONE, slight trace gray fine to coarse sand				
50			SS 12	44-48-37	85	>>▲
55			SS 13	50/3"	100+	>>▲
60			SS 14	50/4"	100+	>>▲
		Boring terminated at -60' NGVD				

TEST NUTTING BOREHOLE 2-126 21.5 CH2M HILL - SITE 5 TARPON PIER.GPJ GINT US.GDT 2/17/12

SOIL AND ROCK CLASSIFICATION CRITERIA

SAND/SILT

N-VALUE (bpf)	RELATIVE DENSITY
0 – 4	Very Loose
5 – 10	Loose
11 – 29	Medium
30 – 49	Dense
>50	Very dense
100	Refusal

CLAY/SILTY CLAY

N-VALUE (bpf)	UNCONFINED COMP. STRENGTH (tsf)	CONSISTENCY
<2	<0.25	v. Soft
2 – 4	0.25 – 0.50	Soft
5 – 8	0.50 – 1.00	Medium
9 – 15	1.00 – 2.00	Soft
16 – 30	2.00 – 4.00	v. Stiff
>30	>4.00	Hard

ROCK

N-VALUE (bpf)	RELATIVE HARDNESS	ROCK CHARACTERISTICS
N≥ 100	Hard to v. hard	Local rock formations vary in hardness from soft to very hard within short vertical and horizontal distances and often contain vertical solution holes of 3 to 36 inch diameter to varying depths and horizontal solution features. Rock may be brittle to split spoon impact, but more resistant to excavation.
25≤ N ≤ 100	Medium hard to hard	
5≤ N ≤ 25	Soft to medium hard	

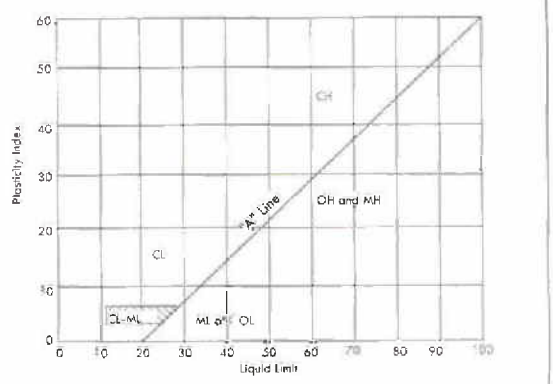
PARTICLE SIZE

Boulder	>12 in.
Cobble	3 to 12 in.
Gravel	4.76 mm to 3 in.
Sand	0.074 mm to 4.76 mm
Silt	0.005 mm to 0.074 mm
Clay	<0.005 mm

DESCRIPTION MODIFIERS

0 – 5%	Slight trace
6 – 10%	Trace
11 – 20%	Little
21 – 35%	Some
>35%	And

Major Divisions			Group Symbols	Typical names	Laboratory classification criteria
Coarse-grained soils (More than half of material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows: Less than five percent.....GW, GP, SW, SP; More than 12 percent.....GM, GC, SM, SC; 5 to 12 percent.....Borderline cases requiring dual systems**
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_z = \frac{(D_{30})^2}{D_{10} x D_{60}}$ between 1 and 3
		Gravels with fines (Appreciable amount of fines)	GW* d / u	Silty gravels, gravel-sand-silt mixtures	Not meeting all gradation requirements for GW
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits below "A" line or P.I. less than 4 / Atterberg limits above "A" line with P.I. greater than 7 — Above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols.
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_z = \frac{(D_{30})^2}{D_{10} x D_{60}}$ between 1 and 3
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW
		Sands with fines (Appreciable amount of fines)	SM* d / u	Silty sands, sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4 / Atterberg limits above "A" line with P.I. more than 7 — Limits plotting in hatched zone with P.I. between 4 and 7 are *borderline* cases requiring use of dual system.
			SC	Clayey sands, sand-clay mixtures	
Fine-grained soils (More than half of material is smaller than No. 200 sieve size)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity	
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
			OL	Organic silts and organic silty clays of low plasticity	
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	
			CH	Inorganic clays of high plasticity, fat clays	
			OH	Organic clays of medium to high plasticity, organic silts	
	Highly organic soils		PT	Peat and other highly organic soils	



Plasticity Chart

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LIMITATIONS OF LIABLILITY

WARRANTY

We warranty that the services performed by Nutting Engineers of Florida, Inc. are conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the profession in our area currently practicing under similar conditions at the time our services were performed. ***No other warranties, expressed or implied, are made.*** While the services of Nutting Engineers of Florida, Inc. are a valuable and integral part of the design and construction teams, we do not warrant, guarantee or insure the quality, completeness, or satisfactory performance of designs, construction plans, specifications we have not prepared, nor the ultimate performance of building site materials or assembly/construction.

SUBSURFACE EXPLORATION

Subsurface exploration is normally accomplished by test borings; test pits are sometimes employed. The method of determining the boring location and the surface elevation at the boring is noted in the report. This information is represented in the soil boring logs and/or a drawing. The location and elevation of the borings should be considered accurate only to the degree inherent with the method used and may be approximate.

The soil boring log includes sampling information, description of the materials recovered, approximate depths of boundaries between soil and rock strata as encountered and immediate depth to water data. The log represents conditions recorded specifically at the location where and when the boring was made. Site conditions may vary through time as will subsurface conditions. The boundaries between different soil strata as encountered are indicated at specific depths; however, these depths are in fact approximate and dependent upon the frequency of sampling, nature and consistency of the respective strata. Substantial variation between soil borings may commonly exist in subsurface conditions. Water level readings are made at the time and under conditions stated on the boring logs. Water levels change with time, precipitation, canal level, local well drawdown and other factors. Water level data provided on soil boring logs shall not be relied upon for groundwater based design or construction considerations.

LABORATORY AND FIELD TESTS

Tests are performed in *general* accordance with specific ASTM Standards unless otherwise indicated. All criteria included in a given ASTM Standard are not always required and performed. Each test boring report indicates the measurements and data developed at each specific test location.

ANALYSIS AND RECOMMENDATIONS

The geotechnical report is prepared primarily to aid in the design of site work and structural foundations. Although the information in the report is expected to be sufficient for these purposes, it shall not be utilized to determine the cost of construction nor to stand alone as a construction specification. Contractors shall verify subsurface conditions as may be appropriate prior to undertaking subsurface work.

Report recommendations are based primarily on data from test borings made at the locations shown on the test boring reports. Soil variations commonly exist between boring locations. Such variations may not become evident until construction. Test pits sometimes provide valuable supplemental information that derived from soil borings. If variations are then noted, the geotechnical engineer shall be contacted in writing immediately so that field conditions can be examined and recommendations revised if necessary.

The geotechnical report states our understanding as to the location, dimensions and structural features proposed for the site. ***Any significant changes of the site improvements or site conditions must be communicated in writing to the geotechnical engineer immediately*** so that the geotechnical analysis, conclusions, and recommendations can be reviewed and appropriately adjusted as necessary.

CONSTRUCTION OBSERVATION

Construction observation and testing is an important element of geotechnical services. The geotechnical engineer's field representative (G.E.F.R.) is the "owner's representative" observing the work of the contractor, performing tests and reporting data from such tests and observations. ***The geotechnical engineer's field representative does not direct the contractor's construction means, methods, operations or personnel.*** The G.E.F.R. does not interfere with the relationship between the owner and the contractor and, except as an observer, does not become a substitute owner on site. The G.E.F.R. is responsible for his/her safety, but has no responsibility for the safety of other personnel at the site. The G.E.F.R. is an important member of a team whose responsibility is to observe and test the work being done and report to the owner whether that work is being carried out in general conformance with the plans and specifications. The enclosed report may be relied upon solely by the named client.

SECTION: 32
TOWNSHIP: 67 S.
RANGE: 25 E.
LATITUDE: 24° 33' 36"
LONGITUDE: 81° 47' 01"

0' 1000' 2000'
SCALE FEET

INDEX TO DRAWINGS

Note: Bathymetric Survey completed by Hans Wilson & Assoc. Inc. September 28, 2011. All depths reference Mean Low Water per DEP Tide Station 872-4542. Mean High Water el. -0.23' NAVD 88; Mean Low Water @ -1.24' NAVD 88.
Note: Site survey information from Island Surveying, Inc. dated September 26, 2011 and Lawrence P. Frank, dated May 16, 1994.

CONSTRUCTION PERMITS PLANS ONLY

HANS J.M. WILSON
REGISTERED PROFESSIONAL ENGINEER
FLORIDA REGISTRATION NO. 39680
DATE: August 21, 2012 4:54:54 p.m.
Drawing: KEYWEST1CONST.DWG

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

hjmw
8-6-12

Title Sheet
SCALE: 1" = 2,000 FT

City of Key West

SHEET 1/9

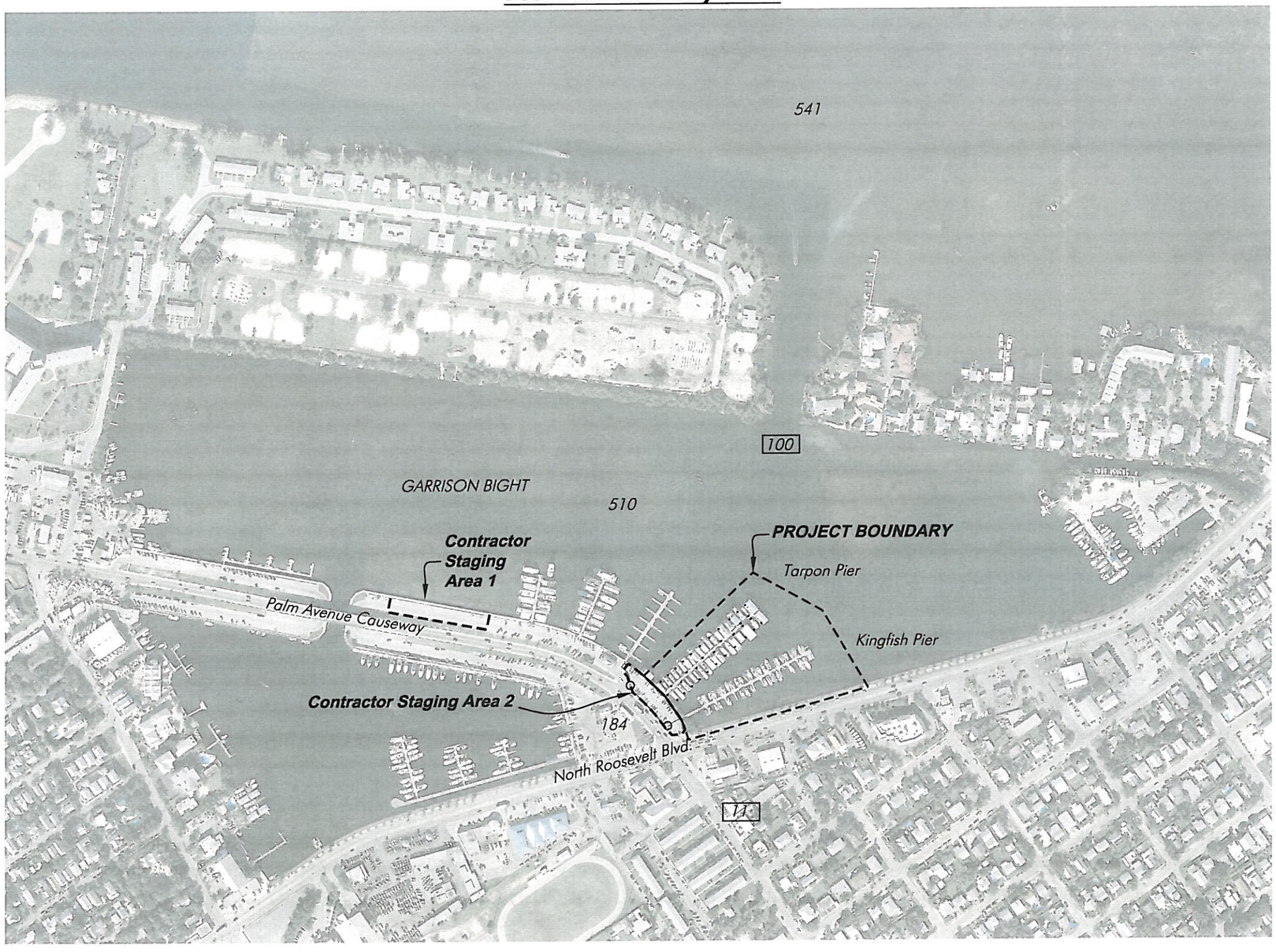
SECTION: 32
TOWNSHIP: 67 S.
RANGE: 25 E.

LATITUDE: 24° 33' 36"
LONGITUDE: 81° 47' 01"

0' 200' 400'
SCALE FEET

N

2009 Monroe County Aerial



FLUCFCS Codes
184 - Marinas
510 - Streams and Waterways
541 - Embayments

Soil Codes
11 - Urban Land
100 - Waters of the Atlantic Ocean

Note: Bathymetric Survey completed by Hans Wilson & Assoc. Inc. September 28, 2011. All depths reference Mean Low Water per DEP Tide Station 872-4542. Mean High Water el. -0.23' NAVD 88; Mean Low Water @ -1.24' NAVD 88.
Note: Site survey information from Island Surveying, Inc. dated September 26, 2011 and Lawrence P. Frank, dated May 16, 1994.

CONSTRUCTION PERMITS PLANS ONLY

HANS J.M. WILSON
REGISTERED PROFESSIONAL ENGINEER
FLORIDA REGISTRATION NO. 39680
DATE: August 21, 2012 4:54:54 p.m.
Drawing: KEYWEST1CONST.DWG

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

JJB
8-6-12

Overall Aerial Plan
SCALE: 1" = 400'

City of Key West

SHEET 2/9

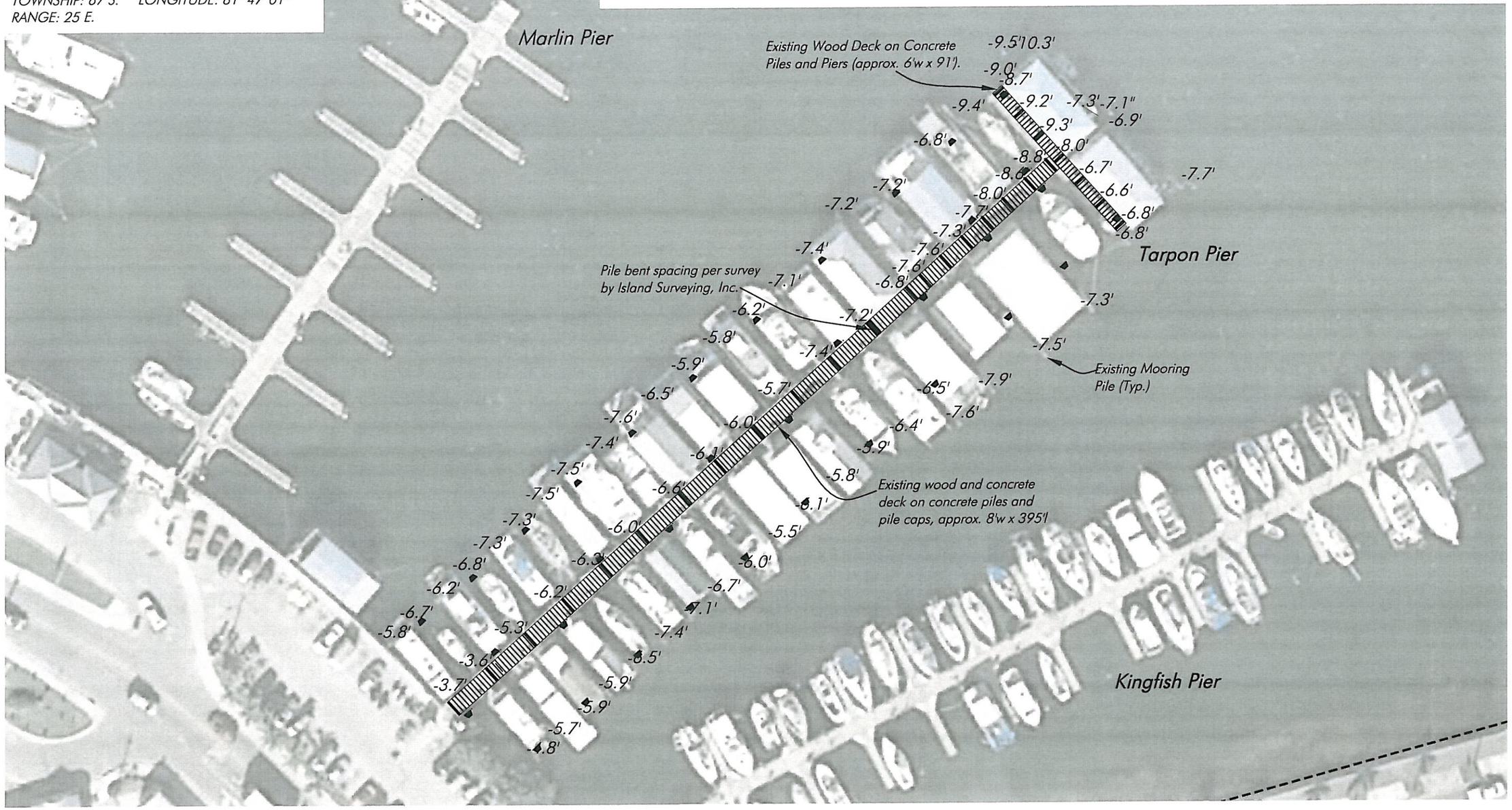
SECTION: 32
TOWNSHIP: 67 S.
RANGE: 25 E.

LATITUDE: 24° 33' 36"
LONGITUDE: 81° 47' 01"

2009 Monroe County Aerial

0' 25' 50'
SCALE FEET

N



Note: Bathymetric Survey completed by Hans Wilson & Assoc. Inc. September 28, 2011. All depths reference Mean Low Water per DEP Tide Station 872-4542. Mean High Water el. -0.23' NAVD 88; Mean Low Water @ -1.24' NAVD 88.
Note: Site survey information from Island Surveying, Inc. dated September 26, 2011 and Lawrence P. Frank, dated May 16, 1994.

CONSTRUCTION PERMITS PLANS ONLY

HANS J.M. WILSON
REGISTERED PROFESSIONAL ENGINEER
FLORIDA REGISTRATION NO. 39680
DATE: August 21, 2012 4:54:54 p.m.
Drawing: KEYWEST1CONST.DWG

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

JJB
8-6-12

Existing Site Plan & Depth Survey

SCALE: 1" = 50'

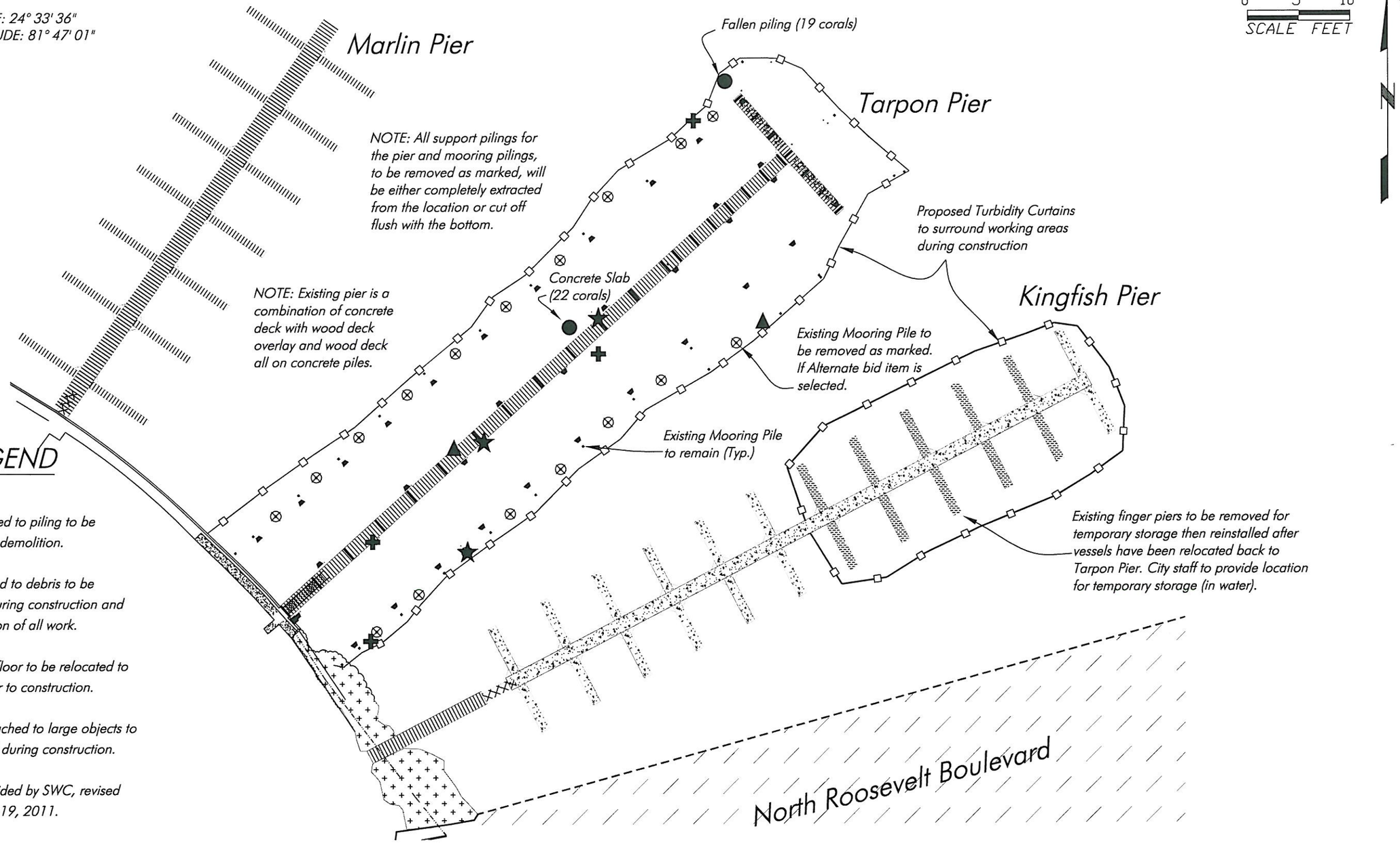
City of Key West

SHEET 3/9

SECTION: 32
TOWNSHIP: 67 S.
RANGE: 25 E.

LATITUDE: 24° 33' 36"
LONGITUDE: 81° 47' 01"

0' 5' 10'
SCALE FEET



CORAL LEGEND

★ Coral (>10 cm.) attached to piling to be relocated prior to piling demolition.

✚ Coral (>10cm.) attached to debris to be temporarily relocated during construction and returned upon completion of all work.

▲ Coral (>10cm.) on seafloor to be relocated to the FKNMS nursery prior to construction.

● Coral (various sizes) attached to large objects to be marked and avoided during construction.

Site information as provided by SWC, revised survey dated December 19, 2011.

⊗ - Mooring Pile to be Removed

Note: Bathymetric Survey completed by Hans Wilson & Assoc. Inc. September 28, 2011. All depths reference Mean Low Water per DEP Tide Station 872-4542. Mean High Water el. -0.23' NAVD 88; Mean Low Water @ -1.24' NAVD 88.
Note: Site survey information from Island Surveying, Inc. dated September 26, 2011 and Lawrence P. Frank, dated May 16, 1994.

CONSTRUCTION PERMITS PLANS ONLY

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REGISTERED PROFESSIONAL ENGINEER
FLORIDA REGISTRATION NO. 39680
DATE: August 21, 2012 4:54:54 p.m.
Drawing: KEYWEST1CONST.DWG

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Demolition & Relocation Plan
SCALE: 1" = 60'

City of Key West

SHEET 4/9

SECTION: 32
TOWNSHIP: 67 S.
RANGE: 25 E.

LATITUDE: 24° 33' 36"
LONGITUDE: 81° 47' 01"

Note: Values shown in slips are clear space between finger piers, equally divided to create the slip width.

Note: Site survey information from Island Surveying, Inc. dated September 26, 2011 and Lawrence P. Frank, dated May 16, 1994.

0' 25 50'
SCALE FEET

Marlin Pier

Existing dock

Turbidity monitoring station 300' offset from site for background.

95' to CM 25 and near edge of channel

SEE DETAIL A

(2) Proposed finger piers @ 4'w x 35'l (typ.)

(20) Proposed finger piers @ 4'w x 25'l (typ.)

Proposed floating dock (10'w x 399'l)

Proposed Turbidity Curtains to surround working areas during construction

Tarpon Pier

Piles to remain(30)

Turbidity Curtains to surround working areas as needed to control turbidity.

Mooring Piles to be removed (18) if finger piers installed. To remain as is without finger piers.

SEE DETAIL B

Contractor Staging Area 2

Contractor to provide security fencing and lighting around parking and storage area as shown.

C5

C12

Kingfish Pier

Existing dock

Contractor to provide unencumbered access from Kingfish Pier to sidewalk for access to upland facilities.

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FLORIDA REGISTRATION NO. 39680
DATE: August 21, 2012 4:54:54 p.m.
Drawing: KEYWEST1CONST.DWG

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Proposed Dimension Plan
SCALE: 1" = 50'

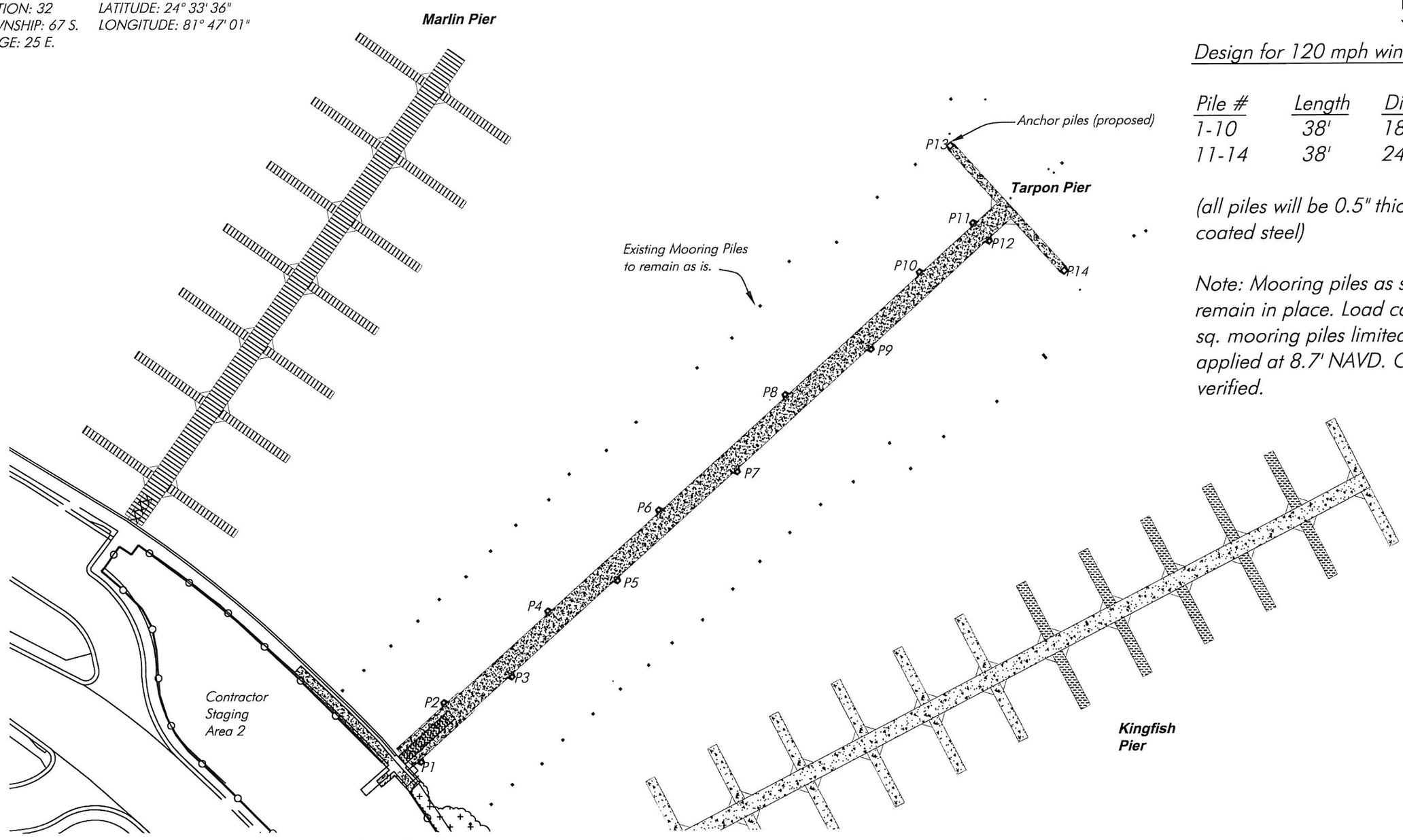
City of Key West

SHEET 5/9

SECTION: 32
TOWNSHIP: 67 S.
RANGE: 25 E.

LATITUDE: 24° 33' 36"
LONGITUDE: 81° 47' 01"

0' 25 50'
SCALE FEET



Design for 120 mph wind loads

Pile #	Length	Dia
1-10	38'	18"
11-14	38'	24"

(all piles will be 0.5" thick epoxy coated steel)

Note: Mooring piles as shown to remain in place. Load capacity on 18" sq. mooring piles limited to 6,800lb. applied at 8.7' NAVD. Capacity not verified.

Note: Bathymetric Survey completed by Hans Wilson & Assoc. Inc. September 28, 2011. All depths reference Mean Low Water per DEP Tide Station 872-4542. Mean High Water el. -0.23' NAVD 88; Mean Low Water @ -1.24' NAVD 88. Note: Site survey information from Island Surveying, Inc. dated September 26, 2011 and Lawrence P. Frank, dated May 16, 1994.

CONSTRUCTION PERMITS PLANS ONLY

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FLORIDA REGISTRATION NO. 39680
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Drawing: KEYWEST1CONST.DWG

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Pile Plan Without Finger Piers (base bid)

SCALE: 1" = 50'

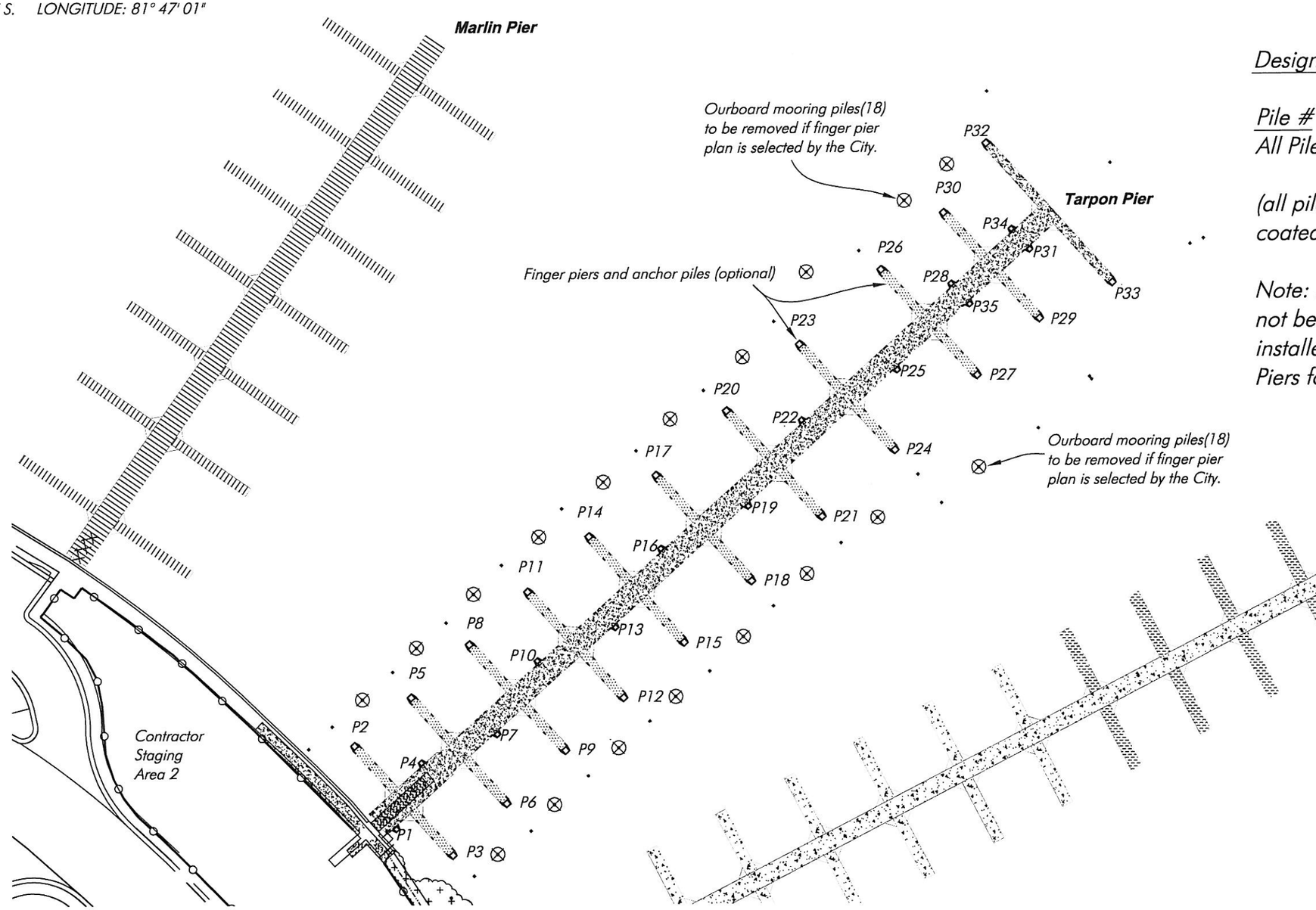
City of Key West

SHEET 6/9

SECTION: 32
TOWNSHIP: 67 S.
RANGE: 25 E.

LATITUDE: 24° 33' 36"
LONGITUDE: 81° 47' 01"

0' 25 50'
SCALE FEET



Design for 120 mph wind loads

Pile #	Length	Dia
All Piles	38'	18"

(all piles will be 0.5" thick epoxy coated steel)

Note: Piles on ends of finger piers will not be installed if finger piers are not installed. Refer to Pile Plan w/o Finger Piers for pile placement.

Note: Bathymetric Survey completed by Hans Wilson & Assoc. Inc. September 28, 2011. All depths reference Mean Low Water per DEP Tide Station 872-4542. Mean High Water el. -0.23' NAVD 88; Mean Low Water @ -1.24' NAVD 88.
Note: Site survey information from Island Surveying, Inc. dated September 26, 2011 and Lawrence P. Frank, dated May 16, 1994.

CONSTRUCTION PERMITS PLANS ONLY

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Pile Plan with Finger Piers(alternate bid item)

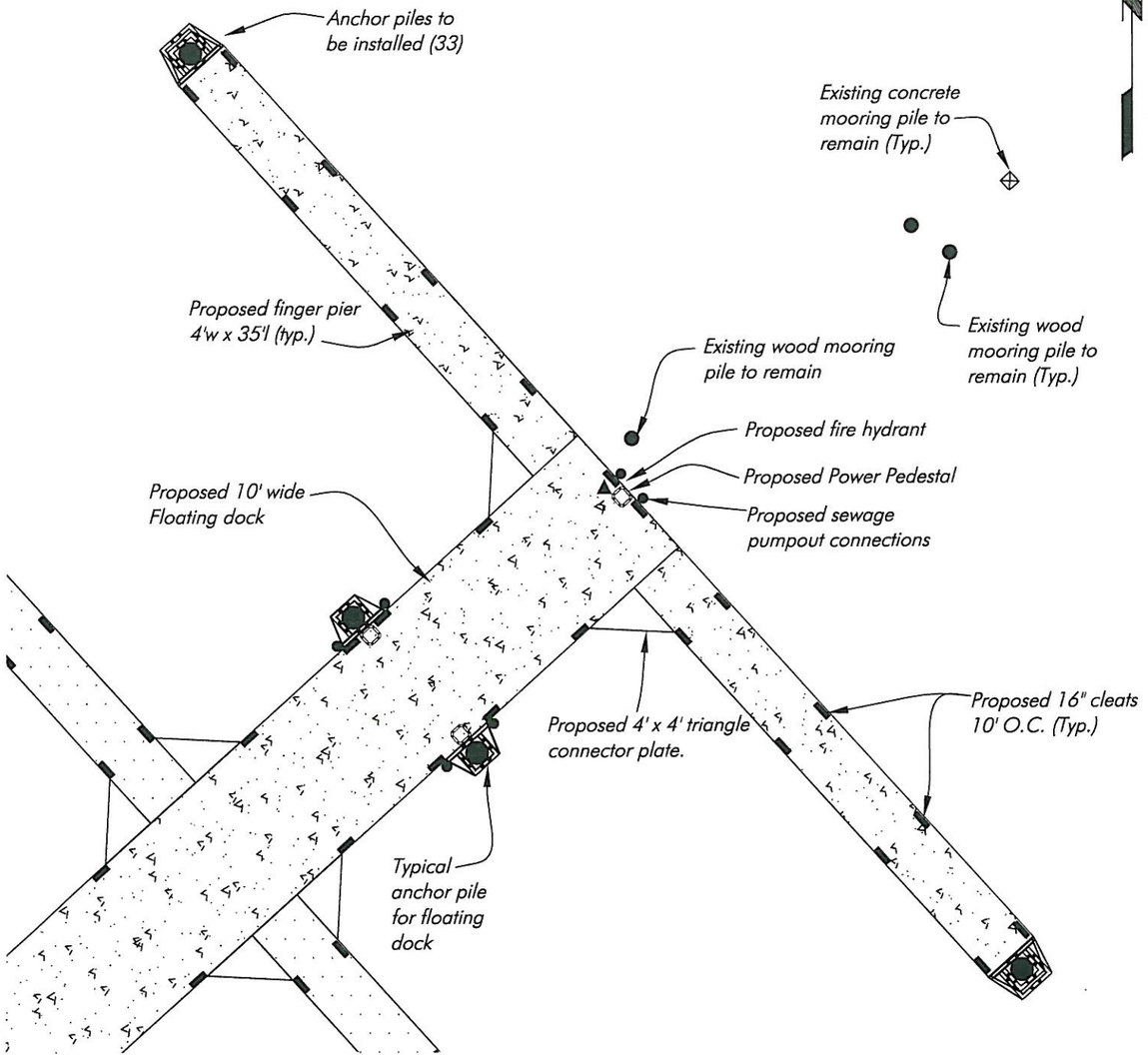
SCALE: 1" = 50'

City of Key West

SHEET 7/9

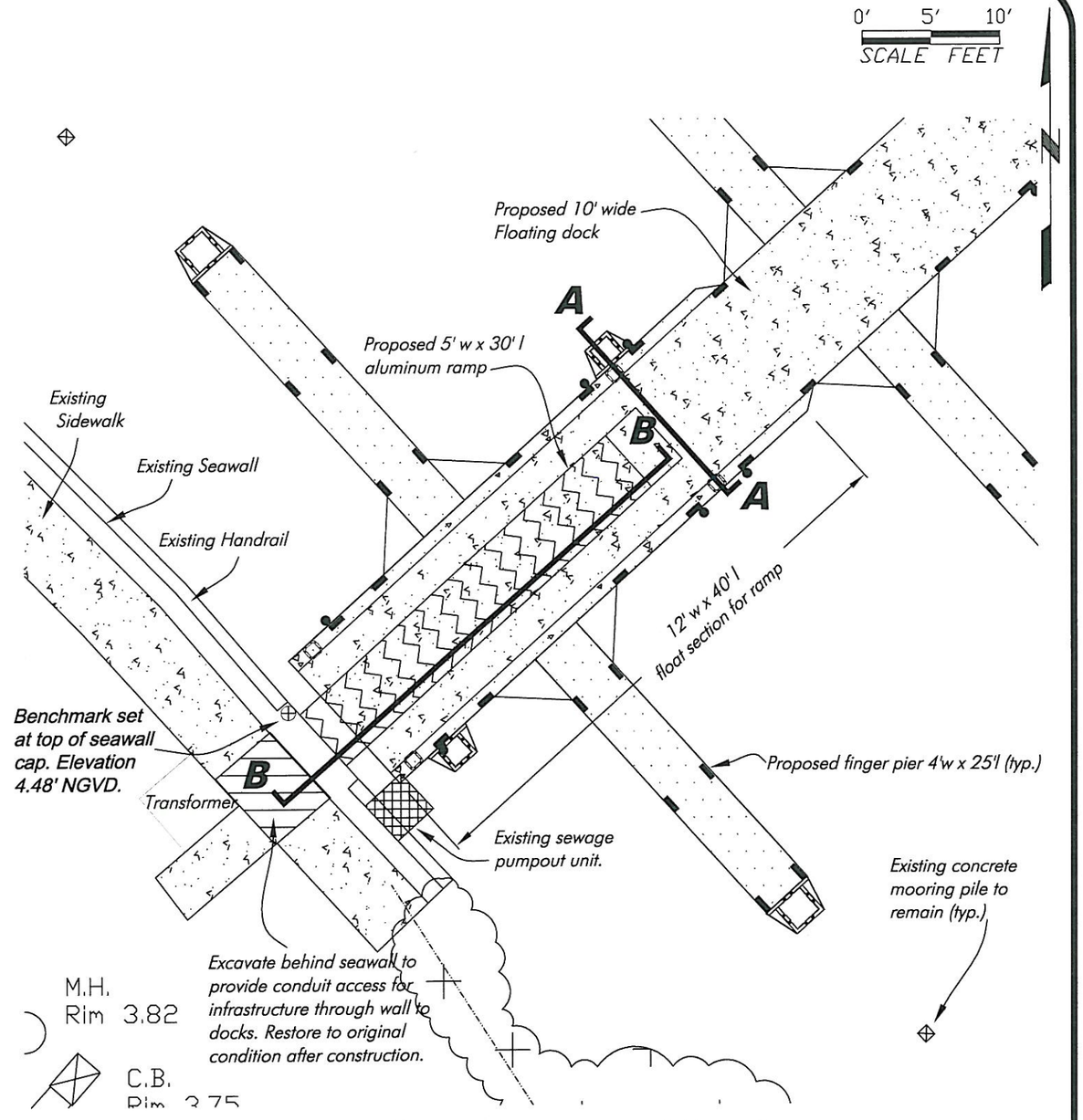
SECTION: 32
TOWNSHIP: 67 S.
RANGE: 25 E.

LATITUDE: 24° 33' 36"
LONGITUDE: 81° 47' 01"



Detail A - Proposed Dock

SCALE: 1" = 10'



Detail B - Proposed Dock

SCALE: 1" = 10'

Note: Bathymetric Survey completed by Hans Wilson & Assoc. Inc. September 28, 2011. All depths reference Mean Low Water per DEP Tide Station 872-4542. Mean High Water el. -0.23' NAVD 88; Mean Low Water @ -1.24' NAVD 88.
Note: Site survey information from Island Surveying, Inc. dated September 26, 2011 and Lawrence P. Frank, dated May 16, 1994.

CONSTRUCTION PERMITS PLANS ONLY

HANS J.M. WILSON
REGISTERED PROFESSIONAL ENGINEER
FLORIDA REGISTRATION NO. 39680
DATE: August 21, 2012 4:54:54 p.m.
Drawing: KEYWEST1CONST.DWG

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8-6-12

Details Proposed Dock

SCALE: 1" = 10'

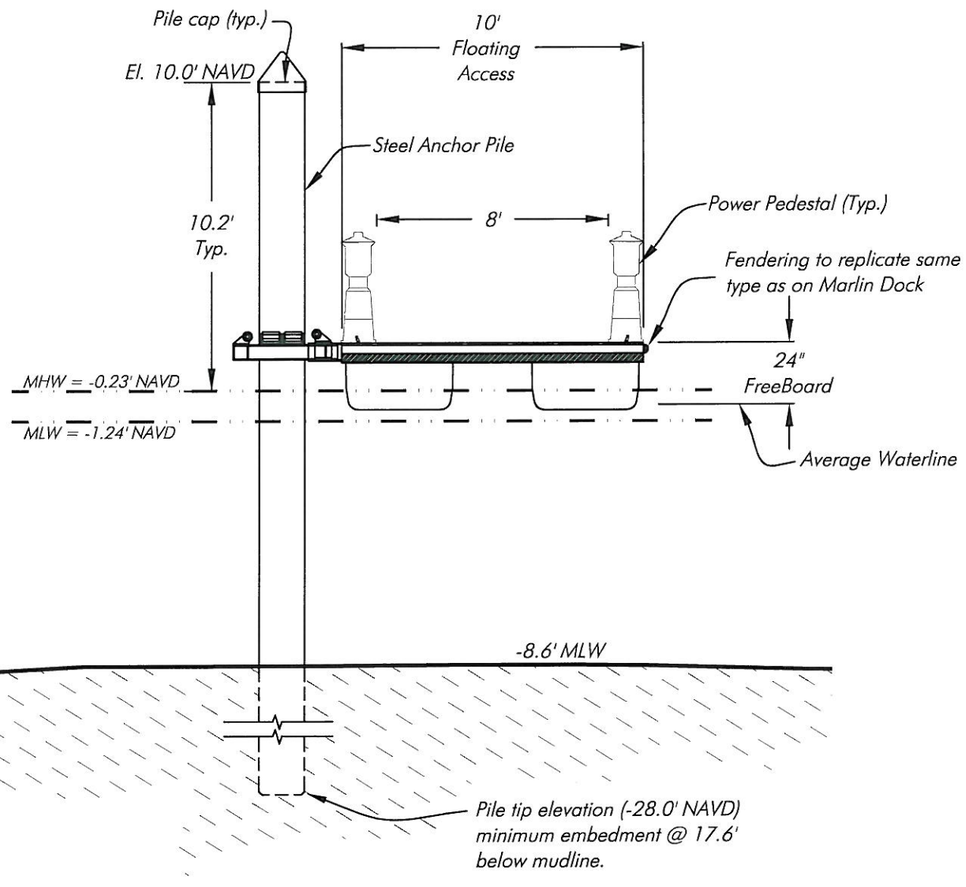
City of Key West

SHEET 8/9

SECTION: 32 LATITUDE: 24° 33' 36"
TOWNSHIP: 67 S. LONGITUDE: 81° 47' 01"
RANGE: 25 E.

0' 2.5' 5'
SCALE FEET

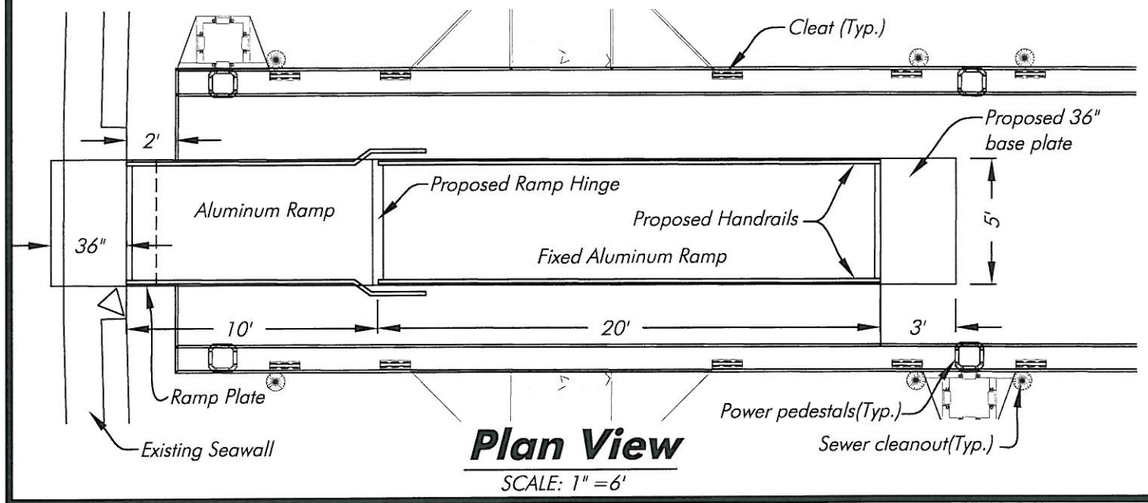
Note: All depths reference Mean Low Water per DEP Tide Station 872-4542.
Mean High Water el. -0.23' NAVD 88; Mean Low Water @ -1.24' NAVD 88.



Cross Section A-A

SCALE: 1" =5'

0' 3' 6'
SCALE FEET

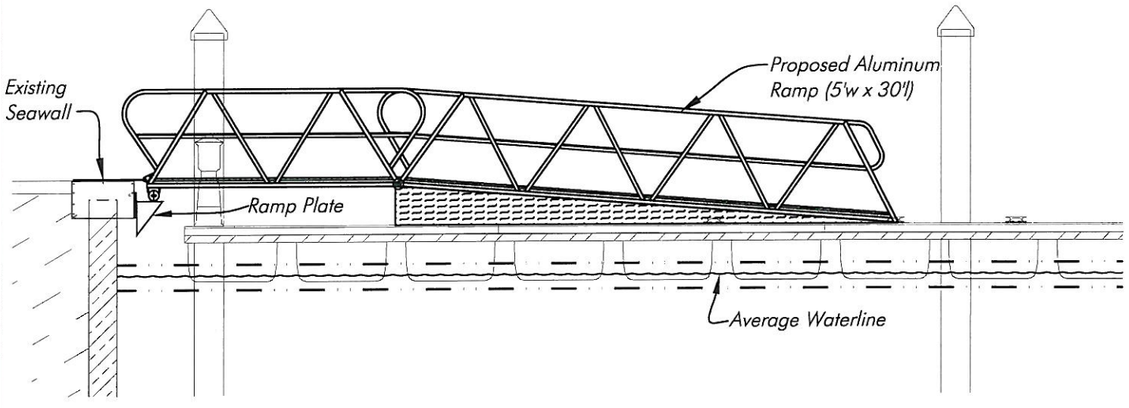


Plan View

SCALE: 1" =6'

Note: Ramp design conceptual only.
Refer to in field construction of access ramp to Marlin Dock for concise example.

0' 3' 6'
SCALE FEET



Cross Section B-B

SCALE: 1" =6'

Note: Bathymetric Survey completed by Hans Wilson & Assoc. Inc. September 28, 2011. All depths reference Mean Low Water per DEP Tide Station 872-4542. Mean High Water el. -0.23' NAVD 88; Mean Low Water @ -1.24' NAVD 88.
Note: Site survey information from Island Surveying, Inc. dated September 26, 2011 and Lawrence P. Frank, dated May 16, 1994.

CONSTRUCTION PERMITS PLANS ONLY

HANS J.M. WILSON
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FLORIDA REGISTRATION NO. 39680
DATE: August 21, 2012 4:54:54 p.m.
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Cross Sections
SCALE: Varies

City of Key West

SHEET 9/9

FIRE EXTINGUISHMENT SYSTEMS SPECIFICATIONS

PART 1 – GENERAL REQUIREMENTS

1.1 SYSTEM DESCRIPTION

A. Tarpon Pier fire extinguishment systems shall consist of a fixed–in–place, automatic, Class I wet standpipe relying upon an existing fire pump to supply the water demand and shall include Class II hose stations and portable type ABC fire extinguishers.

B. System calculations shall be based upon a flow rate for the hydraulically most remote hose nozzle of 100 GPM and a minimum design pressure of 65 PSI. Fire water source is from a public waterworks system. Flow and pressure test data are as follows:

DATE OF TEST: February 16, 2012
PERFORMED BY: Hatalovsky and Judge
FLOW: 880 GPM
RESIDUAL PRESSURE: 50 PSI
STATIC PRESSURE: 52 PSI

1.2 SUMMARY OF WORK

A. Demolition work of this contract generally includes but is not limited to demolishing the existing standpipe system up to the pier and landside interface to the extent indicated on the plans. Landside piping, hydrants, pump, etc. shall be reused in place.

B. Four existing fire hose cabinets with associated hose valves, fire hoses and nozzles installed on the existing pier shall be removed, stored off–site and re–installed on the proposed pier as part of the work of this contract. Modifications to existing hose cabinets or other components where indicated on the plans or specifications shall also be included. Prepare photos and other documentation as may be necessary prior to removal of the equipment denoting existing damage or defects. Report deficiencies immediately to the Engineer and Owner.

C. New construction work shall include but is not limited to providing complete new fire extinguishment piping systems and portable fire extinguishers with cabinets as described in these specifications and drawings for the proposed pier. Work shall include preparing minor modifications to the existing fire water supply main at the proposed pier and seawall interface.

D. Bids shall include as a minimum all labor, tools, materials, plant, transportation, taxes, related items, etc., essential for demolishing existing work and furnishing, installing, operating, and testing of the proposed new work.

1.3 EXAMINATION OF DOCUMENTS

A. The intent of the drawings and specifications is to establish type and quality of materials and a general layout and location of the major components that comprise the fire extinguishment systems. They are not intended to show in minute detail every or all accessories intended for the purposes of executing the work, but it is understood that such details are part of the project scope.

B. Where conflicts exist between the specifications and drawings the most stringent requirements shall apply.

1.4 CODES AND STANDARDS

A. Furnish and install fire extinguishment systems to meet all current requirements of national, state and municipal codes, rules, regulations, laws, and standards as they are adopted by the governing agency and as they may apply.

NFPA 10 Standard for Portable Fire Extinguishers 2007 Edition
NFPA 14 Standard for the Installation of Standpipe and Hose Systems 2007 Edition
NFPA 303 Fire Protection Standard for Marinas and Boatyards 2006 Edition
Florida Fire Prevention Code 2010 Edition
Florida Building Code 2010 Edition
Factory Mutual
Underwriters Laboratories

1.5 PERMITS AND INSPECTIONS

A. Secure and pay for all permits and licenses before actual work is started and observe all requirements stipulated thereon.

B. Coordinate with and give all necessary notices to the Authority Having Jurisdiction for inspection and testing of fire protection systems required to be witnessed by their agent.

1.6 SHOP DRAWING SUBMITTALS AND PRE–INSTALLATION COORDINATION

A. Prior to ordering materials submit shop drawings including manufacturer's catalog cuts, brochures and performance data of pipe and fitting materials, hoses, valves, supports, pipe markers, fire extinguishers, cabinets, and other appurtenances as may be required. Unless specified elsewhere, provide a minimum of six copies for Engineer and Owner review.

B. After owner acceptance of shop drawings, submit the approved documents to the Authority Having Jurisdiction for their approval. Submit in quantities as directed by the Authority Having Jurisdiction.

C. Coordinate with all trades in submittal of shop drawings and for space requirements. If work is installed prior to coordination with other trades which interferes with related work, make all necessary changes to correct the condition at no additional cost to the Owner.

D. Coordinate with floating dock supplier for pipe support spacing requirements integral with structural framing.

1.7 PRODUCTS AND WORKMANSHIP

A. All equipment and materials shall be new and unused as manufactured by companies regularly engaged in the fabrication of the type specified except as otherwise noted herein. Use products of a single manufacturer for similar type equipment. Modified or re–built equipment or materials are not acceptable.

B. Provide standpipe components and piping system installation capable of sustaining 175 PSIG minimum working pressure rating.

C. Install fire extinguishment systems in a neat and workmanlike manner utilizing personnel licensed and skilled in the trades.

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FORT MYERS, FLORIDA 33919
PHONE: (239) 936–4003 FAX: (239) 936–0819

Project No.: 5220–02–00	Date: July 24, 2012
eFile Name: 52200200FP001.dwg	
Designed By: PMK	Drawn By: JB
Checked By: PMK	
Engineer: Paul M. Kinnunen, P.E. Florida 48373	

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MARINE and ENVIRONMENTAL CONSULTANTS

7-24-12

Specifications - Fire Protection

Not To Scale

City of Key West

SHEET FP001

1.8 WARRANTY

A. Provide an unconditional warranty from failure and/or defects on all products and workmanship provided for this project for a minimum of one (1) year from date of substantial completion except as noted herein.

B. Provide six (6) year product warranty for fire extinguishers.

C. Warranty for products removed and reinstalled as indicated on the plans shall be provided for installation workmanship and new components as may be provided.

1.9 DELIVERY AND STORAGE

A. Handle, store and protect equipment and materials in accordance with the manufacturer's recommendations. Replace damaged or defective items with new items.

1.10 DEMOLITION, CUTTING AND PATCHING

A. Protect all existing active services against damage including water, electric, sewer, etc. in areas of proposed construction. If active services are encountered that require relocation, make request to Owner for determination of procedures.

B. Remove and dispose of properly off-site, all abandoned fire extinguishment piping, valves, pipe supports, hoses, equipment, etc. rendered obsolete by work of this project.

C. Provide all necessary cutting and patching required in connection with the fire extinguishment system work. Coordinate with and obtain written approval from the Marine Contractor for all proposed cutting and patching prior to commencement of work.

1.11 CLEANING

A. Clear away all debris, surplus materials, etc., resulting from fire extinguishment system installation work and operations. Leave the job and equipment provided under contract in a clean and first class condition.

1.12 TESTS AND DEMONSTRATIONS

A. Perform tests of the fire extinguishment system as specified herein. Repeat as required until proven acceptable to the Engineer, Owner and Authority Having Jurisdiction. Provide all gauges, tools, pumps, gas, air or other required equipment or materials.

B. Upon completion of testing, demonstrate maintenance, operation and adjustment procedures to owner for all installed systems and equipment.

1.13 RECORD DOCUMENTS

A. Maintain at the job site one set of prints on which are recorded all field changes and other portions of the fire extinguishment system work that vary from the contract documents. Indicate actual pipe system routing and installed accessories and devices.

B. Provide as-built record drawings to the Owner at the completion of the project.

PART 2 - PRODUCT REQUIREMENTS

2.1 PIPING, FITTINGS, AND JOINING MATERIALS

A. High Density Polyethylene (HDPE) pipe shall be ASTM D 3350, SDR 11, Cell Classification of PE 3454344C with butt-fused joints. All fittings shall be of compatible HDPE material and shall be butt-fused. Provide IPF, Driscopipe or equivalent.

B. Non sanitary pressure hose shall be # 2612 rated for minimum 150 PISG working pressure. Hose shall be as supplied by the following:

Crouch Supply Co. Inc.; 305 S. Main Street; Fort Worth, Texas 76104
Attn.: Barbara Dale 1-800-825-1110

An equivalent hose product by alternative manufacturers shall be acceptable.

C. Elbows, flanges and accessories shall be 316 stainless steel construction including plates, bolts, washers, nuts and other components as may be required.

D. Piping identification shall be Seton Snap-Around Pipe Markers or equivalent type of labels. Provide red color band with green legend band. White lettering on the legend band shall read "Fire Water."

2.2 FIRE HOSE CABINETS AND ACCESSORIES

A. Existing fire hose cabinets, hose valves, hoses and nozzles shall be reused.

2.3 FIRE EXTINGUISHERS AND ACCESSORIES

A. Fire extinguishers shall be five pound capacity, 2A:10B:C multi-purpose agent (mono-ammonium phosphate) type units. Cylinders shall be aluminum construction with epoxy powder or baked enamel finish. Valves shall be chrome plated brass. Handles and levers shall be stainless steel. Extinguisher shall be US Coast Guard Approved. Include stainless steel mounting bracket.

B. Fire extinguisher cabinets shall be fiberglass or powder-coated aluminum construction, deck mounted type of a size to accommodate the fire extinguisher specified above. Provide cabinet complete with breakaway glass, stainless steel lockable handle, stainless steel hinges and finish color to match existing fire hose cabinets. Provide signage on both sides of the cabinet indicating in large red letters, "Fire Extinguisher."

2.4 PIPE SUPPORTS

A. Fire extinguishment system supports shall be in accordance with NFPA 14 and shall be as provided by the frame and structure of the floating dock. No pipe hangers are permitted. Securement devices shall be strap anchors or related products by Grinnell, Modern Hanger or B-Line. All anchors and accessories such as mechanical fasteners, washers, etc. shall be 316 Stainless Steel construction.

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FORT MYERS, FLORIDA 33919
PHONE: (239) 936-4003 FAX: (239) 936-0819

Project No.: 5220-02-00	Date: July 24, 2012
eFile Name: 52200200FP002.dwg	
Designed By: PMK	Drawn By: JB
Checked By: PMK	
Engineer: Paul M. Kinnunen, P.E. Florida 48373	

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MARINE and ENVIRONMENTAL CONSULTANTS

7-24-12

Specifications - Fire Protection

Not To Scale

City of Key West

SHEET
FP002

PART 3 – EXECUTION REQUIREMENTS

3.1 EXAMINATION

A. Examine rough–ins for piping, equipment and supports and verify actual locations, sizes and other conditions affecting system performance, maintenance, and operations prior to equipment installation.

B. Identify exact locations of existing services to be reused.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF PIPING

A. Select HDPE pipe with butt fused joints and fittings for all fire water piping except as noted otherwise.

B. Select non–sanitary pressure hose # 2612 for flexible connection between landside pipe and pier side pipe.

C. Install piping at right angles or parallel to seawalls and joists.

D. Install fittings for changes in direction and branch connections.

E. Install piping and hoses in strict accordance with the manufacturer's installation instructions and recommendations.

3.3 INSTALLATION OF PIPE SUPPORTS

A. Install supports, anchors and fasteners for fire extinguishment system in accordance with NFPA 14 and pipe manufacturers written installation instructions. Minimum support requirements shall be as indicated in the following schedule:

Pipe Size	Support Spacing
2–1/2 Inch Diameter and larger	48 Inches Maximum

B. Pipe support spacing shall be as listed above except that horizontal runs of piping shall be supported at least once for each pipe section and at each joint. Provide a minimum of one support for each elbow.

3.4 INSTALLATION OF FIRE HOSE CABINETS AND ACCESSORIES

A. Install fire hose cabinets and accessories at locations indicated on the plans and as directed by the Authority Having Jurisdiction.

B. Mount cabinet securely to decking with mechanical fasteners. Install in strict accordance with the manufacturer's installation instructions and recommendations.

3.5 INSTALLATION OF FIRE EXTINGUISHERS AND CABINETS

A. Install fire extinguishers and cabinets at locations indicated on the plans and as directed by the Authority Having Jurisdiction.

B. Mount cabinet securely to decking with mechanical fasteners. Install in strict accordance with the manufacturer's installation instructions and recommendations.

3.6 INSTALLATION OF IDENTIFICATION SIGNAGE

A. Attach pipe markers on fire extinguishment system piping. Space markers at no greater than 25 feet on center.

3.7 FIRE EXTINGUISHMENT SYSTEM ACCEPTANCE TESTING

A. Flush, test and inspect standpipe systems according to NFPA 14. Provide completed Contractor's Material and Test Certificate, Figure 11.1.3 (a), for standpipe systems to the Engineer and to the Owner.

B. Prepare and install inspection tags for each extinguisher in accordance with NFPA 10. Inspect all extinguishers and replace defective or discharged units discovered at final acceptance inspection.

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Project No.: 5220–02–00	Date: July 24, 2012
eFile Name: 52200200FP003.dwg	
Designed By: PMK	Drawn By: JB
Checked By: PMK	
Engineer: Paul M. Kinnunen, P.E. Florida 48373	

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Tel: 239-334-6870 Fax: 239-334-7810
MARINE and ENVIRONMENTAL CONSULTANTS

7-24-12

Specifications - Fire Protection

Not To Scale

City of Key West

SHEET FP003

DRAWING SYMBOLS

1 / FP101 — PLAN OR DIAGRAM DESIGNATION; DRAWING NUMBER WHERE DRAWN

A / FP5 — SECTION DESIGNATION; DRAWING NUMBER WHERE DRAWN

PLAN NORTH

0' 30' 60' SCALE FEET — GRAPHIC SCALE

FW	FIRE WATER PIPE
PW	POTABLE WATER PIPE
- -	POTABLE WATER PIPE
SS	SANITARY VACUUM PIPE
	SIDE CONNECTION
	RISER UP
	RISE OR DROP IN PIPE
	RISER DROP
	BOTTOM CONNECTION, 45 OR 90 DEG.
	TOP CONNECTION, 45 OR 90 DEG.
	CROSS BOTTOM CONNECTION
	CHECK VALVE
	BALL VALVE
	SEWER HYDRANT
CO.	CLEAN OUT

#	REVISION NUMBER
#	KEYED NOTE TO PLAN
	POINT OF INTERFACE BETWEEN NEW & EXISTING
W	POTABLE WATER AND SANITARY SEWER DOCK BOX
FEC	FIRE EXTINGUISHER CABINET
FHC	FIRE HOSE CABINET
P	ELECTRICAL POWER PEDESTAL
EDP	ELECTRICAL DISTRIBUTION PANEL
YVB	YARD VALVE BOX (CAST IRON)
EX	EXISTING
HB	HOSE BIBB

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Project No.: 5220-02-00 Date: July 24, 2012
eFile Name: 52200200FP004.dwg
Designed By: PMK Drawn By: JB
Checked By: PMK
Engineer: Paul M. Kinnunen, P.E. Florida 48373

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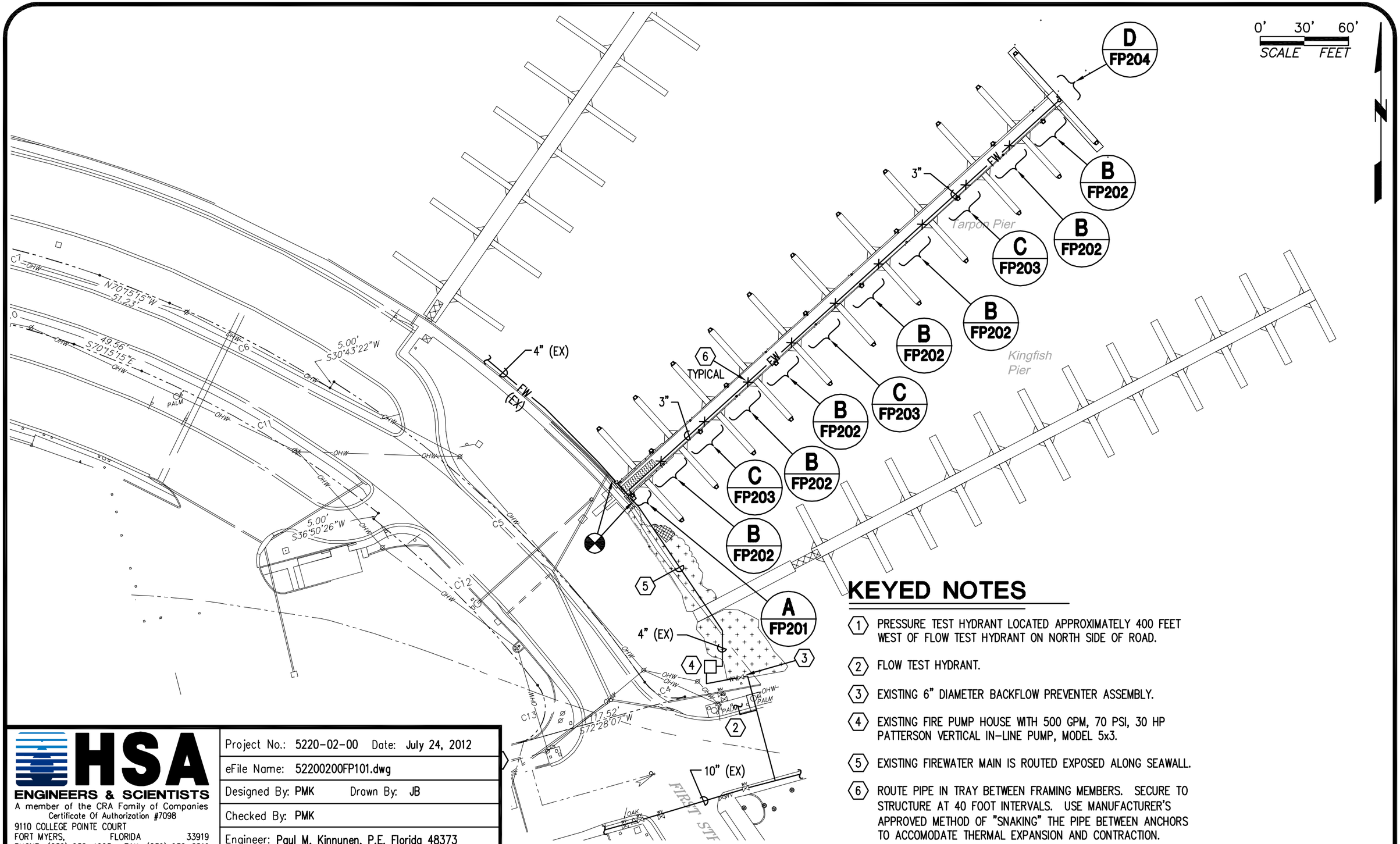
MARINE and ENVIRONMENTAL CONSULTANTS

7-24-12

Symbols Legend - Fire Protection
Not To Scale

City of Key West

SHEET FP004



KEYED NOTES

1. PRESSURE TEST HYDRANT LOCATED APPROXIMATELY 400 FEET WEST OF FLOW TEST HYDRANT ON NORTH SIDE OF ROAD.
2. FLOW TEST HYDRANT.
3. EXISTING 6" DIAMETER BACKFLOW PREVENTER ASSEMBLY.
4. EXISTING FIRE PUMP HOUSE WITH 500 GPM, 70 PSI, 30 HP PATTERSON VERTICAL IN-LINE PUMP, MODEL 5x3.
5. EXISTING FIREWATER MAIN IS ROUTED EXPOSED ALONG SEAWALL.
6. ROUTE PIPE IN TRAY BETWEEN FRAMING MEMBERS. SECURE TO STRUCTURE AT 40 FOOT INTERVALS. USE MANUFACTURER'S APPROVED METHOD OF "SNAKING" THE PIPE BETWEEN ANCHORS TO ACCOMODATE THERMAL EXPANSION AND CONTRACTION.

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Project No.:	5220-02-00 Date: July 24, 2012
eFile Name:	52200200FP101.dwg
Designed By:	PMK Drawn By: JB
Checked By:	PMK
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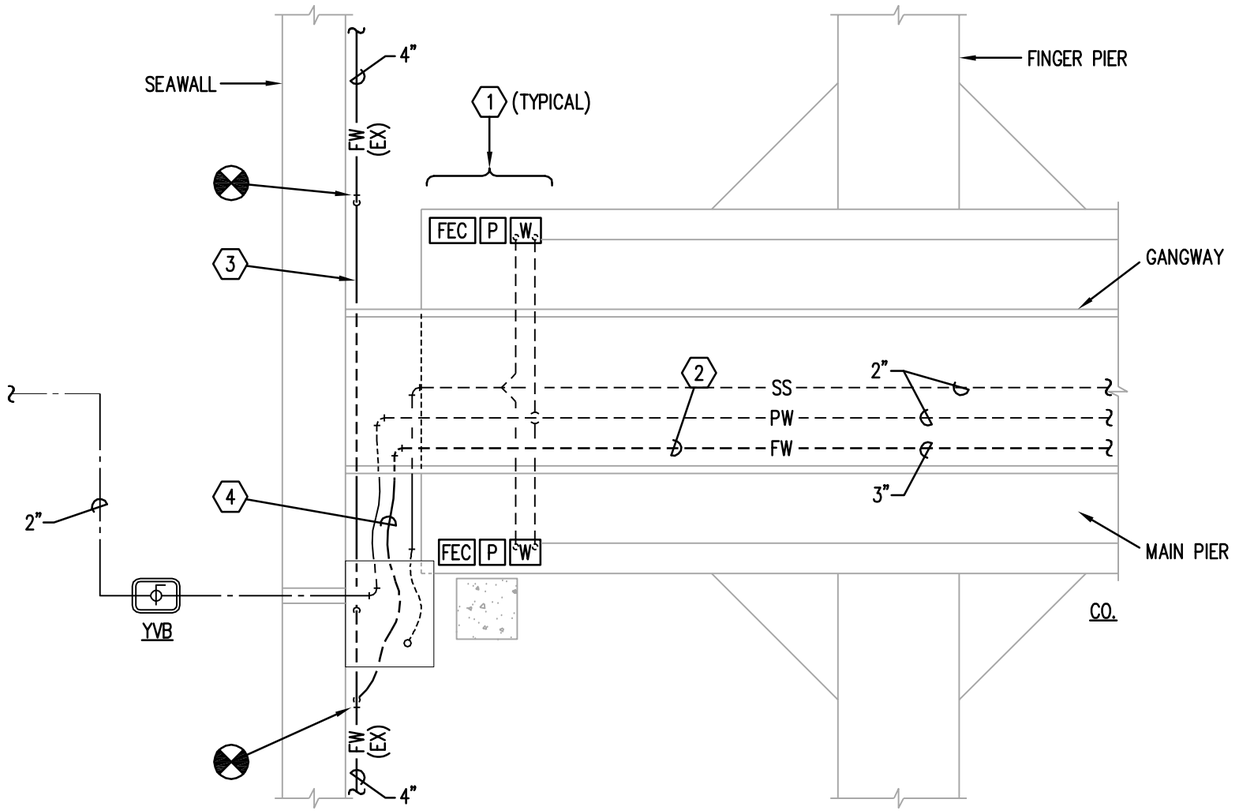
1 FP101 **Partial Site Plan - Fire Protection**

Scale 1" =60'

City of Key West

SHEET FP101



A FP201 **PEDESTAL COORDINATION DIAGRAM**

NOT TO SCALE

KEYED NOTES

1. POSITION UTILITY PEDESTALS AND CABINETS AS CLOSE TO END OF MAIN PIER AS POSSIBLE TO MAXIMIZE CLEAR SPACE FROM EQUIPMENT UP TO FINGER PIER.
2. ROUTE FIRE WATER BELOW DECK IN TRAY BETWEEN LONGITUDINAL FRAMING.
3. EXISTING FIRE WATER SUPPLY MAIN IS ROUTED EXPOSED ALONG SEAWALL. PROVIDE NEW PIPING AS REQUIRED TO OFFSET BELOW PROPOSED SEAWALL PENETRATIONS FOR POTABLE WATER, ELECTRICAL POWER CONDUCTORS AND COMMUNICATIONS CABLING. COORDINATE WITH OTHER TRADES FOR REQUIREMENTS. PROVIDE TRANSITION COUPLINGS TO CONNECT EXISTING CPVC PIPING TO SPECIFIED PIPE.
4. PROVIDE FIRE WATER HOSE TO CONNECT PIPING TO PROPOSED PIER. HOSE TERMINATIONS SHALL BE 316 STAINLESS STEEL ELBOWS. SELECT LENGTH OF HOSE AS REQUIRED TO ACCOMMODATE TIDE DIFFERENTIAL OF 7 FEET.

GENERAL NOTES

A. SS, PW AND ELECTRICAL SYSTEMS SHOWN FOR COORDINATION ONLY. SEE CONSTRUCTION PLANS OF OTHER TRADES FOR ADDITIONAL INFORMATION.

B. COORDINATE FRAMING REQUIREMENTS FOR PIPING SYSTEM WITH FLOATING DOCK SYSTEM SUPPLIER.

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Designed By: PMK	Drawn By: JB
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Diagrams - Fire Protection

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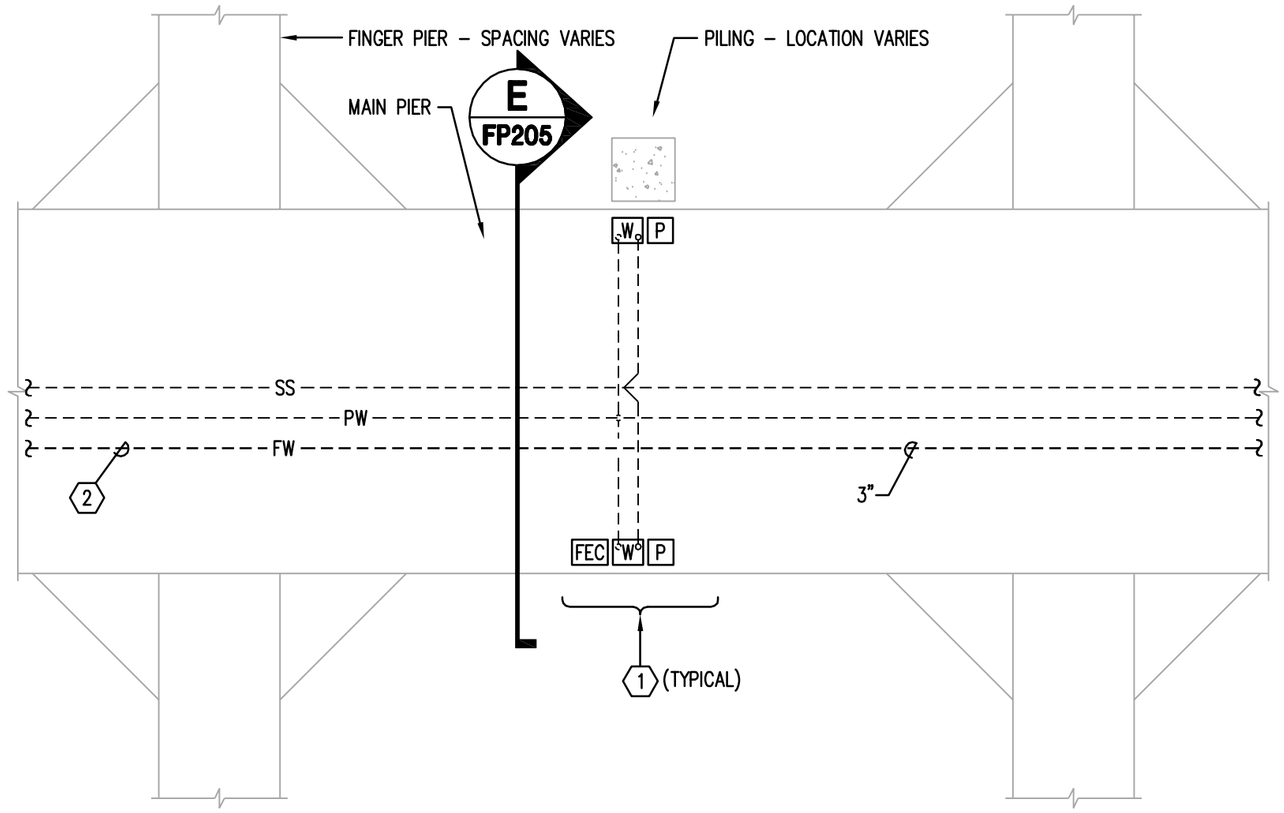
SHEET FP201



KEYED NOTES

1. CENTER THE UTILITY PEDESTALS AND CABINETS BETWEEN FINGER PIERS AND POSITION EQUIPMENT SO AS TO MAXIMIZE CLEAR SPACE FROM EQUIPMENT TO FINGER PIER.
2. ROUTE FIRE WATER BELOW DECK IN TRAY BETWEEN LONGITUDINAL FRAMING.

B / FP202 **PEDESTAL COORDINATION DIAGRAM**

NOT TO SCALE

GENERAL NOTES

A. SS, PW AND ELECTRICAL SYSTEMS SHOWN FOR COORDINATION ONLY. SEE CONSTRUCTION PLANS OF OTHER TRADES FOR ADDITIONAL INFORMATION.

B. COORDINATE FRAMING REQUIREMENTS FOR PIPING SYSTEM WITH FLOATING DOCK SYSTEM SUPPLIER.

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Project No.: 5220-02-00	Date: July 24, 2012
eFile Name: 52200200FP202.dwg	
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Diagrams - Fire Protection

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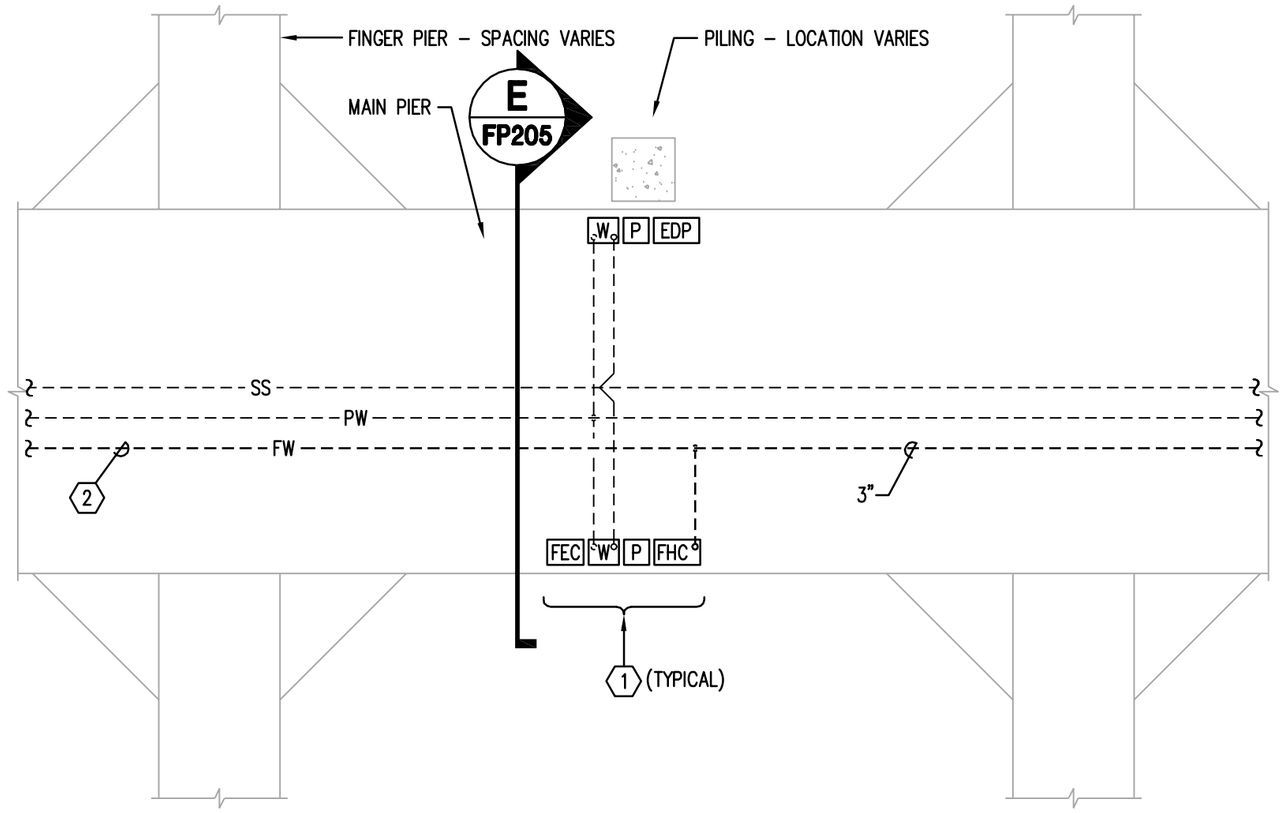
SHEET FP202



KEYED NOTES

1. CENTER THE UTILITY PEDESTALS AND CABINETS BETWEEN FINGER PIERS AND POSITION EQUIPMENT SO AS TO MAXIMIZE CLEAR SPACE FROM EQUIPMENT TO FINGER PIER.
2. ROUTE FIRE WATER BELOW DECK IN TRAY BETWEEN LONGITUDINAL FRAMING.

C
FP203

PEDESTAL COORDINATION DIAGRAM

NOT TO SCALE

GENERAL NOTES

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B. COORDINATE FRAMING REQUIREMENTS FOR PIPING SYSTEM WITH FLOATING DOCK SYSTEM SUPPLIER.

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Project No.: 5220-02-00	Date: July 24, 2012
eFile Name: 52200200FP203.dwg	
Designed By: PMK	Drawn By: JB
Checked By: PMK	
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Diagrams - Fire Protection

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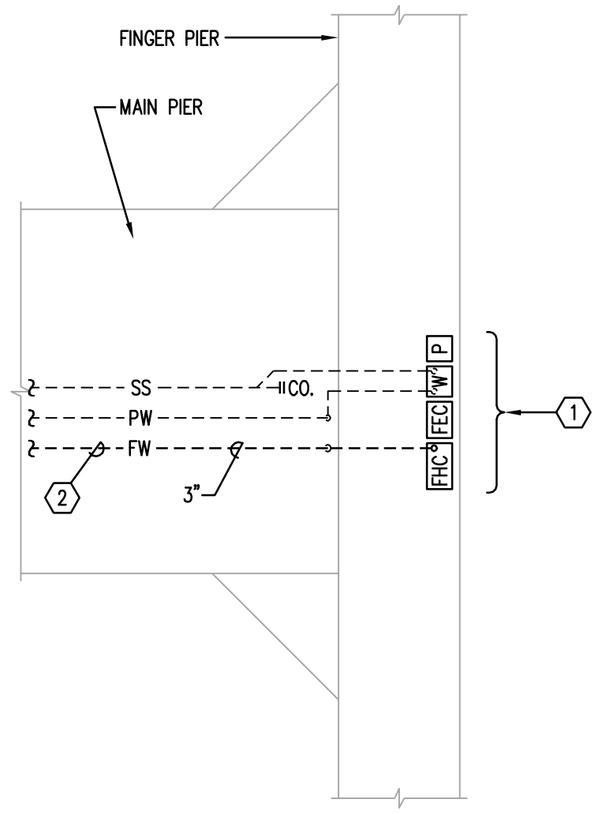
FP203



KEYED NOTES

1. CENTER THE UTILITY PEDESTALS AND CABINETS BETWEEN FINGER PIERS AND POSITION EQUIPMENT SO AS TO MAXIMIZE CLEAR SPACE FROM EQUIPMENT TO FINGER PIER.
2. ROUTE FIRE WATER BELOW DECK IN TRAY BETWEEN LONGITUDINAL FRAMING.

D / FP204 **PEDESTAL COORDINATION DIAGRAM**

NOT TO SCALE

GENERAL NOTES

A. SS, PW AND ELECTRICAL SYSTEMS SHOWN FOR COORDINATION ONLY. SEE CONSTRUCTION PLANS OF OTHER TRADES FOR ADDITIONAL INFORMATION.

B. COORDINATE FRAMING REQUIREMENTS FOR PIPING SYSTEM WITH FLOATING DOCK SYSTEM SUPPLIER.

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Project No.: 5220-02-00	Date: July 24, 2012
eFile Name: 52200200FP204.dwg	
Designed By: PMK	Drawn By: JB
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Engineer: Paul M. Kinnunen, P.E. Florida 48373	

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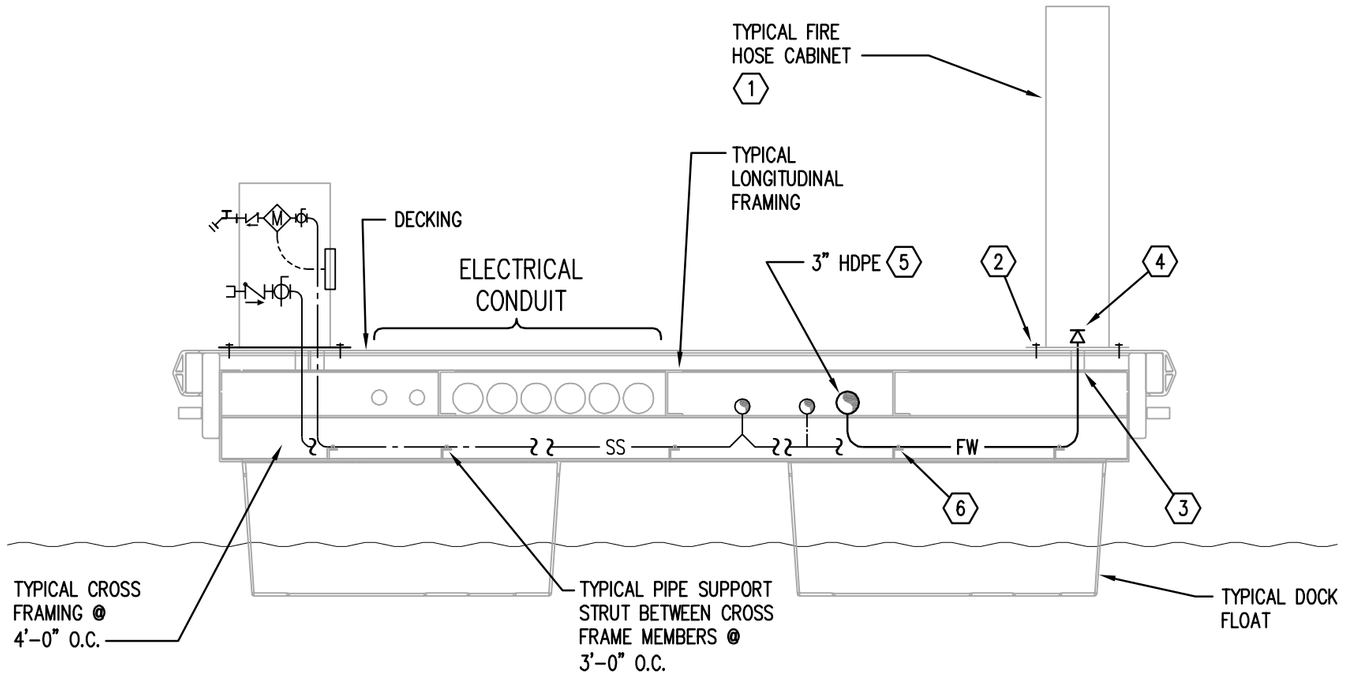
City of Key West

SHEET FP204



KEYED NOTES

1. INSTALL FIRE HOSE CABINET NEAR OUTBOARD EDGE OF PIER SO AS TO OPTIMIZE AVAILABLE SPACE FOR PEDESTRIAN TRAFFIC IN THE CENTER OF THE PIER. ORIENT BOX WITH HOSE ACCESS TO THE INBOARD SIDE. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION AND WORK ITEMS.
2. SECURE CABINET TO DECK WITH MINIMUM OF EIGHT STAINLESS STEEL FASTENERS OR AS RECOMMENDED BY CABINET MANUFACTURER.
3. CORE DRILL DECK FOR FIRE WATER SUPPLY PIPE INSTALLATION. MAKE THE OPENING A MINIMUM OF 1 INCH LARGER THAN OUTSIDE DIAMETER OF PIPE. PROVIDE SHRINK WRAP ON THE PIPE AT THE DECK PENETRATION TO PROTECT AGAINST ABRASION.
4. EXTEND FIRE WATER SUPPLY PIPE UP THRU LEG OF CABINET. DRILL OUT LEG FOR PIPE AS MAY BE REQUIRED. PROVIDE REDUCER AS REQUIRED TO CONNECT TO EXISTING HOSE VALVE.
5. ROUTE HDPE FIRE WATER MAIN IN TRAY BETWEEN PIER FRAMING MEMBERS. PROVIDE HDPE TEE FITTING AT EACH PROPOSED HOSE CABINET LOCATION. SECURE FITTING TO FRAME WITH CLAMP OR EQUIVALENT STRAPPING METHOD.
6. SECURE PIPE TO STRUCTURE WITH CLAMP OR EQUIVALENT STRAPPING METHOD.

E / FP205 SECTION THRU MAIN PIER

NOT TO SCALE

GENERAL NOTES

A. SS, PW AND ELECTRICAL SYSTEMS SHOWN FOR COORDINATION ONLY. SEE CONSTRUCTION PLANS OF OTHER TRADES FOR ADDITIONAL INFORMATION.

B. COORDINATE FRAMING REQUIREMENTS FOR PIPING SYSTEM WITH FLOATING DOCK SYSTEM SUPPLIER.

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Project No.: 5220-02-00	Date: July 24, 2012
eFile Name: 52200200FP205.dwg	
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Diagrams - Fire Protection

Not To Scale

City of Key West

SHEET FP205

FIRE EXTINGUISHMENT SYSTEM CALCULATIONS

PIPE SECTION	SIZE INCHES DIAMETER	FLOW GPM	FRICTION RATE PSI/100'	PIPE LENGTH FEET	PIPE FITTING TYPE	PIPE FITTING QUANTITY	FITTING EQUIVALENT LENGTH FEET	FITTING LENGTH FEET	TOTAL LENGTH FEET	SECTION PRESSURE DROP PSI	TOTAL PRESSURE DROP PSI
Minimum Required Pressure @ Hose Outlet	1-1/2	100								65.00	65.00
100 Feet of Hose	1-1/2	100		100						24.00	89.00
Angle Hose Valve	2-1/2	100			Valve					1.00	90.00
Static Lift - 10 Feet										4.33	94.33
HDPE Pipe Main	3	100	1.54	400	90 Ell	2	7.9	15.8			
					St Tee	3	6.2	18.6	434.4	6.69	101.02
Flexible Connector Pier to Landside - 10 Feet	3	100								1.00	102.02
CPVC Pipe Branch	3	100	0.78	10	90 Ell	2	7.9	15.8	25.8	0.20	102.22
CPVC Pipe Main	4	100	0.23	140	Branch Tee	1	22	22			
					90 Ell	3	12	36	198	0.46	102.68
Steel Pipe Main (Pump Discharge)	4	100	0.62	15	Bf Valve					0.10	102.78
					90 Ell	1	4.2	4.2			
					St Tee	1	2.8	2.8			
					Ck Valve	1	38	38	60	0.37	103.05
Pump Discharge Pressure Regulating Valve	4	100			Globe Valve					1.00	104.05
Steel Pipe Main (Pump Suction)	6	100	0.1	50	Bf Valve					0.10	104.15
					90 Ell	7	5.7	39.9			
					Branch Tee	1	3.8	3.8			
					6x4 Reducer	1	14	14	107.7	0.11	104.26
Backflow Prevention Assembly	4	100			RPDA 909					13.00	117.26
Total Pressure Required @ 100 GPM											117.26
Total Pressure Available @ 100 GPM	Utility Line Pressure (51 PSI per Feb 16, 2012 Flow Test) + Pump Differential Pressure (84 PSI per Patterson Pump Curve) = 135 PSI										
Safety Factor	(135 PSI - 117.26 PSI) = 17 PSI or 15%										

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Project No.: 5220-02-00 Date: July 24, 2012
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Designed By: PMK Drawn By: JB
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Engineer: Paul M. Kinnunen, P.E. Florida 48373

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Schedules - Fire Protection
Not To Scale

City of Key West

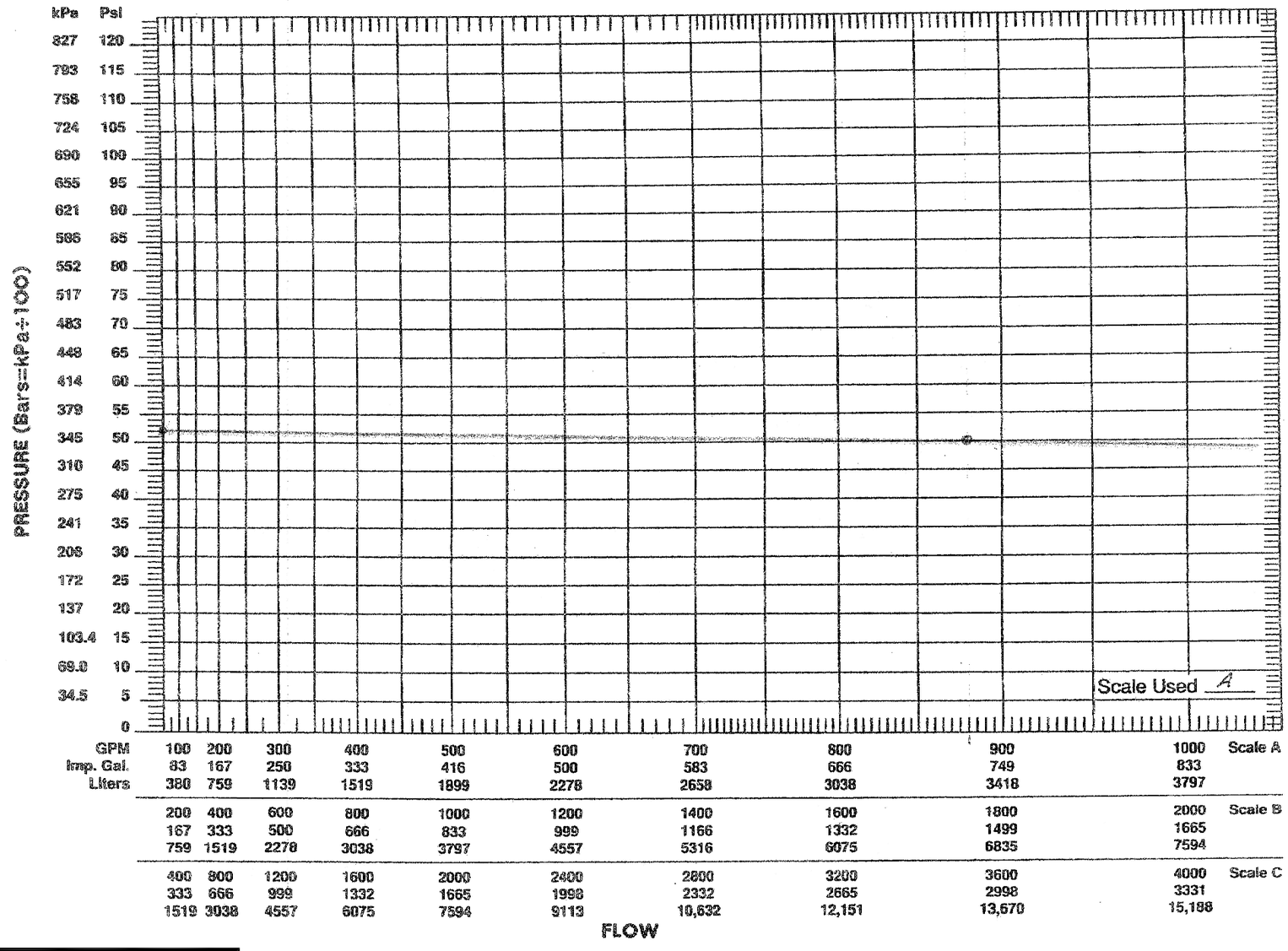
SHEET FP301

Fire Protection Publications
Oklahoma State University
Stillwater, OK 74078

Universal Water Flow Test Summary Sheet

Conducted by Hatalovsky/Judge Scott-Daniel Location North Roosevelt (US1) at Palm Avenue Date 2/16/12

Hydrant coefficient _____ Elevation _____ Static 52 psi Residual 50 psi @ Flow 880



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Project No.: 5220-02-00	Date: July 24, 2012
eFile Name: 52200200FP302.dwg	
Designed By: PMK	Drawn By: JB
Checked By: PMK	
Engineer: Paul M. Kinnunen, P.E. Florida 48373	

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Schedules - Fire Protection

Not To Scale

City of Key West

SHEET FP302

PLUMBING SYSTEMS SPECIFICATIONS

PART 1 - GENERAL REQUIREMENTS

1.1 SYSTEM DESCRIPTION

A. Tarpon Pier plumbing systems shall consist of potable water distribution and sanitary vacuum extended from existing landside utilities and shall include potable water and sanitary sewer dock boxes.

1.2 SUMMARY OF WORK

A. Demolition work of this contract generally includes but is not limited to demolishing the existing potable water distribution and sanitary vacuum systems up to the pier and landside interface to the extent indicated on the plans. Landside piping, pump, etc. shall be reused in place. Existing vacuum pump control system shall remain in use without modification.

B. New construction work shall include but is not limited to providing complete new potable water distribution systems and sanitary vacuum systems as described in these specifications and drawings for the proposed pier.

C. Bids shall include as a minimum all labor, tools, materials, plant, transportation, taxes, related items, etc., essential for demolishing existing work and furnishing, installing, operating and testing of the proposed new work.

1.3 EXAMINATION OF DOCUMENTS

A. The intent of the drawings and specifications is to establish type and quality of materials and a general layout and location of components that comprise the plumbing systems. They are not intended to show in minute detail every or all accessories intended for the purposes of executing the work, but it is understood that such details are part of the project scope.

B. Where conflicts exist between drawings and specifications the most stringent requirements shall apply.

1.4 CODES AND STANDARDS

A. Furnish and install plumbing systems to meet all current requirements of national, state and municipal codes, rules, regulations, laws, and standards as they are adopted by the governing agency and as they may apply.

Florida Building Code, Building 2010 Edition
Florida Building Code, Plumbing 2010 Edition
Underwriters Laboratories

1.5 PERMITS AND INSPECTIONS

A. Secure and pay for all permits and licenses before actual work is started and observe all requirements stipulated thereon.

B. Coordinate with and give all necessary notices to the Authority Having Jurisdiction for inspection and testing of the plumbing systems required to be witnessed by their agent.

1.6 SHOP DRAWING SUBMITTALS AND PRE-INSTALLATION COORDINATION

A. Prior to ordering materials submit shop drawings including manufacturer's catalog cuts, brochures and performance data of pipe and fitting materials, hoses, valves, supports, pipe markers, dock boxes, and other appurtenances as may be required. Unless specified elsewhere, provide a minimum of six copies for review by Engineer and Owner.

B. Coordinate with all trades in submittal of shop drawings and for space requirements. If work is installed prior to coordination with other trades which interferes with related work, make all necessary changes to correct the condition at no additional cost to the Owner.

C. Coordinate with floating dock supplier for pipe support spacing requirements integral with structural framing.

1.7 PRODUCTS AND WORKMANSHIP

A. All equipment and materials shall be new and unused as manufactured by companies regularly engaged in the fabrication of the type specified except as otherwise noted herein. Use products of a single manufacturer for similar type equipment. Modified or re-built equipment or materials are not acceptable.

B. Provide plumbing components and system installation capable of sustaining the following minimum working pressure ratings:

Water Distribution Systems: 125 PSIG.
Sanitary Systems: 29 Inches of Hg Vacuum.

C. Install plumbing systems in a neat and workmanlike manner utilizing personnel licensed and skilled in the trades.

1.8 WARRANTY

A. Provide an unconditional warranty from failure and/or defects on all products and workmanship provided for this project for a minimum of one (1) year from date of substantial completion.

1.9 DELIVERY AND STORAGE

A. Handle, store and protect equipment and materials in accordance with the manufacturer's recommendations. Replace damaged or defective items with new items.

1.10 DEMOLITION, CUTTING AND PATCHING

A. Protect all existing active services against damage including water, electric, sewer, etc. in areas of proposed construction. If active services are encountered that require relocation, make request to Owner for determination of procedures.

B. Remove and dispose of properly off-site, all abandoned plumbing piping, valves, pipe supports, equipment, etc. rendered obsolete by work of this project.

C. Provide all necessary cutting and patching required in connection with plumbing work. Coordinate with and obtain written approval from the Marine Contractor for all proposed cutting and patching prior to commencement of work. Sawcut existing pavement or concrete and excavate as required for installation of underground piping. Backfill and compact soil and provide finished surfaces to match adjacent materials and construction.

1.11 CLEANING

A. Clear away all debris, surplus materials, etc., resulting from plumbing system installation work and operations. Leave the job and equipment provided under contract in a clean and first-class condition.

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Project No.: 5220-02-00	Date: July 24, 2012
eFile Name: 52200200P001.dwg	
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Checked By: PMK	
Engineer: Paul M. Kinnunen, P.E. Florida 48373	

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Specifications - Plumbing
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P001

1.12 TEST AND DEMONSTRATIONS

A. Perform tests of the plumbing systems as specified herein. Repeat as required until proven acceptable to the Engineer, Owner and Authority Having Jurisdiction. Provide all gauges, tools, pumps, gas, air or other required equipment or materials.

1.13 RECORD DOCUMENTS

A. Maintain at the job site one set of prints on which are recorded all field changes and other portions of the plumbing system work that vary from the contract documents. Indicate actual pipe system routing and installed accessories and devices.

B. Provide as–built record drawings to the Owner at the completion of the project.

PART 2 – PRODUCT REQUIREMENTS

2.1 PIPING, FITTINGS, AND JOINING MATERIAL

A. High Density Polyethylene (HDPE) pipe shall be ASTM D 3350, SDR 11, Cell Classification of PE 3454344C with butt–fused joints. All fittings shall be of compatible HDPE material and shall be butt–fused. Provide pipe and fittings as manufactured by IPF, Driscopipe or equivalent.

B. Poly (Vinyl Chloride) (PVC) Plastic Pipe: ASTM D 2665, Schedule 40, plain ends, socket type fittings and ASTM D 2564 solvent cement.

C. Poly (Vinyl Chloride) (PVC) Plastic, Pressure Pipe: ASTM D 1785, SDR 21, plain ends, ASTM D 2467 socket type fittings. Solvent cement shall be ASTM D 2564 with ASTM F 656 primer. Plastic pipe–flanges and gaskets shall be of type and material recommended by the piping system manufacturer. Bolts, washers and nuts shall be Type 316 Stainless Steel.

2.2 HOSES

A. Sanitary hose shall be # 2710 as supplied by the following:

Crouch Supply Co. Inc.; 305 S. Main Street; Fort Worth, Texas 76104
Attn.: Barbara Dale 1–800–825–1110

An equivalent hose product by alternative manufacturers shall be acceptable.

B. Elbows, flanges and accessories shall be 316 Stainless Steel construction including plates, bolts, washers, nuts and other components as may be required.

2.3 PLUMBING VALVES AND ACCESSORIES

A. Manual ball valves shall be CPVC body with Stainless Steel ball, TFE seats and seals, threaded union or flanged ends, lever handle, conventional port, 400 psig w.o.g. pressure at maximum working temperature of 150 degrees F.

B. Potable water check valves shall be marine grade, bronze body dual check type, complying with ASSE 1024, and complete with two compact replaceable check modules.

C. Hose bibbs shall be marine grade, bronze body with integral vacuum breaker, complying with ASSE 1011, and plastic handle.

D. Sanitary vacuum hydrant shall be similar to and compatible with existing assemblies at the marina. Inlet connection shall mate with existing slip to houseboat hoses. Assembly shall include camlock and closer cap, marine grade bronze lift check valve and manual ball valve.

2.4 POTABLE WATER AND SANITARY SEWER DOCK BOX

A. Dock box shall be designed and constructed specifically for marine applications. Cabinet shall be as a minimum Type 5052, 090 gauge, marine grade aluminum construction with welded joints and powder coated gloss white finish inside and outside. Cabinet size shall be designed to accommodate two water supply assemblies and two sanitary vacuum assemblies except where serving a single slip as indicated on the plans. Product shall be similar to existing dock boxes on the adjacent Kingfish Pier and shall be as manufactured by Marina Power Company, Miami, Florida or equivalent owner approved product.

B. Cabinets shall be complete with a tapered aluminum top and shall include Type 316 Stainless Steel hinges and latch. The two side faces of the cabinet shall each have aluminum hose hangers. Aluminum components shall be constructed and finished as described above. Cabinet shall have flanges or mounting plates as suitable for mechanically fastening the unit to the surface of the deck.

C. Potable water supply assemblies located inside the cabinet shall include RF transmitter and water meter, ¾" brass check valve, ¾" manual ball valve and interconnecting piping. The RF transmitter and water meter shall be furnished by the Key West Utility Department and installed within the cabinet by the plumbing contractor. The RF transmitters shall be mounted on the inboard (deck side) face of the cabinet. Dock box manufacturer shall coordinate with the Utility for space and mounting requirements. Each assembly shall be connected to an externally mounted brass hose bibb with vacuum breaker mounted on the outboard (slip side) face of the cabinet. A 1" water supply pipe shall feed through the bottom of the cabinet. Within the cabinet the 1" line shall tee off to supply two ¾" lines and extend to the water meters.

D. Sanitary sewer vacuum assemblies located inside the cabinet shall include 1–1/2" brass check valve, 1–1/2" manual ball valve and interconnecting piping. Each assembly shall be connected to an externally mounted 1–1/2" vacuum sewer 90 degree camlock and closer cap located on the outboard (slip side) face of the cabinet below the potable water hose bibbs. A 1–1/2" sanitary vacuum pipe shall feed through the bottom of the cabinet. Within the cabinet the pipe shall branch off with a Y or lateral fitting to connect to the two 1–1/2" vacuum inlets.

2.5 PIPE SUPPORTS

A. Plumbing system supports shall be as provided by the frame and structure of the floating dock. No pipe hangers are permitted. Securement devices shall be strap anchors or related products by Grinnell, Modern Hanger or B–Line. All anchors and accessories such as mechanical fasteners, washers, etc. shall be 316 Stainless Steel construction.

2.6 PIPE IDENTIFICATION

A. Piping identification shall be Seton Snap–Around Pipe Markers or equivalent type of labels. For potable water piping provide blue color band with green legend band. White lettering on the legend band shall read "Potable Water." For sanitary vacuum piping provide yellow color band with black legend band. White lettering on the legend band shall read "Sanitary Sewer."

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine rough–ins for piping, equipment and supports and verify actual locations, sizes and other conditions affecting system performance, maintenance, and operations prior to equipment installation.

B. Identify exact locations of existing services to be reused.

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Specifications - Plumbing

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3.2 EXCAVATION, BACKFILL, COMPACTION AND SURFACE FINISHING

A. Excavate pipe trench to depth of existing piping and as required to provide 12" clearance from pipe on sides and 6" on the bottom. Shape trench bottom for uniform bearing and support of pipe.

B. Place and compact bedding course on trench bottom to provide continuous support for joints, fittings and pipe barrels.

C. Place and compact fill material in layers using satisfactory soil material in not more than 4" in loose depth. Place fill material evenly on all sides of structures and uniformly along the full length of each structure. Compact each layer at 85 percent.

D. Finish the top surface of the trench with materials to match adjacent construction and as approved by the Owner.

3.3 INSTALLATION OF PIPING

A. Use pipe, fittings and joining methods for piping systems according to the following applications:

Water Distribution Mains Larger than 1 Inch diameter shall be HDPE
Water Distribution Landside to Pier side Flexible Connections shall be Sanitary Hose # 2710.
Water Distribution Branches Less than or equal to 1 Inch diameter shall be PVC SDR 21

Sanitary Vacuum Mains shall be HDPE
Sanitary Vacuum Landside to Pier side Flexible Connections shall be Sanitary Hose # 2710.
Sanitary Vacuum Branch Lines to Hydrants shall be PVC Schedule 40

B. Install piping at right angles or parallel to seawalls and framing members.

C. Install fittings for changes in direction and branch connections. Use long sweep fittings for sanitary vacuum piping.

D. Install piping and hoses in strict accordance with the manufacturer's installation instructions and recommendations

3.4 INSTALLATION OF PIPE SUPPORTS

A. Install supports, anchors and fasteners for plumbing systems in accordance with the Florida Plumbing Code and pipe manufacturers written installation instructions. See plans for additional requirements. Minimum support requirements shall be as indicated in the following schedule:

Pipe Size	Support Spacing
2 Inch Diameter and smaller	36 Inches Maximum
2-1/2 Inch Diameter and larger	48 Inches Maximum

B. Pipe support spacing shall be as listed above except that horizontal runs of piping shall be supported at least once for each pipe section and at each joint. Provide minimum of one support for each elbow.

3.5 INSTALLATION OF DOCK BOXES AND ACCESSORIES

A. Install dock boxes at locations indicated on the plans and as directed by the Engineer and the Owner.

B. Mount equipment securely to framing and/or decking with mechanical fasteners. Install in strict accordance with the manufacturer's installation instructions and recommendations.

C. Install potable water RF meters that are furnished by the water utility company. Coordinate space requirements.

3.6 INSTALLATION OF IDENTIFICATION LABELS

A. Attach pipe markers on plumbing system piping mains. Space markers at no greater than 25 feet on center.

3.7 TESTING OF POTABLE WATER DISTRIBUTION SYSTEMS

A. Test for leaks and defects in new water distribution piping systems. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of system tested.

B. Cap and subject the piping system to a static water pressure of 125 PSIG or 50 PSIG above the operating pressure without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.

C. Repair leaks and defects with new materials and retest system or portion thereof until satisfactory results are obtained.

D. Prepare reports for tests and required corrective action.

3.8 TESTING OF SANITARY PIPING SYSTEMS

A. Test for leaks and defects in sanitary piping systems. If testing is performed in segments, submit a separate report for each test, complete with a diagram of the portion of the system tested.

B. Cap and subject the piping system to a static vacuum pressure of 12 inches of Hg. Isolate test source and allow to stand for 4 hours. Leaks and loss of test pressure to more than 7 inches of Hg. constitute defects that must be repaired.

C. Repair leaks and defects using new materials and retest system or portion thereof until satisfactory results are obtained.

D. Prepare reports for tests and required corrective action.

3.9 CLEANING

A. Purge new potable water distribution piping systems prior to use.

B. Use purging and disinfecting procedure prescribed by authority having jurisdiction or, if a method is not prescribed by that authority, the procedure described in either AWWA C651 or AWWA C652 or as described below:

Flush piping system with clean, potable water until dirty water does not appear at outlets. Fill system or part thereof with water/chlorine solution containing at least 50 parts per million of chlorine. Isolate (valve off) and allow to stand for 24 hours. Provide proper signage to prevent accidental use during disinfection. Drain system or part thereof of previous solution and refill with water/chlorine solution containing at least 200 parts per million of chlorine. Isolate and allow to stand for 3 hours. Flush system with clean, potable water until chlorine does not remain in water coming from system following allowed standing time.

C. Submit water samples in sterile bottles to authority having jurisdiction. Repeat procedure if biological examination made by the authority shows evidence of contamination.

D. Prepare and submit reports for purging and disinfecting activities.

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Specifications - Plumbing

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SHEET P003

DRAWING SYMBOLS

1 / FP101 — PLAN OR DIAGRAM DESIGNATION; DRAWING NUMBER WHERE DRAWN

A / FP5 — SECTION DESIGNATION; DRAWING NUMBER WHERE DRAWN

FW — FIRE WATER PIPE

PW — POTABLE WATER PIPE

POTABLE WATER PIPE

SS — SANITARY VACUUM PIPE

SIDE CONNECTION

RISER UP

RISE OR DROP IN PIPE

RISER DROP

BOTTOM CONNECTION, 45 OR 90 DEG.

TOP CONNECTION, 45 OR 90 DEG.

CROSS BOTTOM CONNECTION

CHECK VALVE

BALL VALVE

SEWER HYDRANT

CO. — CLEAN OUT

N — PLAN NORTH

0' 30' 60' SCALE FEET — GRAPHIC SCALE

— REVISION NUMBER

— KEYED NOTE TO PLAN

POINT OF INTERFACE BETWEEN NEW & EXISTING

W (1) (2) — POTABLE WATER AND SANITARY SEWER DOCK BOX
(1) ONE HB & SS INLET
(2) TWO HB'S & SS INLETS

FEC — FIRE EXTINGUISHER CABINET

FHC — FIRE HOSE CABINET

P — ELECTRICAL POWER PEDESTAL

EDP — ELECTRICAL DISTRIBUTION PANEL

YVB — YARD VALVE BOX (CAST IRON)

EX — EXISTING

HB — HOSE BIBB

PP — PRESSURE PIPE

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Symbols Legend - Plumbing

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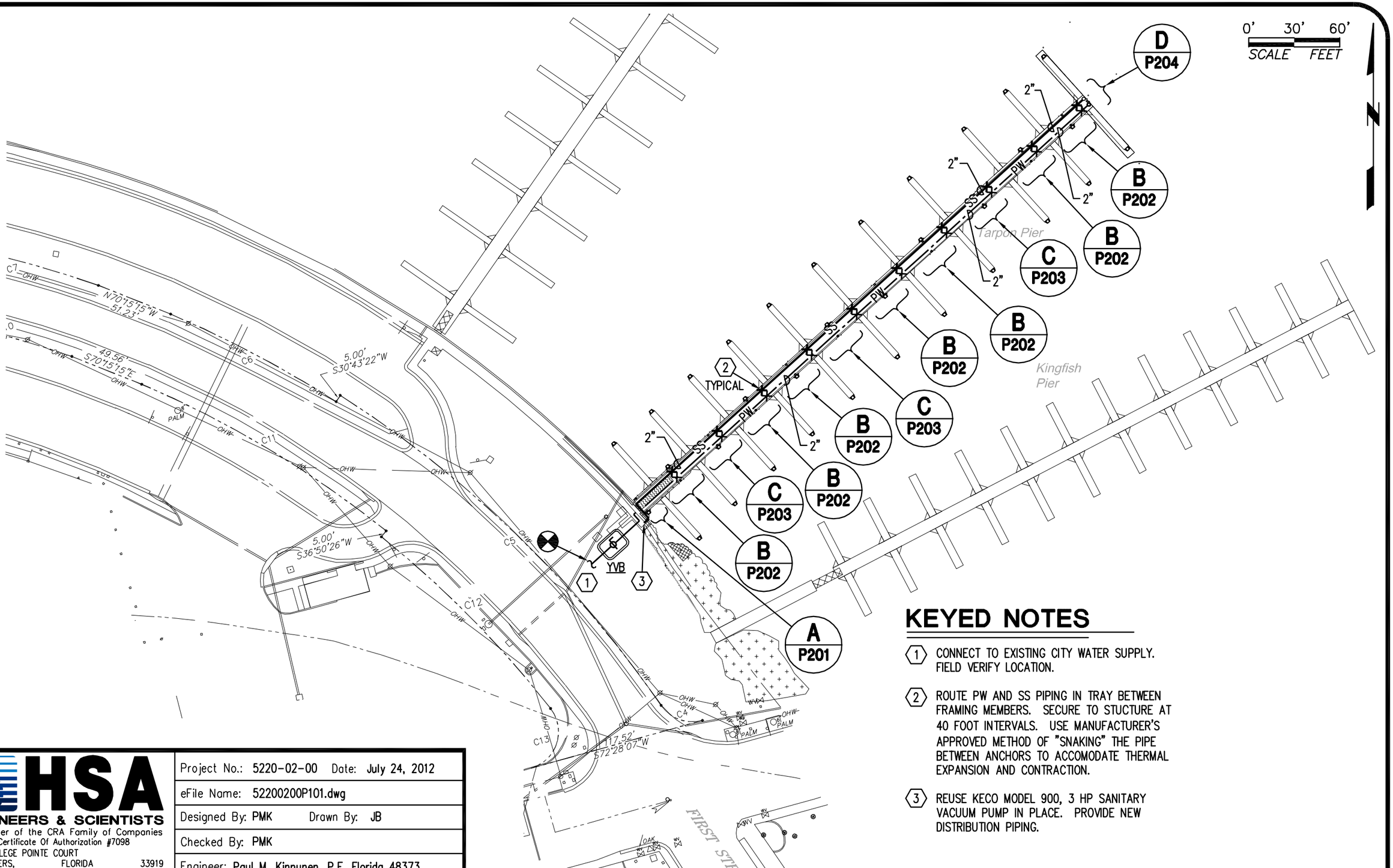

KEYED NOTES

1. CONNECT TO EXISTING CITY WATER SUPPLY. FIELD VERIFY LOCATION.
2. ROUTE PW AND SS PIPING IN TRAY BETWEEN FRAMING MEMBERS. SECURE TO STUCTURE AT 40 FOOT INTERVALS. USE MANUFACTURER'S APPROVED METHOD OF "SNAKING" THE PIPE BETWEEN ANCHORS TO ACCOMODATE THERMAL EXPANSION AND CONTRACTION.
3. REUSE KECO MODEL 900, 3 HP SANITARY VACUUM PUMP IN PLACE. PROVIDE NEW DISTRIBUTION PIPING.

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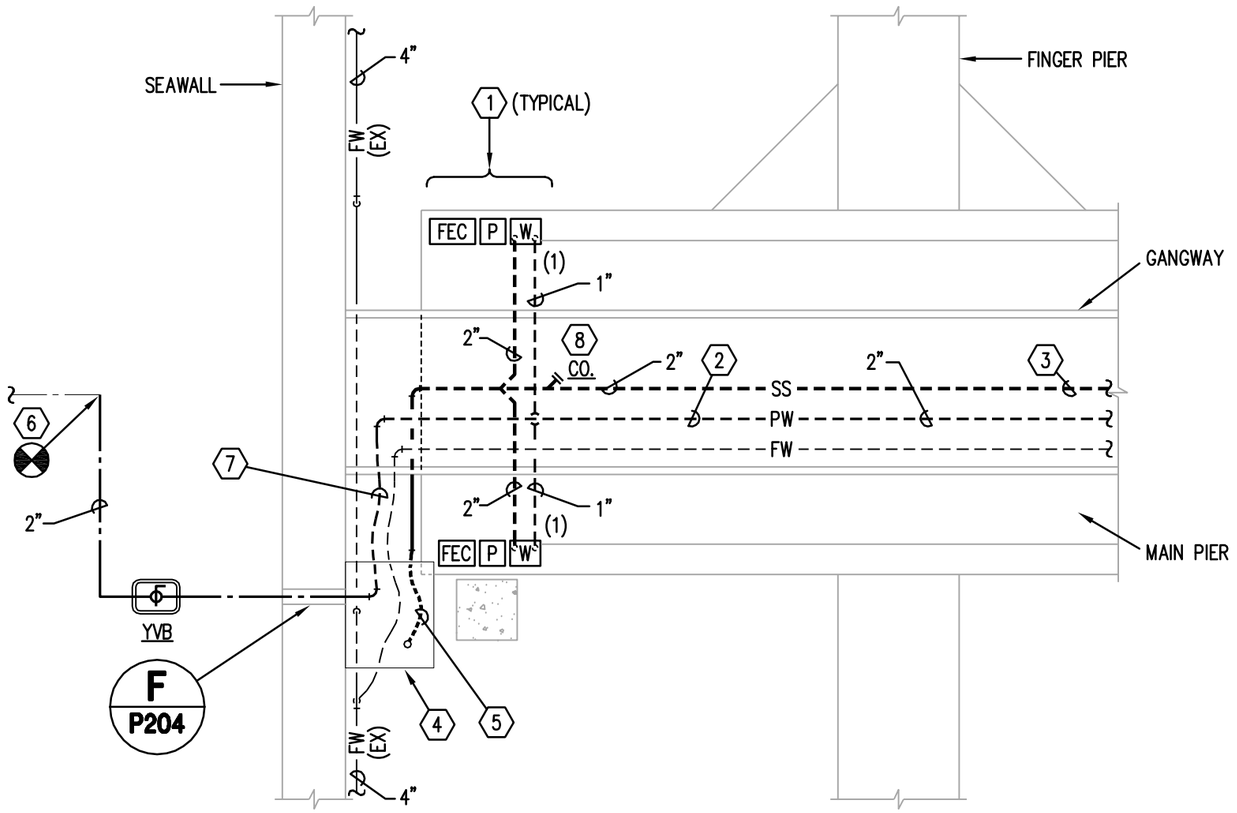
1 / P101 — ***Partial Site Plan - Plumbing***

Scale 1" =60'

City of Key West

SHEET P101



KEYED NOTES

1. POSITION UTILITY PEDESTALS AND CABINETS AS CLOSE TO END OF MAIN PIER AS POSSIBLE TO MAXIMIZE CLEAR SPACE BETWEEN EQUIPMENT AND FINGER PIER.
2. ROUTE POTABLE WATER PIPE MAIN BELOW DECK IN TRAY BETWEEN LONGITUDINAL FRAMING. SEE E/P205.
3. ROUTE SANITARY VACUUM PIPE MAIN BELOW DECK IN TRAY BETWEEN LONGITUDINAL FRAMING. SEE E/P205.
4. REUSE SANITARY VACUUM EQUIPMENT IN PLACE. CONNECT PROPOSED VACUUM HOSE TO EXISTING PUMP INLET. REMOVE AND REPLACE PUMP DISCHARGE PIPING AS REQUIRED TO CLEAR PROPOSED CONSTRUCTION. MATCH EXISTING MATERIALS.
5. PROVIDE SANITARY VACUUM HOSE TO CONNECT PROPOSED PIPING TO VACUUM PUMP. SELECT LENGTH OF HOSE AS REQUIRED TO ACCOMMODATE TIDE DIFFERENTIAL OF 7 FEET.
6. INTERCEPT AND EXTEND EXISTING POTABLE WATER SUPPLY TO PROPOSED PIER. PROVIDE NEW MAIN VALVE IN VALVE BOX. TOP OF BOX TO BE FLUSH WITH ADJACENT SURFACE. FIELD VERIFY EXACT LOCATION OF EXISTING WATER SUPPLY. PROVIDE TRANSITION COUPLING TO CONNECT EXISTING PIPE TO SPECIFIED PIPE.
7. PROVIDE POTABLE WATER HOSE TO CONNECT PIPING TO PROPOSED PIER. HOSE TERMINATIONS SHALL BE 316 STAINLESS STEEL ELBOWS. SELECT LENGTH OF HOSE AS REQUIRED TO ACCOMMODATE TIDE DIFFERENTIAL OF 7 FEET.
8. PROVIDE CLEANOUTS IN SANITARY VACUUM PIPING AT MAXIMUM 50 FEET ON CENTER.

A/P201 PEDESTAL COORDINATION DIAGRAM

NOT TO SCALE

GENERAL NOTES

A. FW AND ELECTRICAL SYSTEMS SHOWN FOR COORDINATION ONLY. SEE CONSTRUCTION PLANS OF OTHER TRADES FOR ADDITIONAL INFORMATION.

B. COORDINATE FRAMING REQUIREMENTS FOR PIPING SYSTEMS WITH FLOATING DOCK SYSTEMS SUPPLIER.

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Diagrams - Plumbing

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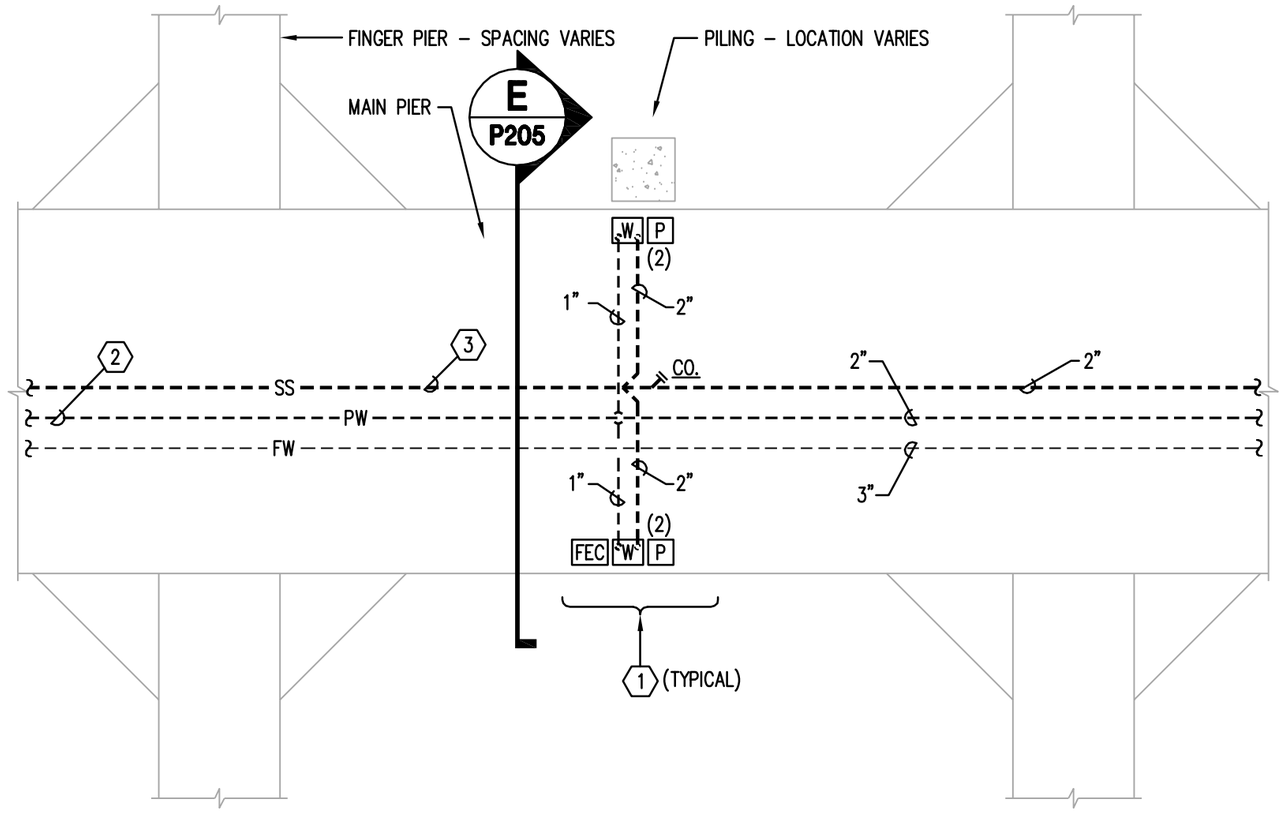
SHEET P201



KEYED NOTES

1. CENTER THE UTILITY PEDESTALS AND CABINETS BETWEEN FINGER PIERS AND POSITION EQUIPMENT SO AS TO MAXIMIZE CLEAR SPACE FROM EQUIPMENT TO FINGER PIER.
2. ROUTE POTABLE WATER IN TRAY BELOW DECK BETWEEN LONGITUDINAL FRAMING.
3. ROUTE SANITARY VACUUM PIPE MAIN BELOW DECK IN TRAY BETWEEN LONGITUDINAL FRAMING.

B / P202 PEDESTAL COORDINATION DIAGRAM

NOT TO SCALE

GENERAL NOTES

A. FW AND ELECTRICAL SYSTEMS SHOWN FOR COORDINATION ONLY. SEE CONSTRUCTION PLANS OF OTHER TRADES FOR ADDITIONAL INFORMATION.

B. COORDINATE FRAMING REQUIREMENTS FOR PIPING SYSTEMS WITH FLOATING DOCK SYSTEMS SUPPLIER.

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Diagrams - Plumbing

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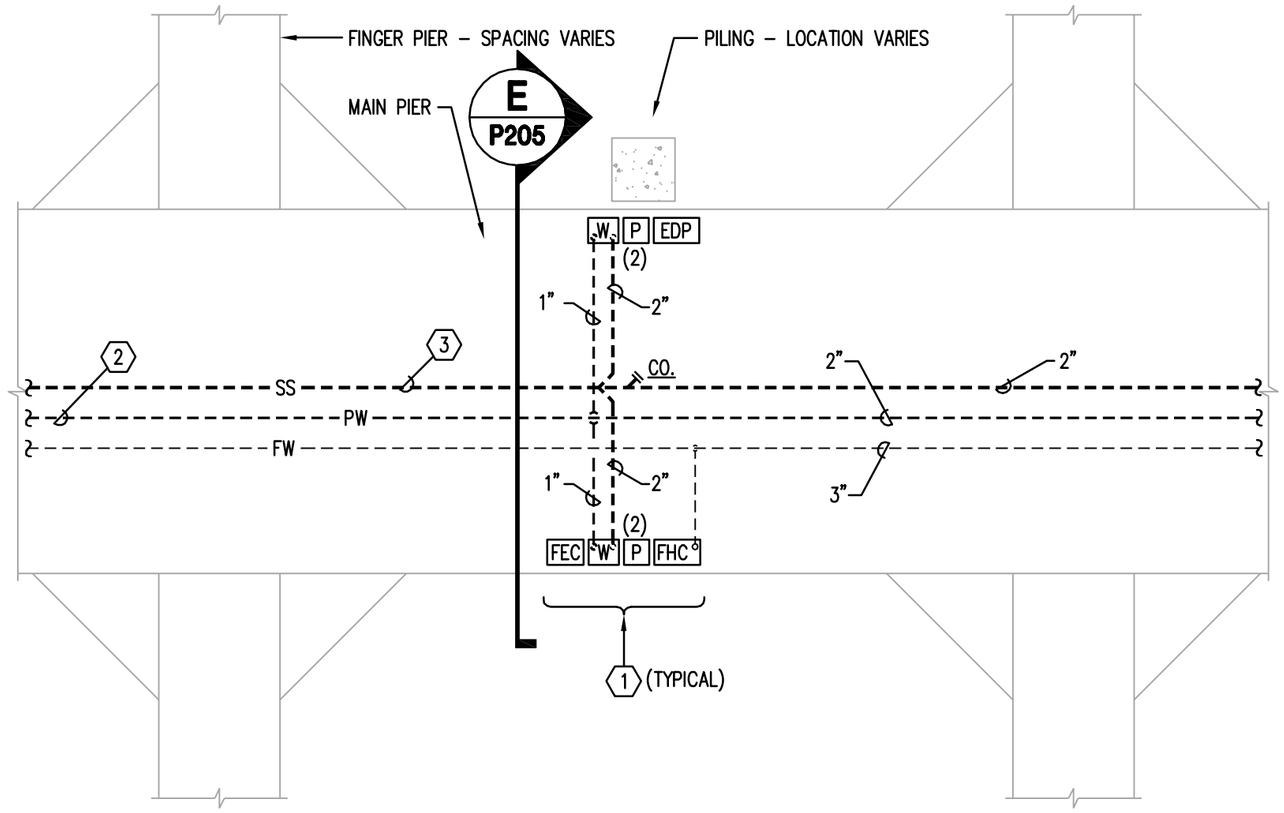

KEYED NOTES

1. CENTER THE UTILITY PEDESTALS AND CABINETS BETWEEN FINGER PIERS AND POSITION EQUIPMENT SO AS TO MAXIMIZE CLEAR SPACE FROM EQUIPMENT TO FINGER PIER.
2. ROUTE POTABLE WATER IN TRAY BELOW DECK BETWEEN LONGITUDINAL FRAMING.
3. ROUTE SANITARY VACUUM PIPE MAIN BELOW DECK IN TRAY BETWEEN LONGITUDINAL FRAMING.

C P203 PEDESTAL COORDINATION DIAGRAM

NOT TO SCALE

GENERAL NOTES

A. FW AND ELECTRICAL SYSTEMS SHOWN FOR COORDINATION ONLY. SEE CONSTRUCTION PLANS OF OTHER TRADES FOR ADDITIONAL INFORMATION.

B. COORDINATE FRAMING REQUIREMENTS FOR PIPING SYSTEMS WITH FLOATING DOCK SYSTEMS SUPPLIER.

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Diagrams - Plumbing

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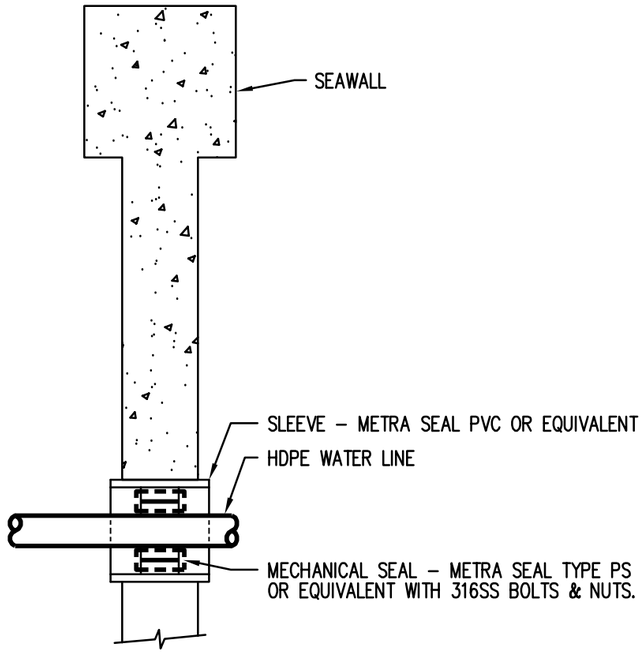
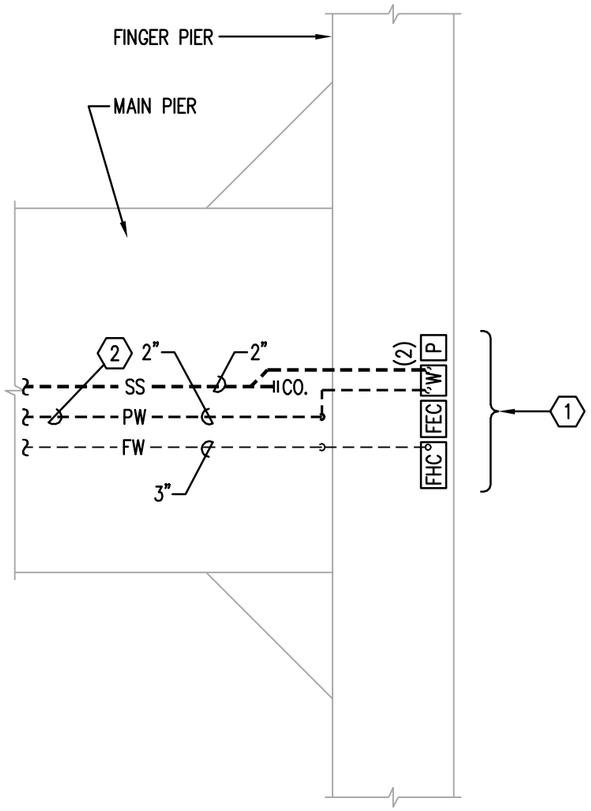


F / P204 WALL PENETRATION DIAGRAM

NOT TO SCALE



D / P204 PEDESTAL COORDINATION DIAGRAM

NOT TO SCALE

KEYED NOTES

1. CENTER THE UTILITY PEDESTALS AND CABINETS BETWEEN FINGER PIERS AND POSITION EQUIPMENT SO AS TO MAXIMIZE CLEAR SPACE FROM EQUIPMENT TO FINGER PIER.
2. ROUTE POTABLE WATER IN TRAY BELOW DECK BETWEEN LONGITUDINAL FRAMING.
3. ROUTE SANITARY VACUUM PIPE MAIN IN TRAY BELOW DECK BETWEEN LONGITUDINAL FRAMING.

GENERAL NOTES

A. FW AND ELECTRICAL SYSTEMS SHOWN FOR COORDINATION ONLY. SEE CONSTRUCTION PLANS OF OTHER TRADES FOR ADDITIONAL INFORMATION.

B. COORDINATE FRAMING REQUIREMENTS FOR PIPING SYSTEMS WITH FLOATING DOCK SYSTEMS SUPPLIER.

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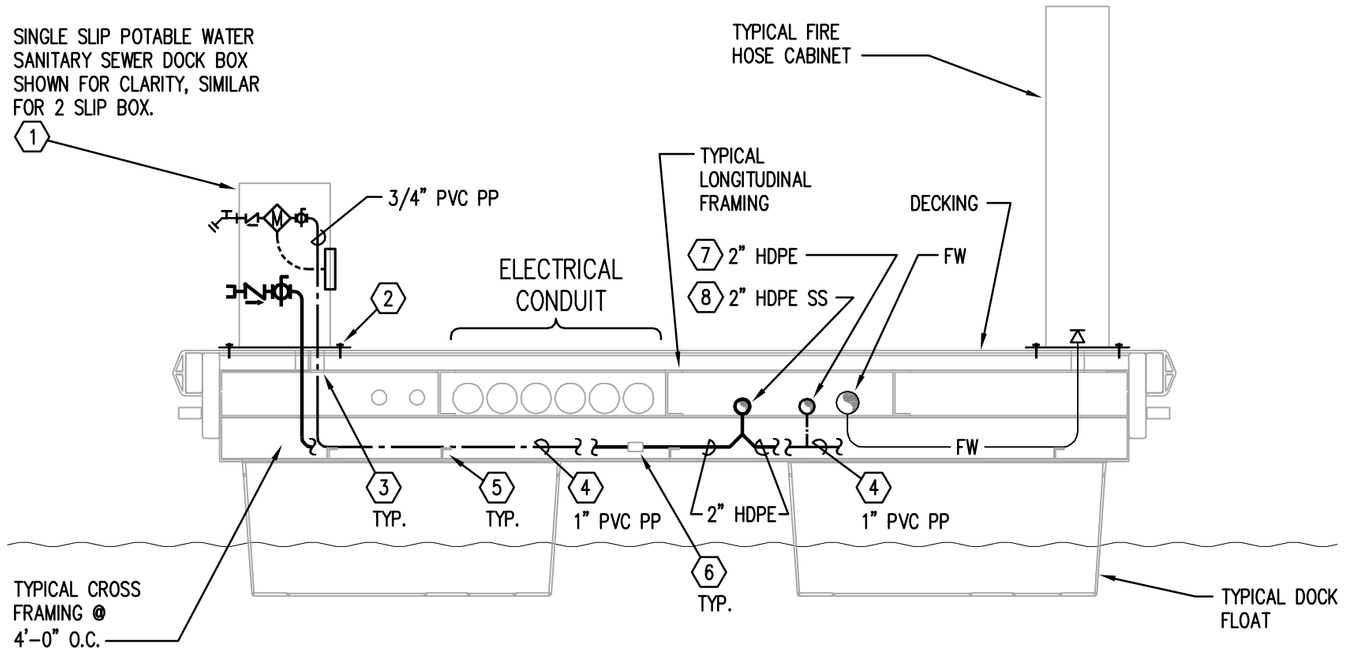

E P205 **SECTION THRU MAIN PIER**

NOT TO SCALE

KEYED NOTES

1. INSTALL POTABLE WATER & SANITARY SEWER DOCK BOX NEAR EDGE OF PIER SO AS TO OPTIMIZE AVAILABLE SPACE FOR PEDESTRIAN TRAFFIC IN THE CENTER OF THE PIER. ORIENT BOX WITH HOSE BIBBS TO THE OUTBOARD SIDE AND RF METER READER DEVICES TO THE INBOARD SIDE. SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION AND WORK ITEMS.
2. SECURE CABINET TO DECK WITH MINIMUM OF FOUR STAINLESS STEEL FASTENERS OR AS RECOMMENDED BY CABINET MANUFACTURER.
3. CORE DRILL DECK FOR PIPE INSTALLATION. MAKE THE OPENING A MINIMUM OF 1 INCH LARGER THAN OUTSIDE DIAMETER OF PIPE. PROVIDE SHRINK WRAP ON THE PIPE AT THE DECK PENETRATION TO PROTECT AGAINST ABRASION.
4. EXTEND PVC PRESSURE PIPE FOR POTABLE WATER SUPPLY TO DOCK BOX AND TIE INTO SINGLE POINT CONNECTION FOR PW SUPPLY.
5. SECURE PIPE TO SUPPORT FRAME WITH CLAMPS OR EQUIVALENT STRAPPING METHOD.
6. PROVIDE FERNCO OR EQUIVALENT RUBBER BOOT CONNECTOR WITH 316 STAINLESS STEEL HARDWARE TO CONNECT HDPE BRANCH TEE TO PVC-DWV SANITARY HYDRANT BRANCH PIPE.
7. ROUTE HDPE POTABLE WATER SUPPLY MAIN IN TRAY BETWEEN PIER FRAMING MEMBERS. PROVIDE HDPE TEE FITTING AT EACH PAIR OF PROPOSED POTABLE WATER DOCK BOXES. TRANSITION TO PVC PRESSURE PIPE AFTER BRANCH TEE.
8. ROUTE HDPE SANITARY VACUUM PIPE MAIN IN TRAY BETWEEN PIER FRAMING MEMBERS. PROVIDE HDPE TEE FITTING AT EACH PAIR OF PROPOSED DOCK BOXES. USE LOW SWEEP FITTINGS.

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Diagrams - Plumbing

Not To Scale

City of Key West

SHEET P205

ELECTRICAL LEGEND

- [FEC] FIRE EXTINGHISHER CABINET, SEE FIRE PROTECTION PLANS
- [FHC] FIRE HOSE CABINET, SEE FIRE PROTECTION PLANS
- [GFMS] GROUND FAULT MONITORING SYSTEM W/ AUDIBLE AND VISIBLE ALARM.
- [PP] EXISTING POWER PEDESTAL POWER PEDESTALS ARE EXISTING TO BE REUSED. PEDESTALS WILL BE STORED BY OWNER. CONTRACTOR SHALL INSTALL AND MAKE ALL CONNECTIONS.
- [W] WATER BOX, SEE PLUMBING PLANS
- 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 / E101 — DETAIL NUMBER / DRAWING NUMBER WHERE DRAWN

SECTION 16410

SPECIAL REQUIREMENTS

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

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.

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Project No.: 5220-02-00	Date: July 24, 2012
eFile Name: 52200200E001.dwg	
Designed By: RMR	Drawn By: RMR
Checked By: CDH	
Engineer: Chad D. Huff, P.E. Florida 55440	

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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.

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2.02 EXPANSION FITTINGS

A. CONDUIT EXPANSION FITTINGS SHALL BE SCHEDULE 40 PVC SHALL 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. TYPE TYPE "W" OR 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

- GENERAL

ESCRIPTION

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 CONDUCTO 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.

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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 #EI173157.

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.

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7-24-12

Specifications - Electrical

Not To Scale

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.

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 3R

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

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Checked By: CDH	
Engineer: Chad D. Huff, P.E. Florida 55440	

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Specifications - Electrical

Not To Scale

City of Key West

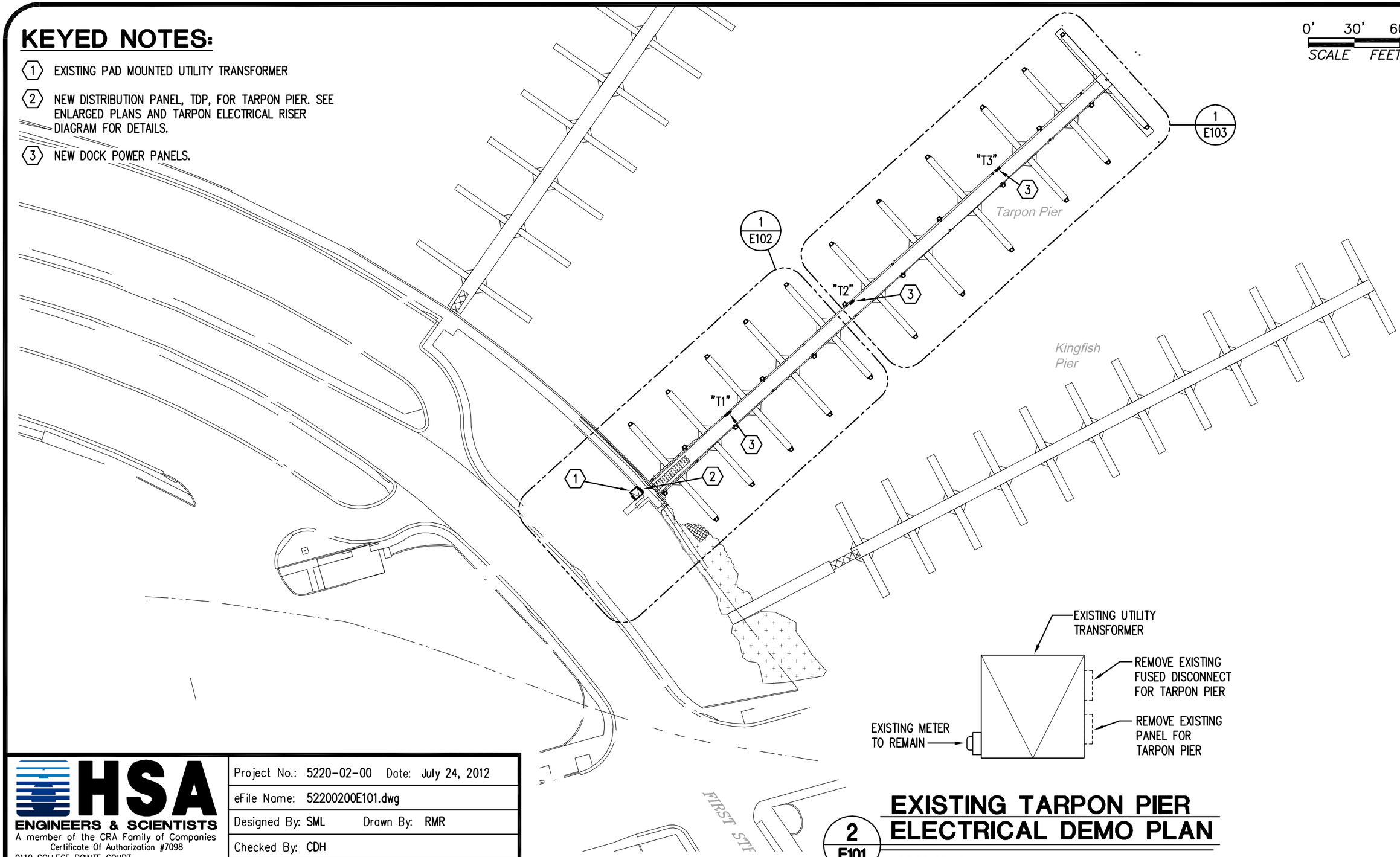
SHEET
E005

KEYED NOTES:

1. EXISTING PAD MOUNTED UTILITY TRANSFORMER
2. NEW DISTRIBUTION PANEL, TDP, FOR TARPON PIER. SEE ENLARGED PLANS AND TARPON ELECTRICAL RISER DIAGRAM FOR DETAILS.
3. NEW DOCK POWER PANELS.

0' 30' 60'
SCALE FEET

N



2 E101 EXISTING TARPON PIER ELECTRICAL DEMO PLAN

NOT TO SCALE

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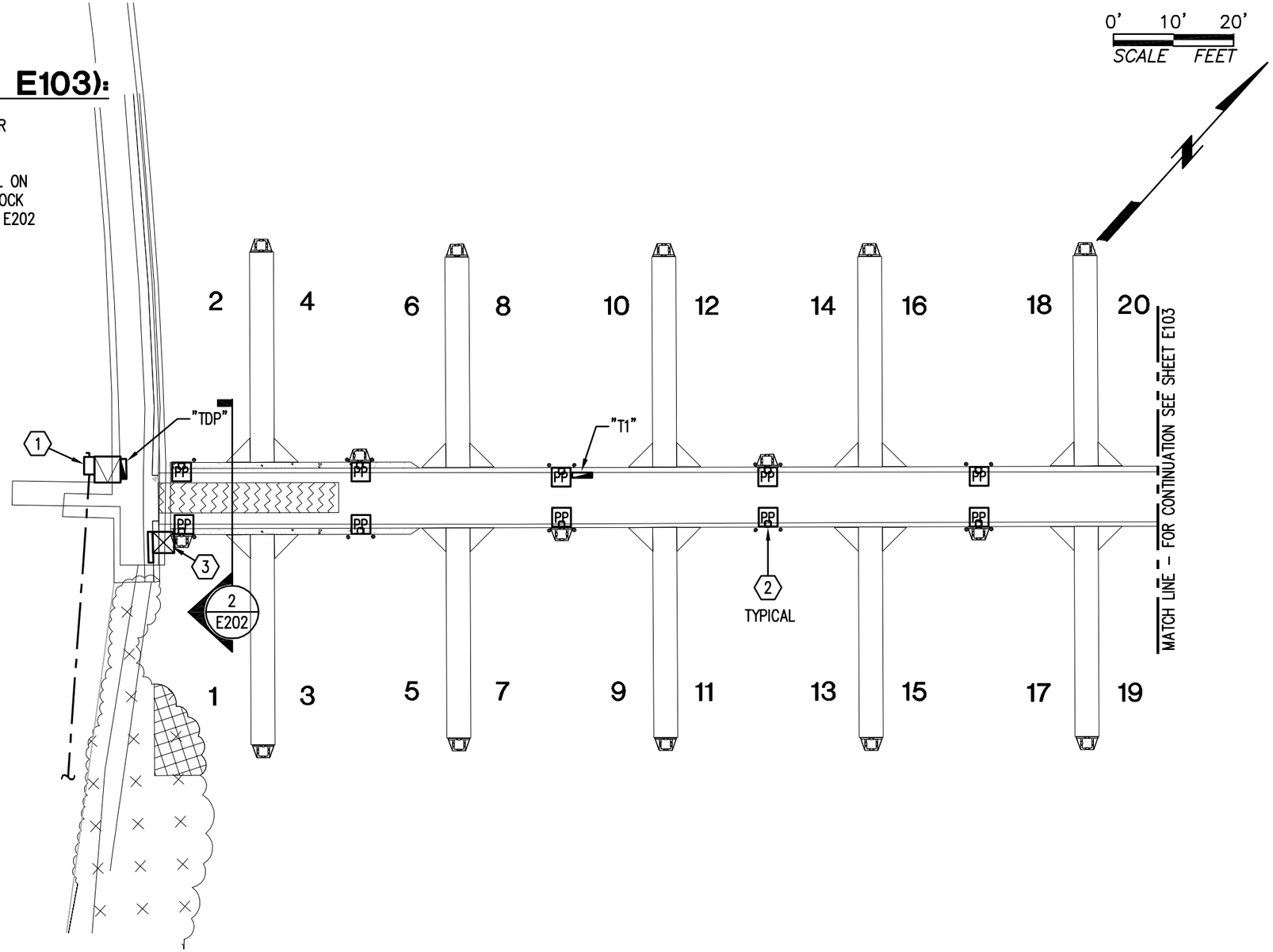
1 E101 **Overall Site Plan - Electrical**
Scale 1" =60'

City of Key West

SHEET E101

KEYED NOTES (SHEETS E102 & E103):

1. NEW ENCLOSED CIRCUIT BREAKER FOR KINGFISH PIER. SEE KINGFISH RISER DIAGRAM.
2. EXISTING POWER PEDESTAL TO REMAIN. REMOVE, STORE, AND RE-INSTALL ON NEW FLOATING DOCK. ADD NEW PHOTOCELL FOR CONTROL OF EXISTING DOCK LIGHT. PHOTOCELL SHALL FACE NORTH. SEE PEDESTAL DETAIL ON SHEET E202 FOR DETAILS.
3. EXISTING KECO PUMP. RECONNECT TO NEW PANEL. CIRCUIT T1-17,19.



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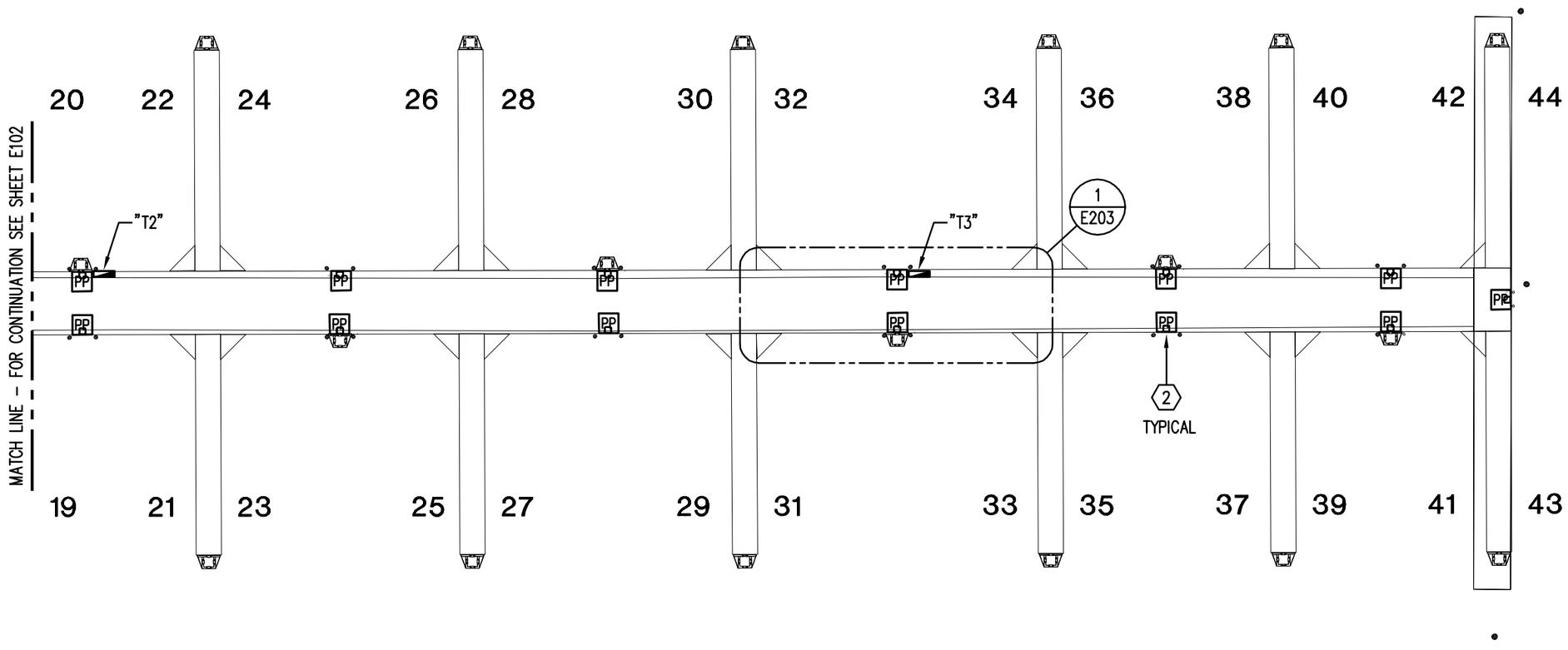
1 / E102 **Tarpon Pier** Scale 1" =20'
Partial Site Plan - Electrical

City of Key West

SHEET E102

0' 10' 20'
SCALE FEET



* SEE SHEET E102 FOR KEYED NOTES.

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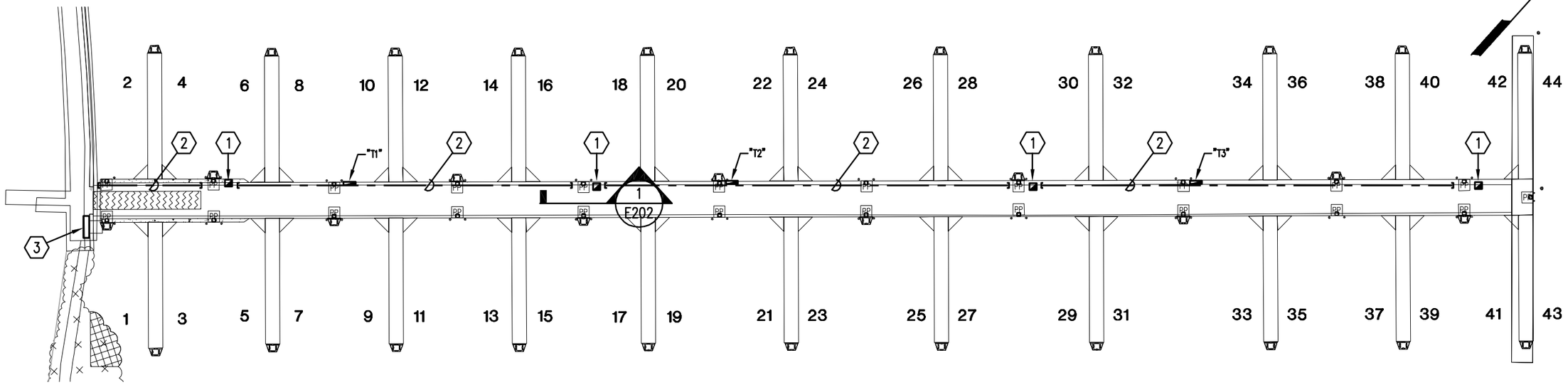
1/E103 **Tarpon Pier** Scale 1" =20'
Partial Site Plan - Electrical

City of Key West

SHEET E103

0' 15' 30'
SCALE FEET



KEYED NOTES:

1. CATV SERVICE PEDESTAL, COORDINATE PLACEMENT WITH CATV PROVIDER.
2. (2) 2" CONDUITS FOR CATV AND TELEPHONE WIRING. SEE DETAIL 1 ON SHEET E202 FOR DETAILS.
3. NEW CATV AND TELEPHONE ENCLOSURE TO CONCEAL EXISTING CATV AND TELEPHONE EQUIPMENT. ENCLOSURE SHALL BE CONSTRUCTED OF MARINE GRADE ALUMINUM WITH POWDER COATED WHITE FINISH. ENCLOSURE SHALL BE APPROXIMATELY 80"W. X 12"D. X 36"H., WITH OPEN BOTTOM AND BACK. EXISTING TELEPHONE EQUIPMENT TO REMAIN.

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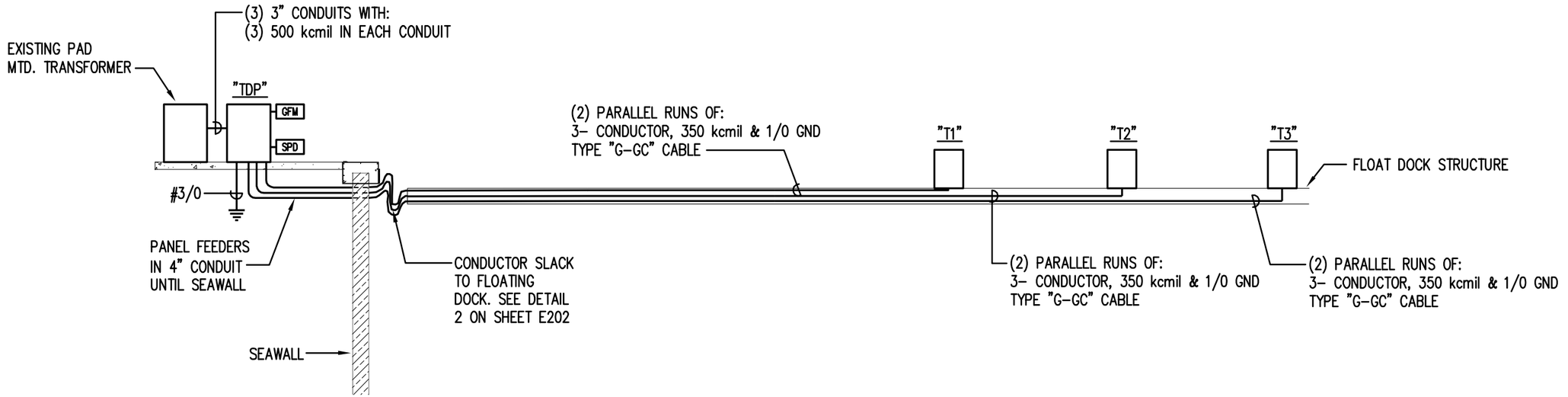
1 / E104 **Tarpon Pier** Scale 1" = 30'
Partial Site Plan - CATV & Tel.

City of Key West

SHEET E104



TARPON PIER ELECTRICAL RISER DIAGRAM

NOT TO SCALE

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Diagrams - Electrical

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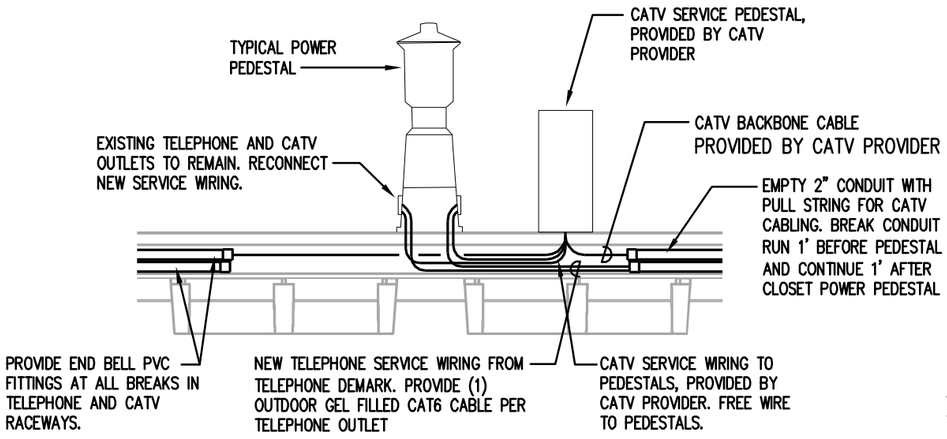
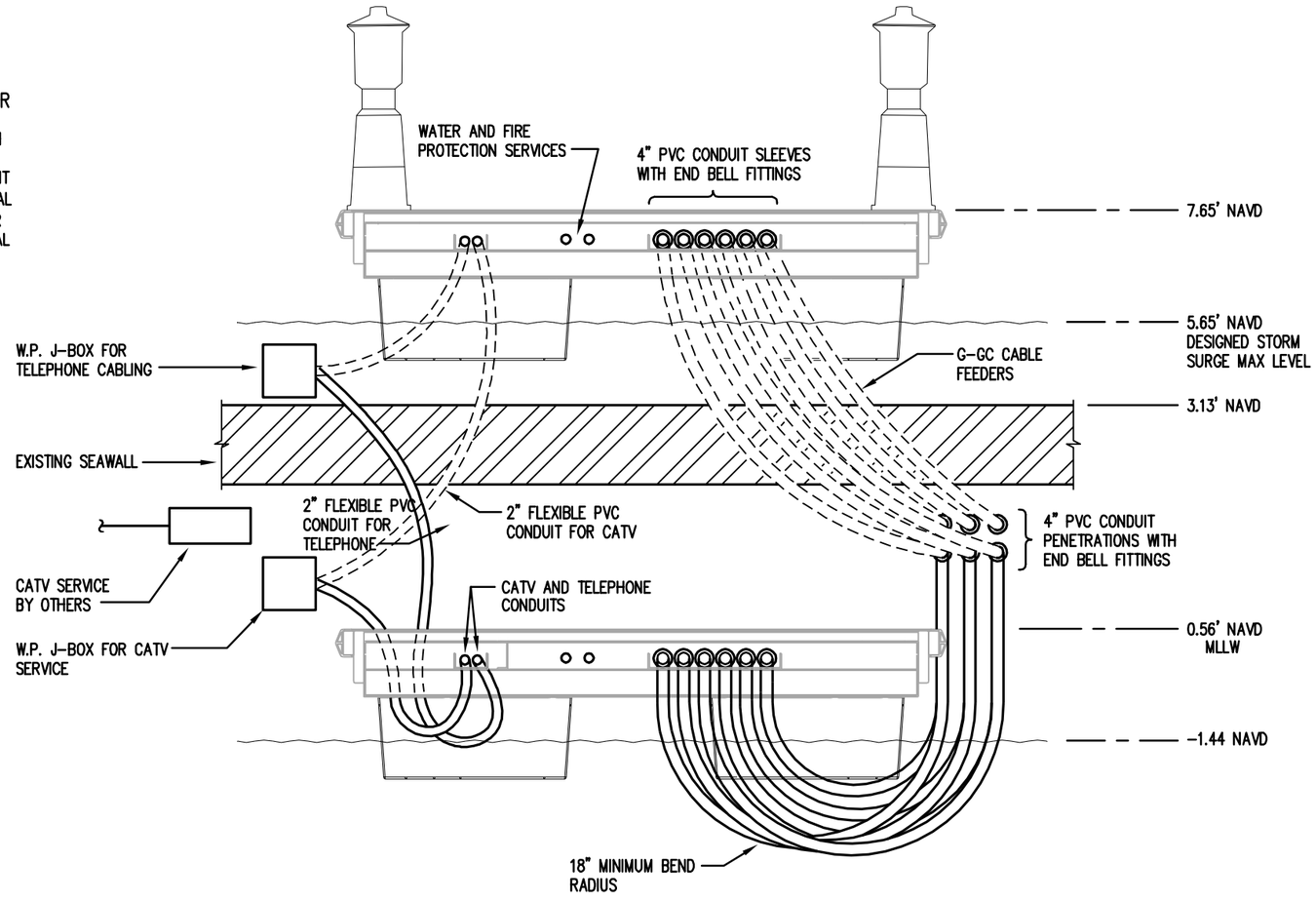
City of Key West

SHEET
E201



1 / E202 **CATV & TELEPHONE SERVICE DETAIL**

NOT TO SCALE



2 / E202 **FLEXIBLE ELECTRICAL SERVICE CONNECTION DETAIL**

NOT TO SCALE

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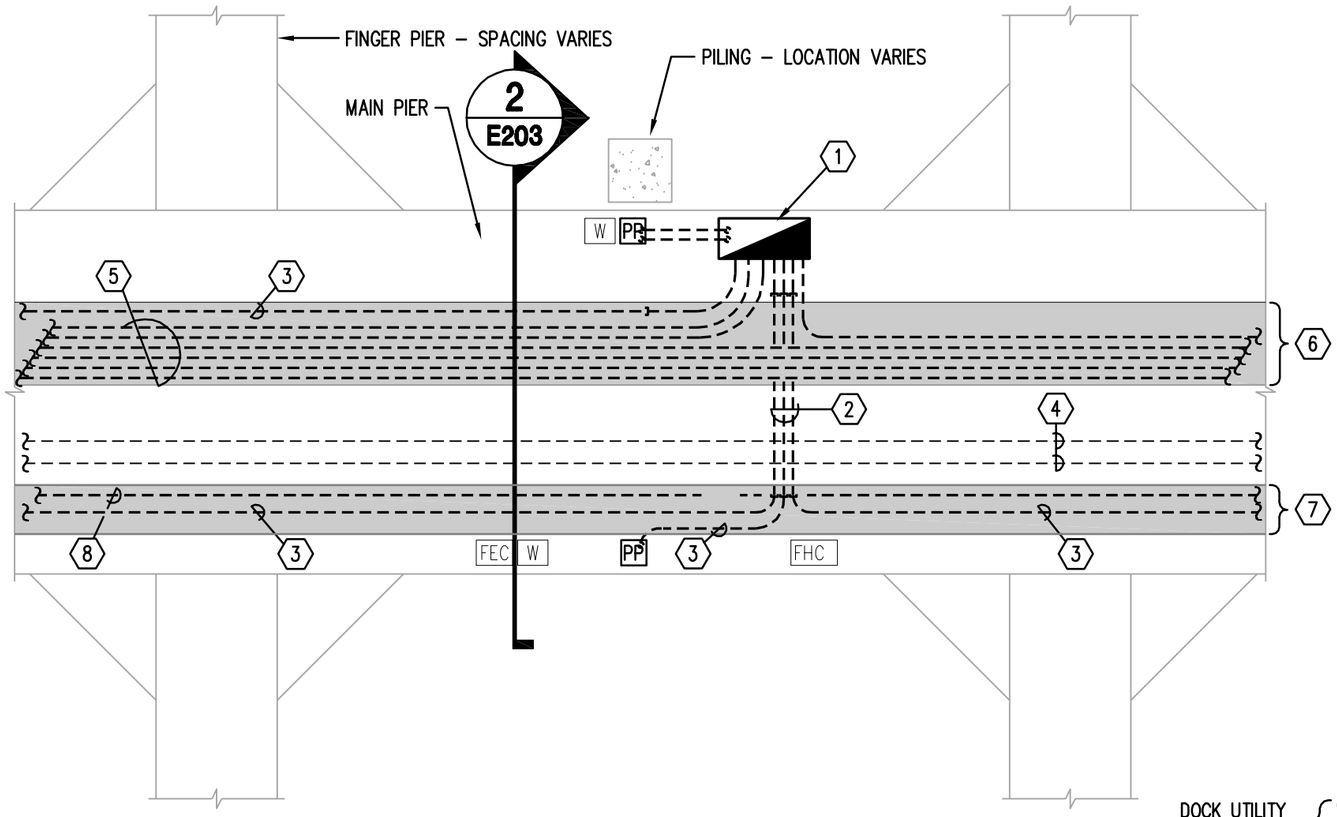
Diagrams - Electrical

Not To Scale

City of Key West

SHEET E202

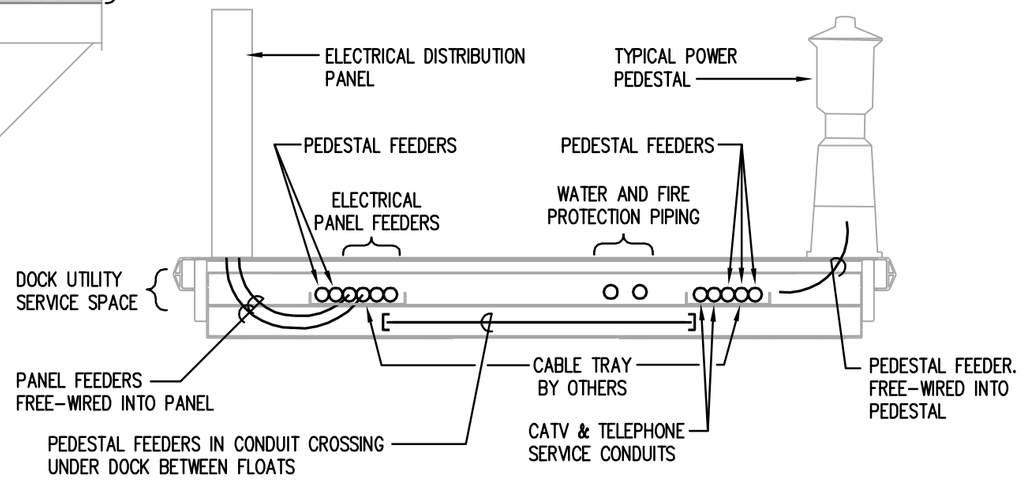


1 E203 **PEDESTAL COORDINATION DIAGRAM**

NOT TO SCALE

KEYED NOTES

1. ELECTRICAL PANEL – LOCATED BETWEEN FLOATS.
2. PEDESTAL FEEDER IN CONDUIT, CROSSING UNDER WATER AND FIRE PROTECTION PIPING.
3. PEDESTAL FEEDERS FREEWIRED IN CABLE TRAY.
4. WATER AND FIRE PROTECTION PIPING
5. ELECTRICAL PANEL FEEDERS FREEWIRED IN CABLE TRAY.
6. CABLE TRAY FOR ELECTRICAL FEEDERS. MINIMUM WIDTH SHALL BE 18".
7. CABLE TRAY FOR ELECTRICAL FEEDERS. MINIMUM WIDTH SHALL BE 9".
8. CATV AND TELEPHONE WIRING IN CONDUIT.



2 E203 **ELECTRICAL SERVICE CONNECTION DETAIL**

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Diagrams - Electrical

Not To Scale

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SHEET E203

MAINS: ☐ LOADCENTER ■ PANELBOARD
■ MLO ■ TOP ☐ BOTTOM PHASE: 1
☐ MCB AIC: 42K TRIP: WIRE: 3

PANEL DESIG: **TDP**

BUSSING: ■ CU ☐ AL
☐ ISO GROUND
☐ FEED–THRU LUGS
■ FULL NEUTRAL
■ STD. GROUND BUS
AMPS: 1200

MOUNTING:
■ SURFACE
☐ FLUSH
VOLTS: 120/240
NEMA TYPE: 3R

FED FROM:	SUPPLY FEEDER:	LOCATION:
UTILITY TRANSFORMER	SEE RISER DIAGRAM	

FEEDER COND	FEEDER WIRE	FEEDER EG	LOAD DESCRIPTION	BKR TRIP	CKT NO.	CKT NO.	BKR TRIP	LOAD DESCRIPTION	FEEDER COND	FEEDER WIRE	FEEDER EG
4"	R	R	Panel T1	600	1	2	600	Panel T3	R	R	4"
			Shunt Trip	600	3	4	600	Shunt Trip			
4"	R	R	Panel T2		5	6		GFM and Shunt Trip		2 #12	#12
			Shunt Trip	600	7	8	20	Surge Protection (SPD)			
				600	9	10	30				
					11	12	30				
					13	14					
					15	16					
					17	18					
					19	20					
					21	22					
					23	24					
					25	26					
					27	28					
					29	30					
					31	32					
					33	34					
					35	36					
					37	38					
					39	40					
					41	42					

NOTES:
1. WIRE SIZE SHALL MATCH C.B. TRIP SIZE . PER N.E.C. UNLESS NOTED
2. CONDUIT SHALL BE EMT UNLESS NOTED AS FOLLOWS. P=PVC, I=IMC, MC=METAL–CLAD CABLE, NM=NON–METALLIC SHEATHED CABLE
3. FULLY RATED PANEL

NOTES:

R. See Riser Diagram for feeder details.

MAINS: ☐ LOADCENTER ■ PANELBOARD
■ MLO ☐ TOP ■ BOTTOM PHASE: 1
☐ MCB AIC: 22K TRIP: WIRE: 3

PANEL DESIG: **T1**

BUSSING: ■ CU ☐ AL
☐ ISO GROUND
☐ FEED–THRU LUGS
■ FULL NEUTRAL
■ STD. GROUND BUS
AMPS: 600

MOUNTING:
■ SURFACE
☐ FLUSH
VOLTS: 120/240
NEMA TYPE: 3R

FED FROM:	SUPPLY FEEDER:	LOCATION:
PANEL TDP	SEE RISER DIAGRAM	TARPON PIER

FEEDER COND	FEEDER WIRE	FEEDER EG	LOAD DESCRIPTION	BKR TRIP	CKT NO.	CKT NO.	BKR TRIP	LOAD DESCRIPTION	FEEDER COND	FEEDER WIRE	FEEDER EG
N/A	#6	#10	SLIP T1	50	1	2	50	SLIP T2	N/A	#6	#10
N/A	#2	#8	SLIPS T3 & T5	50	3	4	50	SLIPS T4 & T6	N/A	#2	#8
N/A	#2	#8	SLIPS T7 & T9	100	5	6	100	SLIPS T8 & T10	N/A	#2	#8
N/A	#2	#8	SLIPS T11 & T13	100	7	8	100	SLIPS T12 & T14	N/A	#2	#8
N/A	#10	#10	SEWER PUMP (3 HP)	100	9	10	100				
				100	11	12	100				
				100	13	14	100				
				100	15	16	100				
				35	17	18					
				35	19	20					
					21	22					
					23	24					
					25	26					
					27	28					
					29	30					
					31	32					
					33	34					
					35	36					
					37	38					
					39	40					
					41	42					

NOTES:
1. WIRE SIZE SHALL MATCH C.B. TRIP SIZE . PER N.E.C. UNLESS NOTED
2. CONDUIT SHALL BE SCHEDULE 40 PVC UNLESS NOTED
3. FULLY RATED PANEL

NOTES:

ALL FEEDERS SHALL BE 3–CONDUCTOR WITH GROUND TYPE G–GC CABLE

* PEDESTAL FEEDERS RUN IN DOCK CABLE TRAY SYSTEM.

NOTE: PANELS TO BE MONITORED FOR GROUND FAULTS PER SPECIFICATIONS. SEE SHEETS E004 AND E005.

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Project No.:	5220-02-00 Date: July 24, 2012
eFile Name:	52200200E301.dwg
Designed By:	SML Drawn By: RMR
Checked By:	CDH
Engineer:	Chad D. Huff, P.E. Florida 55440

HANS WILSON & ASSOC., INC.
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MARINE and ENVIRONMENTAL CONSULTANTS

7-24-12

Schedules - Electrical
Not To Scale

City of Key West

SHEET E301

MAINS: ☐ LOADCENTER ■ PANELBOARD
■ MLO ☐ TOP ■ BOTTOM PHASE: 1
☐ MCB AIC: 22K TRIP: WIRE: 3

PANEL DESIG: **T2**

BUSSING: ■ CU ☐ AL
☐ ISO GROUND
☐ FEED–THRU LUGS
■ FULL NEUTRAL
■ STD. GROUND BUS
AMPS: 600

MOUNTING:
■ SURFACE
☐ FLUSH
VOLTS: 120/240
NEMA TYPE: 1

FED FROM: PANEL TDP

SUPPLY FEEDER: SEE RISER DIAGRAM

LOCATION:

FEEDER COND	FEEDER WIRE	FEEDER EG	LOAD DESCRIPTION	BKR TRIP	CKT NO.	CKT NO.	BKR TRIP	LOAD DESCRIPTION	FEEDER COND	FEEDER WIRE	FEEDER EG
N/A	#2	#8	SLIPS T15 & T17	100	1	2	100	SLIPS T16 & T18	N/A	#2	#8
				100	3	4	100				
N/A	#2	#8	SLIPS T19 & T21	100	5	6	100	SLIPS T20 & T22	N/A	#2	#8
				100	7	8	100				
N/A	#2	#8	SLIPS T23 & T25	100	9	10	100	SLIPS T24 & T26	N/A	#2	#8
				100	11	12	100				
N/A	#2	#8	SLIPS T27 & T29	100	13	14	100	SLIPS T28 & T30	N/A	#2	#8
				100	15	16	100				
					17	18					
					19	20					
					21	22					
					23	24					
					25	26					
					27	28					
					29	30					
					31	32					
					33	34					
					35	36					
					37	38					
					39	40					
					41	42					

NOTES:
1. WIRE SIZE SHALL MATCH C.B. TRIP SIZE . PER N.E.C. UNLESS NOTED
2. CONDUIT SHALL BE SCHEDULE 40 PVC UNLESS NOTED
3. FULLY RATED PANEL

NOTES:
ALL FEEDERS SHALL BE 3–CONDUCTOR WITH GROUND TYPE G–GC CABLE

* PEDESTAL FEEDERS RUN IN DOCK CABLE TRAY SYSTEM.

MAINS: ☐ LOADCENTER ■ PANELBOARD
■ MLO ☐ TOP ■ BOTTOM PHASE: 1
☐ MCB AIC: 22K TRIP: WIRE: 3

PANEL DESIG: **T3**

BUSSING: ■ CU ☐ AL
☐ ISO GROUND
☐ FEED–THRU LUGS
■ FULL NEUTRAL
■ STD. GROUND BUS
AMPS: 600

MOUNTING:
■ SURFACE
☐ FLUSH
VOLTS: 120/240
NEMA TYPE: 1

FED FROM: PANEL TDP

SUPPLY FEEDER: SEE RISER DIAGRAM

LOCATION:

FEEDER COND	FEEDER WIRE	FEEDER EG	LOAD DESCRIPTION	BKR TRIP	CKT NO.	CKT NO.	BKR TRIP	LOAD DESCRIPTION	FEEDER COND	FEEDER WIRE	FEEDER EG
N/A	#2	#8	SLIPS T31 & T33	100	1	2	100	SLIPS T32 & T34	N/A	#2	#8
				100	3	4	100				
N/A	#2	#8	SLIPS T35 & T37	100	5	6	100	SLIPS T36 & T38	N/A	#1/0	#8
				100	7	8	100				
N/A	#1/0	#8	SLIPS T39 & T41	100	9	10	100	SLIPS T38 & T40	N/A	#1/0	#8
				100	11	12	100				
N/A	#1/0	#8	SLIPS T43 & T44	100	13	14					
				100	15	16					
					17	18					
					19	20					
					21	22					
					23	24					
					25	26					
					27	28					
					29	30					
					31	32					
					33	34					
					35	36					
					37	38					
					39	40					
					41	42					

NOTES:
1. WIRE SIZE SHALL MATCH C.B. TRIP SIZE . PER N.E.C. UNLESS NOTED
2. CONDUIT SHALL BE SCHEDULE 40 PVC UNLESS NOTED
3. FULLY RATED PANEL

NOTES:
ALL FEEDERS SHALL BE 3–CONDUCTOR WITH GROUND TYPE G–GC CABLE

* PEDESTAL FEEDERS RUN IN DOCK CABLE TRAY SYSTEM.

NOTE: PANELS TO BE MONITORED FOR GROUND FAULTS PER SPECIFICATIONS. SEE SHEETS E004 AND E005.

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Project No.: 5220-02-00 Date: July 24, 2012
eFile Name: 52200200E302.dwg
Designed By: SML Drawn By: RMR
Checked By: CDH
Engineer: Chad D. Huff, P.E. Florida 55440

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Schedules - Electrical
Not To Scale

City of Key West

SHEET
E302

PANEL "TDP" (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	Wire Size	Grounding Conductor	VOLTAGE DROP	% VOLTAGE DROP	Conductors/ Phase
Panel T1	240	1			168000	134400	560.0	100%	SCH 40	CU	Ampacity	90%	70	4	600	350KCM	#1	2.02	0.84%	2
Panel T2	240	1			192000	134400	560.0	100%	SCH 40	CU	Ampacity	90%	185	4	600	350KCM	#1	5.35	2.23%	2
Panel T3	240	1			168000	134400	560.0	100%	SCH 40	CU	Ampacity	90%	300	4	600	350KCM	#1	8.67	3.61%	2
PANEL TDP (CONNECTED)	240	1			528000	0	0.0	NA	SCH 40	CU	Ampacity	NA	NA	NA	NA	NA	NA	NA	NA	NA
PANEL TDP (DEMAND)	240	1	TOTAL AFTER NEC			264000	1100.0	100%	SCH 40	CU	Ampacity	90%	5		1200	500KCM	#3/0	0.15	0.06%	3

Amps 1100 A 240V, 1PH

PANEL "T1" (LOADS AND VOLTAGE DROP CALCS)

Description	Voltage	Phase	Amps	HP	VA	Load VA	Amps	Load Factor	Conduit Type	Wire Type	Sizing Method	Power Factor	Length of Run	Conduit Size	Breaker Size	Wire Size	Grounding Conductor	VOLTAGE DROP	% VOLTAGE DROP	Conductors/ Phase
SLIP T1	240	1	50			12000	50.0	100%	SCH 40	CU	Ampacity	90%	55	2	50	#6	#10	2.55	1.06%	1
SLIP T2	240	1	50			12000	50.0	100%	SCH 40	CU	Ampacity	90%	60	2	50	#6	#10	2.78	1.16%	1
SLIP T3/T5	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	25	2 1/2	100	#2	#8	0.95	0.40%	1
SLIP T4/T6	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	35	2 1/2	100	#2	#8	1.33	0.56%	1
SLIP T7/T9	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	5	2 1/2	100	#2	#8	0.19	0.08%	1
SLIP T8/T10	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	15	2 1/2	100	#2	#8	0.57	0.24%	1
SLIP T11/T13	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	40	2 1/2	100	#2	#8	1.52	0.64%	1
SLIP T12/T14	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	50	2 1/2	100	#2	#8	1.91	0.79%	1
PANEL T1 (CONNECTED)	240	1				168000	700.0	NA	SCH 40	CU	Ampacity	NA	NA	NA	NA	NA	NA	NA	NA	NA
PANEL T1 (DEMAND)	240	1	TOTAL AFTER NEC			134400	560.0	NA	SCH 40	CU	Ampacity	*	*	*	NA	*	*	*	*	*

*See TDP load schedule for Panel feeder information

Amps 560 A 240V, 1PH

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Project No.: 5220-02-00 Date: July 24, 2012
eFile Name: 52200200E303.dwg
Designed By: SML Drawn By: RMR
Checked By: CDH
Engineer: Chad D. Huff, P.E. Florida 55440

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Schedules - Electrical
Not To Scale

City of Key West

SHEET E303

PANEL "T2" (LOADS AND VOLTAGE DROP CALCS)

Description	Voltage	Phase	Amps	HP	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 T15/T17	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	40	2 1/2	100	1	#2	#8	1.52	0.64%	1
SLIPS T16/T18	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	50	2 1/2	100	1	#2	#8	1.91	0.79%	1
SLIPS T19/T21	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	5	2 1/2	100	1	#2	#8	0.19	0.08%	1
SLIPS T20/T22	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	15	2 1/2	100	1	#2	#8	0.57	0.24%	1
SLIPS T23/T25	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	35	2 1/2	100	1	#2	#8	1.33	0.56%	1
SLIPS T24/T26	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	45	2 1/2	100	1	#2	#8	1.72	0.71%	1
SLIPS T27/T29	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	80	2 1/2	100	1	#2	#8	3.05	1.27%	1
SLIPS T28/T30	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	90	2 1/2	100	1	#2	#8	3.43	1.43%	1
PANEL T2 (CONNECTED)	240	1				192000	800.0	NA	SCH 40	CU	Ampacity	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PANEL T2 (DEMAND)	240	1	TOTAL AFTER NEC			134400	560.0	NA	SCH 40	CU	Ampacity	*	*	*	NA	*	*	*	*	*	*

*See TDP load schedule for Panel feeder information

Amps 560 A 240V, 1PH

PANEL "T3" (LOADS AND VOLTAGE DROP CALCS)

Description	Voltage	Phase	Amps	HP	VA	Load VA	Amps	Load Factor	Conduit Type	Wire Type	Sizing Method	Power Factor	Length of Run	Conduit Size	Breaker Size	Wire Size	Grounding Conductor	VOLTAGE DROP	% VOLTAGE DROP	Conductors/ Phase
SLIPS T31/T33	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	10	2 1/2	100	#2	#8	0.38	0.16%	1
SLIPS T32/T34	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	20	2 1/2	100	#2	#8	0.76	0.32%	1
SLIPS T35/T37	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	50	2 1/2	100	#2	#8	1.91	0.79%	1
SLIPS T36/T38	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	60	3	100	#1/0	#8	1.53	0.64%	1
SLIPS T39/T41	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	85	3	100	#1/0	#8	2.16	0.90%	1
SLIPS T40/T42	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	95	3	100	#1/0	#8	2.42	1.01%	1
SLIPS T43/T44	240	1	100			24000	100.0	100%	SCH 40	CU	Ampacity	90%	105	3	100	#1/0	#8	2.67	1.11%	1
PANEL T3 (CONNECTED)	240	1				168000	700.0	NA	SCH 40	CU	Ampacity	NA	NA	NA	NA	NA	NA	NA	NA	NA
PANEL T3 (DEMAND)	240	1	TOTAL AFTER NEC			134400	560.0	NA	SCH 40	CU	Ampacity	*	*	*	NA	*	*	*	*	*

*See TDP load schedule for Panel feeder information

Amps 560 A 240V, 1PH

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Project No.: 5220-02-00 Date: July 24, 2012
eFile Name: 52200200E304.dwg
Designed By: SML Drawn By: RMR
Checked By: CDH
Engineer: Chad D. Huff, P.E. Florida 55440

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Schedules - Electrical
Not To Scale

City of Key West

SHEET E304