



CONTRACT DOCUMENTS FOR:

ITB #18 - 036
AQUARIUM SEAWALL REPAIR
PROJECT # HU1701E01
JULY 2018

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City of Key West
Engineering Services

CITY OF KEY WEST

KEY WEST, FLORIDA

CONTRACT DOCUMENTS

for

ITB #18-036: AQUARIUM SEAWALL REPAIR

CONSISTING OF:
BIDDING REQUIREMENTS
CONTRACT FORMS
CONDITIONS OF THE CONTRACT
ENGINEERING DESIGN STANDARDS
SURVEYS & GEOTECH
PERMITS
DRAWINGS &

CITY OF KEY WEST

ENGINEERING SERVICES

KEY WEST, FLORIDA

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PART 1

BIDDING REQUIREMENTS

INVITATION TO BID

Sealed Bids for the Construction of ITB #18-036: AQUARIUM SEAWALL REPAIR Project HU 1701E01, addressed to the City of Key West, will be received at the office of the City Clerk, City of Key West, 1300 White St., Key West, Florida, until **3:00 p.m., local time, on Wednesday, September 12th, 2018** and then will be publicly opened and read. Any bids received after the time and date specified will not be considered.

The City retains the right to award bid to the bidder that serves the best interest of the City.

This project includes, but is not limited to, construction of approximately 177 lineal feet of steel sheetpile sea wall with reinforced concrete cap as repair to an existing seawall damaged during Hurricane Irma. To access, a 38 foot x 11 foot section of an existing pedestrian bridge will likely need to be removed, stored, and reinstalled. See Part 4 “Engineering Design Standards” and Part 7 “Drawings” for a more complete description of project.

Drawings and Specifications may be obtained from Demand Star by Onvia. Please contact Demand Star at www.demandstar.com or call 1-800-711-1712.

A **mandatory pre-bid meeting** will be held in the Comissioners’ Conference Room at the City Hall located at 1300 White Street, Key West, FL 33040 on **Wednesday, August 29th, 2018 at 10:00 a.m.**

One (1) original and two (2) flash drives in PDF format of the Bid are to be submitted in two sealed envelopes, one within the other, clearly marked on the outside, “ITB #18-036: AQUARIUM SEAWALL REPAIR” and addressed to:

CITY CLERK
KEY WEST CITY HALL
1300 WHITE STREET
KEY WEST, FLORIDA 33040

Each Bid must be submitted on the prescribed forms and accompanied by bid security as prescribed in the Instructions to Bidders, payable to the City of Key West, Florida, in an amount not less than five (5) percent of the amount bid.

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

The successful Bidder will be required to furnish the necessary additional bond(s) for the faithful performance of the Contract, as prescribed in the Bidding Documents. Within 10 days after the Notice of Award, the successful Bidder will also be required to furnish documentation showing that he is in compliance with the licensing requirements of the state and that the provisions of Chapter 66 Section 87 of the Code of Ordinances of the City of Key West. Compliance with these provisions is required before he can enter into the agreement contained in the Contract Documents. Specifically, within 10 days after the Notice of Award, the successful Bidder must demonstrate that he holds, as a minimum, the following licenses and certificates:

- A. Possess a City of Key West Business Tax Receipt

OR,

- B. Be registered in the City of Key West building system.

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

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

At the time of the award, the successful Bidder must show satisfactory document of such State, County and City licenses as would be required. Any permit and/or license requirement and subsequent costs are located within the bid documents. The successful Bidder must also be able to satisfy the City Attorney as to such insurance coverage and legal requirements as may be demanded in Bid. The City may reject bids: (1) for budgetary reasons, (2) if the bidder misstates or conceals a material fact in its bid, (3) if the bid does not strictly conform to the law or is non-responsive to the bid requirements, (4) if the bid is conditional, (5) if a change of circumstances occurs making the purpose of the bid unnecessary, (6) or if such rejection is in the best interest of the City. The City may also waive any minor formalities or irregularities in any bid.

INSTRUCTIONS TO BIDDERS

1. CONTRACT DOCUMENTS

A. FORMAT

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

B. DOCUMENT INTERPRETATION

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

Questions should be directed in writing to Steve McAlearney, Engineering Services Department for the City of Key West, at (305) 809-3747 or smcalearney@cityofkeywest-fl.gov. Should there be any doubt as to the meaning or intent of said Contract Documents, the Bidder should request of the Engineer, in writing (at least eight (8) days prior to the Bid opening) an interpretation thereof. Any interpretation or change in said Contract Documents will be made only in writing, in the form of addenda to the Documents which will be furnished to all registered holders of Bidding Documents. Bidders shall submit with their PROPOSALS, or indicate receipt of, all Addenda. The Owner will not be responsible for any other explanation or interpretations of said Documents.

2. GENERAL DESCRIPTION OF THE PROJECT

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

3. QUALIFICATION OF CONTRACTORS

The prospective Bidders must meet the statutorily prescribed requirements before award of the Contract by the Owner.

4. BIDDER'S UNDERSTANDING

Each Bidder must inform himself of the conditions relating to the execution of the work, and it is required that he will inspect the site and make himself thoroughly familiar with all the Contract Documents. Failure to do so will not relieve the successful Bidder of his obligation to enter into a Contract and complete the contemplated work in strict accordance with the Contract Documents. Each Bidder shall inform himself of, and the Bidder awarded a Contract shall comply with, federal, state, and local laws, statutes, and ordinances relative to the execution of the work.

This requirement includes, but is not limited to, applicable regulations concerning minimum wage rates, nondiscrimination in the employment of labor, protection of public and employee safety and health, environmental protection, the protection of natural resources, fire protection, burning and nonburning requirements, permits, fees, and similar subjects.

5. TYPE OF PROPOSAL

A. LUMP SUM

The BID for the work is to be submitted on a lump sum basis. Lump sum prices shall be submitted for all items of work set forth in the bid. All items required to complete the work specified but not included in the bid shall be considered incidental to those set forth in the bid.

The Bidder shall submit a Schedule of Values with the BID (Refer to Part 8).

6. PREPARATION OF PROPOSALS

A. GENERAL

All blank spaces in the Proposal form must be filled in, as required, in BLACK INK. All price information will be shown in both words and figures where required. No changes shall be made in the phraseology of the forms. Written amounts shall govern in case of discrepancy between amounts stated in writing and the amounts stated in figures.

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

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

C. SIGNATURE

The Bidder shall sign his proposal in the blank space provided therefor. If Bidder is a corporation, the legal name of the corporation shall be set forth above, together with the signature of the officer or officers authorized to sign Contracts on behalf of the corporation. If the Bidder is a partnership, the true name of the firm shall be set forth above, together with the signature of the partner or partners authorized to sign Contracts on behalf of the partnership. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a notarized power of attorney must be on file with the Owner prior to opening of Proposals or submitted with the Proposal, otherwise the Proposal will be regarded as not properly authorized.

D. SPECIAL BIDDING REQUIREMENTS

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

The Bidder's attention is brought to the hiring practices and licenses and permits of the City of Key West. These are defined in the addition to Article 38, ORDINANCES, PERMITS, and LICENSES, as set forth in the Supplementary Conditions.

The Bidder shall submit with his Bid his experience record showing his experience and expertise in related work. Such experience record shall provide at least five (5) current or recent projects of similar work, preferably within Florida or the Southeastern United States. For each project, the following information will be provided:

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

E. ATTACHMENTS

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

Anti-Kickback Affidavit
Public Entity Crime Form
City of Key West Indemnification Form
Equal Benefit for Domestic Partners Affidavit
Non-collusion Affidavit
Cone of Silence Affidavit
Lobbying Restrictions Certificate
Bidder's Checklist

7. STATE AND LOCAL SALES AND USE TAX

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

8. SUBMISSION OF PROPOSALS

All Proposals must be submitted not later than the time prescribed, at the place, and in the manner set forth in the Invitation to Bid. Proposals must be made on the Proposal forms provided herewith and submitted intact with the volume containing the Bidding requirements, Contract forms, and Conditions of the Contract.

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

9. MODIFICATION OR WITHDRAWAL OF PROPOSALS

Prior to the time and date designated for receipt of Proposals, any Proposal submitted may be modified or withdrawn by notice to the party receiving Proposals at the place designated for the receipt of Proposals. Such notice shall be in writing over the signature of the Bidder or by email. If by email, written confirmation over the signature of the Bidder shall be mailed and postmarked on or before the date and time set for receipt of Proposals, and it shall be so worded as not to reveal the amount of the original Proposal. No Proposal may be withdrawn after the time scheduled for the opening of Proposals, unless the time specified in paragraph AWARD OF CONTRACT of these Instructions to Bidders shall have elapsed.

10. BID SECURITY

Proposals must be accompanied by cash, a certified check drawn on a bank in good standing, or a Bid Bond issued by a Surety authorized to issue such bonds in the state where the work is located, in the amount of five (5) percent of the total amount of the Proposal submitted. This Bid security shall be given as a guarantee that the Bidder will not withdraw his Proposal for a period of sixty (60) days after Bid opening, and that if awarded the Contract, the successful Bidder will execute the attached Contract within the time specified.

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

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

11. RETURN OF BID SECURITY

Within fifteen (15) days after the award of the Contract, the Owner will return the Bid securities to all Bidders whose Proposals are not to be further considered in awarding the Contract. Retained Bid securities will be held until the Contract has been finally executed, after which all Bid securities, other than Bidder's Bonds and any guarantees which have been forfeited, will be returned to the respective Bidders whose Proposals they accompanied.

12. AWARD OF CONTRACT

Within forty-five (45) calendar days after the opening of the Proposals, the Owner will accept one of the Proposals or will act in accordance with the following paragraphs. The acceptance of the Proposal will be by written notice of award, mailed to the office designated in the Proposal, or delivered to the Bidder's representative. In the event of

failure of the lowest responsive Bidder to sign the Contract and provide acceptable insurance certificate(s), the Owner may award the Contract to the next lowest, responsive, responsible Bidder. Such award, if made, will be made within sixty (60) days after the opening of the Proposals.

The Owner reserves the right to accept or reject any and all Proposals, and to waive any informalities and irregularities in said Proposal.

13. BASIS OF AWARD

The award will be made by the Owner on the basis of that Proposal from the lowest responsive, responsible Bidder, which in the Owner's sole and absolute judgement, will serve the best interests of the Owner.

The Owner reserves the right to accept or reject any or all Proposals and to waive any informalities and irregularities in said Proposals.

If at the time this Contract is to be awarded, the total of the lowest acceptable Proposal exceeds the funds then estimated by the Owner as available, the Owner may reject all Proposals or take such other action as best serves the Owner's interest.

14. EXECUTION OF CONTRACT

The successful Bidder shall, within ten (10) working days after receiving notice of award, sign and deliver to the Owner a Contract in the form hereto attached together with the acceptable insurance certificates as required in these Documents. Within ten (10) working days after receiving the signed Contract, with acceptable insurance from the successful Bidder, the Owner's authorized agent will sign the Contract. Signature by both parties constitutes execution of the Contract.

15. CONTRACT BONDS

A. PERFORMANCE AND PAYMENT BONDS

The successful Bidder shall file with the OWNER, at the time of delivery of the signed Contract, a Performance Bond and Payment Bond on the form bound herewith, each in the full amount of the Contract price in accordance with the requirements of Florida Statutes Section 255.05 or 713.23, as applicable, as security for the faithful performance of the Contract and the payment of all persons supplying labor and materials for the construction of the work and to cover all guarantees against defective workmanship or materials, or both, during the warranty period following the date of final acceptance of the work by the OWNER. The Surety furnishing this bond shall have a sound financial standing and a record of service satisfactory to the OWNER, shall be authorized to do business in the State of Florida, and shall be listed on the current U.S. Department of Treasury Circular Number 570 or amendments thereto in the Federal Register of acceptable Sureties for federal projects. The CONTRACTOR shall supply the OWNER with phone numbers, addresses, and contacts for the Surety and their agents. Pursuant to Section 255.05(7), Florida Statutes, in lieu of the bond required by law, the contractor may

file with the city an alternative form of security in the form of cash, a money order, a certified check, a cashier's check or an irrevocable letter of credit.

B. POWER-OF-ATTORNEY

The Attorney-in-Fact (Resident Agent) who executes this Performance and Payment Bond in behalf of the Surety must attach a notarized copy of his power-of-attorney as evidence of his authority to bind the Surety on the date of execution of the bond.

All Contracts, Performance and Payment Bonds, and respective powers-of-attorney will have the same date.

16. FAILURE TO EXECUTE CONTRACT AND FURNISH BONDS

The Bidder who has been awarded a contract and who fails to promptly and properly execute the contract shall forfeit the Bid security that accompanied the Bid, and the Bid security shall be retained as liquidated damages by the Owner, and it is agreed that said sum is a fair estimate of the amount of the damages the Owner will sustain in case the Bidder fails to enter into a Contract or furnish the required bonds. Bid security deposited in the form of cash, a certified check, or cashier's check shall be subject to the same requirements as a Bid Bond.

17. TIME OF COMPLETION

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

PROPOSAL

TO: CITY OF KEY WEST
ADDRESS: 1300 WHITE STREET
P.O. BOX 1409
KEY WEST, FLORIDA 33041

PROJECT TITLE: ITB #18-036: AQUARIUM SEAWALL

ENGINEERING PROJECT NUMBER: HU 1701E01

BIDDER'S INFORMATION

Contact Name: _____

Email: _____

Telephone: _____

BIDDER'S DECLARATION AND UNDERSTANDING

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

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

The Bidder further agrees that he has exercised his own judgment regarding the interpretation of subsurface information and has utilized all data that he believes pertinent from the Engineer, Owner, and other sources in arriving at his conclusions.

The Bidder further agrees that the Owner may "non-perform" the work in the event that the low bid is in excess of available funding. Non-performance will be determined prior to Notice of Award.

CONTRACT EXECUTION AND BONDS

The Bidder agrees that if this Proposal is accepted, he will, within ten (10) days including Sundays and legal holidays, after Notice of Award, sign the Contract in the form annexed hereto, and will, at that time deliver to the Owner evidence of holding the required licenses and certificates, and will, to the extent of his Proposal, furnish all machinery, tools, apparatus, and other means of construction and do the work and furnish all the materials necessary to complete all work as specified or indicated in the Contract Documents.

CERTIFICATES OF INSURANCE

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

START OF CONSTRUCTION AND CONTRACT COMPLETION TIME

The Bidder further agrees to begin work within ten (10) calendar days after the date of the Notice to Proceed. Contractors need to submit a construction plan (including, but not limited to; staging plan, equipment, and work schedule) with the bid for approval. **Project shall be completed within one hundred fifty (150) calendar days from Notice to Proceed.**

LIQUIDATED DAMAGES

In the event the Bidder is awarded the Contract and shall fail to complete the work authorized by the Contract within the time limit or extended time limit agreed upon in that Contract, as more particularly set forth in the Contract Documents, liquidated damages shall be paid to the Owner at the rate of \$500.00 per day for all work authorized under the Contract Documents, until the work shall have been satisfactorily completed as provided in the Contract Documents. Sundays and legal holidays shall be included in determining days in default.

The Bidder hereby acknowledges that he has received Addenda No. _____ , _____ ,

_____, _____, _____. (Bidder shall insert No. of each addendum received) and agrees that all addenda issued are hereby made part of the Contract Documents, and the Bidder further agrees that his proposal(s) includes all impacts resulting from said addenda.

SALES AND USE TAX

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

LUMP SUM

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

SUBCONTRACTORS

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

Portion of Work: _____

Name: _____

Address: _____

Portion of Work: _____

Name: _____

Address: _____

Portion of Work: _____

Name: _____

Address: _____

SURETY

_____ whose address is

_____, _____, _____
Street City State Zip

BIDDER

The name of the Bidder submitting this Bid is: _____

Doing business at _____

City _____ State _____ Zip _____

This address is where all communications concerning this Bid shall be sent.

The names of the principal officers of the Corporation submitting this Bid, or of the Partnership, or of all persons interested in this Bid as Principals are as follows:

Name	Title
_____	_____
_____	_____
_____	_____
_____	_____

If Sole Proprietor or Partnership

IN WITNESS hereto the undersigned has set his/her/its hand this _____ day of _____, 2018.

Signature of Bidder _____

Title _____

If Corporation

IN WITNESS WHEREOF the undersigned corporation has caused this instrument to be executed and its seal affixed by its duly authorized officers this _____ day of _____, 2018.

(SEAL)

Name of Corporation

By: _____

Title: _____

Attest: _____

Secretary

FLORIDA BID BOND

BOND NO. _____

AMOUNT: \$ _____

KNOW ALL MEN BY THESE PRESENTS, that _____

_____ hereinafter called the PRINCIPAL, and _____

a corporation duly organized under the laws of the State of _____ having its principal place of business at _____

_____ in the State

of _____ and authorized to do business in the State of Florida, as SURETY, are held firmly bound unto hereinafter called the Obligee, in the sum of _____

_____ DOLLARS (\$ _____)

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

THE CONDITION OF THIS BOND IS SUCH THAT:

WHEREAS, the PRINCIPAL is herewith submitting his or its Bid or Proposal for: ITB #18-036: AQUARIUM SEAWALL REPAIR/ HU 1701E01, said Bid Proposal, by reference thereto, being hereby made a part hereof.

WHEREAS, the PRINCIPAL contemplates submitting or has submitted a bid to the OBLIGEE for the furnishing of labor, materials, (except those specifically furnished by the Owner), equipment, machinery, tools, apparatus, means of transportation for, and the performance of the work covered in the Proposal and the detailed Drawings and Specifications entitled:

ITB #18-036: AQUARIUM SEAWALLREPAIR/ HU 1701E01

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

NOW, THEREFORE, the conditions of this obligation are such that if the PRINCIPAL within 5 working days after written notice of such acceptance, enters into a written Contract with the OBLIGEE then this obligation shall be void: otherwise the sum herein stated shall be due and payable to the OBLIGEE and the Surety herein agrees to pay said sum immediately upon

demand of the OBLIGEE in good and lawful money of the United States of America, as liquidated damages for failure thereof of said principal.

Signed and sealed this _____ day of _____, 2018.

PRINCIPAL

By: _____

SURETY

By: _____
Attorney-In-Fact

ANTI-KICKBACK AFFIDAVIT

STATE OF FLORIDA)
 : SS
COUNTY OF MONROE)

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

By: _____

Sworn and subscribed before me this
_____ day of _____, 2018.

NOTARY PUBLIC, State of Florida at Large

My Commission Expires: _____

* * * * *

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

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

1. This sworn statement is submitted with Bid, Bid or Contract No. _____ for

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

whose business address is _____
_____ and (if applicable) its Federal
Employer Identification Number (FEIN) is _____ (If the entity has no FEIN,
include the Social Security Number of the individual signing this sworn statement.)

3. My name is _____ and my relationship to
(Please print name of individual signing)

the entity named above is _____.

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

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

6. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes, means
 1. A predecessor or successor of a person convicted of a public entity crime: or
 2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The ownership by one person of shares constituting controlling interest in another person, or a pooling of equipment or income among persons when not for fair market value under an arm's length agreement, shall be a prima facie case that one person controls another person. A person who knowingly enters into a joint venture with a person who has been convicted of a public entity crime in Florida during the preceding 36 months shall be considered an affiliate.

7. I understand that a "person" as defined in Paragraph 287.133(1)(8), Florida Statutes, means any natural person or entity organized under the laws of any state or of the United States with the legal power to enter into a binding contract and which Bids or applies to Bid on contracts for the provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The

term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

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

___ Neither the entity submitting this sworn statement, nor any officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, nor any affiliate of the entity have been charged with and convicted of a public entity crime subsequent to July 1, 1989.

___ The entity submitting this sworn statement, or one or more of the officers, directors, executives, partners, shareholders, employees, members, or agents who are active in management of the entity, or an affiliate of the entity has been charged with and convicted of a public entity crime subsequent to July 1, 1989, AND (Please indicate which additional statement applies.)

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

___ The person or affiliate was placed on the convicted vendor list. There has been a subsequent proceeding before a hearing officer of the State of Florida, Division of Administrative Hearings. The final order entered by the hearing officer determined that it was in the public interest to remove the person or affiliate from the convicted vendor list. (Please attach a copy of the final order.)

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

(Signature)

(Date)

STATE OF _____

COUNTY OF _____

PERSONALLY APPEARED BEFORE ME, the undersigned authority,

_____ who, after first being sworn by me, affixed his/her signature in the
(Name of individual signing)

space provided above on this _____ day of _____, 2018.

My commission expires: _____
NOTARY PUBLIC

CITY OF KEY WEST INDEMNIFICATION FORM

The CONTRACTOR shall indemnify and hold harmless the City of Key West, its officers, and employees, from liabilities, damages, losses and costs, including, but not limited to reasonable attorney's fees, to the extent caused by the negligence, recklessness or intentional wrongful misconduct of CONTRACTOR and persons employed or utilized by CONTRACTOR in the performance of this agreement. Except as specifically provided herein, this agreement does not require CONTRACTOR to indemnify the City of Key West, its employees, officers, directors, or agents from any liability, damage, loss, claim, action or proceeding.

These indemnifications shall survive the term of this agreement. In the event that any action or proceeding is brought against the City of Key West by reason of such claim or demand, CONTRACTOR shall, upon written notice from the City of Key West, resist and defend such action or proceeding by counsel satisfactory to the City of Key West.

The indemnification provided above shall obligate CONTRACTOR to defend at its own expense to and through appellate, supplemental or bankruptcy proceeding, or to provide for such defense, at the City of Key West's option, any and all claims of liability and all suits and actions of every name and description covered above which may be brought against the City of Key West whether performed by CONTRACTOR, or persons employed or utilized by CONTRACTOR.

The CONTRACTOR's obligation under this provision shall not be limited in any way by the agreed upon Contract Price as shown in this agreement, or the CONTRACTOR's limit of or lack of sufficient insurance protection.

CONTRACTOR: _____

SEAL:

Address

Signature

Print Name

Title

DATE: _____

EQUAL BENEFITS FOR DOMESTIC PARTNERS AFFIDAVIT

STATE OF _____)
 : SS
COUNTY OF _____)

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

By: _____

Sworn and subscribed before me this

_____ day of _____, 2018.

NOTARY PUBLIC, State of Florida at Large

My Commission Expires: _____

CONE OF SILENCE AFFIDAVIT

STATE OF _____)
: SS
COUNTY OF _____)

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

Sworn and subscribed before me this

_____ Day of _____, 2018.

NOTARY PUBLIC, State of _____ at Large

My Commission Expires: _____

Sec. 2-773. Cone of Silence

(a) Definitions. For purposes of this section, reference to one gender shall include the other, use of the plural shall include the singular, and use of the singular shall include the plural. The following definitions apply unless the context in which the word or phrase is used requires a different definition:

- 1) *Competitive Solicitation* means a formal process by the City of Key West relating to the acquisition of goods or services, which process is intended to provide an equal and open opportunity to qualified persons and entities to be selected to provide the goods or services. Competitive Solicitation shall include request for proposals ("RFP"), request for qualifications ("RFQ"), request for letters of interest ("RFLI"), invitation to bid ("ITB") or any other advertised solicitation.
- 2) *Cone of Silence* means a period of time during which there is a prohibition on communication regarding a particular Competitive Solicitation.
- 3) *Evaluation or Selection Committee* means a group of persons appointed or designated by the City to evaluate, rank, select, or make a recommendation regarding a Vendor or the Vendor's response to the Competitive Solicitation. A member of such a committee shall be deemed a city official for the purposes of subsection (c) below.
- 4) *Vendor* means a person or entity that has entered into or that desires to enter into a contract with the City of Key West or that seeks an award from the City to provide goods, perform a service, render an opinion or advice, or make a recommendation related to a Competitive Solicitation for compensation or other consideration.
- 5) *Vendor's Representative* means an owner, individual, employee, partner, officer, or member of the board of directors of a Vendor, or a consultant, lobbyist, or actual or potential subcontractor or sub consultant who acts at the behest of a Vendor in communicating regarding a Competitive Solicitation.

(b) Prohibited Communications: A Cone of Silence shall be in effect during the course of a Competitive Solicitation and prohibit:

- 1) Any communication regarding a particular Competitive Solicitation between a potential Vendor or Vendor's Representative and the City's administrative staff including, but not limited to, the city manager and his or her staff;
- 2) Any communication regarding a particular Competitive Solicitation between a potential Vendor or Vendor's Representative and the Mayor, City Commissioners, or their respective staff;
- 3) Any communication regarding a particular Competitive Solicitation between a potential Vendor or Vendor's Representative and any member of a City evaluation and/or selection committee therefore; and

- 4) Any communication regarding a particular Competitive Solicitation between the Mayor, City Commissioners, or their respective staff, and a member of a City evaluation and/or selection committee therefore.

(c) Permitted Communications: Notwithstanding the foregoing, nothing contained herein shall prohibit:

- 1) Communication between members of the public who are not Vendors or a Vendor's representative and any city employee, official or member of the City Commission;
- 2) Communications in writing at any time with any city employee, official or member of the City Commission, unless specifically prohibited by the applicable Competitive Solicitation.

(A) However, any written communication must be filed with the City Clerk. Any City employee, official or member of the City Commission receiving or making any written communication must immediately file it with the City Clerk.

(B) The City Clerk shall include all written communication as part of the agenda item when publishing information related to a particular Competitive Solicitation.

- 3) Oral communications at duly noticed pre-bid conferences;
- 4) Oral presentations before publicly noticed evaluation and/or selection committees;
- 5) Contract discussions during any duly noticed public meeting;
- 6) Public presentations made to the City Commission or advisory body thereof during any duly noticed public meeting;
- 7) Contract negotiations with city staff following the award of a Competitive Solicitation by the City Commission; or
- 8) Purchases exempt from the competitive process pursuant to section 2-797 of these Code of Ordinances.

(d) Procedure

- 1) The Cone of Silence shall be imposed upon each Competitive Solicitation at the time of Public Notice of such solicitation as provided by section 2-826 of this Code. Public notice of the Cone of Silence shall be included in the notice of the Competitive Solicitation. The city manager shall issue a written notice of the release of each Competitive Solicitation to the affected departments, with a copy thereof to each Commission member, and shall include in any public solicitation for goods and services a statement disclosing the requirements of this ordinance.

- 2) The Cone of Silence shall terminate at the time the City Commission or other authorized body makes final award or gives final approval of a contract, rejects all bids or responses to the Competitive Solicitation, or takes other action which ends the Competitive Solicitation.
- 3) Any City employee, official or member of the City Commission that is approached concerning a Competitive Solicitation while the Cone of Silence is in effect shall notify such individual of the prohibitions contained in this section. While the Cone of Silence is in effect, any City employee, official or member of the City Commission who is the recipient of any oral communication by a potential Vendor or Vendor's Representative in violation of this section shall create a written record of the event. The record shall indicate the date of such communication, the persons with whom such communication occurred, and a general summation of the communication.

(e) Violations/penalties and procedures.

- 1) A sworn complaint alleging a violation of this ordinance may be filed with the City Attorney's office. In each such instance, an initial investigation shall be performed to determine the existence of a violation. If a violation is found to exist, the penalties and process shall be as provided in section 1-15 of this Code.
- 2) In addition to the penalties described herein and otherwise provided by law, a violation of this ordinance shall render the Competitive Solicitation void at the discretion of the City Commission.
- 3) Any person who violates a provision of this section shall be prohibited from serving on a City of Key West advisory board, evaluation and/or selection committee.
- 4) In addition to any other penalty provided by law, violation of any provision of this ordinance by a City of Key West employee shall subject said employee to disciplinary action up to and including dismissal.
- 5) If a Vendor is determined to have violated the provisions of this section on two more occasions it shall constitute evidence under City Code section 2-834 that the Vendor is not properly qualified to carry out the obligations or to complete the work contemplated by any new Competitive Solicitation. The City's Purchasing Agent shall also commence any available debarment from city work proceeding that may be available upon a finding of two or more violations by a Vendor of this section.

NON-COLLUSION AFFIDAVIT

STATE OF _____)
: SS
COUNTY OF _____)

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

By: _____

Sworn and subscribed before me this

_____ day of _____, 2018.

NOTARY PUBLIC, State of Florida at Large

My Commission Expires: _____

LOBBYING RESTRICTIONS

The undersigned certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

3. The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

_____ Signature of Contractor's Authorized Official

_____ Name and Title of Contractor's Authorized Official

_____ Date

BIDDER'S CHECKLIST

(Note: The purpose of this checklist is to serve as a reminder of major items to be addressed in submitting a bid and is not intended to be all inclusive. It does not alleviate the Bidder from the responsibility of becoming familiar with all aspects of the Contract Documents and proper completion and submission of the bid.)

- All Contract documents thoroughly read and understood.
- All blank spaces in Bid Form filled in, using black ink.
- Total and unit prices added correctly.
- Addenda acknowledged (if applicable).
- Subcontractors (if applicable) are named as indicated in the Proposal.
- Experience record included.
- Bid signed by authorized officer.
- Bid Bond completed and executed, including power-of-attorney dated the same date as Bid Bond.
- Bidder familiar with federal, state, and local laws, ordinances, rules and regulations affecting performance of the work.
- Bidder, if successful, able to obtain and/or demonstrate possession of required licenses and certificates within (10) ten calendar days after receiving a Notice of Award.
- Bid submitted intact with the volume containing the Bidding Requirements, Contract Forms, Conditions of the Contract, one (1) original and two (2) USB drives, each containing a single complete PDF file.
- Bid Documents submitted in sealed envelope and addressed and labeled in conformance with the instructions in the Invitation to Bid.
- Other forms listed below.

Bidders shall cite compliance with these required Contract Provisions and shall include the following EXECUTED documents with bid:

- Anti-Kickback Affidavit.
- Public Entity Crimes.
- City of Key West Indemnification Form.
- Equal Benefits for Domestic Partners Affidavit.
- Cone of Silence Affidavit.
- Non-collusion Affidavit.
- Lobbying Restrictions Certification

Failure to include the above forms may result in a determination that the proposal is nonresponsive.

Additionally, a signed bid shall indicate acknowledgement and compliance with the following federal regulations on pages 67-72 of the Supplementary Conditions:

- Access by Grantee
- Copyrights
- Disadvantaged Business Enterprises (DBE)
- Energy Policy & Conservation Act
- Equal Employment Opportunity
- Contract Hours & Safety Standards
- Clean Air Act
- Federal Water Pollution Control Act
- Disbarment & Suspension
- Byrd Anti-Lobbying Amendment
- Procurement of Recovered Materials
- Retention of All Records
- Additional Federal Regulations

PART 2

CONTRACT FORMS

CONTRACT

This Contract, made and entered into this _____ day of _____ 2018

by and between the City of Key West, hereinafter called the "OWNER", and _____

hereinafter called the "CONTRACTOR";

WITNESSETH:

The CONTRACTOR, in consideration of the sum to be paid him by the OWNER and of the covenants and agreements herein contained, hereby agrees at his own proper cost and expense to do all the work and furnish all the materials, tools, labor, and all appliances, machinery, and appurtenances for ITB #18-036: AQUARIUM SEAWALL REPAIR, HU 1701E01, Key West, Florida to

the extent of the Proposal made by the CONTRACTOR, dated the _____ day of

_____ 2018 all in full compliance with the Contract Documents referred to herein.

The BIDDING REQUIREMENTS, including the signed copy of the Proposal, the CONTRACT FORMS, the PERFORMANCE AND PAYMENT BONDS, the CONDITIONS OF THE CONTRACT, the SPECIFICATIONS, and the DRAWINGS, and other items, dated July 2018, are hereby referred to and by reference made a part of this Contract as fully and completely as if the same were fully set forth herein and are mutually cooperative therewith.

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

The CONTRACTOR agrees to complete the work within the time specified in the Contract Documents and to accept as full payment hereunder the amounts computed as determined by the Contract Documents and based on the said Proposal.

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

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

In the event that the CONTRACTOR shall fail to complete the work within the time limit or the extended time limit agreed upon, as more particularly set forth in the Contract Documents, liquidated damages shall be paid at the rate of \$500 per day. Sundays and legal holidays shall be included in determining days in default.

This Contract will automatically expire upon completion of the project.

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

_____ day of _____, A.D., 2018

CITY OF KEY WEST

By _____

Title _____

CONTRACTOR

By _____

Title _____

PERFORMANCE BOND

BOND NO. _____

AMOUNT: \$ _____

KNOW ALL MEN BY THESE PRESENTS, that in accordance with Florida Statutes Section 255.05, _____

with offices at _____
hereinafter called the CONTRACTOR (Principal), and

with offices at _____
a corporation duly organized and existing under and by virtue of the laws of the State of Florida, hereinafter called the SURETY, and authorized to transact business within the State of Florida, as SURETY, are held and firmly bound unto **CITY OF KEY WEST**, represented by its _____, hereinafter called the CITY (Obligee), in the sum of:

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

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the CONTRACTOR has executed and entered into a certain Contract hereto attached, with the CITY, dated _____, 2018 to furnish at his own cost, charges, and expense all the necessary materials, equipment, and/or labor in strict and express accordance with said Contract and the Contract Documents as defined therein, all of which is made a part of said Contract by certain terms and conditions in said Contract more particularly mentioned, which Contract, consisting of the various Contract Documents is made a part of this Bond as fully and completely as if said Contract Documents were set forth herein;

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

1. Shall in all respects comply with the terms and conditions of said Contract and his obligation there under, including the Contract Documents (which include the plans, drawings, specifications, and conditions as prepared by the CITY, invitation to bid, instructions to bidders, the CONTRACTOR’S bid as accepted by the above CITY, the bid and contract performance and payment bonds, and all addenda, if any, issued prior to the opening of bids), being made a part of this bond by reference, at the times and in the manner prescribed in the contract; and

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

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

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

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

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

IN WITNESS WHEREOF, the above parties bonded together have executed this instrument this _____ day of _____, 2018 the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACTOR

By: _____

(SEAL)

ATTEST

SURETY

By: _____

(SEAL)

ATTEST

PAYMENT BOND

BOND NO. _____

AMOUNT: \$ _____

KNOW ALL MEN BY THESE PRESENTS, that in accordance with Florida Statutes Section 255.05, _____

with offices at _____

hereinafter called the CONTRACTOR, (Principal), and _____

with offices at _____

a corporation duly organized and existing under and by virtue of the laws of the State of

_____, hereinafter called the SURETY, and authorized to transact business within the State of Florida, as SURETY, are held and firmly bound CITY OF KEY WEST, represented

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

_____ DOLLARS (\$ _____),

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

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT:

WHEREAS, the CONTRACTOR has executed and entered into a certain Contract for _____ attached hereto, with the CITY, dated _____, 2018 to furnish at his own cost, charges, and expense the necessary materials, equipment, and/or labor in strict and express accordance with said Contract and the plans, drawings (if any), and specifications prepared by the CITY, all of which is made a part of said Contract by certain terms and conditions in said Contract more particularly mentioned, which Contract, consisting of the various Contract Documents specifically mentioned herein and relative hereto, is made a part of this Bond as fully and completely as if said Contract Documents were set forth herein.

NOW THEREFORE, the conditions of this obligation are such that if the above bounden CONTRACTOR shall in all respects comply with the terms and conditions of said Contract and his obligation thereunder, including the Contract Documents (which include the plans, drawings, specifications, and conditions prepared by the CITY, invitation to bid, instructions to bidders, the CONTRACTOR'S bid as accepted by the CITY, the bid and contract and payment bonds, and all

addenda, if any, issued prior to the opening of bids), and further that if said CONTRACTOR shall promptly make payments to all persons supplying materials, equipment, and/or labor, used directly or indirectly by said CONTRACTOR or subcontractors in the prosecution of the work for said contract in accordance with Florida Statutes, Section 255.05 or Section 713.23, then this obligation shall be void; otherwise to remain in full force and effect for the term of said contract, including and all guarantee periods as specifically mentioned in said Contract Documents.

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

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

IN WITNESS WHEREOF, the above parties bounded together have executed this instrument

this _____ day of _____, 2018, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative, pursuant to authority of its governing body.

CONTRACTOR

By: _____

(SEAL)

ATTEST

SURETY

By: _____

(SEAL)

ATTEST

PART 3

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DEFINITIONS

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

1. AS APPROVED

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

2. AS SHOWN, AND AS INDICATED

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

3. BIDDER

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

4. CONTRACT DOCUMENTS

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

5. CONTRACTOR

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

6. CONTRACT COMPLETION

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

7. DAYS

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

8. DRAWINGS

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

9. ENGINEER

The person or organization identified as such in the Contract Documents. The Term “ENGINEER” means ENGINEER or his authorized representative.

10. NOTICE

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

11. OR EQUAL

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

12. OWNER

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

13. PLANS (See Drawings)

14. SPECIFICATIONS

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

15. NOTICE TO PROCEED

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

16. SUBSTANTIAL COMPLETION

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

17. WORK

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

mean “furnish and install, complete in-place “.

CONTRACT DOCUMENTS

18. INTENT OF CONTRACT DOCUMENTS

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

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

19. DISCREPANCIES AND OMISSIONS

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

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

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

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

20. CHANGES IN THE WORK

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

In giving instructions, the ENGINEER may order minor changes in the work not involving extra cost and not inconsistent with the purposes of the Project, but otherwise, except in an emergency endangering life and Property, additions or

deductions from the work shall be performed only in pursuance of an approved Change Order from the OWNER, countersigned by the ENGINEER.

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

**21. EXAMINATION AND VERIFICATION
OF CONTRACT DOCUMENTS**

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

**22. DOCUMENTS TO BE KEPT
ON THE JOBSITE**

The CONTRACTOR shall keep one copy of the Contract Documents on the job- site, in good order, available to the ENGINEER and to his representatives.

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

23. ADDITIONAL CONTRACT DOCUMENTS

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

24. OWNERSHIP OF CONTRACT DOCUMENTS

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

THE ENGINEER

25. AUTHORITY OF THE ENGINEER

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

**26. DUTIES AND RESPONSIBILITIES
OF THE ENGINEER**

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

The ENGINEER will make recommendations to the OWNER, in writing, on all claims of the OWNER or the CONTRACTOR arising from interpretation or execution of the Contract Documents. Such recommendations will be of factual and/or technical nature, and will not include the legal interpretation of the Contract Documents. Any necessary legal interpretation of the Contract Document will be made by the OWNER. Such recommendation shall be necessary before the CONTRACTOR can receive additional money under the terms of the Contract. Changes in work ordered by the ENGINEER shall be made in compliance with Article CHANGES IN THE WORK.

One or more Project representatives may be assigned to observe the work. It is understood that such Project representatives shall have the authority to issue notice of nonconformance and make decisions within the limitations of the authority of the ENGINEER. The CONTRACTOR shall furnish all reasonable assistance required by the ENGINEER or Project representatives for Proper observation of the work. The above-mentioned Project representatives shall not relieve the CONTRACTOR of his obligations to conduct comprehensive inspections of the work and to furnish materials and perform acceptable work, and to provide adequate safety Precautions, in conformance with the intent of the Contract.

**27. LIMITATIONS ON ENGINEER'S
RESPONSIBILITIES**

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

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

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

28. REJECTED WORK

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

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

latent defects discovered after the guarantee period.

29. LINES AND GRADES

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

30. SUBMITTALS

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

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

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

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

ENGINEER's review of submittals shall not relieve CONTRACTOR from the responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of submission and ENGINEER has given written approval of each such variation by a specific written notation thereof incorporated therein or accompanying the shop drawing or sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for errors or omissions in the shop drawings or from responsibility for having complied with the Provisions herein.

Where a shop drawing or sample is required by the specifications, any related work performed Prior to ENGINEER's review and approval of the pertinent submission shall be at the sole expense and responsibility of the CONTRACTOR.

31. DETAIL DRAWINGS AND INSTRUCTIONS

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

THE CONTRACTOR AND HIS EMPLOYEES

32. CONTRACTOR, AN INDEPENDENT AGENT

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

32. (a) ASSIGNMENT OF CONTRACT

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

33. SUBCONTRACTING

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

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

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

34. INSURANCE AND LIABILITY

A. GENERAL

The CONTRACTOR shall provide (from insurance companies acceptable to the OWNER) the insurance coverage designated hereinafter and pay all costs before commencing work under this Contract. The CONTRACTOR shall furnish the OWNER with certificates of insurance specified herein showing the type, amount class of operations covered, effective dates, and date of expiration of policies, and containing substantially the following statement:

“The insurance covered by this certificate shall not be canceled or materially altered, except after 30 days' written notice has been received by the OWNER.”

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

B. CONTRACTOR AND SUBCONTRACTOR INSURANCE

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

C. COMPENSATION AND EMPLOYER'S LIABILITY INSURANCE

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

D. GENERAL LIABILITY INSURANCE (INCLUDING AUTOMOBILE)

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

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

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

E. BUILDERS RISK ALL RISK INSURANCE

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

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

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

F. NO PERSONAL LIABILITY OF PUBLIC OFFICIALS

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

liability upon any public official.

35. INDEMNITY

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

36. EXCLUSION OF CONTRACTOR CLAIMS

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

37. TAXES AND CHARGES

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

38. REQUIREMENTS OF STATE LAW FOR PUBLIC WORKS PROJECTS

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

39. CODES, ORDINANCES, PERMITS AND LICENSES

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

40. SUPERINTENDENCE

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

Precautions in connection with the work under Contract.

41. RECEPTION OF ENGINEER'S COMMUNICATIONS

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

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

42. SAFETY

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

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

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

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

43. PROTECTION OF WORK AND PROPERTY

The CONTRACTOR shall at all times safely guard and Protect from damage the OWNER's Property, adjacent Property, and his own work from injury or loss in connection with this Contract. All facilities required for Protection by federal, state, or municipal laws and regulations and local conditions must be provided and maintained.

The CONTRACTOR shall Protect his work and materials from damage due to the nature of the work, the elements, carelessness of other CONTRACTORS, or from any cause whatever until the completion and acceptance of the work. All loss or damages arising out of the nature of the work to be done under these Contract Documents, or from any unforeseen obstruction or defects which may be encountered in the Prosecution of the work, or from the action of the elements, shall be sustained by the CONTRACTOR.

**44. RESPONSIBILITY OF CONTRACTOR
TO ACT IN AN EMERGENCY**

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

45. MATERIALS AND APPLIANCES

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

Unless otherwise specified, all materials shall be new, and both workmanship and materials shall be of good quality. The CONTRACTOR shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

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

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

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

47. SUBSTITUTION OF MATERIALS

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

48. TESTS, SAMPLES, AND OBSERVATIONS

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

The OWNER, ENGINEER, and authorized government agents, and their representatives shall at all times be Provided safe

access to the work wherever it is in Preparation or Progress, and the CONTRACTOR shall Provide facilities for such access and for observations, including maintenance of temporary and permanent access.

If the Specifications, laws, ordinances, or any public authority require any work, to be specially tested or approved, the CONTRACTOR shall give timely notice of its readiness for observations. If any work should be covered up without approval or consent of the ENGINEER, it shall, if required by the ENGINEER, be uncovered for examination at the CONTRACTOR's expense.

Reexamination of questioned work may be ordered by the ENGINEER, and, if so ordered, the work shall be uncovered by the CONTRACTOR. If such work is found to be in accordance with the Contract Documents, the OWNER will pay the cost of uncovering, exposure, observation, inspection, testing and reconstruction. If such work is found to be not in accordance with the Contract Documents, the CONTRACTOR shall correct the defective work, and the cost of reexamination and correction of the defective work shall be paid by the CONTRACTOR.

49. ROYALTIES AND PATENTS

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

50. CONTRACTOR'S RIGHT TO TERMINATE CONTRACT

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

51. CORRECTION OF DEFECTIVE WORK DURING WARRANTY PERIOD

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

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

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

the rejected work removed and replaced, and the CONTRACTOR and his Surety shall be liable for the cost thereof.

PROGRESS OF THE WORK

52. BEGINNING OF THE WORK

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

53. SCHEDULES AND PROGRESS REPORTS

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

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

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

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

54. PROSECUTION OF THE WORK

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

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

55. OWNER'S RIGHT TO RETAIN IMPERFECT WORK

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

56. OWNER'S RIGHT TO DO WORK

Should the CONTRACTOR neglect to Prosecute the work in conformance with the Contract Documents or neglect or refuse at his own cost to remove and replace work rejected by the ENGINEER, then the OWNER may notify the Surety of the condition, and after 10 days' written notice to the CONTRACTOR and the Surety, or without notice if an emergency or danger to the work or public exists, and without Prejudice to any other right which the OWNER may have under Contract, or

otherwise, take over that portion of the work which has been improperly or non-timely executed, and make good the deficiencies and deduct the cost thereof from the payments then or thereafter due the CONTRACTOR.

57. OWNER'S RIGHT TO TRANSFER EMPLOYMENT

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

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

58. DELAYS AND EXTENSION OF TIME

If the CONTRACTOR is delayed in the Progress of the work by any act or neglect of the OWNER or the ENGINEER, or by any separate CONTRACTOR employed by the OWNER, or by strikes, lockouts, fire, adverse weather conditions not reasonably anticipated, or acts of Nature, and if the CONTRACTOR, within 48 hours of the start of the occurrence, gives written notice to the OWNER of the cause of the potential delay and estimate of the possible time extension involved, and within 10 days after the cause of the delay has been remedied, the CONTRACTOR gives written notice to the OWNER of any actual time extension requested as a result of the aforementioned occurrence, then the Contract time may be extended by change order for such reasonable time as the ENGINEER determines. It is agreed that no claim shall be made or allowed for any damages, loss, or expense which may arise out of any delay caused by the above referenced acts or occurrences other than claims for the appropriate extension of time. No extension of time will be granted to the CONTRACTOR for delays occurring to parts of the work that have no measurable impact on the completion of the total work under this Contract. No extension of time will be considered for weather conditions reasonably anticipated for the area in which the work is being performed. Reasonably anticipated weather conditions will be based on official records of monthly Precipitation and other historical data. Adverse weather conditions, if determined to be of a severity that would impact Progress of the work, may be considered as cause for an extension of Contract completion time.

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

59. DIFFERING SITE CONDITIONS

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

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

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

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

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

60. LIQUIDATED DAMAGES

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

61. OTHER CONTRACTS

The OWNER reserves the right to let other Contracts in connection with the work. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their work and shall properly connect and coordinate his work with theirs.

If any part of the work under this Contract depends for Proper execution or results upon the work of any other CONTRACTOR, utility service company or OWNER, the CONTRACTOR shall inspect and Promptly report to the ENGINEER in writing any patent or apparent defects to deficiencies in such work that render it unsuitable for such Proper execution and results. The CONTRACTOR's failure to so report shall constitute and acceptance of the work by others as being fit and Proper for integration with work under this Contract, except for latent or non-apparent defects and deficiencies in the work.

62. USE OF PREMISES

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

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

63. SUBSTANTIAL COMPLETION DATE

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

64. PERFORMANCE TESTING

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

65. OWNER'S USE OF PORTIONS OF THE WORK

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

66. CUTTING AND PATCHING

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

67. CLEANING UP

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

PAYMENT

68. PAYMENT FOR CHANGE ORDERS

The OWNER's request for quotations on alterations to the work shall not be considered authorization to proceed with the work expediting, delivery, and installation of all equipment and materials. Within a reasonable period after the

CONTRACTOR submits to the OWNER a written request for an extension of time, the ENGINEER will Present his written opinion to the OWNER as to whether an extension of time is justified, and, if so, his recommendation as to the number of days for time extension. The OWNER will make the final decision on all requests for extension of time.

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

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

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

A. UNIT PRICES

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

B. LUMP SUM

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

C. COST REIMBURSEMENT WORK

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

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

1. Labor including foremen for those hours they are assigned and participating in the cost reimbursement work (actual payroll cost, including wages, fringe benefits as established by negotiated labor agreements, labor insurance, and labor taxes as established by law). No other fixed labor burdens will be considered, unless approved in writing by the OWNER.
2. Material delivered and used on the designated work, including sales tax, if paid by the CONTRACTOR or his SUBCONTRACTOR.
3. Rental or equivalent rental cost of equipment, including necessary transportation for items having a value in excess of \$100. Rental or equivalent rental cost will be allowed for only those days or hours during which the equipment is in actual use. Rental and transportation allowances shall not exceed the current rental rates prevailing in the locality. The rentals allowed for equipment will, in all cases, be understood to cover all fuel, supplies,

repairs, and renewals, and no further allowances will be made for those items, unless specific agreement to that effect is made.

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

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

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

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

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

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

69. PARTIAL PAYMENTS

A. GENERAL

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

B. ESTIMATE

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

ENGINEER will, within 7 days after receipt of each request for payment, either indicate in writing a recommendation of

payment and present the request to OWNER, or return the request to CONTRACTOR indicating in writing ENGINEER's reasons for refusing to recommend payment. In the latter case, CONTRACTOR may, within 7 days, make the necessary corrections and resubmit the request.

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

1. The work is defective, or completed work has been damaged requiring correction or replacement;
2. Written claims have been made against OWNER or Liens have been filed in connection with the work;
3. The Contract Price has been reduced because of Change Orders;
4. OWNER has been required to correct defective work or complete the work in accordance with Article OWNER'S RIGHT TO DO WORK;
5. Of CONTRACTOR's unsatisfactory Prosecution of the work in accordance with the Contract Documents; or
6. CONTRACTOR's failure to make payment to SUBCONTRACTORS or for labor, materials, or equipment.

C. DEDUCTION FROM ESTIMATE

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

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

D. QUALIFICATION FOR PARTIAL PAYMENT FOR MATERIALS DELIVERED

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

1. Materials, as used herein, shall be considered to be those items which are fabricated and manufactured material and equipment. No consideration shall be given to individual purchases of less than \$200 for any one item.
2. To receive partial payment for materials delivered to the site, but not incorporated in the work, it shall be necessary for the CONTRACTOR to include a list of such materials on the Partial Payment Request. At his sole discretion, the ENGINEER may approve items for which partial payment is to be made. Partial payment shall be based on the CONTRACTOR's actual cost for the materials as evidenced by invoices from the supplier. Proper storage and Protection shall be provided by the CONTRACTOR, and as approved by the ENGINEER. Final payment shall be made only for materials actually incorporated in the work and, upon acceptance of the work, all materials remaining for which advance payments had been made shall revert to the CONTRACTOR, unless otherwise agreed, and

partial payments made for these items shall be deducted from the final payment for the work.

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

E. PAYMENT

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

70. CLAIMS FOR EXTRA WORK

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

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

71. RELEASE OF LIENS OR CLAIMS

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

72. FINAL PAYMENT

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

73. NO WAIVER OF RIGHTS

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

**74. ACCEPTANCE OF FINAL PAYMENT
CONSTITUTES RELEASE**

The acceptance by the CONTRACTOR of the final payment shall release the OWNER and the ENGINEER, as representatives of the OWNER, from all claims and all liability to the CONTRACTOR for all things done or furnished in connection with the work, and every act of the OWNER and others relating to or arising out of the work except claims Previously made in writing and still unsettled. No payment, however, final or otherwise, shall operate to release the CONTRACTOR or his Sureties from obligations under this Contract and the Performance Bond, Payment Bond, and other bonds and warranties, as herein provided.

SUPPLEMENTARY CONDITIONS

REVISIONS AND ADDITIONS TO THE GENERAL CONDITIONS

The General Conditions are hereby revised as follows:

ARTICLE 9 "ENGINEER"

Add the following:

Wherever in these Documents the word "Engineer" appears, it shall be understood to mean the Owner's representative, Tetra Tech, Inc, overseeing the project for the City.

ARTICLE 34 "INSURANCE & LIABILITY"

Delete Article 34 "INSURANCE & LIABILITY" (A), (B), (C), and (D) in their entirety and substitute the following:

Contractor shall maintain limits no less than those stated below:

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

Auto Liability	\$1,000,000	Combined Single Limit
General Liability	\$2,000,000	Aggregate (Per Project)
	\$2,000,000	Products Aggregate
	\$1,000,000	Any One Occurrence
	\$1,000,000	Personal Injury
	\$ 300,000	Fire Damage/Legal
Professional Liability	\$2,000,000	Per Claim / Aggregate
Additional Umbrella Liability	\$2,000,000	Occurrence / Aggregate
Watercraft Liability	\$1,000,000	
Jones Act	\$1,000,000	
US Longshore and Harbor (USL&H)	\$1,000,000	

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

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

Bodily Injury Each Accident	\$1,000,000
Bodily Injury by Disease Each Employee	\$1,000,000
Bodily Injury by Disease Policy Limit	\$1,000,000

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

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

CONTRACTOR will comply with any and all safety regulations required by any agency or regulatory body including but not limited to OSHA. CONTRACTOR will notify City of Key West immediately by telephone at (305) 809-3963 any accident or injury to anyone that occurs on the jobsite and is related to any of the work being performed by the CONTRACTOR.

Add the following Article:

G. SURETY AND INSURER QUALIFICATIONS

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

ARTICLE 35 "INDEMNITY"

Delete Article 35 "INDEMNITY" in its entirety and substitute the following:

INDEMNITY

To the fullest extent permitted by law, the CONTRACTOR expressly agrees to indemnify and hold harmless the City of Key West, their officers, directors, agents, and employees (herein called the "indemnitees") from liabilities, damages, losses and costs, including, but not limited to, reasonable attorney's fees and court costs, such legal expenses to include costs incurred in establishing the indemnification and other rights agreed to in this Paragraph, to persons or property, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the CONTRACTOR, its Subcontractors or persons employed or utilized by them in the performance of the Contract. Claims by indemnitees for indemnification shall be limited to the amount of CONTRACTOR's insurance or \$1 million

per occurrence, whichever is greater. The parties acknowledge that the amount of the indemnity required hereunder bears a reasonable commercial relationship to the Contract and it is part of the project specifications or the bid documents, if any.

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

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

Add the following:

A. PERMIT FOR WORK WITHIN THE FEDERAL, COUNTY, AND/OR STATE RIGHTS-OF-WAY

The Contractor will obtain from the county and/or state the necessary permit for work within the rights-of-way. The Contractor shall abide by all regulations and conditions stipulated in the permits, and such conditions and requirements are hereby made a part of these Supplementary Conditions, as fully and completely as though the same were fully set forth herein.

The Contractor shall prepare, submit, and have approved at his expense traffic maintenance plans required by federal, state, county, and local agencies having jurisdiction.

B. PERMIT FOR WORK WITHIN LOCAL RIGHTS-OF-WAY

The Contractor shall obtain from the City of Key West the necessary permits for work within the rights-of-way. The Contractor shall abide by all regulations and conditions, including maintenance of traffic.

C. NOISE ORDINANCE

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

D. "LICENSES"

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

2. Further, the successful Bidder must, within 10 days of Notice of Award, furnish documentation showing that, as a minimum, he has complied with the provisions of Chapter 18 of the Code of Ordinances of the City of Key West in order to enter into the Agreement contained in the Contract Documents.
3. Specifically, within 10 days after Notice of Award, the successful Bidder must demonstrate that he holds, as a minimum, the following licenses and certificates:
 - a. Possess a City of Key West Business Tax Receipt

OR,

 - b. Be registered in the City of Key West building system.

E. WORK DURING HOLIDAYS

There shall be no work during City Holidays, State Holidays and National Holidays. Any construction operations during these days shall be approved by the City of Key West.

ARTICLE 40 "SUPERINTENDENCE"

Add the following sub article:

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

ARTICLE 42 "SAFETY"

Add the following sub article:

OCCUPATIONAL SAFETY AND HEALTH

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

ARTICLE 57 "OWNERS RIGHT TO TRANSFER EMPLOYMENT"

Add the following Article:

TERMINATION FOR CONVENIENCE AND RIGHT OF SUSPENSION

- A. Owner shall have the right to terminate this Contract without cause by written notice of Termination to the Contractor. In the event of such termination for convenience, the

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

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

ARTICLE 60 "LIQUIDATED DAMAGES"

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

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

ARTICLE 68 "PAYMENT FOR CHANGE ORDERS"

Add the following paragraphs

If not initially included in the original construction agreement, Change Orders will be implemented subject to approval by the City Commission.

Payment for subcontractors, materials and equipment authorized by the Owner in a written Change Order but not listed in the above Proposal will be provided at the supplier's invoice plus 10 %.

ARTICLE 69 "PARTIAL PAYMENTS"

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

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

Sub Article C. "DEDUCTION FROM ESTIMATE

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

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

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

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

ARTICLE 72 "FINAL PAYMENT"

Add the following;

A. Acceptance and Final Payment

Whenever the Contractor has completely performed the work provided for under the Contract and the Engineer has performed a final inspection and made final acceptance and subject to the terms of the Engineer will prepare a final estimate showing the value of the work as soon as the Engineer makes the necessary measurements and computations. The Engineer will correct all prior estimates and payments in the final estimate and payment. The OWNER will pay the estimate, less any sums that the OWNER may have deducted or retained under the provisions of the Contract, as soon as practicable after final acceptance of the work, provided the Contractor has met the requirements of (1) through (6) below.

- 1 The Contractor has agreed in writing to accept the balance due or refund the overpayment, as determined by the OWNER, as full settlement of his account under the Contract and of all claims in connection therewith, or the Contractor, accepted the balance due or refunded the overpayment, as determined by the OWNER, with the stipulation that his acceptance of such payment or the making of such refund does not constitute any bar, admission, or estoppel, or have any effect as to those payments in dispute or the subject of a pending claim between the Contractor and the OWNER. To

receive payment based on a FINAL PAYMENT CERTIFICATE, The Contractor further agrees, by submitting a FINAL PAYMENT CERTIFICATE that any pending or future arbitration claim or suit is limited to those particulars, including the itemized amounts, defined in the original FINAL PAYMENT CERTIFICATE , and that he will commence with any such arbitration claim or suit within 15 calendar days from and after the time of final PAYMENT of the work and that his failure to file a formal claim within this period constitutes his full acceptance of the Engineer's final estimate and payment. The overpayment refund check from the Contractor, if required, will be considered a part of any Acceptance Letter executed.

- 2 The Contractor has properly maintained the project, as specified hereinbefore.
- 3 The Contractor has furnished a sworn affidavit to the effect that the Contractor has paid all bills and no suits are pending (other than those exceptions listed, if any) in connection with work performed under the Contract and that the Contractor has not offered or made any gift or gratuity to, or made any financial transaction of any nature with, any employee of the OWNER in the performance of the Contract.
- 4 The surety on the contract bond consents, by completion of their portion of the affidavit and surety release subsequent to the Contractor's completion of his portion, to final payment to the Contractor and agrees that the making of such payment does not relieve the surety of any of its obligations under the bond.
- 5 The Contractor has furnished all required sand quality tests and analysis reports to the Engineer.
- 6 Final payment will not be released until the Owner receives verification from the Engineer that all work has been completed in accordance with the attached drawings and permits.

ADD ARTICLE 75 "RESPONSIBILITY OF CONTRACTOR TO ACT IN AN EMERGENCY"

- A. The city shall pay no additional compensation for hurricane and or any other acts of nature.
- B. **CLEANUP PROCEDURES FOR HURRICANE WARNINGS AND HURRICANE WATCH.** In the event the owner or National Oceanographic and Atmospheric Administration (NOAA) issues a Tropical Storm Watch or a Hurricane Watch for the Keys, the Engineer will contact the Contractor informing him that the Watch has been established. Within four (4) hours of the notice the Contractor shall provide the Engineer with a written plan and schedule describing how and when the Contractor will remove all unnecessary items from the work area and tie down all necessary supplies and barricades in the event a Tropical Storm Warning or a Hurricane Warning is issued. The Contractor shall remove all unnecessary items from work areas and shall tie down all movable objects (under 200 lbs.) The Engineer will determine "necessary" items. The Owner shall not be liable for any financial hardship or delays caused as a result of demobilization or remobilization of work due to the above.

ADD ARTICLE 76 "CITY OF KEY WEST LICENSES, PERMITS AND FEES"

- A. Pursuant to the Public Proposal Disclosure Act, there are a number of licenses, permits, and/or fees a Contractor REQUIRED BY THE CITY OF KEY WEST before or during construction by virtue of this construction as part of the Contract. **Payment of these licenses, permits and/or fees is the responsibility of the Contractor unless specifically excluded.** The Contractor shall verify each required license, permit, or fee before submitting the Proposal.

FEDERAL REQUIREMENTS

The following Federal requirements are incorporated into this Proposal

- A. ACCESS BY THE GRANTEE, SUB GRANTEE, FEDERAL GRANTOR AGENCY AND COMPTROLLER GENERAL: The CONTRACTOR shall allow access by the grantee, sub grantee, Federal grantor agency and Comptroller General of the United States, or any of their duly authorized representatives to any books, documents, papers, and records of the CONTRACTOR which are directly pertinent to that specific contract for the purpose of making audit, examination, excerpts and transcriptions.
- B. COPYRIGHTS: The Grantee is free to copyright original work developed in the course of or under the agreement. FEMA reserves a royalty-free, nonexclusive and irrevocable right to reproduce, publish, or otherwise use, and to authorize others to use the work for Government purposes. Publication resulting from work performed under this agreement shall include an acknowledgement of FEMA financial support, by granted number, and a statement that the publication does not constitute an endorsement by FEMA or reflect FEMA views.
- C. DISADVANTAGED BUSINESS ENTERPRISES (DBE) CONTRACTORS: The CONTRACTOR agrees to ensure that Disadvantage Business Enterprises as defined in 49 C.F.R. Part 23, as amended, have the maximum opportunity to participate in the performance of contracts and this agreement. In this regard, CONTRACTOR shall take all necessary and reasonable steps in accordance with 49 C.F.R. Part 23, as amended, to ensure that the Disadvantaged Business Enterprises have the maximum opportunity to compete for and perform contracts. The CONTRACTOR shall not discriminate on the basis of race, color, national origin or sex in the award and performance of federal assisted contracts.
- D. ENERGY POLICY AND CONSERVATION ACT: The CONTRACTOR shall comply with mandatory standards and policies relating to energy efficiency which are contained in the state energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub. L. 94-163).
- E. EQUAL EMPLOYMENT OPPORTUNITY:

During the performance of this contract, the CONTRACTOR agrees as follows:

- i. The CONTRACTOR will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The CONTRACTOR will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, or national origin. Such action shall include, but not be limited to the

following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The CONTRACTOR agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.

- ii. The CONTRACTOR will, in all solicitations or advertisements for employees placed by or on behalf of the CONTRACTOR, state that all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, or national origin.
- iii. The CONTRACTOR will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the CONTRACTOR's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- iv. The CONTRACTOR will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
- v. The CONTRACTOR will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.
- vi. In the event of the CONTRACTOR's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part and the CONTRACTOR may be declared ineligible for further Government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions as may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.
- vii. The CONTRACTOR will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (i) through (vii) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The CONTRACTOR will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, That in the event a CONTRACTOR becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction by the administering agency the CONTRACTOR may request the United States to enter into such litigation to protect the interests of the United States.

- viii. CONTRACTOR shall:
1. Place qualified small and minority businesses and women's business enterprises on solicitation lists.
 2. Assure that small and minority businesses and women's business enterprises are solicited whenever they are potential sources.
 3. Divide work, when economically feasible, into smaller tasks to permit maximum participation by small and minority businesses, and women's business enterprises.
 4. Establish delivery schedules, where the requirement permits, which encourage participation by small and minority businesses, and women's business enterprises.
 5. Provide documentation of compliance with 1-4 above.

F. CONTRACT WORK HOURS AND SAFETY STANDARDS ACT COMPLIANCE

- i. Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.
- ii. Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States, for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.
- iii. Withholding for unpaid wages and liquidated damages. The Federal Emergency Management Agency (FEMA) shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.
- iv. Subcontracts. The CONTRACTOR Or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or

lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.”

G. CLEAN AIR ACT

- i. The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.

The contractor agrees to report each violation to the City of Key West and understands and agrees that the City of Key West will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

The contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by FEMA.

H. FEDERAL WATER POLLUTION CONTROL ACT

The contractor agrees to comply with all applicable standards, orders or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. 1251 et seq.

The contractor agrees to report each violation to the City of Key West and understands and agrees that the City of Key West will, in turn, report each violation as required to assure notification to the Federal Emergency Management Agency, and the appropriate Environmental Protection Agency Regional Office.

The contractor agrees to include these requirements in each subcontract exceeding \$150,000 financed in whole or in part with Federal assistance provided by FEMA.

I. DEBARMENT AND SUSPENSION:

- i. This contract is a covered transaction for purposes of 2 C.F.R. pt.180 and 2 C.F.R. pt. 3000. As such the CONTRACTOR is required to verify that none of the CONTRACTOR, its principals (defined at 2 C.F.R. § 180.995), or its affiliates (defined at 2 C.F.R. § 180.905) are excluded (defined at 2 C.F.R.§ 180.940) or disqualified (defined at 2 C.F.R. § 180.935).
- ii. The CONTRACTOR must comply with 2 C.F.R. pt. 180, subpart C and 2C.F.R. part 3000, subpart C and must include a requirement to comply with these regulations in any lower tier covered transaction it enters into.
- iii. This certification is a material representation of fact relied upon by (insert name of subrecipient). If it is later determined that the CONTRACTOR did not comply with 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C, in addition to remedies available to (name of state agency serving as recipient and name of subrecipient), the Federal Government may pursue available remedies, including but not limited to suspension and/or debarment.

- iv. The bidder or proposer agrees to comply with the requirements of 2 C.F.R. pt. 180, subpart C and 2 C.F.R. pt. 3000, subpart C while this offer is valid and throughout the period of any contract that may arise from this offer. The bidder or proposer further agrees to include a provision requiring such compliance in its lower tier covered transactions.

J. BYRD ANTI-LOBBYING AMENDMENT,

Byrd Anti-Lobbying Amendment, 31 U.S.C. § 1352 (as amended)

- i. Contractors who apply or bid for an award of \$100,000 or more shall file the required certification. Each tier certifies to the tier above that it will not and has not used Federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any Federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-Federal funds that takes place in connection with obtaining any Federal award. Such disclosures are forwarded from tier to tier up to the recipient.
- ii. Attach Certification for Contracts, Grants, Loans, and Cooperative Agreements submitted with bid if exceeding \$100,000 using the form on page 33 of this document.

K. PROCUREMENT OF RECOVERED MATERIALS

- i. In the performance of this contract, the CONTRACTOR shall make maximum use of products containing recovered materials that are EPA- designated items unless the product cannot be acquired-
 - (i) Competitively within a timeframe providing for compliance with the contract performance schedule;
 - (ii) Meeting contract performance requirements; or
 - (iii) At a reasonable price.
- ii. Information about this requirement, along with the list of EPA- designate items, is available at EPA's Comprehensive Procurement Guidelines web site, <https://www.epa.gov/smm/comprehensive-procurement-guideline-cpg-program>.”

L. RETENTION OF ALL RECORDS: The CONTRACTOR is required to retain all records for seven (7) years after grantees or sub grantees make final payments and all other pending matters are closed.

M. ADDITIONAL FEDERAL REQUIREMENTS

- i. **REMEDIES** – In the event of a breach by CONTRACTOR of the terms and conditions of this Agreement CITY shall be entitled to recover any and all monetary damages arising therefrom including the recovery of reasonable attorney fees at all trial and appellate levels.
- ii. **ACCESS TO RECORDS**

1. The CONTRACTOR agrees to provide the City of Key West, (City Manager), the FEMA Administrator, the Comptroller General of the United States, or any of their authorized representatives access to any books, documents, papers, and records of the CONTRACTOR which are directly pertinent to this contract for the purposes of making audits, examinations, excerpts, and transcriptions.
 2. The CONTRACTOR agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.
 3. The CONTRACTOR agrees to provide the FEMA Administrator or his authorized representatives access to construction or other work sites pertaining to the work being completed under the contract.
- iii. DHS SEAL, LOGO AND FLAGS: the CONTRACTOR shall not use the DHS seal(s), logos, crests, or reproductions of flags or likenesses of DHS agency officials without specific FEMA pre- approval.
- iv. COMPLIANCE WITH FEDERAL LAW, REGULATIONS AND EXECUTIVE ORDERS: The CONTRACTOR will comply will all applicable federal law, regulations, executive orders, FEMA policies, procedures, and directives.
- v. NO OBLIGATION: The Federal Government is not a party to this contract and is not subject to any obligations or liabilities to the non-Federal entity, CONTRACTOR, or any other party pertaining to any matter resulting from the contract.
- vi. FRAUD AND FALSE OR FRAUDULENT OR RELATED ACTS: The CONTRACTOR acknowledges that 31 U.S.C. Chap. 38 (Administrative Remedies for False Claims and Statements) applies to the CONTRACTOR's actions pertaining to this contract.

PART 4

ENGINEERING DESIGN STANDARDS

4. Engineering Design Standards



ENGINEERING DESIGN STANDARDS

KEY WEST AQUARIUM SEAWALL REPLACEMENT

PROJECT ID: HU1701E01

KEY WEST, FLORIDA

TECHNICAL SPECIFICATIONS

07/30/18



Tetra Tech, Inc.
759 South Federal Highway, Suite 314
Stuart, Florida 34994
Phone: (772) 781-3400
Fax: (772) 781-3411
Cert. of Authorization: 2429

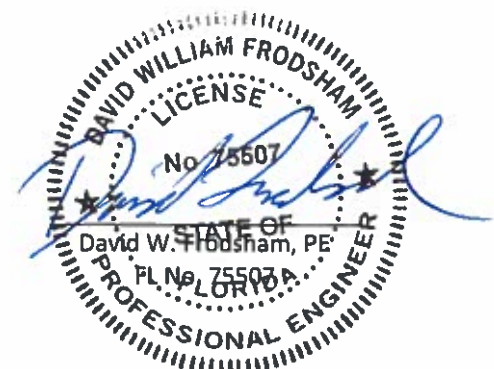


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SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

1.1.1 Project Information and Description of Work

The work includes the furnishing of all materials, equipment, and labor needed for the installation of approximately 185 LF of steel cantilever sheetpile seawall with approximately 177 LF (~21.5 CY) of reinforced concrete cap and all incidental work necessary to provide a complete and serviceable project including restoration of the project site after construction is complete. Sheets shall be DZ-95, ASTM A690 Gr 50 for the western 105 LF and EZ-95 ASTM A690 Gr 50 for the eastern 80 LF. Each DZ-95 sheet shall be a minimum of 40 feet long, and will constitute the western portion of the seawall. Each EZ-95 ASTM A690 Gr 50 sheet shall be a minimum of 30 feet long, which will constitute the eastern portion of the seawall. The top of the concrete cap shall be set at a continuous elevation of +5.0' NAVD-88, with the exception of the bridge connection which will need to be modified to provide an ADA accessible walkway. Elsewhere along the project the adjacent upland grade shall be set at +4.5' NAVD-88 with no steeper than a 4:1 slope back to existing elevations. The steel sheetpile will be set in straight line segments with the horizontal location of the sheetpile placed no more than 3 feet waterward of the existing seawall, in conformance with the layout provided on the plan set and the FDEP permit.

A summary of the contractor's anticipated activities involved with this project include, but are not limited to the following:

- a. Obtaining all necessary permits
- b. Submittal of shop drawings
- c. Preparation and maintenance of a submittal register
- d. Field staking the sheetpile alignment and obtaining City/Engineer approval prior to initiating site preparation activities
- e. Preconstruction video surveys of all buildings, internal and external, within a 50 LF radius of proposed driving activities
- f. Securing site and staging area(s): Includes the installation of barriers/fencing/signs to keep pedestrians safely out of the construction site, and the installation of sediment and turbidity barriers to keep construction debris within the construction zone
- g. Maintenance of traffic to access Mallory Square by land, and for access by sea in coordination with the Cruise schedule
- h. Temporary removal and storage of the northern portion of the wooden pedestrian bridge as a single span in accordance with the design plans and specifications by Artibus Engineering
- i. Removal and temporary stockpiling of wood pilings to facilitate barge access
- j. Installation and continuous maintenance of NPDES BMPs throughout construction
- k. Temporary relocation of rubble riprap to facilitate sheet pile installation
- l. Demolition and disposal of ~20 LF of corroded sheetpiling
- m. Demolition and disposal of ~30 LF of collapsed native stone seawall

- n. Vibration monitoring of adjacent buildings within 50 LF radius of driving activities during all driving activities
- o. Driving of sheetpile along the staked alignment approved by the City/Engineer
- p. Extension of all utility penetrations through the new seawall with similar materials and City/Engineer approved unions/connections
- q. Filling void between steel sheetpile and existing seawall with approved fill material & filter fabric
- r. Construction of two closure pours at the ends of the seawall, including repairs at the west end to close off soil migration from the adjacent uplands
- s. Forming, placing reinforcement, and casting new concrete seawall cap
- t. Installation of temporarily stockpiled wood pilings, removed previously to facilitate construction access
- u. Replacement/Construction of the north section of the pedestrian bridge, in conformance with the Artibus plans and specifications.
- v. Restoration of all site areas utilized by the Contractor to equal or better condition
- w. Maintenance of as-built records and submittal of as-built survey.

1.1.2 Location

The work is located at the KEY WEST AQUARIUM along the north wall of the aquarium basin, to the south end of Mallory Square. The address is 1 Whitehead Street, Key West, FL 33040.

1.1.1 Project Information and Description of Work

Several unique considerations for the project need to be accounted for in the bids and proposed construction methods of the prospective contractor(s) in order to ensure a successful project. No additional payment beyond the awarded bid shall be made to the contractor for failure to be aware of and account for these or other constraints of the project. These include, but are not limited to the following:

- a. Bridge Removal & Replacement
 - a. The northern portion of the pedestrian bridge is intended to be removed as a single span, stored, and replaced in the same footprint with some modifications to the north end to account for the proposed seawall. For more information related to this effort, please refer to the plans and specifications provided by Artibus Engineering.
- b. Site Access
 - a. Once the bridge section is removed, there is an approximately 35' wide access path between the concrete bridge support structures for access to the aquarium basin. It is envisioned that the contractor will be able to access through this path with segmental barges without needing to demolish or otherwise alter the concrete bridge support structures. Any deviation from that intent will need to be accounted for in the proposer's bid and approved by the City/Engineer.
 - b. A monopile exists at the entrance to the basin which serves the nearby mooring cruise ships, and is to remain undisturbed throughout construction.
 - c. The contractor shall be aware of the cruise ship mooring area to the south of the site, the cruise ship schedule, and shall make any accommodation necessary to not interfere with that schedule or otherwise impact the cruise ship operations.

- d. A pathway exists to the east of the two-story building at the eastern end of the project which may be blocked due to the presence of aquarium related equipment and should not be relied upon as an access route for material delivery or storage.
- c. Presence of Historical Structures
 - a. Several of the structures adjacent to the Key West Aquarium Basin are designated as historical structures, including the cable huts, the two-story building to their east, and the Aquarium building itself.
 - b. Pre-construction and Post-construction video surveys as well as seismic monitoring during driving activities are included as part of this project to record and monitor the condition and potential for adverse impacts to these structures as a result of construction activity.
 - c. Should the seismic monitoring or other procedures reveal any adverse impacts or potential of the same to these structures as a result of construction activities, the contractor shall adjust his means and methods as necessary to reduce vibratory impacts to a level that will not adversely affect these structures.
- d. Coordination with Aquarium
 - a. The contractor shall be aware of the presence of marine life within the basin. The Key West Aquarium Basin is host to several species of marine life which serve as exhibits and may include some species of sharks. Prior to construction, the aquarium shall be responsible for the temporary relocation of any exhibit sharks for the duration of construction. The contractor shall coordinate with the aquarium as required to minimize any impacts to the aquarium's operations.
 - b. Any wooden pilings, decking, or other aquarium feature that is temporarily relocated for the construction of the seawall shall be replaced in the same location wherever possible. The contractor shall assume the replacement of the piling with a new piling in the bid.
 - c. The contractor shall be aware of the location of the aquarium's well system, located to the east of the two-story building, and shall not adversely impact that system. No excavation shall occur in the vicinity of this well system.
- e. Timber Pilings
 - a. A number of timber pilings will need to be removed from within the basin to allow the contractor's barge sufficient space to complete the project.
 - b. The contractor is expected to bid the project to remove and replace any timber piling removed with a new piling, 40' in length, embedded to approximately (-)33 ft NGVD29.
 - c. In the event that any timber pilings removed are found, in the opinion of the CITY or ENGINEER to be in good condition and salvageable, the contractor shall reuse the timber pilings and provide the City with a credit.
 - d. Pilings shall not be cutoff unless as directed by the City.

1.2 OCCUPANCY OF PREMISES

Building(s) will be occupied during performance of work under this Contract.

Before work is started, arrange with the City of Key West to provide a sequence of construction, means of access, space for storage of materials and equipment, and use of roads, parking, and all other facilities that will be impacted by the work and provide this plan at the pre-construction meeting.

1.3 LOCATION OF UNDERGROUND UTILITIES

Obtain digging permits prior to start of excavation, and comply with Installation requirements for locating and marking underground utilities. Contact local utility locating service a minimum of 48 hours prior to excavating, to mark utilities, and within sufficient time required if work occurs on a Monday or after a Holiday. Verify existing utility locations indicated on contract drawings, within area of work.

Identify and mark all other utilities not managed and located by the local utility companies. It will be up to the contractor to field verify the elevations of existing wall, docks, piping, utilities, and any type of underground obstruction not indicated, or specified to be removed. Verify elevations before installing new work closer than nearest manhole or other structure at which an adjustment in grade can be made. Existing drains and other services that currently extend through the existing concrete wall shall be maintained, extended through the new wall, and reconnected as necessary.

1.3.1 Notification Prior to Excavation

Notify the CITY at least 48 hours prior to starting excavation work.

1.4 SALVAGE MATERIAL AND EQUIPMENT

CONTRACTOR responsible for collection, storage and disposal of all demolished materials at approved location off-site. No debris shall be buried anywhere on the project site.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 33 00

**SUBMITTAL PROCEDURES
05/11**

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 Submittal Descriptions (SD)

Submittals requirements are specified in the technical sections. Submittals are identified by Submittal Description (SD) numbers and titles as follows:

SD-01 Preconstruction Submittals

Submittals which are required prior to construction:

- Certificates of insurance
- Surety bonds
- List of proposed subcontractors
- List of proposed products
- Construction progress schedule
- Submittal register
- Schedule of prices or Earned Value Report
- Health and safety plan
- Work plan
- Quality control(QC) plan
- Environmental protection plan
- Hurricane Preparedness Plan

Plans submitted may be in written (paragraph) or graphical (drawing) form depending on the needs of the City's Representative. Plans written in paragraph form shall be detailed enough to adequately describe the plan of action for the work item. Plans and shop drawings prepared in graphical form shall be clear, concise and drawn to scale if possible. Drawings not drawn to scale shall be clearly identified as such. All drawings shall use the same elevation data provided on the design build (RFP) drawings.

SD-02 Shop Drawings

Shop drawings are defined as drawings, diagrams and schedules specifically prepared to illustrate some portion of the work. The shop drawings for the steel sheet pile selection, the concrete cap mix design, & timber pile installation will all need to be signed and sealed by a Professional Engineer registered in the State of Florida and submitted to the CITY and the City's Representative for approval.

Diagrams and instructions from a manufacturer or fabricator for use in producing the product and as aids to the Contractor for integrating the product or system in the project do not need to be signed and sealed as described above but should be included as a reference.

Drawings prepared by or for the Contractor to show how multiple systems and interdisciplinary work will interact with one another shall be coordinated with the CITY and/or its representatives as necessary.

SD-03 Product Data

Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for some portion of the work.

Samples of warranty language when the contract requires extended product warranties.

SD-04 Samples

Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged.

Color samples from the manufacturer's standard line (or custom color samples if specified) to be used in selecting or approving colors for the project.

Field samples and mock-ups constructed on the project site establish standards by which the ensuing work can be judged. Includes assemblies or portions of assemblies which are to be incorporated into the project and those which will be removed at conclusion of the work.

SD-05 Design Data

Design calculations, mix designs, analyses or other data pertaining to a part of work.

SD-06 Manufacturer's Instructions

Preprinted material describing installation of a product, system or material, including special notices and (MSDS) concerning impedances, hazards and safety precautions.

SD-07 Operation and Maintenance Data

Data that is furnished by the manufacturer, or the system provider, to the equipment operating and maintenance personnel, including manufacturer's help and product line documentation necessary to maintain and install equipment. This data is needed by operating and maintenance personnel for the safe and efficient operation, maintenance and repair of the item.

This data is intended to be incorporated in an operations and maintenance manual or control system.

SD-08 Closeout Submittals

Documentation to record compliance with technical or administrative requirements or to establish an administrative mechanism.

Submittals required for Guiding Principle Validation (GPV) or Third Party Certification (TPC).

Special requirements necessary to properly close out a construction contract. For example, Record Drawings and as-built drawings. Also, submittal requirements necessary to properly close out a major phase of construction on a multi-phase contract. Record drawings shall identify any plan deviations made through the course of construction as well as elevations of the seawall cap and adjacent grades

1.1.2 Approving Authority

Office or designated person authorized to approve submittals is the City of Key West Engineering Department and/ or the City's Representative.

1.1.3 Work

As used in this section, on- and off-site construction required by contract documents, including labor necessary to produce submittals, construction, materials, products, equipment, and systems incorporated or to be incorporated in such construction.

1.2 SUBMITTALS

CITY approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with this section.

SD-01 Preconstruction Submittals

Submittal Register; G

1.3 SUBMITTAL CLASSIFICATION

Submittals are classified as follows:

1.3.1 CITY Approved (G)

Within the terms of the Contract Clause SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION, they are considered to be "shop drawings."

1.4 PREPARATION

1.4.1 Source Drawings for Shop Drawings

The entire set of Source Drawing files (DWG) will not be provided to the Contractor. Only those requested by the Contractor to prepare shop drawings will be provided. Request the specific Drawing

Number only for the preparation of Shop Drawings. These drawings will only be provided after award.

1.4.1.1 Terms and Conditions

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the CITY. The Contractor must make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the CITY, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the CITY harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic Source Drawing files are not construction documents. Differences may exist between the Source Drawing files and the corresponding construction documents. The CITY makes no representation regarding the accuracy or completeness of the electronic Source Drawing files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the furnished Source Drawing files provided by the CITY and the signed and sealed construction provided by the EOR, the EORs' documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. If the Contractor uses, duplicates or modifies these electronic Source Drawing files for use in producing construction data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

1.5 INFORMATION ONLY SUBMITTALS

Normally submittals for information only will not be returned. Approval of the CITY is not required on information only submittals. The CITY reserves the right to require the Contractor to resubmit any item found not to comply with the contract. This does not relieve the Contractor from the obligation to furnish material conforming to the plans and specifications; will not prevent the CITY from requiring removal and replacement of nonconforming material incorporated in the work; and does not relieve the Contractor of the requirement to furnish samples for testing by the CITY laboratory or for check testing by the CITY in those instances where the technical specifications so prescribe.

1.6 SUBMITTAL REGISTER

Prepare and maintain submittal register, as the work progresses. Do not change data which is output in columns (c), (d), (e), and (f) as delivered by CITY; retain data which is output in columns (a), (g), (h), and (i) as approved. A submittal register showing items of equipment and materials for which submittals are required by the specifications is provided as an attachment. This list may not be all inclusive and additional submittals may be required. The CITY will provide an initial submittal register in electronic format with the following fields completed. The contractor may use this format or may provide his own as long as all of the "columns" described below are included.

Column (c): Lists specification section in which submittal is required.

Column (d): Lists each submittal description (SD No. and type, e.g. SD-02 Shop Drawings) required in each specification section.

Column (e): Lists one principal paragraph in specification section where a material or product is specified. This listing is only to facilitate locating submitted requirements. Do not consider entries in column (e) as limiting project requirements.

Thereafter, the Contractor is to track all submittals by maintaining a complete list, including completion of all data columns, including dates on which submittals are received and returned by the CITY.

1.6.1 Use of Submittal Register

Submit submittal register. Submit with QC plan and project schedule. Verify that all submittals required for project are listed and add missing submittals. Coordinate and complete the following fields on the register submitted with the QC plan and the project schedule:

Column (a) Activity Number: Activity number from the project schedule.

Column (g) Contractor Submit Date: Scheduled date for approving authority to receive submittals.

Column (h) Contractor Approval Date: Date Contractor needs approval of submittal.

Column (i) Contractor Material: Date that Contractor needs material delivered to Contractor control.

1.6.2 Contractor Use of Submittal Register

Update the following fields in the CITY-furnished submittal register program or equivalent fields in program utilized by Contractor with each submittal throughout contract.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (j) Action Code (k): Date of action used to record Contractor's review when forwarding submittals to QC.

Column (l) List date of submittal transmission.

Column (q) List date approval received.

1.6.3 Approving Authority Use of Submittal Register

Update the following fields in the CITY-furnished submittal register program or equivalent fields in program utilized by Contractor.

Column (b) Transmittal Number: Contractor assigned list of consecutive numbers.

Column (l) List date of submittal receipt.

Column (m) through (p) List Date related to review actions.

Column (q) List date returned to Contractor.

1.6.4 Copies Delivered to the CITY

Deliver one copy of submittal register updated by Contractor to CITY with each payment application.

1.7 VARIATIONS

Variations from contract requirements require both Engineer of Record (EOR) and CITY approval and will be considered where advantageous to CITY.

1.7.1 Considering Variations

Discussion with CITY prior to submission, after consulting with the DOR, will help ensure functional and quality requirements are met and minimize rejections and re-submittals. When contemplating a variation which results in lower cost, consider submission of the variation as a Value Engineering Change Proposal (VECP).

Specifically point out variations from contract requirements in transmittal letters. Failure to point out deviations may result in the CITY requiring rejection and removal of such work at no additional cost to the CITY.

1.7.2 Proposing Variations

When proposing variation, deliver written request to the CITY, with documentation of the nature and features of the variation and why the variation is desirable and beneficial to CITY, including the DOR's written analysis and approval. If lower cost is a benefit, also include an estimate of the cost savings. In addition to documentation required for variation, include the submittals required for the item. Clearly mark the proposed variation in all documentation.

1.7.3 Warranting that Variations are Compatible

When delivering a variation for approval, Contractor, including its Engineer(s) of Record, warrants that this contract has been reviewed to establish that the variation, if incorporated, will be compatible with other elements of work.

1.7.4 Review Schedule Extension

In addition to normal submittal review period, a period of 10 working days will be allowed for consideration by the CITY of submittals with variations.

1.8 SCHEDULING

Schedule and submit concurrently submittals covering component items forming a system or items that are interrelated. Include certifications to be submitted with the pertinent drawings at the same time. No delay damages or time extensions will be allowed for time lost in late submittals.

- a. Coordinate scheduling, sequencing, preparing and processing of submittals with performance of work so that work will not be delayed by submittal processing. Allow for potential resubmittal of requirements.
- b. Submittals called for by the contract documents will be listed on the register. If a submittal is called for but does not pertain to the contract work, the Contractor is to include the submittal in the register and annotate it "N/A" with a brief explanation. Approval by the CITY does not relieve the Contractor of supplying submittals required by the contract documents but which have been omitted from the register or marked "N/A."
- c. Re-submit register and annotate monthly by the Contractor with actual submission and approval dates. When all items on the register have been fully approved, no further re-submittal is required.
- d. Carefully control procurement operations to ensure that each individual submittal is made on or before the Contractor scheduled submittal date shown on the approved "Submittal Register."

1.9 CITY APPROVING AUTHORITY

When approving authority is CITY's Resident Project Representative (RPR), the CITY's RPR will:

- a. Note date on which submittal was received.
- b. Review submittals for approval within scheduling period specified and only for conformance with project design concepts and compliance with contract documents.
- c. Identify returned submittals with one of the actions defined in paragraph REVIEW NOTATIONS and with markings appropriate for action indicated.

Upon completion of review of submittals requiring CITY approval, stamp and date submittals. Two copies of the submittal will be retained by the CITY and two copies of the submittal will be returned to the Contractor.

1.9.1 Review Notations

Submittals will be returned to the Contractor with the following notations:

- a. Submittals marked "approved" or "accepted" authorize the Contractor to proceed with the work covered.

- b. Submittals marked "approved as noted" or "approved, except as noted, resubmittal not required," authorize the Contractor to proceed with the work covered provided he takes no exception to the corrections.
- c. Submittals marked "not approved" or "disapproved," or "revise and resubmit," indicate noncompliance with the contract requirements or design concept, or that submittal is incomplete. Resubmit with appropriate changes. No work shall proceed for this item until resubmittal is approved.
- d. Submittals marked "not reviewed" will indicate submittal has been previously reviewed and approved, is not required, does not have evidence of being reviewed and approved by Contractor, or is not complete. A submittal marked "not reviewed" will be returned with an explanation of the reason it is not reviewed. Resubmit submittals returned for lack of review by Contractor or for being incomplete, with appropriate action, coordination, or change.

1.10 DISAPPROVED OR REJECTED SUBMITTALS

Make corrections required by the CITY's RPR. If the Contractor considers any correction or notation on the returned submittals to constitute a change to the contract drawings or specifications; notice is to be given to the CITY. Contractor is responsible for the dimensions and design of connection details and construction of work. Failure to point out deviations may result in the CITY requiring rejection and removal of such work at the Contractor's expense.

If changes are necessary to submittals, make such revisions and submission of the submittals in accordance with the procedures above. No item of work requiring a submittal change is to be accomplished until the changed submittals are approved.

1.11 APPROVED OR ACCEPTED SUBMITTALS

Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor under the Contractor Quality Control (CQC) requirements of this contract is responsible for.

After submittals have been approved or accepted by the CITY's RPR, no resubmittal for the purpose of substituting materials or equipment will be considered unless accompanied by an explanation of why a substitution is necessary.

1.12 APPROVED SAMPLES

Approval of a sample is only for the characteristics or use named in such approval and is not be construed to change or modify any contract requirements. Before submitting samples, the Contractor is to assure that the materials or equipment will be available in quantities required in the project. No change or substitution will be permitted after a sample has been approved.

Match the approved samples for materials and equipment incorporated in the work. If requested, approved samples, including those which may be damaged in testing, will be returned to the

Contractor, at his expense, upon completion of the contract. Samples not approved will also be returned to the Contractor at its expense, if so requested.

Failure of any materials to pass the specified tests will be sufficient cause for refusal to consider, under this contract, any further samples of the same brand or make of that material. CITY (and the City's RPR) reserve(s) the right to disapprove any material or equipment which previously has proved unsatisfactory in service.

Samples of various materials or equipment delivered on the site or in place may be taken by the CITY for testing. Samples failing to meet contract requirements will automatically void previous approvals. Contractor to replace such materials or equipment to meet contract requirements.

Approval of the Contractor's samples by the CITY does not relieve the Contractor of his responsibilities under the contract.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

-- End of Section --

SECTION 01 50 00

TEMPORARY CONSTRUCTION FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. FEDERAL AVIATION ADMINISTRATION (FAA)

FAA AC 70/7460-1

(2007; Rev K) Obstruction Marking and Lighting

1.2 SUBMITTALS

CITY approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Construction Site Plan; G
Hurricane Preparedness Plan; G

1.3 CONSTRUCTION SITE PLAN

Prior to the start of work, submit a site plan showing the locations and dimensions of temporary facilities (including layouts and details, equipment and material storage area (onsite and offsite), and access and haul routes, avenues of ingress/egress to the fenced area and details of the fence installation. Identify any areas which may have to be graveled to prevent the tracking of mud. Indicate if the use of a supplemental or other staging area is desired. Show locations of safety and construction fences, site trailers, construction entrances, trash dumpsters, temporary sanitary facilities, and worker parking areas.

1.4 HURRICANE CONDITION OF READINESS

Unless directed otherwise, comply with:

- a. Condition FOUR Sustained winds of 50 knots or greater expected within 72 hours: Normal daily jobsite cleanup and good housekeeping practices. Collect and store in piles or containers scrap lumber, waste material, and rubbish for removal and disposal at the close of each work day. Maintain the construction site including storage areas, free of accumulation of debris. Stack form lumber in neat piles less than 4 feet high. Remove all debris, trash, or objects that could become missile hazards.
- b. Condition THREE Sustained winds of 50 knots or greater expected within 48 hours: Maintain "Condition FOUR" requirements and commence securing operations necessary for "Condition

ONE" which cannot be completed within 18 hours. Cease all routine activities which might interfere with securing operations. Commence securing and stow all gear and portable equipment. Make preparations for securing buildings. Review requirements pertaining to "Condition TWO" and continue action as necessary to attain "Condition THREE" readiness. Contact CITY for weather and Condition of Readiness (COR) updates and completion of required actions.

- c. Condition TWO Sustained winds of 50 knots or greater expected within 24 hours: Curtail or cease routine activities until securing operation is complete. Reinforce or remove form work and scaffolding. Secure machinery, tools, equipment, materials, or remove from the jobsite. Expend every effort to clear all missile hazards and loose equipment from general base areas. Contact CITY for weather and COR updates and completion of required actions.
- d. Condition ONE. Sustained winds of 50 knots or greater expected within 12 hours: Secure the jobsite, and leave CITY premises.

PART 2 PRODUCTS

2.1 TEMPORARY SIGNAGE

2.1.1 Bulletin Board

Immediately upon beginning of work, provide a weatherproof glass-covered bulletin board not less than 36 by 48 inches in size for displaying the Equal Employment Opportunity poster, Wage Rate Information poster, and other information approved by the CITY.

2.1.2 Project and Safety Signs

The requirements for the signs, their content, and location are as indicated. Erect signs within 15 days after receipt of the notice to proceed. Correct the data required by the safety sign daily, with light colored metallic or non-metallic numerals.

PART 3 EXECUTION

3.1 EMPLOYEE PARKING

Contractor employees will park privately owned vehicles in an area designated by the CITY. This area will be within reasonable walking distance of the construction site. Contractor employee parking must not interfere with existing and established parking requirements of the CITY installation.

3.2 TEMPORARY BULLETIN BOARD

Locate the bulletin board at the project site in a conspicuous place easily accessible to all employees, as approved by the CITY.

3.3 AVAILABILITY AND USE OF UTILITY SERVICES

3.3.1 Temporary Utilities

Provide temporary utilities required for construction. Materials may be new or used, must be adequate for the required usage, not create unsafe conditions, and not violate applicable codes and standards.

3.3.2 Sanitation

- a. Provide and maintain within the construction area minimum field-type sanitary facilities approved by the CITY and periodically remove waste to a commercial facility. Any penalties and / or fines associated with improper discharge will be the responsibility of the Contractor. Maintain these conveniences at all times without nuisance. Include provisions for pest control and elimination of odors. CITY toilet facilities will not be available to Contractor's personnel.

3.3.3 Telephone

Make arrangements and pay all costs for telephone facilities desired.

3.3.4 Obstruction Lighting of Cranes

Provide a minimum of 2 aviation red or high intensity white obstruction lights on temporary structures (including cranes) over 100 feet above ground level. Light construction and installation must comply with FAA AC 70/7460-1. Lights must be operational during periods of reduced visibility, darkness, and as directed by the CITY.

3.3.5 Fire Protection

Provide temporary fire protection equipment for the protection of personnel and property during construction. Remove debris and flammable materials daily to minimize potential hazards.

3.4 TRAFFIC PROVISIONS

3.4.1 Maintenance of Traffic

- a. Conduct operations in a manner that will not close any thoroughfare or interfere in any way with traffic on roads or highways except with written permission of the CITY at least 15 calendar days prior to the proposed modification date. Contractor may move oversized and slow-moving vehicles to the worksite provided requirements of the highway authority have been met.
- b. Conduct work so as to minimize obstruction of traffic, and maintain traffic on at least half of the roadway width at all times. Obtain approval from the CITY prior to starting any activity that will obstruct traffic.
- c. Provide, erect, and maintain, at contractors expense, lights, barriers, signals, passageways, detours, and other items, that may be required by the Life Safety Signage, overhead protection authority having jurisdiction.

3.4.2 Protection of Traffic

Maintain and protect traffic on all affected roads during the construction period except as otherwise specifically directed by the CITY. Measures for the protection and diversion of traffic, including the

provision of watchmen and flagmen, erection of barricades, placing of lights around and in front of equipment, the work, and the erection and maintenance of adequate warning, danger, and direction signs, will be as required by the State and local authorities having jurisdiction. Protect the traveling public from damage to person and property. Minimize the interference with public traffic on roads selected for hauling material to and from the site. Investigate the adequacy of existing roads and their allowable load limit. Contractor is responsible for the repair of any damage to roads caused by construction operations.

3.4.3 Rush Hour Restrictions

Do not interfere with the peak traffic flows preceding and during normal operations without notification to and approval by the CITY.

3.4.4 Dust Control

Dust control methods and procedures must be approved by the CITY. Treat dust abatement on access roads with applications of calcium chloride, water sprinklers, or similar methods or treatment.

3.5 CONTRACTOR'S TEMPORARY FACILITIES

Contractor-owned or -leased trailers must be identified by CITY assigned numbers. Apply the number to the trailer within 14 calendar days of notification, or sooner, if directed by the CITY.

3.5.1 Safety

Protect the integrity of any installed safety systems or personnel safety devices. If entrance into systems serving safety devices is required, the Contractor must obtain prior approval from the CITY. If it is temporarily necessary to remove or disable personnel safety devices in order to accomplish contract requirements, provide alternative means of protection prior to removing or disabling any permanently installed safety devices or equipment and obtain approval from the CITY.

3.5.2 Storage Area

Construct a temporary 6 foot high chain link fence around trailers and materials. Include plastic strip inserts, colored green, so that visibility through the fence is obstructed. Fence posts may be driven, in lieu of concrete bases, where soil conditions permit. Do not place or store Trailers, materials, or equipment outside the fenced area unless such trailers, materials, or equipment are assigned a separate and distinct storage area by the CITY away from the vicinity of the construction site but within the installation boundaries. Trailers, equipment, or materials must not be open to public view with the exception of those items which are in support of ongoing work on any given day. Do not stockpile materials outside the fence in preparation for the next day's work. Park mobile equipment, such as tractors, wheeled lifting equipment, cranes, trucks, and like equipment within the fenced area at the end of each work day.

3.5.3 Supplemental Storage Area

Not Applicable.

3.5.4 Appearance of Trailers

- a. Trailers utilized by the Contractor for administrative or material storage purposes must present a clean and neat exterior appearance and be in a state of good repair. Trailers which, in the opinion of the CITY, require exterior painting or maintenance will not be allowed on installation property.
- b. Maintain the temporary facilities. Failure to do so will be sufficient reason to require their removal.

3.5.5 Maintenance of Storage Area

- a. Keep fencing in a state of good repair and proper alignment. Grassed or unpaved areas, which are not established roadways, will be covered with a layer of gravel as necessary to prevent rutting and the tracking of mud onto paved or established roadways, should the Contractor elect to traverse them with construction equipment or other vehicles; gravel gradation will be at the Contractor's discretion. Mow and maintain grass located within the boundaries of the construction site for the duration of the project. Grass and vegetation along fences, buildings, under trailers, and in areas not accessible to mowers will be edged or trimmed neatly.

3.5.6 Security Provisions

Provide adequate outside security lighting at the Contractor's temporary facilities. The Contractor will be responsible for the security of its own equipment; in addition, the Contractor will notify the appropriate law enforcement agency requesting periodic security checks of the temporary project field office.

3.5.7 Weather Protection of Temporary Facilities and Stored Materials

Take necessary precautions to ensure that roof openings and other critical openings in the building are monitored carefully. Take immediate actions required to seal off such openings when rain or other detrimental weather is imminent, and at the end of each workday. Ensure that the openings are completely sealed off to protect materials and equipment in the building from damage.

3.5.7.1 Building and Site Storm Protection

When a warning of gale force winds is issued, take precautions to minimize danger to persons, and protect the work and nearby CITY property. Precautions must include, but are not limited to, closing openings; removing loose materials, tools and equipment from exposed locations; and removing or securing scaffolding and other temporary work. Close openings in the work when storms of lesser intensity pose a threat to the work or any nearby CITY property.

3.6 FIELD OFFICE

3.6.1 Trailer-Type Mobile Office

The Contractor may, at its option, and with City approval, furnish and maintain a trailer-type mobile office acceptable to the CITY and providing as a minimum the facilities specified above. Securely anchor the trailer to the ground at all four corners to guard against movement during high winds.

3.7 TEMPORARY PROJECT SAFETY FENCING

As soon as practicable, but not later than 15 days after the date established for commencement of work, furnish and erect temporary project safety fencing at the work site. Maintain the safety fencing during the life of the contract and, upon completion and acceptance of the work, will become the property of the Contractor and be removed from the work site.

3.8 CLEANUP

Remove construction debris, waste materials, packaging material and the like from the work site daily. Any dirt or mud which is tracked onto paved or surfaced roadways must be cleaned away. Store any salvageable materials resulting from demolition activities within the fenced area described above or at the supplemental storage area. Neatly stack stored materials not in trailers, whether new or salvaged.

3.9 RESTORATION OF STORAGE AREA

Upon completion of the project remove the bulletin board, signs, barricades, haul roads, and any other temporary products from the site. After removal of trailers, materials, and equipment from within the fenced area, remove the fence that will become the property of the Contractor. Restore areas used by the Contractor for the storage of equipment or material, or other use to the original or better condition. Remove gravel used to traverse grassed areas and restore the area to its original condition, including top soil and seeding as necessary.

-- End of Section --

TEMPORARY ENVIRONMENTAL CONTROLS

11/15

PART 1 GENERAL**1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.120	Hazardous Waste Operations and Emergency Response
40 CFR 112	Oil Pollution Prevention
40 CFR 122.26	Storm Water Discharges (Applicable to State NPDES Programs, see section 123.25)
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 261.7	Residues of Hazardous Waste in Empty Containers
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 268	Land Disposal Restrictions
40 CFR 273	Standards for Universal Waste Management
40 CFR 279	Standards for the Management of Used Oil
40 CFR 403	General Pretreatment Regulations for Existing and New Sources of Pollution
40 CFR 60	Standards of Performance for New Stationary Sources
40 CFR 63	National Emission Standards for Hazardous Air Pollutants for Source Categories
49 CFR 171	General Information, Regulations, and Definitions
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shippers - General Requirements for Shipments and Packaging

1.2 DEFINITIONS

1.2.1 Class I and II Ozone Depleting Substance (ODS)

Class I ODS is defined in Section 602(a) of The Clean Air Act. A list of Class I ODS can be found on the EPA website at the following weblink. <http://www.epa.gov/ozone/science/ods/classone.html>.

Class II ODS is defined in Section 602(s) of The Clean Air Act. A list of Class II ODS can be found on the EPA website at the following weblink. <http://www.epa.gov/ozone/science/ods/classtwo.html>.

1.2.2 Contractor Generated Hazardous Waste

Contractor generated hazardous waste is materials that, if abandoned or disposed of, may meet the definition of a hazardous waste. These waste streams would typically consist of material brought on site by the Contractor to execute work, but are not fully consumed during the course of construction. Examples include, but are not limited to, excess paint thinners (i.e. methyl ethyl ketone, toluene), waste thinners, excess paints, excess solvents, waste solvents, excess pesticides, and contaminated pesticide equipment rinse water.

1.2.3 Electronics Waste

Electronics waste is discarded electronic devices intended for salvage, recycling, or disposal.

1.2.4 Environmental Pollution and Damage

Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the environment aesthetically, culturally or historically.

1.2.5 Environmental Protection

Environmental protection is the prevention/control of pollution and habitat disruption that may occur to the environment during construction. The control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2.6 Hazardous Debris

As defined in paragraph SOLID WASTE, debris that contains listed hazardous waste (either on the debris surface, or in its interstices, such as pore structure) in accordance with 40 CFR 261. Hazardous debris also includes debris that exhibits a characteristic of hazardous waste in accordance with 40 CFR 261.

1.2.7 Hazardous Materials

Hazardous materials as defined in 49 CFR 171 and listed in 49 CFR 172.

Hazardous material is any material that: Is regulated as a hazardous material in accordance with 49 CFR 173; or requires a Safety Data Sheet (SDS) in accordance with 29 CFR 1910.120; or during end use, treatment, handling, packaging, storage, transportation, or disposal meets or has components that meet or have potential to meet the definition of a hazardous waste as defined by 40 CFR 261 Subparts A, B, C, or D. Designation of a material by this definition, when separately regulated or controlled by other sections or directives, does not eliminate the need for adherence to that hazard-specific guidance which takes precedence over this section for "control" purposes. Such material includes ammunition, weapons, explosive actuated devices, propellants, pyrotechnics, chemical and biological warfare materials, medical and pharmaceutical supplies, medical waste and infectious materials, bulk fuels, radioactive materials, and other materials such as asbestos, mercury, and polychlorinated biphenyls (PCBs).

1.2.8 Hazardous Waste

Hazardous Waste is any material that meets the definition of a solid waste and exhibit a hazardous characteristic (ignitability, corrosivity, reactivity, or toxicity) as specified in 40 CFR 261, Subpart C, or contains a listed hazardous waste as identified in 40 CFR 261, Subpart D.

1.2.9 Land Application

Land Application means spreading or spraying discharge water at a rate that allows the water to percolate into the soil. No sheeting action, soil erosion, discharge into storm sewers, discharge into defined drainage areas, or discharge into the "waters of the United States" must occur. Comply with federal, state, and local laws and regulations.

1.2.10 Municipal Separate Storm Sewer System (MS4) Permit

MS4 permits are those held by installations to obtain NPDES permit coverage for their stormwater discharges.

1.2.11 National Pollutant Discharge Elimination System (NPDES)

The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States.

1.2.12 Oily Waste

Oily waste are those materials that are, or were, mixed with Petroleum, Oils, and Lubricants (POLs) and have become separated from that POLs. Oily wastes also means materials, including wastewaters, centrifuge solids, filter residues or sludges, bottom sediments, tank bottoms, and sorbents which have come into contact with and have been contaminated by, POLs and may be appropriately tested and discarded in a manner which is in compliance with other state and local requirements.

This definition includes materials such as oily rags, "kitty litter" sorbent clay and organic sorbent material. These materials may be land filled provided that: It is not prohibited in other state regulations or local ordinances; the amount generated is "de minimus" (a small amount); it is the

result of minor leaks or spills resulting from normal process operations; and free-flowing oil has been removed to the practicable extent possible. Large quantities of this material, generated as a result of a major spill or in lieu of proper maintenance of the processing equipment, are a solid waste. As a solid waste, perform a hazardous waste determination prior to disposal. As this can be an expensive process, it is recommended that this type of waste be minimized through good housekeeping practices and employee education.

1.2.13 Regulated Waste

Regulated waste are solid wastes that have specific additional federal, state, or local controls for handling, storage, or disposal.

1.2.14 Sediment

Sediment is soil and other debris that have eroded and have been transported by runoff water or wind.

1.2.15 Solid Waste

Solid waste is a solid, liquid, semi-solid or contained gaseous waste. A solid waste can be a hazardous waste, non-hazardous waste, or non-Resource Conservation and Recovery Act (RCRA) regulated waste. Types of solid waste typically generated at construction sites may include:

1.2.15.1 Debris

Debris is non-hazardous solid material generated during the construction, demolition, or renovation of a structure that exceeds 2.5-inch particle size that is: a manufactured object; plant or animal matter; or natural geologic material (for example, cobbles and boulders), broken or removed concrete, masonry, and rock asphalt paving; ceramics; roofing paper and shingles. Inert materials may be reinforced with or contain ferrous wire, rods, accessories and weldments. A mixture of debris and other material such as soil or sludge is also subject to regulation as debris if the mixture is comprised primarily of debris by volume, based on visual inspection.

1.2.15.2 Green Waste

Green waste is the vegetative matter from landscaping, land clearing and grubbing, including, but not limited to, grass, bushes, scrubs, small trees and saplings, tree stumps and plant roots. Marketable trees, grasses and plants that are indicated to remain, be re-located, or be re-used are not included.

1.2.15.3 Material not regulated as solid waste

Material not regulated as solid waste is nuclear source or byproduct materials regulated under the Federal Atomic Energy Act of 1954 as amended; suspended or dissolved materials in domestic sewage effluent or irrigation return flows, or other regulated point source discharges; regulated air emissions; and fluids or wastes associated with natural gas or crude oil exploration or production.

1.2.15.4 Non-Hazardous Waste

Non-hazardous waste is waste that is excluded from, or does not meet, hazardous waste criteria in accordance with 40 CFR 263.

1.2.15.5 Recyclables

Recyclables are materials, equipment and assemblies such as doors, windows, door and window frames, plumbing fixtures, glazing and mirrors that are recovered and sold as recyclable, and structural components. It also includes used fuel oil, textiles, high-grade paper products and corrugated cardboard, stackable pallets in good condition, clean crating material, and clean rubber/vehicle tires. Metal meeting the definition of lead contaminated or lead based paint contaminated may not be included as recyclable if sold to a scrap metal company. Paint cans that meet the definition of empty containers in accordance with 40 CFR 261.7 may be included as recyclable if sold to a scrap metal company.

1.2.15.6 Surplus Soil

Surplus soil is existing soil that is in excess of what is required for this work, including aggregates intended, but not used, for on-site mixing of concrete, mortars, and paving. Contaminated soil meeting the definition of hazardous material or hazardous waste is not included and must be managed in accordance with paragraph HAZARDOUS MATERIAL MANAGEMENT.

1.2.15.7 Scrap Metal

This includes scrap and excess ferrous and non-ferrous metals such as reinforcing steel, structural shapes, pipe, and wire that are recovered or collected and disposed of as scrap. Scrap metal meeting the definition of hazardous material or hazardous waste is not included.

1.2.15.8 Wood

Wood is dimension and non-dimension lumber, plywood, chipboard, hardboard. Treated or painted wood that meets the definition of lead contaminated or lead based contaminated paint is not included. Treated wood includes, but is not limited to, lumber, utility poles, crossties, and other wood products with chemical treatment.

1.2.16 Surface Discharge

Surface discharge means discharge of water into drainage ditches, storm sewers, creeks or "waters of the United States". Surface discharges are discrete, identifiable sources and require a permit from the governing agency. Comply with federal, state, and local laws and regulations.

1.2.17 Wastewater

Wastewater is the used water and solids from a community that flow to a treatment plant.

1.2.17.1 Stormwater

Stormwater is any precipitation in an urban or suburban area that does not evaporate or soak into the ground, but instead collects and flows into storm drains, rivers, and streams.

1.2.18 Waters of the United States

Waters of the United States means Federally jurisdictional waters, including wetlands, that are subject to regulation under Section 404 of the Clean Water Act or navigable waters, as defined under the Rivers and Harbors Act.

1.2.19 Universal Waste

The universal waste regulations streamline collection requirements for certain hazardous wastes in the following categories: batteries, pesticides, mercury-containing equipment (for example, thermostats), and lamps (for example, fluorescent bulbs). The rule is designed to reduce hazardous waste in the municipal solid waste (MSW) stream by making it easier for universal waste handlers to collect these items and send them for recycling or proper disposal. These regulations can be found at 40 CFR 273.

1.3 SUBMITTALS

CITY approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

- Certificates of insurance
- Surety bonds
- List of proposed subcontractors
- List of proposed products
- Construction progress schedule
- Submittal register
- Schedule of prices or Earned Value Report
- Health and safety plan
- Work plan
- Quality control(QC) plan
- Environmental protection plan
- Hurricane Preparedness Plan

SD-01 Preconstruction Submittals

Environmental Protection Plan; G

Stormwater Notice of Intent (for NPDES general permit for construction); G

SD-08 Closeout Submittals

Stormwater Pollution Prevention Plan Compliance Notebook; G

Stormwater Notice of Termination (for NPDES general permit for construction); G

1.4 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Protect the environmental resources within the project boundaries and those affected outside the limits of permanent work during the entire duration of this Contract. Comply with federal, state, and local regulations pertaining to the environment, including water, air, solid waste, hazardous waste and substances, oily substances, and noise pollution.

Tests and procedures assessing whether construction operations comply with Applicable Environmental Laws may be required. Analytical work must be performed by qualified laboratories; and where required by law, the laboratories must be certified.

1.4.1 Conformance with the Environmental Management System

Perform work under this contract consistent with the policy and objectives identified in the installation's Environmental Management System (EMS). Perform work in a manner that conforms to objectives and targets of the environmental programs and operational controls identified by the EMS. Support CITY personnel when environmental compliance and EMS audits are conducted by escorting auditors at the Project site, answering questions, and providing proof of records being maintained. Provide monitoring and measurement information as necessary to address environmental performance relative to environmental, energy, and transportation management goals. In the event an EMS nonconformance or environmental noncompliance associated with the contracted services, tasks, or actions occurs, take corrective and preventative actions. In addition, employees must be aware of their roles and responsibilities under the installation EMS and of how these EMS roles and responsibilities affect work performed under the contract.

Coordinate with the installation's EMS coordinator to identify training needs associated with environmental aspects and the EMS, and arrange training or take other action to meet these needs. Provide training documentation to the CITY. The Installation Environmental Office will retain associated environmental compliance records. Make EMS Awareness training completion certificates available to CITY auditors during EMS audits and include the certificates in the Employee Training Records. See paragraph EMPLOYEE TRAINING RECORDS.

1.5 SPECIAL ENVIRONMENTAL REQUIREMENTS

Comply with the special environmental requirements listed here and attached at the end of this section.

1.6 QUALITY ASSURANCE

1.6.1 Preconstruction Survey and Protection of Features

This paragraph supplements the Contract Clause **PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS**. Prior to start of any onsite construction activities, perform a Preconstruction Confirmation Survey of the project site with the CITY, and take photographs showing existing environmental conditions in and adjacent to the site.

Submit a report for the record. Include in the report a plan describing the features requiring protection under the provisions of the Contract Clauses, which are not specifically identified on the drawings as environmental features requiring protection along with the condition of trees, shrubs and grassed areas immediately adjacent to the site of work and adjacent to the Contractor's assigned storage area and access route(s), as applicable. The Contractor and the CITY will sign this survey report upon mutual agreement regarding its accuracy and completeness. Protect those environmental features included in the survey report and any indicated on the drawings, regardless of interference that their preservation may cause to the work under the Contract.

1.6.2 Regulatory Notifications

Provide regulatory notification requirements in accordance with federal, state and local regulations. In cases where the CITY will also provide public notification (such as stormwater permitting), coordinate with the CITY. Submit copies of regulatory notifications to the CITY within 14 days prior to commencement of work activities. Typically, regulatory notifications must be provided for the following (this listing is not all-inclusive): demolition, renovation, NPDES defined site work, construction, removal or use of a permitted air emissions source, and remediation of controlled substances (asbestos, hazardous waste, lead paint).

1.6.3 Environmental Brief

Provide the following information: types, quantities, and use of hazardous materials that will be brought onto the installation; and types and quantities of wastes/wastewater that may be generated during the Contract. Discuss the results of the Preconstruction Survey at this time.

Prior to initiating any work on site, meet with the CITY and installation Environmental Office to discuss the proposed Environmental Protection Plan (EPP). Develop a mutual understanding relative to the details of environmental protection, including measures for protecting natural and cultural resources, required reports, required permits, permit requirements (such as mitigation measures), and other measures to be taken.

1.6.4 Non-Compliance Notifications

The CITY will notify the Contractor in writing of any observed noncompliance with federal, state or local environmental laws or regulations, permits, and other elements of the Contractor's EPP. After receipt of such notice, inform the CITY of the proposed corrective action and take such action when approved by the CITY. The CITY may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or equitable adjustments allowed for any such suspensions. This is in addition to any other actions the CITY may take under the contract, or in accordance with the Federal Acquisition Regulation or Federal Law.

1.7 ENVIRONMENTAL PROTECTION PLAN

The purpose of the EPP is to present an overview of known or potential environmental issues that must be considered and addressed during construction. Incorporate construction related objectives and targets from the installation's EMS into the EPP. Include in the EPP measures for protecting natural and cultural resources, required reports, and other measures to be taken. Meet with the CITY or CITY Representative to discuss the EPP and develop a mutual understanding relative to the details

for environmental protection including measures for protecting natural resources, required reports, and other measures to be taken. Submit the EPP within 14 days after notice to proceed and not less than 10 days before the start of construction. Revise the EPP throughout the project to include any reporting requirements, changes in site conditions, or contract modifications that change the project scope of work in a way that could have an environmental impact. No requirement in this section will relieve the Contractor of any applicable federal, state, and local environmental protection laws and regulations. During Construction, identify, implement, and submit for approval any additional requirements to be included in the EPP. Maintain the current version onsite.

The EPP includes, but is not limited to, the following elements:

1.7.1 General Overview and Purpose

1.7.1.1 Descriptions

A brief description of each specific plan required by environmental permit or elsewhere in this Contract such as stormwater pollution prevention plan, spill control plan, solid waste management plan, wastewater management plan, contaminant prevention plan, a historical, archaeological, cultural resources, biological resources and wetlands plan, traffic control plan, Non-Hazardous Solid Waste Disposal Plan, borrowing material plan, etc.

1.7.1.2 Duties

The duties and level of authority assigned to the person(s) on the job site who oversee environmental compliance, such as who is responsible for adherence to the EPP, who is responsible for spill cleanup and training personnel on spill response procedures, who is responsible for manifesting hazardous waste to be removed from the site (if applicable), and who is responsible for training the Contractor's environmental protection personnel.

1.7.1.3 Procedures

A copy of any standard or project-specific operating procedures that will be used to effectively manage and protect the environment on the project site.

1.7.1.4 Communications

Communication and training procedures that will be used to convey environmental management requirements to Contractor employees and subcontractors.

1.7.1.5 Contact Information

Emergency contact information (office phone number, cell phone number, and e-mail address).

1.7.2 General Site Information

1.7.2.1 Drawings

Drawings showing locations of staging areas, material storage areas, structures, sanitary facilities, maintenance of existing storm drains and conveyances, and stockpiles of excess soil.

1.7.2.2 Work Area

Work area plan showing the proposed activity in each portion of the area and identify the areas of limited use or nonuse. Include measures for marking the limits of use areas, including methods for protection of features to be preserved within authorized work areas and methods to control runoff and to contain materials on site, and a traffic control plan.

1.7.2.3 Documentation

A letter signed by an officer of the firm appointing the Environmental Manager (Foreman) and stating that person is responsible for managing and implementing the Environmental Program as described in this contract. Include in this letter the Environmental Manager's authority to direct the removal and replacement of non-conforming work.

1.7.3 Management of Natural Resources

- a. Land resources
- b. Tree protection
- c. Replacement of damaged landscape features
- d. Temporary construction
- e. Fish and benthic resources

1.7.4 Protection of Historical and Archaeological Resources

- a. Objectives
- b. Methods

1.7.5 Stormwater Management and Control

- a. Ground cover
- b. Erodible soils
- c. Temporary measures
 - (1) Structural Practices
 - (2) Temporary and permanent stabilization
- d. Effective selection, implementation and maintenance of Stormwater Best Management Practices (BMPs).

1.7.6 Protection of the Environment from Waste Derived from Contractor Operations

Control and disposal of solid and sanitary waste. Control and disposal of hazardous waste.

This item consists of the management procedures for hazardous waste to be generated. The elements of those procedures will coincide with the Installation Hazardous Waste Management Plan. The CONTRACTOR will provide a copy of the Installation Hazardous Waste Management Plan. As a minimum, include the following:

- a. List of the types of hazardous wastes expected to be generated

- b. Procedures to ensure a written waste determination is made for appropriate wastes that are to be generated
- c. Sampling/analysis plan, including laboratory method(s) that will be used for waste determinations and copies of relevant laboratory certifications
- d. Methods and proposed locations for hazardous waste accumulation/storage (that is, in tanks or containers)
- e. Management procedures for storage, labeling, transportation, and disposal of waste (treatment of waste is not allowed unless specifically noted)
- f. Management procedures and regulatory documentation ensuring disposal of hazardous waste complies with Land Disposal Restrictions (40 CFR 268)
- g. Management procedures for recyclable hazardous materials such as lead-acid batteries, used oil, and similar
- h. Used oil management procedures in accordance with 40 CFR 279; Hazardous waste minimization procedures
- i. Plans for the disposal of hazardous waste by permitted facilities; and Procedures to be employed to ensure required employee training records are maintained.

1.7.7 Prevention of Releases to the Environment

Procedures to prevent releases to the environment

Notifications in the event of a release to the environment

1.7.8 Regulatory Notification and Permits

List what notifications and permit applications must be made. Some permits require up to 180 days to obtain. Demonstrate that those permits have been obtained or applied for by including copies of applicable environmental permits. The EPP will not be approved until the permits have been obtained.

1.7.9 Clean Air Act Compliance

1.7.9.1 Haul Route

Submit truck and material haul routes along with a Dirt and Dust Control Plan for controlling dirt, debris, and dust on Installation roadways. As a minimum, identify in the plan the subcontractor and equipment for cleaning along the haul route and measures to reduce dirt, dust, and debris from roadways.

1.7.9.2 Pollution Generating Equipment

Identify air pollution generating equipment or processes that may require federal, state, or local permits under the Clean Air Act. Determine requirements based on any current installation permits and the impacts of the project. Provide a list of all fixed or mobile equipment, machinery or operations that could generate air emissions during the project to the Installation Environmental Office (Air Program Manager).

1.7.9.3 Stationary Internal Combustion Engines

Identify portable and stationary internal combustion engines that will be supplied, used or serviced. Comply with 40 CFR 60 Subpart IIII, 40 CFR 60 Subpart JJJJ, 40 CFR 63 and local regulations as applicable. At minimum, include the make, model, serial number, manufacture date, size (engine brake horsepower), and EPA emission certification status of each engine. Maintain applicable records and log hours of operation and fuel use. Logs must include reasons for operation and delineate between emergency and non-emergency operation.

1.7.9.4 Refrigerants

Identify management practices to ensure that heating, ventilation, and air conditioning (HVAC) work involving refrigerants complies with 40 CFR 82 requirements. Technicians must be certified, maintain copies of certification on site, use certified equipment and log work that requires the addition or removal of refrigerant.

1.7.9.5 Air Pollution-engineering Processes

Identify planned air pollution-generating processes and management control measures (including, but not limited to, spray painting, abrasive blasting, demolition, material handling, fugitive dust, and fugitive emissions). Log hours of operations and track quantities of materials used.

1.7.9.6 Monitoring

For the protection of public health, monitor and control contaminant emissions to the air from Hazardous, Toxic, and Radioactive Waste remedial action area sources to minimize short-term risks that might be posed to the community during implementation of the remedial alternative in accordance with the following.

- a. Perimeter Air Contaminant of Concern (TBD if necessary).
- b. Time Averaged Perimeter Action Levels (TBD if necessary).

Concentration	(TBD if necessary)
Time	(TBD if necessary)

- c. Perimeter Sampling/Monitoring Location[s] (TBD if necessary).
- d. Monitoring Instruments/Sampling and Analysis Methods (TBD if necessary).
- e. Staffing (TBD if necessary).

1.7.9.7 Compliant Materials

Provide the CITY a list of MSDSs for all hazardous materials proposed for use on site. Materials must be compliant with all Clean Air Act regulations for emissions including solvent and volatile organic compound contents, and applicable National Emission Standards for Hazardous Air Pollutants requirements. The CITY may alter or limit use of specific materials as needed to meet installation permit requirements for emissions.

1.8 LICENSES AND PERMITS

Obtain licenses and permits required for the construction of the project and in accordance with FAR 52.236-7. Notify the CITY of all general use permitted equipment the Contractor plans to use on site. This paragraph supplements the Contractor's responsibility under FAR 52.236-7.

a. The following permits have been obtained by the CITY:

(1) FDEP File No.: 44-03418446-001-EE, Monroe County

(2) ACOE File No.: SAJ-2016-00621 (NW-GGM)

1.9 ENVIRONMENTAL RECORDS BINDER

Maintain on-site a separate three-ring Environmental Records Binder and submit at the completion of the project. Make separate parts within the binder that correspond to each submittal listed under paragraph CLOSEOUT SUBMITTALS in this section.

1.10 SOLID WASTE MANAGEMENT PERMIT

Provide the CITY with written notification of the quantity of anticipated solid waste or debris that is anticipated or estimated to be generated by construction. Include in the report the locations where various types of waste will be disposed or recycled. Include letters of acceptance from the receiving location or as applicable; submit one copy of the receiving location state and local Solid Waste Management Permit or license showing such agency's approval of the disposal plan before transporting wastes off property.

1.10.1 Solid Waste Management Report

Monthly, submit a solid waste disposal report to the CITY. For each waste, the report will state the classification (using the definitions provided in this section), amount, location, and name of the business receiving the solid waste.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROTECTION OF BENTHIC and other NATURAL RESOURCES

Minimize interference with, disturbance to, and damage to fish, wildlife, and plants, including their habitats. Prior to the commencement of activities, consult with the Installation Environmental Office, regarding rare species or sensitive habitats that need to be protected. The protection of rare, threatened, and endangered animal and plant species identified, including their habitats, is the Contractor's responsibility. The following species are known and could be affected within the construction area: Corals referenced in the Benthic Resources Report.

Preserve the natural resources within the project boundaries and outside the limits of permanent work. Restore to an equivalent or improved condition upon completion of work that is consistent with the requirements of the Installation Environmental Office or as otherwise specified. Confine construction activities to within the limits of the work indicated or specified.

3.1.1 Flow Ways

Do not alter water flows or otherwise significantly disturb the native habitat adjacent to the project and critical to the survival of fish and wildlife, except as specified and permitted.

3.1.2 Vegetation

Except in areas to be cleared, do not remove, cut, deface, injure, or destroy trees or shrubs without the CITY's permission. Do not fasten or attach ropes, cables, or guys to existing nearby trees for anchorages unless authorized by the CITY. Where such use of attached ropes, cables, or guys is authorized, the Contractor is responsible for any resultant damage.

Protect existing trees that are to remain to ensure they are not injured, bruised, defaced, or otherwise damaged by construction operations. Remove displaced rocks from uncleared areas. Coordinate with the CITY and Installation Environmental Office to determine appropriate action for trees and other landscape features scarred or damaged by equipment operations.

3.2 STORMWATER

Generally, do not discharge stormwater from construction sites to the sanitary sewer. If the water is noted or suspected of being contaminated, it may only be released to the storm drain system if the discharge is specifically permitted. Obtain authorization in advance from the Installation Environmental Office for any release of contaminated water.

3.2.1 Construction General Permit

Under the terms and conditions of the permit, install, inspect, maintain BMPs, prepare stormwater erosion and sediment control inspection reports, and submit SWPPP inspection reports. Maintain construction operations and management in compliance with the terms and conditions of the general permit for stormwater discharges from construction activities.

3.2.1.1 Stormwater Pollution Prevention Plan

Submit a project-specific Stormwater Pollution Prevention Plan (SWPPP) to the CITY for approval, prior to the commencement of work. The SWPPP must meet the requirements of 40 CFR 122.26 and the State General Permit for stormwater discharges from construction sites.

Include the following:

- a. Comply with terms of the FDEP NPDES general permit for stormwater discharges from construction activities. Prepare SWPPP in accordance with state requirements.
- b. Select applicable BMPs from EPA Fact Sheets located at <http://water.epa.gov/polwaste/npdes/swbmp/Construction-Site-StormWater-Run-Off-Control.cfm> or in accordance with applicable state or local requirements.
- c. Include a completed copy of the Notice of Intent, BMP Inspection Report Template, and Stormwater Notice of Termination, except for the effective date.

3.2.1.2 Stormwater Notice of Intent for Construction Activities

Prepare and submit the Notice of Intent for NPDES coverage under the general permit for construction activities to the CITY for review and approval.

Prepare and submit a Notice of Intent as a co-permittee to the CITY, for review and approval.

Submit the approved NOI and appropriate permit fees onto the appropriate federal or state agency for approval. No land disturbing activities may commence without permit coverage. Maintain an approved copy of the SWPPP at the onsite construction office, and continually update as regulations require, reflecting current site conditions.

3.2.1.3 Inspection Reports

Submit "Inspection Reports" to the CITY in accordance with the State of Florida Construction General Permit.

3.2.1.4 Stormwater Pollution Prevention Plan Compliance Notebook

Create and maintain a three ring binder of documents that demonstrate compliance with the Construction General Permit. Include a copy of the permit Notice of Intent, proof of permit fee payment, SWPPP and SWPPP update amendments, inspection reports and related corrective action records, copies of correspondence with the State Permitting Agency, and a copy of the permit Notice of Termination in the binder. At project completion, the notebook becomes property of the CITY. Provide the compliance notebook to the CITY.

3.2.1.5 Stormwater Notice of Termination for Construction Activities

Submit a Notice of Termination to the CITY for approval once construction is complete and final stabilization has been achieved on all portions of the site for which the permittee is responsible. Once approved, submit the Notice of Termination to the appropriate state or federal agency.

3.2.2 Erosion and Sediment Control Measures

Provide erosion and sediment control measures in accordance with state and local laws and regulations. Preserve vegetation to the maximum extent practicable.

Erosion control inspection reports may be compiled as part of a stormwater pollution prevention plan inspection reports.

3.2.2.1 Erosion Control

Prevent erosion. Stabilize slopes by combination of methods necessary for effective erosion control. Use of hay bales is prohibited.

3.2.2.2 Sediment Control Practices

Implement sediment control practices to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Implement sediment control practices prior to soil disturbance and prior to creating areas with concentrated flow, during the construction process to minimize erosion and sediment laden runoff.

3.2.3 Work Area Limits

Mark the areas that need not be disturbed under this Contract prior to commencing construction activities. Mark or fence isolated areas within the general work area that are not to be disturbed. Protect monuments and markers before construction operations commence. Where construction operations are to be conducted during darkness, any markers must be visible in the dark. Personnel must be knowledgeable of the purpose for marking and protecting particular objects.

3.2.4 Contractor Facilities and Work Areas

Place field offices, staging areas, stockpile storage, and temporary buildings in areas designated on the drawings or as directed by the CITY. Move or relocate the Contractor facilities only when approved by the CITY. Provide erosion and sediment controls for onsite borrow and spoil areas to prevent sediment from entering nearby waters. Control temporary excavation and embankments for plant or work areas to protect adjacent areas.

3.2.5 Municipal Separate Storm Sewer System (MS4) Management

Comply with the Installation's MS4 permit requirements.

3.3 SURFACE AND GROUNDWATER

3.3.1 Cofferdams, Diversions, and Dewatering

NOT USED.

3.3.2 Waters of the United States

Do not enter, disturb, destroy, or allow discharge of contaminants into waters of the United States except as authorized herein. The protection of waters of the United States shown on the drawings in accordance with paragraph LICENSES AND PERMITS is the Contractor's responsibility. Authorization to enter specific waters of the United States identified does not relieve the Contractor from any obligation to protect other waters of the United States within, adjacent to, or in the vicinity of the construction site and associated boundaries.

3.4 PROTECTION OF CULTURAL RESOURCES

3.4.1 Historical Resources

Existing historical resources within the work area are shown on the drawings. Protect these resources and be responsible for their preservation during the life of the Contract.

3.5 WASTE MINIMIZATION

Minimize the use of hazardous materials and the generation of waste. Include procedures for pollution prevention/ hazardous waste minimization in the Hazardous Waste Management Section of the EPP. Obtain a copy of the installation's Pollution Prevention/Hazardous Waste Minimization Plan for reference material when preparing this part of the EPP. If no written plan exists, obtain information by contacting the CITY. Describe the anticipated types of the hazardous materials to be used in the construction when requesting information.

3.5.1 Salvage, Reuse and Recycle

Identify anticipated materials and waste for salvage, reuse, and recycling. Describe actions to promote material reuse, resale or recycling. To the extent practicable, all scrap metal must be sent for reuse or recycling and will not be disposed of in a landfill.

Include the name, physical address, and telephone number of the hauler, if transported by a franchised solid waste hauler. Include the destination and, unless exempted, provide a copy of the state or local permit (cover) or license for recycling.

3.6 WASTE MANAGEMENT AND DISPOSAL

3.6.1 Wastewater

3.6.1.1 Disposal of wastewater must be as specified below.

3.6.1.1.1 Treatment

Do not allow wastewater from construction activities, such as onsite material processing, concrete curing, concrete clean-up, water used in concrete trucks, and forms to enter water ways or to be discharged prior to being treated to remove pollutants. Dispose of the construction- related waste water off-CITY property in accordance with 40 CFR 403, state, regional, and local laws and regulations.

3.7 PREVIOUSLY USED EQUIPMENT

Clean previously used construction equipment prior to bringing it onto the project site. Equipment must be free from soil residuals, egg deposits from plant pests, noxious weeds, and plant seeds. Consult with the U.S. Department of Agriculture jurisdictional office for additional cleaning requirements.

3.8 PETROLEUM, OIL, LUBRICANT (POL) STORAGE AND FUELING

POL products include flammable or combustible liquids, such as gasoline, diesel, lubricating oil, used engine oil, hydraulic oil, mineral oil, and cooking oil. Store POL products and fuel equipment and motor vehicles in a manner that affords the maximum protection against spills into the environment. Manage and store POL products in accordance with EPA 40 CFR 112, and other federal, state, regional, and local laws and regulations. Use secondary containments, dikes, curbs, and other barriers, to prevent POL products from spilling and entering the ground, storm or sewer drains, stormwater ditches or canals, or navigable waters of the United States. Describe in the EPP (see paragraph ENVIRONMENTAL PROTECTION PLAN) how POL tanks and containers must be stored, managed, and inspected and what protections must be provided.

3.8.1 Used Oil Management

Manage used oil generated on site in accordance with 40 CFR 279. Determine if any used oil generated while onsite exhibits a characteristic of hazardous waste. Used oil containing 1,000 parts per million of solvents is considered a hazardous waste and disposed of at the Contractor's expense. Used oil mixed with a hazardous waste is also considered a hazardous waste. Dispose in accordance with paragraph HAZARDOUS WASTE DISPOSAL.

3.8.2 Oil Storage Including Fuel Tanks

Provide secondary containment and overfill protection for oil storage tanks. A berm used to provide secondary containment must be of sufficient size and strength to contain the contents of the tanks plus 5 inches freeboard for precipitation. Construct the berm to be impervious to oil for 72 hours that no discharge will permeate, drain, infiltrate, or otherwise escape before cleanup occurs. Use drip pans during oil transfer operations; adequate absorbent material must be onsite to clean up any spills and prevent releases to the environment. Cover tanks and drip pans during inclement weather. Provide procedures and equipment to prevent overfilling of tanks. If tanks and containers with an aggregate aboveground capacity greater than 1320 gallons will be used onsite (only containers with a capacity of 55 gallons or greater are counted), provide and implement a SPCC plan meeting the requirements of 40 CFR 112. Do not bring underground storage tanks to the installation for Contractor use during a project. Submit the SPCC plan to the CITY for approval.

Monitor and remove any rainwater that accumulates in open containment dikes or berms. Inspect the accumulated rainwater prior to draining from a containment dike to the environment, to determine there is no oil sheen present.

3.9 INADVERTENT DISCOVERY OF PETROLEUM-CONTAMINATED SOIL OR HAZARDOUS WASTES

If petroleum-contaminated soil, or suspected hazardous waste is found during construction that was not identified in the Contract documents, immediately notify the CITY. Do not disturb this material until authorized by the CITY.

3.10 POST CONSTRUCTION CLEANUP

Clean up areas used for construction in accordance with Contract Clause: "Cleaning Up". Unless otherwise instructed in writing by the CITY, remove traces of temporary construction facilities such as haul roads, work area, structures, foundations of temporary structures, stockpiles of excess or waste materials, and other vestiges of construction prior to final acceptance of the work. Grade parking area and similar temporarily used areas to conform with surrounding contours.

-- End of Section --

SECTION 01 74 19

CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT

PART 1 GENERAL

1.1 CITY POLICY

CITY policy is to apply sound environmental principles in the design, construction and use of facilities. As part of the implementation of that policy: (1) practice efficient waste management when sizing, cutting, and installing products and materials and (2) use all reasonable means to divert construction and demolition waste from landfills and incinerators and to facilitate their recycling or reuse. If possible, divert project solid waste from the landfill. **Do not use solid waste to fill the void between the old wall and the new wall. Use approved fill material only.**

1.2 MANAGEMENT

Develop and implement a waste management program. Take a pro-active, responsible role in the management of construction and demolition waste and require all subcontractors, vendors, and suppliers to participate in the effort. Construction and demolition waste includes products of demolition or removal, excess or unusable construction materials, packaging materials for construction products, and other materials generated during the construction process but not incorporated into the work. In the management of waste, consider the availability of viable markets, the condition of the material, the ability to provide the material in suitable condition and in a quantity acceptable to available markets, and time constraints imposed by internal project completion mandates. Implement any special programs involving rebates or similar incentives related to recycling of waste. Revenues or other savings obtained for salvage, or recycling accrue to the Contractor. Appropriately permit firms and facilities used for recycling, reuse, and disposal for the intended use to the extent required by federal, state, and local regulations. Also, provide on-site instruction of appropriate separation, handling, recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

1.3 MEETINGS

If necessary, conduct Construction Waste Management meetings. After award of the Contract and prior to commencement of work, schedule and conduct a meeting with the CITY to discuss the proposed Waste Management Plan and to develop a mutual understanding relative to the details of waste management. The requirements for this meeting may be fulfilled during the coordination and mutual understanding meeting outlined in Section QUALITY CONTROL. At a minimum, discuss environmental and waste management goals and issues at the following additional meetings:

- a. Pre-bid meeting.
- b. Preconstruction meeting.
- c. Regular site meetings.
- d. Work safety meetings.

1.4 WASTE MANAGEMENT PLAN

Submit a waste management plan within 15 days after notice to proceed and not less than 10 days before the preconstruction meeting. The plan demonstrates how to meet the project waste diversion goal. Also, include the following in the plan:

It is understood that the mooring piles and portions of the docks will be removed, stored and replaced. Only the existing concrete cap will need to be managed as a part of the demolition.

- a. Name of individuals on the Contractor's staff responsible for waste prevention and management. (FOREMAN)
- b. Actions that will be taken to reduce solid waste generation, including coordination with subcontractors to ensure awareness and participation.
- c. Description of the regular meetings to be held to address waste management.
- d. Description of the specific approaches to be used in recycling/reuse of the various materials generated, including the areas on site and equipment to be used for processing, sorting, and temporary storage of wastes.
- e. Characterization, including estimated types and quantities, of the waste to be generated.
- f. Name of landfill and/or incinerator to be used and the estimated costs for use, assuming that there would be no salvage or recycling on the project.
- g. Identification of local and regional reuse programs, including non-profit organizations such as schools, local housing agencies, and organizations that accept used materials such as materials exchange networks and Habitat for Humanity. Include the name, location, and phone number for each reuse facility to be used, and provide a copy of the permit or license for each facility.
- h. List of specific waste materials that will be salvaged for resale, salvaged and reused on the current project, salvaged and stored for reuse on a future project, or recycled. Identify the recycling facilities by name, location, and phone number, including a copy of the permit or license for each facility.
- i. Identification of materials that cannot be recycled/reused with an explanation or justification, to be approved by the CITY.
- j. Description of the means by which any waste materials identified in item (h) above will be protected from contamination.
- k. Description of the means of transportation of the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site).

- I. Anticipated net cost savings determined by subtracting Contractor program management costs and the cost of disposal from the revenue generated by sale of the materials and the incineration and/or landfill cost avoidance.

Revise and resubmit Plan as required by the CITY. Approval of Contractor's Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations or meeting project cumulative waste diversion requirement. Distribute copies of the Waste Management Plan to each subcontractor, the Quality Control Manager, and the CITY.

1.5 RECORDS

Maintain records to document the quantity of waste generated; the quantity of waste diverted through sale, reuse, or recycling; and the quantity of waste disposed by landfill or incineration. Make the records available to the CITY during construction, and deliver to the CITY upon completion of the construction, a copy of the records.

1.6 COLLECTION

Separate, store, protect, and handle at the site identified recyclable and salvageable waste products in a manner that maximizes recyclability and salvagability of identified materials. Provide the necessary containers, bins and storage areas to facilitate effective waste management and clearly and appropriately identify them. Provide materials for barriers and enclosures around recyclable material storage areas which are nonhazardous and recyclable or reusable. Locate out of the way of construction traffic. Provide adequate space for pick-up and delivery and convenience to subcontractors. Recycling and waste bin areas are to be kept neat and clean, and handle recyclable materials to prevent contamination of materials from incompatible products and materials. Clean contaminated materials prior to placing in collection containers. Use cleaning materials that are nonhazardous and biodegradable. Handle hazardous waste and hazardous materials in accordance with applicable regulations and coordinate with Section 01 57 19 TEMPORARY ENVIRONMENTAL CONTROLS. Separate materials by one of the following methods:

1.6.1 Source Separated Method.

Separate waste products and materials that are recyclable from trash and sorted as described below into appropriately marked separate containers and then transported to the respective recycling facility for further processing. Deliver materials in accordance with recycling or reuse facility requirements (e.g., free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process). Separate materials into the following category types as appropriate to the project waste and to the available recycling and reuse programs in the project area:

- a. Land clearing debris.
- b. Asphalt.
- c. Concrete and masonry.
- d. Metal (e.g. banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized, stainless steel, aluminum, copper, zinc, lead brass, bronze).
 - (1) Ferrous.

- (2) Non-ferrous.
- e. Wood (nails and staples allowed).
- f. Debris.
- g. Paper.
 - (1) Bond.
 - (2) Newsprint.
 - (3) Cardboard and paper packaging materials.
- h. Non-hazardous paint and paint cans.
- i. Beverage containers.

1.6.2 Co-Mingled Method.

Place waste products and recyclable materials into a single container and then transport to a recycling facility where the recyclable materials are sorted and processed.

1.6.3 Other Methods.

Other proposed methods may be used when approved by the CITY.

1.7 DISPOSAL

Control accumulation of waste materials and trash. Recycle or dispose of collected materials off-site at intervals approved by the CITY and in compliance with waste management procedures. Except as otherwise specified in other sections of the specifications, dispose of in accordance with the following:

1.7.1 Reuse.

Give first consideration to salvage for reuse since little or no re-processing is necessary for this method, and less pollution is created when items are reused in their original form. Coordinate reuse with the CITY. Consider sale or donation of waste suitable for reuse.

1.7.2 Recycle.

Recycle waste materials not suitable for reuse, but having value as being recyclable. Arrange for timely pickups from the site or deliveries to recycling facilities in order to prevent contamination of recyclable materials.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

-- End of Section --

SECTION 01 78 00

CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.1 DEFINITIONS

1.1.1 As-Built Drawings

As-built drawings are developed and maintained by the Contractor and depict actual conditions, including deviations from the Contract Documents. These deviations and additions may result from coordination required by, but not limited to: contract modifications; official responses to Contractor submitted Requests for Information; direction from the CITY; designs which are the responsibility of the Contractor, and differing site conditions. Maintain the as-builts throughout construction as red-lined hard copies on site. These files serve as the basis for the creation of the record drawings.

1.1.2 Record Drawings

The record drawings are the final compilation of actual conditions reflected in the as-built drawings.

1.2 SOURCE DRAWING FILES

Request the full set of electronic drawings, in the source format, for Record Drawing preparation, after award and at least 30 days prior to required use.

1.2.1 Terms and Conditions

Data contained on these electronic files must not be used for any purpose other than as a convenience in the preparation of construction drawings and data for the referenced project. Any other use or reuse shall be at the sole risk of the Contractor and without liability or legal exposure to the CITY. The Contractor must make no claim and waives to the fullest extent permitted by law, any claim or cause of action of any nature against the CITY, its agents or sub consultants that may arise out of or in connection with the use of these electronic files. The Contractor must, to the fullest extent permitted by law, indemnify and hold the CITY harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs, arising out of or resulting from the use of these electronic files.

These electronic CAD drawing files are not construction documents. Differences may exist between the CAD files and the corresponding construction documents. The CITY makes no representation regarding the accuracy or completeness of the electronic CAD files, nor does it make representation to the compatibility of these files with the Contractor hardware or software. In the event that a conflict arises between the signed and sealed construction documents prepared by the CITY and the furnished Source drawing files, the signed and sealed construction documents govern. The Contractor is responsible for determining if any conflict exists. Use of these Source Drawing files does not relieve the Contractor of duty to fully comply with the contract documents, including and without limitation, the need to check, confirm and coordinate the work of all contractors for the project. If

the Contractor uses, duplicates or modifies these electronic source drawing files for use in producing construction drawings and data related to this contract, remove all previous indicia of ownership (seals, logos, signatures, initials and dates).

1.3 SUBMITTALS

CITY approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-08 Closeout Submittals
Final Approved Shop Drawings; G
As-Built Drawings; G

1.4 WARRANTY MANAGEMENT

1.4.1 Warranty Management Plan

Develop a warranty management plan which contains information relevant to the clause Warranty of Construction. Include within the warranty management plan all required actions and documents to assure that the CITY receives all warranties to which it is entitled. The plan must be in narrative form and contain sufficient detail to render it suitable for use by future maintenance and repair personnel, whether tradesmen, or of engineering background, not necessarily familiar with this contract. The term "status" as indicated below must include due date and whether item has been submitted or was accomplished. Warranty information made available during the construction phase must be submitted to the CITY for approval prior to each monthly pay estimate. Assemble approved information in a binder and turn over to the CITY upon acceptance of the work. The construction warranty period will begin on the date of project acceptance and continue for the full product warranty period. Include within the warranty management plan, but not limited to, the following:

- a. Roles and responsibilities of all personnel associated with the warranty process, including points of contact and telephone numbers within the organizations of the Contractors, subcontractors, manufacturers or suppliers involved.
- b. Furnish with each warranty the name, address, and telephone number of each of the guarantor's representatives nearest to the project location.
- c. Listing and status of delivery of all Certificates of Warranty for extended warranty items, to include workmanship, corrosion, coatings, fasteners, etc.
- d. A list for each warranted equipment, item, and feature of construction or system indicating:
 - (1) Name of item.
 - (2) Location where installed.
 - (3) Name and phone numbers of manufacturers or suppliers.
 - (4) Names, addresses and telephone numbers of sources of suppliers.

- (5) Warranties and terms of warranty. Include one-year overall warranty of construction, including the starting date of warranty of construction. Items which have extended warranties must be indicated with separate warranty expiration dates.
- (8) Cross-reference to warranty certificates as applicable.
- (9) Starting point and duration of warranty period.
- (10) Summary of maintenance procedures required to continue the warranty in force.
- (11) Organization, names and phone numbers of persons to call for warranty service.
- (12) Typical response time and repair time expected for various warranted equipment.

e. Procedure and status of tagging of all equipment covered by extended warranties.

1.4.2 Performance Bond

The Performance Bond must remain effective throughout the construction period.

- a. In the event the Contractor fails to commence and diligently pursue any construction warranty work required, the CITY will have the work performed by others, and after completion of the work, will charge the remaining construction warranty funds of expenses incurred by the CITY while performing the work, including, but not limited to administrative expenses.
- b. In the event sufficient funds are not available to cover the construction warranty work performed by the CITY at the Contractor's expense, the CITY will have the right to recoup expenses from the bonding company.
- c. Following oral or written notification of required construction warranty repair work, respond in a timely manner. Written verification will follow oral instructions. Failure to respond will be cause for the CITY to proceed against the Contractor.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 AS-BUILT DRAWINGS

3.1.1 Markup Guidelines

Make comments and markup the drawings complete without reference to letters, memos, or materials that are not part of the As-Built drawing. Show what was changed, how it was changed, where items(s) were relocated and change related details. These working as-built markup prints must be neat, legible and accurate as follows:

- a. Use base colors of red, green, and blue. Color code for changes as follows:
 - (1) Special (Blue) - Items requiring special information, coordination, or special detailing or detailing notes.

(2) Deletions (Red) - Over-strike deleted graphic items (lines), lettering in notes and leaders.

(3) Additions (Green) - Added items, lettering in notes and leaders.

- b. Provide a legend if colors other than the "base" colors of red, green, and blue are used.
- c. Add and denote any additional equipment or material facilities, service lines, incorporated under As-Built Revisions if not already shown in legend.
- d. Use frequent written explanations on markup drawings to describe changes. Do not totally rely on graphic means to convey the revision.
- e. Use legible lettering and precise and clear digital values when marking prints. Clarify ambiguities concerning the nature and application of change involved.
- f. Wherever a revision is made, also make changes to related section views, details, legend, profiles, plans and elevation views, schedules, notes and call out designations, and mark accordingly to avoid conflicting data on all other sheets.
- g. For deletions, cross out all features, data and captions that relate to that revision.
- h. For changes on small-scale drawings and in restricted areas, provide large-scale inserts, with leaders to the applicable location.
- i. Indicate one of the following when attaching a print or sketch to a markup print:
 - 1) Add an entire drawing to contract drawings.
 - 2) Provided for reference only to further detail the initial design.
- j. Incorporate all shop and fabrication drawings into the markup drawings.

3.1.2 As-Built Drawings Content

Show on the as-built drawings, but not limited to, the following information:

- a. The actual location, kinds and sizes of all sub-surface utility lines. In order that the location of these lines and appurtenances may be determined in the event the surface openings or indicators become covered over or obscured, show by offset dimensions to two permanently fixed surface features the end of each run including each change in direction on the record drawings. Locate valves, splice boxes and similar appurtenances by dimensioning along the utility run from a reference point. Also record the average depth below the surface of each run.
- b. The location and dimensions of any changes within the building structure.
- c. Layout and schematic drawings of electrical circuits and piping.
- d. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from contract plans.

- e. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor; including but not limited to shop drawings, fabrication, erection, installation plans and placing details, pipe sizes, insulation material, dimensions of equipment foundations, etc.
- f. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.
- g. Changes or Revisions which result from the final inspection.
- h. Where contract drawings or specifications present options, show only the option selected for construction on the working as-built markup drawings.
- i. If borrow material for this project is from sources on CITY property, or if CITY property is used as a spoil area, furnish a contour map of the final borrow pit/spoil area elevations.
- j. Systems designed or enhanced by the Contractor, such as HVAC controls, fire alarm, fire sprinkler, and irrigation systems.
- k. Changes in location of equipment and architectural features.
- j. Modifications (include within change order price the cost to change working as-built markup drawings to reflect modifications).
- l. Actual location of anchors, construction and control joints, etc., in concrete.
- m. Unusual or uncharted obstructions that are encountered in the contract work area during construction.
- n. Location, extent, thickness, and size of stone protection particularly where it will be normally submerged by water.

3.2 CLEANUP

Leave premises "broom clean." Clean interior and exterior glass surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces. Clean equipment and fixtures to a sanitary condition. Clean debris from drainage systems. Sweep paved areas and rake clean landscaped areas. Remove waste and surplus materials, rubbish and construction facilities from the site.

3.2.1 Extraordinary Cleanup Requirements

The following cleanup requirements apply: **Do not place any debris waterward of the proposed wall.**

-- End of Section --

SECTION 02215

PROTECTION OF EXISTING STRUCTURES

PART 1 - GENERAL

1.01 SCOPE:

- A. Summary of Work: The CONTRACTOR shall furnish all labor, equipment, and materials for protecting existing structures during construction, and for monitoring and documenting the effectiveness of said protection.
- B. Related Work Specified Elsewhere:
 - 1. SECTION 01 33 00 – Submittals Procedures
 - 2. SECTION 01 32 00 - Construction Video and Photographs
 - 3. SECTION 31 41 15 – Steel Sheet Piling

1.02 APPLICABLE STANDARDS AND PUBLICATIONS:

- A. Standards or Codes: The edition of the standards of the organizations listed below in effect at the time of the advertisement for bids form a part of this specification to the extent referenced. See the various paragraphs for the specified standard. In the case of a conflict between the requirements of this SECTION and those of the listed document, the requirements of this SECTION shall prevail.
- 4. All applicable local (City, County, Village, Town, Tribe, etc.) codes, regulations, ordinances, and standards.
- 5. Florida Department of Transportation (FDOT)
 - a. Standard Specifications for Road and Bridge Construction.

1.03 DEFINITIONS:

- A. Existing Nearby Facilities at Risk (ENFAR): the collective name of any and all nearby buildings, structures, facilities, utilities, property, access roads, levees, and others located within or adjacent to the Site that could receive seismic motion greater than one-half inch per /second (or a more stringent velocity required by a permit or agency) and could be at risk for being damaged from ground vibrations due to construction.

1.04 SUBMITTALS: The CONTRACTOR shall provide the following Compliance Submittals in accordance with SECTION 01300, which are required:

- C. A complete list of all applicable rules and regulations with which they must comply.
- D. Pre-Construction Condition Video & Photographic Survey and Vibration Monitoring and Control:
 - 6. The CONTRACTOR shall submit a Pre-Construction Condition video survey, not less than ten (10) days prior to commencing construction operations.
 - 7. The CONTRACTOR shall schedule and conduct a pre-construction condition survey. The CONTRACTOR shall provide one (1) person from its organization and its specialist on vibration control who meets the qualifications of Article 1.05 to organize and lead a team, with the CITY and a representative of each ENFAR, in making a pre-construction condition survey. At a minimum, each ENFAR shall be inspected and its condition documented. The following is a list of each ENFAR specific to this Project for which a pre-construction inspection and report is mandatory whether the ENFAR

criteria are met or not: The aquarium, the cable huts, and the two story building, all adjacent to the project.

3. A survey method acceptable to the CONTRACTOR's insurance company shall be used.
Damage resulting from construction is the CONTRACTOR's responsibility. The CONTRACTOR shall notify the CITY and occupants of nearby buildings at least 24 hours before the start of construction.
 4. Fourteen (14) days before start of construction, the CONTRACTOR shall submit the name and qualifications of the vibration specialist including the following:
 - a. Project names, description, locations, and dates of services performed.
 - b. Name and phone number of owner/agency contact who can verify the experience of the specialist.
 5. The CONTRACTOR shall control vibrations and monitor each operation with approved seismographs and monitoring equipment located at acceptable locations when constructing near buildings, structures, or utilities that may be subject to damage from vibrations. When vibration damage to buildings, structures, or utilities is possible, use seismographs capable of recording particle velocity for three mutually perpendicular components of vibration. The vibration specialist shall interpret the seismograph records to ensure that the data is effectively used in the control of the operations.
- C. The Pre-construction condition survey document shall include at a minimum:
- c. A map of the Project Site with areas of concern highlighted.
 - d. Videotaped or photographically documented existing conditions, and instances of preexisting cracks or other defects. The documentation shall clearly identify each item. Documentation shall describe the location, the direction from which the photo was taken, and dates. Documentation shall include a narrative of each issue. CONTRACTOR shall note the condition of the existing structures and shall locate and identify any areas where bulging, sloughing, cracking, or existing damage is observed.
 - e. Actual measured horizontal and vertical dimensions (not estimated dimensions) from the nearest operations to surveyed properties, structures, levees, utilities or facilities. The CONTRACTOR is required to have a Professional Land Surveyor registered in the State of Florida supervise the measurements and recording of this information.
 - f. Pertinent diaries or logs of conversations with owners related to the pre-construction condition of the inspected ENFAR's.
 - g. The CONTRACTOR shall clearly document existing conditions.
- D. Seismic Monitoring Records:
1. The records shall be clearly tied to specific construction events and include instrument identification, locations, dates, and times with tabulated and summarized results.
- E. Damage Investigation Survey Document:
1. Within seven (7) calendar days of any WORK event causing damage to any property a survey shall be conducted. Such survey shall include as a minimum:
 - a. Detailed description of the damage, including videotape or photographic documentation.

- b. Name, address and telephone number of the Owner of the damaged property, structures, levees, utilities or facilities. The CITY will supply a master list of adjacent property owner information.
 - h. Evaluation of the cause of the damage and measures taken or to be taken to prevent recurrence.
 - 2. The CONTRACTOR shall supplement this report on a bi-weekly basis (or other time period as determined by the CITY) until the damage is repaired or otherwise made whole.
 - 8. The CONTRACTOR shall submit an overview of the damage survey results including the status of any damage events, within 30 calendar days of the completion of all construction operations.
- F. Damage Inspection Survey:
 - 9. The CONTRACTOR shall perform Damage Inspection surveys to detect any effects resulting from construction operations.
 - 10. The CONTRACTOR shall submit Damage Inspection survey, photographs, and other finalized data to the CITY.
 - 11. The CITY shall inspect the properties, levees, structures, facilities and utilities after receipt of the report to verify the accuracy of the survey. Florida Department of Transportation (FDOT), Florida Power & Light (FPL) or other property or utility owners may inspect their structures, facilities, levees or utilities. Any damaged areas, which were not specifically identified in the pre-construction survey narrative and photographs, shall be deemed to have been caused by the construction operations. The CONTRACTOR shall be responsible for required repairs at no additional cost to the CITY.

1.05 QUALIFICATIONS:

- A. Vibration Control Specialist. The CONTRACTOR shall utilize a vibration control specialist who is permitted and licensed in the State of Florida with at least five (5) consecutive years of experience in vibration monitoring with at least three (3) projects per year as specified in Article 1.04.

1.06 RESPONSIBILITIES:

- E. The CONTRACTOR shall include in its bid consideration in its progress schedule for time it takes to obtain permits, permit revisions and inspections from the issuing entities.
- F. The CONTRACTOR shall obtain copies of all applicable codes, regulations, laws and ordinances and keep them in its on-site project file.

1.07 CERTIFICATIONS AND TESTING: (Not Used)

1.08 INSPECTION COORDINATION: (Not Used)

PART 2 - PRODUCTS

2.01 MATERIALS ENCOUNTERED:

- A. Materials to be encountered include geologic formations for which the CONTRACTOR has determined appropriate methods for achieving required grades, loosening material, and fragmenting according to gradation requirements. The CONTRACTOR shall ensure in its bid that it has considered all the potential expenses related to the construction required to comply with the industry regulations and with requirements of the plans and specifications.

PART 3 - EXECUTION

3.01 GENERAL:

- A. The CONTRACTOR shall be responsible for any damage to existing properties, utilities, structures, facilities, levees or access roads due to construction activities. The CONTRACTOR shall expediently repair (within 30 days or as directed by the CITY) at no additional expense. Upon the circumstance of damage:
 - 12. The CONTRACTOR shall stop construction operations.
 - 13. The CONTRACTOR shall provide the required damage survey.
 - 14. The CONTRACTOR shall undertake to rectify the damage.
 - 15. The CONTRACTOR shall revise, resubmit, and obtain the CITY's acceptance, and any required third-party acceptance, on the appropriate construction methods before any further WORK is undertaken.
- B. The CONTRACTOR shall have the sole responsibility for the safety of all WORK activities including labor, materials handling, shipment, storage, and equipment.
- C. No time extensions will be made, nor will additional compensation be made for delays or other circumstances related to unacceptable WORK.
- D. The CONTRACTOR shall take precautions to preserve the materials outside the lines of excavation in an undisturbed condition.

3.02 COORDINATION WITH THIRD PARTIES WITH RESPECT TO CONSTRUCTION:

- A. Critical properties, public utilities, levees, structures or facilities may lie close to construction areas associated with this Project. During Project development agreements may have been made between the CITY and relevant third parties. Some of these agreements will guide, restrict and affect the CONTRACTOR's activities. The following list includes the affected parties, and conditions, restrictions, timeframes, issues and consequences that the CONTRACTOR must consider in his bid for both costs and scheduling. The CONTRACTOR shall be responsible for plan implementation and effectiveness while accommodating such agreements. There will be no extra compensation for activities the CONTRACTOR must pursue to satisfy the conditions.

3.03 TURBIDITY AND EROSION CONTROL:

- A. The CONTRACTOR shall install turbidity and erosion control devices in accordance with the plans prior to start of construction.

3.04 SITE PREPARATION:

- A. Vibration Control: The CONTRACTOR shall provide a minimum of three (3) seismographs sufficient to measure and record ground movements caused by construction. The seismographs shall be placed at locations to include, but not limited to, the nearest properties, buildings, structures, levees, or utilities, and such locations are to be approved by the CITY:

16. Seismograph operators shall be qualified personnel capable of setting up instruments at designated locations and efficiently recording the construction. Construction shall be controlled in such a manner that the maximum ground vibration level at any structure which is vulnerable to damage shall not exceed a zero-to-peak particle velocity of one-half inch per /second or any more stringent permit or regulatory agency requirement.
17. The instrumentation shall record three (3) orthogonal components (vertical, radial, and transverse with respect to the location of the construction) of particle velocity direct (or shall have sufficient resolution of acceleration or displacement such that particle velocity can be readily and accurately determined from the records). The instantaneous vector sum of the three (3) directional components of vibration will be used to compute the maximum vibration level. A written memorandum of vibration intensity shall be submitted within 24 hours when specifically requested by the CITY, or without request when such intensity exceeds a peak particle velocity of one and one-half inch per second.

END OF SECTION

SECTION 02 41 00

DEMOLITION AND DECONSTRUCTION

05/10

PART 1 GENERAL

1.1 PROJECT DESCRIPTION

1.1.1 Demolition/Deconstruction Plan

Prepare a combined Demolition and Deconstruction Plan and submit proposed salvage, demolition, deconstruction, and removal procedures for approval before work is started. Include in the plan procedures for careful removal and disposition of materials specified to be salvaged, coordination with other work in progress, a disconnection schedule of utility services, a detailed description of methods and equipment to be used for each operation and of the sequence of operations. Plans shall be approved by CITY prior to work beginning.

1.1.2 General Requirements

Do not begin demolition or deconstruction until authorization is received from the CITY. Remove rubbish and debris from the project site; do not allow accumulations to occur near the water. The work includes demolition, deconstruction, salvage of identified items and materials, and removal of resulting rubbish and debris. Remove rubbish and debris from CITY property daily, unless otherwise directed. Store materials that cannot be removed daily in areas specified by the CITY.

1.2 ITEMS TO REMAIN IN PLACE

Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the CITY. Repair or replace damaged items as approved by the CITY. Coordinate the work of this section with all other work indicated. Construct and maintain shoring, bracing, and supports as required. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition, deconstruction, or removal work. Repairs, reinforcement, or structural replacement require approval by the CITY prior to performing such work.

1.2.1 Existing Construction Limits and Protection

Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide temporary shoring and bracing for support of building components to prevent settlement or other movement. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove dust, dirt, and debris from work areas daily.

1.2.2 Weather Protection

For portions of the wall to remain, protect from the weather when possible during deconstruction. Where removal of existing overburden or concrete is necessary to accomplish work, have materials and workmen ready to provide adequate and temporary covering of exposed areas.

1.2.3 Trees

Protect trees within the project site which might be damaged during demolition or deconstruction, and which are indicated to be left in place, by a 6 foot high fence. Erect and secure fence a minimum of 5 feet from the trunk of individual trees or follow the outer perimeter of branches or clumps of trees. Replace any tree designated to remain that is damaged during the work under this contract with like-kind or as approved by the CITY.

1.2.4 Utility Service

Maintain existing utilities indicated to stay in service and protect against damage during demolition and deconstruction operations. Prior to start of work, utilities serving each area of alteration or removal will be shut off by the CITY and disconnected and sealed by the Contractor.

1.2.5 Facilities

Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities. Sheet Pile and mooring piles or any other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, must remain standing without additional bracing, shoring, or lateral support until demolished or deconstructed, unless directed otherwise by the CITY. Ensure that no elements determined to be unstable are left unsupported and place and secure bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract.

The existing concrete panel wall is the most unstable on the east end of the wall nearest the boat ramp. The contractor should take every precaution when working in this area to protect the existing panels and other upland facilities.

1.3 BURNING

The use of burning at the project site for the disposal of refuse and debris will not be permitted.

1.4 AVAILABILITY OF WORK AREAS

Areas in which the work is to be accomplished will be available in accordance with the following schedule:

Seawall and upland adjacent to wall	Date: 7-days after the NTP
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Portion of Mallory Square as permitted by the City	TBD - depending on the issuance of the award and the notice to proceed.
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1.5 SUBMITTALS

CITY approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Demolition & Deconstruction Plan; G

1.6 QUALITY ASSURANCE

Submit timely notification of demolition, deconstruction, and renovation projects to Federal, State, Regional, and CITY authorities. Notify the FDEP, NOAA, the ACOE and the CITY in writing 10 working days prior to the commencement of work. Comply with federal, state, and local hauling and disposal regulations. Use of explosives will not be permitted.

1.6.1 Dust and Debris Control

Prevent the spread of dust and debris and avoid the creation of a nuisance in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, flooding, or pollution. Clean the work area daily. Sweep pavements as often as necessary to control the spread of debris that may result in foreign object damage potential to vehicular and/or pedestrian.

1.7 PROTECTION

1.7.1 Traffic Control Signs

- a. Where pedestrian and driver safety is endangered in the area of removal work, use barricades with flashing lights. Anchor barricades in a manner to prevent displacement by wind. Notify the CITY prior to beginning such work. Tripping or fall hazards should not be left unprotected overnight.
- b. Provide a minimum of 2 FAA type L-810 steady burning red obstruction lights on temporary structures (including cranes) over 100 feet above ground level. The use of LED based obstruction lights are not permitted.

1.7.2 Protection of Personnel

Before, during and after the demolition and deconstruction work continuously evaluate the condition of the structure being demolished and deconstructed and take immediate action to protect all personnel working in and around the project site. No area, section, or component of floors, roofs,

walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

1.8 FOREIGN OBJECT DAMAGE (FOD)

NOT USED

1.9 RELOCATIONS

Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair or replace items to be relocated which are damaged by the Contractor with new undamaged items as approved by the CITY.

1.10 EXISTING CONDITIONS

This item is provided for use by the contractor to verify the existing conditions described by the CITY. Before beginning any demolition or deconstruction work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing conditions in the presence of the CITY showing the condition of structures and other facilities adjacent to areas of alteration or removal. Photographs sized 4 inch will be acceptable as a record of existing conditions. Include in the record the elevation of the top of foundation walls, finish floor elevations, possible conflicting electrical conduits, plumbing lines, alarms systems, the location and extent of existing cracks and other damage and description of surface conditions that exist prior to before starting work. It is the Contractor's responsibility to verify and document all required outages which will be required during the course of work, and to note these outages on the record document. Submit survey results.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

Inspect and evaluate existing structures onsite for reuse. Existing construction scheduled to be removed for reuse shall be disassembled. Dismantled and removed materials are to be separated, set aside, and prepared as specified, and stored or delivered to a collection point for reuse, remanufacture, recycling, or other disposal, as specified. Materials shall be designated for reuse onsite whenever possible.

3.1.1 Structures

- a. Remove existing structures indicated to be removed to top of existing seawall.
- b. Demolish and/or deconstruct structures in a systematic manner from the top of the structure to the ground. Demolish the concrete cap in small sections. Remove structural members and

mooring piles with a crane or other equipment (preferably from the upland), and lower to ground by means of suitable methods.

- c. Locate demolition and deconstruction equipment as far away from the face of the existing wall as possible so as to not impose excessive loads or surcharges on the structure.

3.1.2 Utilities and Related Equipment

3.1.2.1 General Requirements

Do not interrupt existing utilities serving the CITY's occupied or used facilities, except when authorized in writing by the CITY. Do not interrupt existing utilities serving facilities occupied and used by the CITY except when approved in writing and then only after temporary utility services have been approved and provided.

3.1.2.2 Disconnecting Existing Utilities

Remove existing utilities uncovered by work and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the CITY. When utility lines are encountered but are not indicated on the drawings, notify the CITY prior to further work in that area. Remove meters and related equipment and deliver to a location in accordance with instructions of the CITY.

3.1.3 Fencing

Remove only a portion of the fencing, gates and other related salvaged items scheduled for removal and transport to designated areas. Remove gates as whole units.

3.1.4 Paving and Slabs

Remove concrete and asphaltic concrete paving and slabs including aggregate base as required. Provide neat sawcuts at limits of wall-cap or other concrete removal as indicated. Pavement and slabs designated to be recycled and utilized in this project shall be moved, ground and stored as directed by the CITY. Pavement and slabs not to be used in this project shall be removed from the Installation at Contractor's expense.

3.1.5 Concrete

Saw concrete along straight lines to a depth of a minimum 2 inch. Make each cut perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete. Salvage removed concrete.

3.1.6 Structural Steel

Dismantle structural steel at field connections and in a manner that will prevent bending or damage. Salvage structural steel, angles, plates, columns and shapes. Flame-cutting torches are permitted when other methods of dismantling are not practical.

3.1.7 Miscellaneous Metal

Salvage light-gage and cold-formed metal pieces, such as steel studs, sections of steel sheet pile, accessories and similar items. Scrap metal shall become the Contractor's property. Recycle scrap metal as part of demolition and deconstruction operations. Provide separate containers to collect scrap metal and transport to a scrap metal collection or recycling facility, in accordance with the Waste Management Plan.

3.1.8 Carpentry

Salvage for reuse lumber, millwork items, and finished boards, and sort by type and size. Chip or shred and recycle salvaged wood unfit for reuse, except stained, painted, or treated wood.

3.1.9 Conduit and Miscellaneous Items

Salvage conduit except where embedded in concrete or masonry. Consider corroded, bent, or damaged conduit as scrap metal. Sort straight and undamaged lengths of conduit according to size and type. Classify supports, knobs, tubes, cleats, and straps as debris to be removed and disposed.

3.2 CONCURRENT EARTH-MOVING OPERATIONS

Do not begin excavation, filling, and other earth-moving operations that are sequential to demolition or deconstruction work in areas occupied by structures to be demolished or deconstructed until all demolition and deconstruction in the area has been completed and debris removed. Fill holes, open basements and other hazardous openings.

3.3 DISPOSITION OF MATERIAL

3.3.1 Title to Materials

Except for salvaged items specified in related Sections, and for materials or equipment scheduled for salvage, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor and shall be removed from CITY property. Title to materials resulting from demolition and deconstruction, and materials and equipment to be removed, is vested in the Contractor upon approval by the CITY of the Contractor's demolition, deconstruction, and removal procedures, and authorization by the CITY to begin demolition and deconstruction. The CITY will not be responsible for the condition or loss of, or damage to, such property after contract award. Showing for sale or selling materials and equipment on site is prohibited.

3.3.2 Reuse of Materials and Equipment

Remove and store materials in the Demolition and Deconstruction Plan to be reused or relocated to prevent damage, and reinstall as the work progresses.

3.3.3 Salvaged Materials and Equipment

Remove materials in the Demolition and Deconstruction Plan specified to be removed by the Contractor and that are to remain the property of the CITY, and deliver to a storage site as directed.

- a. Salvage items and material to the maximum extent possible.
- b. Store all materials salvaged for the Contractor as approved by the CITY and remove from CITY property before completion of the contract. On site sales of salvaged material is prohibited.
- c. Remove salvaged items to remain the property of the CITY in a manner to prevent damage, and packed or crated to protect the items from damage while in storage or during shipment. Items damaged during removal or storage must be repaired or replaced to match existing items. Properly identify the contents of containers.
- d. Remove historical items in a manner to prevent damage. Store the historical items for reuse in the project.

3.3.4 Unsalvageable and Non-Recyclable Material

Dispose of unsalvageable and non-recyclable noncombustible material in the disposal area approved to accept the waste. Dispose of unsalvageable and non-recyclable combustible material in the sanitary fill in this approved area.

3.4 CLEANUP

Remove debris and rubbish from basement and similar excavations. Remove and transport the debris in a manner that prevents spillage on streets or adjacent areas. Apply local regulations regarding hauling and disposal.

3.5 DISPOSAL OF REMOVED MATERIALS

3.5.1 Regulation of Removed Materials

Dispose of debris, rubbish, scrap, and other non-salvageable materials resulting from removal operations with all applicable federal, state and local regulations as contractually specified in the Waste Management Plan. Storage of removed materials on the project site is prohibited.

3.5.2 Burning on CITY Property

Burning of materials removed from demolished and deconstructed structures will not be permitted on CITY property.

3.5.3 Removal to Spoil Areas on CITY Property

Transport noncombustible materials removed from demolition and deconstruction structures to designated spoil areas on CITY property.

3.5.4 Removal from CITY Property

Transport waste materials removed from demolished and deconstructed structures, except waste soil, from CITY property for legal disposal. Dispose of waste soil as directed.

3.6 REUSE OF SALVAGED ITEMS

Recondition salvaged materials and equipment designated for reuse before installation. Replace items damaged during removal and salvage operations or restore them as necessary to usable condition.

-- End of Section --

REMOVAL AND SALVAGE OF HISTORIC CONSTRUCTION MATERIALS

PART 1 GENERAL

1.1 PROJECT DESCRIPTION

The work includes removal and salvage of identified historic items and materials, and removal of resulting rubbish and debris. General demolition of non-historic materials and removal of resulting rubbish and debris shall comply with the requirements of Section 02 41 00 DEMOLITION AND DECONSTRUCTION. Materials to be salvaged or recycled shall be stored daily in areas and manner specified by the CITY. In the interest of conservation, salvage and recycling shall be pursued to the maximum extent possible.

1.1.1 Dust Control

The amount of dust resulting from removal, salvage and demolition operations shall be controlled to prevent the spread of dust to occupied portions of the construction site and to avoid creation of a nuisance in the surrounding area. Use of water to control dust will not be permitted when it will result in, or create, damage to existing building materials and hazardous or objectionable conditions such as ice, flooding and pollution.

1.1.2 Protection

1.1.2.1 Protection of Existing Historic Property

Before beginning any removal, salvage or demolition work, survey the site and examine the drawings and specifications to determine the extent of the work. Take necessary precautions to avoid damage to existing historic items that are to remain in place, to be reused, or to remain the property of the CITY. Repair or restore items damaged by the Contractor to original condition, or replaced, as approved by the CITY. Coordinate the work of this section with all other work and shall construct and maintain shoring, bracing and supports, as required. Ensure that structural elements are not overloaded and shall provide additional supports as may be required as a result of any cutting, removal, or demolition work performed under this contract.

1.1.2.2 Protection from the Weather

The interior of buildings to remain and salvageable materials shall be protected from the weather at all times. Salvaged historic materials shall be stored out of contact with the ground and under weathertight covering if possible.

1.1.2.3 Environmental Protection

The contractor shall coordinate with the CITY for any additional environmental protection measures that arise as a result of the implementation of this specification.

1.2 SUBMITTALS

CITY approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Work Plan; G

1.3 QUALIFICATIONS

Provide qualified workers trained and experienced in recycling, removal and salvage of historic materials. A current point-of-contact for identified references shall be provided.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 SALVAGED ITEMS

Salvage items to the maximum extent possible. Prior to any demolition work, historic items to be salvaged shall be removed from the structure. Removal of salvageable items shall be accomplished by hand labor to the maximum extent possible. Care shall be taken to not damage portions of the structure to remain or items identified for salvage. Materials not scheduled for salvage or recycling shall be removed prior to any salvaging procedures. Keep a complete recording of all salvaged materials including the condition of such materials before, and after, salvage operations.

3.1.1 Site Work

The following site items shall be removed intact and salvaged: Mooring piles, white plastic pile caps, and the marginal portions of the five existing docks.

3.1.2 Concrete

The following concrete items shall be removed intact and salvaged: Contractor shall coordinate with the CITY to confirm the disposition of the concrete cap. For bidding purposes, the contractor should plan to demo and remove the concrete cap.

3.1.3 Masonry

Not Used

3.1.4 Metals

Not Used

3.1.5 Wood

The following materials shall be removed intact and salvaged: wood decking, wood stairs and handrails, ladders, timber mooring piles, header boards, and other timber products that can be reused if removed and stored in good condition. No wood that appears to have been damaged during the deconstruction process shall be reused.

3.1.6 Mechanical Equipment

The following mechanical equipment shall be removed intact and salvaged: Access gates to docks.

3.1.6 Storm water systems

All existing storm drainage and other upland facilities will be protected.

3.1.7 Electrical Equipment:

The following electrical fixtures and equipment shall be removed intact and salvaged: Electrical wiring on the docks shall be protected and reused. New wiring shall be provided from the main breaker panel to the proposed pull boxes. Existing solar powered field lighting will be protected and/or removed, stored and replaced.

3.2 RECYCLED MATERIALS

The following materials shall be recycled: timber piles, plastic pile caps, and portions of existing decking, electrical wiring serving the docks and other works as required. The following materials may be recycled (if possible): dimension lumber, scrap wood from form work, and rubble from concrete cap. Recycle materials to the maximum extent possible. Removal of recyclable materials shall be accomplished by hand labor wherever possible. Historic portions of the structure to remain and items identified for salvage shall not be damaged while removing materials for recycling. **No rubble or other recycled materials shall be placed between the old and new wall.**

3.3 DISPOSITION OF MATERIALS

Title to materials and equipment to be demolished, is vested in the Contractor upon receipt of notice to proceed. The CITY will not be responsible for the condition, loss or damage to such property after notice to proceed.

3.3.1 Material Salvaged for the Contractor

Temporarily store salvaged material as approved by the CITY and remove from CITY property before completion of the contract. Sale of salvaged material on the site is prohibited.

3.3.2 Items Salvaged for the CITY

Salvaged items to remain the property of the CITY shall be removed in a manner to prevent damage, packed or crated to protect the items from damage, or as directed by the CITY. Items damaged

during removal or storage shall be repaired or replaced to match existing items. Containers shall be properly identified as to contents. The following items reserved as property of the CITY shall be delivered to the areas designated: TBD. Contractor shall coordinate with CITY if materials are salvaged and not used on the project.

3.4 CLEAN-UP

Upon completion of the work, portions of structure to remain and adjacent areas and structures shall be cleaned of dust, dirt, and debris caused by salvage and demolition operations. Debris and rubbish shall be removed and transported in a manner that prevents spillage on streets or adjacent areas. Local regulations regarding hauling and disposal shall apply.

-- End of Section --

SECTION 03 10 00

CONCRETE FORMWORK

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall design and furnish all materials for concrete formwork, bracing, and supports and shall design and construct all falsework, all in accordance with the provisions of the Contract Documents.

1.02 RESPONSIBILITY

- A. The design and engineering of the formwork as well as safety considerations are the responsibility of the Contractor.

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Without limiting the generality of other requirements of these Specifications, all work specified herein shall conform to or exceed the requirements of the Florida Building Code and the applicable requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of this Section.
 - 1. Codes and Standards
The Building Code, as referenced herein, is the Florida Building Code (FBC).
 - 2. Government Standards
PS 1 U.S. Product Standard for Concrete Forms, Class I.
 - 3. Commercial Standards
ACI 347 Recommended Practice for Concrete Formwork.
ACI 318R Building Code Requirements for Reinforced Concrete.

1.04 QUALITY ASSURANCE

- A. The variation from established grade or lines shall not exceed 1/4 inch in 10 feet and there shall be no offsets or visible bulges or waviness in the finished surface. All tolerances shall be within the "Suggested Tolerances" specified in ACI 347. The Contractor shall grind smooth all fins and projections between formwork panels as directed by the Engineer.
- B. Curved forms shall be used for curved and circular structures that are cast-in-place. Straight panels will not be acceptable for forming curved structures.

PART 2 - PRODUCTS

2.01 FORM MATERIALS

- A. Except as otherwise expressly accepted by the Engineer, all lumber brought on the job site for use as forms, shoring, or bracing shall be new material. All forms shall be smooth surface forms and shall be of the following materials:

Footing sides -Construction grade Hem Fir or Douglas Fir

Walls -Steel or plywood panel

Columns -Steel, plywood or fiber glass Roof and floor

Slabs -Plywood

All other work -Steel panels, plywood or tongue and groove lumber

- A. Materials for concrete forms, formwork, and falsework shall conform to the following requirements:
1. Lumber shall be Southern Pine, construction grade or better, in conformance with U.S. Product Standard PS20.
 2. Plywood for concrete formwork shall be new, waterproof, synthetic resin bonded, exterior type Douglas Fir or Southern Pine plywood manufactured especially for concrete formwork and shall conform to the requirements of PS I for Concrete Forms, Class I, and shall be edge sealed. Thickness shall be as required to support concrete at the rate it is placed, but not less than 5/8-inch thick.

2.02 PREFABRICATED FORMS

- A. Form materials shall be metal, wood, plywood, or other acceptable material that will not adversely affect the concrete and will facilitate placement of concrete to the shape, form, line, and grade indicated. Metal forms shall be an acceptable type that will accomplish such results. Wood forms for surfaces to be painted shall be Medium Density Overlaid plywood, MDO Ext. Grade.

2.03 FORMWORK ACCESSORIES

- A. Exterior corners in concrete members shall be provided with 3/4-inch chamfers. Re-entrant corners in concrete members shall not have fillets unless otherwise shown.
- B. Form ties shall be provided with a plastic cone or other suitable means for forming a conical hole to insure that the form tie may be broken off back of the face of the concrete. The maximum diameter of removable cones for rod ties, or of other removable form-tie fasteners having a circular cross-section, shall not exceed 1-1/2 inches; and all such fasteners shall be such as to leave holes of regular shape for reaming.
- C. Form ties for water-retaining structures shall have integral waterstops. Removable taper ties may be used when acceptable to the Engineer. Taper ties shall not be used to cast water retaining structural walls. At other locations, a preformed neoprene or

polyurethane tapered plug sized to seat at the center of the wall shall be inserted in the hole left by the removal of the taper tie.

- D. Form release agent shall be a blend of natural and synthetic chemicals that employs a chemical reaction to provide quick, easy and clean release of concrete from forms. It shall not stain the concrete and shall leave the concrete with a paintable surface. Formulation of the form release agent shall be such that it would minimize formation of "Bug Holes" in cast- in-place concrete.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Forms to confine the concrete and shape it to the required lines shall be used wherever necessary. The Contractor shall assume full responsibility for the adequate design of all forms, and any forms which are unsafe or inadequate in any respect shall promptly be removed from the Work and replaced at the Contractor's expense. A sufficient number of forms of each kind shall be provided to permit the required rate of progress to be maintained. The design and inspection of concrete forms and falsework, shall comply with applicable local, state and Federal regulations. Plumb and string lines shall be installed before concrete placement and shall be maintained during placement. Such lines shall be used by Contractor's personnel and by the Engineer and shall be in sufficient number and properly installed. During concrete placement, the Contractor shall continually monitor plumb and string line form positions and immediately correct deficiencies.
- B. Concrete forms shall conform to the shape, lines, and dimensions of members as called for on the Drawings, and shall be substantially, free from surface defects, and sufficiently tight to prevent leakage. Forms shall be properly braced or tied together to maintain their position and shape under a load of freshly-placed concrete.
- C. All forms shall be true in every respect to the required shape and size, shall conform to the established alignment and grade, and shall be of sufficient strength and rigidity to maintain their position and shape under the loads and operations incident to placing and vibrating the concrete. Suitable and effective means shall be provided on all forms for holding adjacent edges and ends of panels and sections tightly together and in accurate alignment so as to prevent the formation of ridges, fins, offsets, or similar surface defects in the finished concrete. Plywood, 5/8 inch and greater in thickness, may be fastened directly to studding if the studs are spaced close enough to prevent visible deflection marks in the concrete. The forms shall be tight so as to prevent the loss of water, cement and fines during placing and vibrating of the concrete. Specifically, the bottom of wall forms that rest on concrete footings or slabs shall be provided with a gasket to prevent loss of fines and paste during placement and vibration of concrete. Such gasket may be a 1 to 1-1/2-inch diameter polyethylene rod held in position to the underside of the wall form. Adequate clean-out holes shall be provided at the bottom of each lift of forms. The size, number, and location of such clean-outs shall be as acceptable to the Engineer.

- D. Concrete construction joints will not be permitted at locations other than those shown or specified, except as may be acceptable to the Engineer. When a second lift is placed on hardened concrete, special precautions shall be taken in the way of the number, location, and tightening of ties at the top of the old lift and bottom of the new to prevent any unsatisfactory effect whatsoever on the concrete. Pipe stubs and anchor bolts shall be set in the forms where required.

3.02 EARTH FORMS

- A. All vertical surfaces of concrete members shall be formed, except where placement of the concrete against the ground is called for on the Drawings. Not less than 1 inch of concrete shall be added to the thickness of the concrete member as shown where concrete is permitted to be placed against trimmed ground in lieu of forms. Such permission will be granted only for members of comparatively limited height and where the character of the ground is such that it can be trimmed to the required lines and will stand securely without caving or sloughing until the concrete has been placed.

3.03 FOOTINGS, SLAB EDGES AND GRADE BEAMS

- A. Provide wood side forms for all footings, slab edges and grade beams.

3.04 APPLICATION - FORM RELEASE AGENT

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

3.05 INSERTS, EMBEDDED PARTS AND OPENINGS

- A. Embedded Form Ties: Holes left by the removal of form tie cones shall be reamed with suitable toothed reamers so as to leave the surface of the holes clean and rough before being filled with mortar as specified for in Section 03350 entitled "Concrete Finishes". Wire ties for holding forms will not be permitted. No form-tying device or part thereof, other than metal, shall be left embedded in the concrete. Ties shall not be removed in such manner as to leave a hole extending through the interior of the concrete members. The use of snap-ties which cause spalling of the concrete upon form stripping or tie removal will not be permitted. If steel panel forms are used, rubber grommets shall be provided where the ties pass through the form in order to prevent loss of cement paste. Where metal rods extending through the concrete are used to support or to strengthen forms, the rods shall remain embedded and shall terminate not less than 1-inch back from the formed face or faces of the concrete.

3.06 FORM CLEANING

- A. Forms may be reused only if in good condition and only if acceptable to the Engineer. Light sanding between uses will be required wherever necessary to obtain uniform surface texture on all exposed concrete surfaces. Exposed concrete surfaces are defined

as surfaces which are permanently exposed to view. Unused tie rod holes in forms shall be covered with metal caps or shall be filled by other methods acceptable to the Engineer.

3.07 FORMWORK TOLERANCES

- A. Formwork shall be constructed to insure that finished concrete surfaces will be in accordance with the tolerances listed in ACI 347.
 - 1. The following construction tolerances are hereby established and apply to finished walls and slab unless otherwise shown in the Drawings:

Item	Tolerance
Variation of the constructed linear outline from the established position in plan	In 10 feet: 1/4 inch; In 20 feet or more: 1/2 inch
Variation from the level or from the grades shown on the Drawings	In 10 feet: 1/4 inch; In 20 feet or more: 1/2 inch
Variation from the plum	In 10 feet: 1/4 inch; In 20 feet or more: 1/2 inch
Variation in the thickness of slabs and walls	Minus 1/4 inch; Plus 1/2 inch
Variation in the locations and sizes of slab and wall openings	Plus or minus 1/4 inch

3.08 FORM REMOVAL

- A. Remove top forms on sloping surfaces of concrete as soon as removal operations will not allow the concrete to sag. Perform any needed repairs or treatment required on sloping surfaces at once and follow immediately with the specified curing.
- B. The Contractor shall be responsible for the removal of forms and shores. Forms or shores shall not be removed before test cylinders have reached the specified minimum 28 day comprehensive strength for the class of concrete specified in Section 03300 entitled "Cast- in-Place Concrete", nor sooner than listed below:
 - 1. Grade beam side forms 3 days
 - 2. Wall forms 3 days
 - 3. Column forms 3 days
 - 4. Beam and girder side forms 3 days
 - 5. Beam bottoms and slab forms/shores 14 days

3.09 MAINTENANCE OF FORMS

- A. Forms shall be maintained at all times in good condition, particularly as to size, shape, strength, rigidity, tightness, and smoothness of surface. Forms, when in place, shall conform to the established alignment and grades. Before concrete is placed, the forms

shall be thoroughly cleaned. The form surfaces shall be treated with a nonstaining mineral oil or other lubricant acceptable to the Engineer. Any excess lubricant shall be satisfactorily removed before placing the concrete. Where field oiling of forms is required, the Contractor shall perform the oiling at least two weeks in advance of their use. Care shall be exercised to keep oil off the surfaces of steel reinforcement and other metal items to be embedded in concrete.

-- End of Section --

SECTION 03 30 00

CAST -IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 THE REQUIREMENT

- A. The Contractor shall furnish all materials for concrete in accordance with the provisions of this Section and shall form, mix, place, cure, repair, finish, and do all other work as required to produce finished concrete, all in accordance with the requirements of the Contract Documents.
- B. The requirements in this section shall apply to the following types of concrete:
 - 1. Class A Concrete: Normal weight concrete used at all locations, unless otherwise noted.
 - 2. Class B Concrete: Normal weight concrete with pea-rock aggregate. Class B concrete shall be used only at locations indicated on the Drawings.
 - 3. Class C Concrete: Normal weight concrete used in electrical/ instrumentation ductbanks, pipe encasements and sidewalks.
 - 4. Tremie concrete: Concrete indicated to be placed underwater.

1.02 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Without limiting the generality of other requirements of these Specifications, all work specified herein shall conform to or exceed the requirements of the Florida Building Code (FBC) and the applicable requirements of the following documents to the extent that the provisions of such documents are not in conflict with the requirements of this Section.
- B. Codes and Standards
 - 1. The Building Code, as referenced herein, shall be the Florida Building Code.
- C. Federal Specifications
 - 1. UU-B-790A (Int. Amd. 1) Building Paper, Vegetable Fiber (Kraft, Waterproofed, Water Repellant and Fire Resistant).
- D. Commercial Standards
 - ACI 214.1 R-81 Recommended Practice for Evaluation of Strength Test Results of Concrete.
 - AC1318R Building Code Requirements for Reinforced Concrete.
 - ACI 301 Specifications for Structural Concrete for Buildings.
 - ACI 315R Details and Detailing of Concrete Reinforcement.
 - ACI 347R Recommended Practice for Concrete Formwork.
 - ASTM C 31 Methods of Making and Curing Concrete Test Specimens in the Field.
 - ASTM C 33 Specification for Concrete Aggregates.
 - ASTM C 39 Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - ASTM C 94 Specification for Ready-Mixed Concrete.
 - ASTM C 114 Method for Chemical Analysis of Hydraulic Cement.

ASTM C 136	Method for Sieve Analysis of Fine and Coarse Aggregate.
ASTM C 143	Test Method for Slump of Portland Cement Concrete.
ASTM C 150	Specification for Portland Cement.
ASTM C 156	Test Method for Water Retention by Concrete Curing Materials.
ASTM C 157	Test Method for Length Change of Hardened Cement Mortar and Concrete.
ASTM C 192	Method of Making and Curing Concrete Test Specimens in the Laboratory.
ASTM C 260	Specification for Air-Entraining Admixtures for Concrete.
ASTM C 494	Specification for Chemical Admixtures for Concrete.

1.03 SUBMITTALS

- A. The design mix to be used shall be prepared by qualified persons and submitted for review. The design of the mix is the responsibility of the Contractor subject to the limitations of the specifications. Review processing of this submission will be required only as evidence that the mix has been designed by qualified persons and that the minimum requirements of the specifications have been met. Such review will in no way alter the responsibility of the Contractor to furnish concrete meeting the requirements of the specifications relative to strength and slump. If in the progress of the work the sources of materials change in characteristics or the Contractor requests a new source in writing, the Contractor shall, at his expense submit new test data and information for the establishment of a new design mix. Submit mix designs for all classes of concrete.
- B. Where ready-mix concrete is used, the Contractor shall provide delivery tickets at the time of delivery of each load of concrete. In addition to the information required by ASTM C94, each ticket shall show the mix number, cement content and water/cement ratio.
- C. Location of all proposed construction joints.
- D. Manufacturer's data on all admixtures.
- E. Concrete mix designs for each type of mix proposed and its intended locations.
- F. A schedule of all concrete placement with volume of concrete planned to be placed each day.
- G. A layout of all structures with all planned construction joint locations.

1.04 QUALITY ASSURANCE

- A. Plant equipment and facilities shall meet all requirements of the Check List for Certification of Ready Mixed Concrete Production facilities of the National Ready Mixed Concrete Association and ASTM C 94.
- B. Tests for compressive strength and slump of concrete will be performed as specified herein. Test for determining slump will be in accordance with the requirements of ASTM C 143.
- C. The cost of all tests, will be borne by the Contractor. The Contractor shall also be charged for the cost of any additional tests and investigation on work performed which does not meet the Specifications.
- D. Concrete for testing shall be supplied by the Contractor at no cost to the Owner, and the Contractor shall provide assistance to the Concrete Testing Company in obtaining samples. The Contractor shall dispose of and clean up all excess material.
- E. Construction Tolerances

1. The Contractor shall set and maintain concrete forms and perform finishing operations so as to ensure that the completed work is within the tolerances specified herein. Surface defects and irregularities are defined as finishes are to be distinguished from tolerances. Tolerance is the specified permissible variation from lines, grades, or dimensions shown. Where tolerances are not stated in the Specifications, permissible deviations will be in accordance with ACI 347 and Section 03100 entitled "Concrete Formwork".

1.05 FIELD SAMPLES

A. Field Compression Tests

1. Compression test specimens shall be taken during construction from the first placement of each class of concrete specified herein and at intervals thereafter as selected by the Engineer to insure continued compliance with these Specifications. At least one set of test specimens shall be made for each 50 yards of concrete placed. Each set of test specimens shall be a minimum of 5 cylinders.
2. Compression test specimens for concrete shall be made in accordance with ASTM C 31. Specimens shall be 6-inch diameter by 12-inch high cylinders.
3. Compression test shall be performed in accordance with ASTM C 39. One cylinder tested at 3 days, one test cylinders will be tested at 7 days and 2 at 28 days. The remaining cylinder will be held to verify test results, if needed.

B. Evaluation and Acceptance of Concrete

1. Evaluation and acceptance of the compressive strength of concrete shall be according to the requirements of ACI 318, Chapter 5 "Concrete Quality Mixing and Placing", and as specified herein.
2. If any concrete fails to meet these requirements, immediate corrective action shall be taken to increase the compressive strength for all subsequent batches of the type of concrete affected.
3. All concrete which fails to meet the ACI requirements and these specifications, is subject to removal and replacement at the cost of the Contractor.

PART 2 - PRODUCTS

2.01 CONCRETE MATERIALS

- A. Materials shall be delivered, stored, and handled so as to prevent damage by water or breakage. Only one brand of cement shall be used. Cement reclaimed from cleaning bags or leaking containers shall not be used. All cement shall be used in the sequence of receipt of shipments.
- B. All materials furnished and stored for the work shall comply with the requirements of ACI 301, as applicable.
- C. Materials for concrete shall conform to the following requirements:
 1. Cement shall be standard brand portland cement conforming to ASTM C 150 for

Type II. Portland cement shall contain not more than 0.60 percent alkalis. The term "alkalies" referred to herein is defined as the sum of the percentage of sodium oxide and 0.658 times the percentage of potassium oxide ($\text{Na}_2\text{O} + 0.658 \text{K}_2\text{O}$). These oxides shall be determined in accordance with ASTM C 114. A single brand of cement shall be used throughout the Work, and prior to its use, the brand shall be acceptable to the Engineer. The cement shall be suitably protected from exposure to moisture until used. Cement that has become lumpy shall not be used. Sacked cement shall be stored in such a manner so as to permit access for inspection and sampling. Certified mill test reports for each shipment of cement to be used shall be submitted to the Engineer if requested regarding compliance with these Specifications.

2. Water shall be potable, clean, and free from objectionable quantities of silty organic matter, alkali, salts and other impurities. The water shall be considered potable, for the purposes of this Section only, if it meets the requirements of the local governmental agencies.
3. Aggregates shall be obtained from pits acceptable to the Engineer, shall be non-reactive, and shall conform to the Florida Building Code (FBC) and ASTM C 33. Maximum size of coarse aggregate shall be as specified in Article 2.04, Paragraph B of this Section. Lightweight sand for fine aggregate will not be permitted.
 - a. Coarse aggregates shall consist of clean, hard, durable gravel, crushed gravel, crushed rock or a combination thereof. The coarse aggregates shall be prepared and handled in two or more size groups for combined aggregates with a maximum size not greater than 1 inch. When the aggregates are proportioned for each batch of concrete the two size groups shall be combined.
 - b. Fine aggregates shall be manufactured sand that is hard and durable.
 - c. Combined aggregates shall be well graded from coarse to fine sizes, and shall be uniformly graded between screen sizes to produce a concrete that has optimum workability and consolidation characteristics. Where a trial batch is required for a mix design, the final combined aggregate gradations will be established during the trial batch process.
 - d. When tested in accordance with "Potential Reactivity of Aggregates (Chemical Method)" (ASTM C 289), the ratio of silica released to reduction in alkalinity shall not exceed 1.0.
 - e. When tested in accordance with "Organic Impurities in Sands for Concrete" (ASTM C 40), the fine aggregate shall produce a color in the supernatant liquid no darker than the reference standard color solution.
 - f. When tested in accordance with "Resistance to Abrasion of Small size Coarse Aggregate by Use of the Los Angeles Machine" (ASTM C 131), the coarse aggregate shall show a loss not exceeding 42 percent after 500 revolutions, or 10.5 percent after 100 revolutions.
 - g. When tested in accordance with "Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate" (ASTM C 88), the loss resulting after five cycles shall not exceed 10 percent for fine or coarse aggregate when using sodium sulfate.
4. All cement, admixtures, sealers, and form release agents used in or on the concrete or mortar shall conform to NSF International (NSF) standard 61-2001 and Addendum 1.0-2001 to NSF Standard 61-2001.

5. Aggregate used in the concrete or mortar shall be clean (i.e. free of excess clay, silt, mica, organic matter, chemical salts and coated grains) and shall be essentially free of those metals and radionuclides regulated under applicable primary drinking water standards.

2.02 ADMIXTURES

- A. Air-entraining agent meeting the requirements of ASTM C 260, shall be used. Sufficient air-entraining agent shall be used to provide a total air content of 3 to 5 percent.
- B. Admixtures shall be required at the Engineer's discretion or, if not required, may be added at the Contractor's option to control the set, effect water reduction, and increase workability. In either case, the addition of an admixture shall be at the Contractor's expense. The use of an admixture shall be subject to acceptance by the Engineer. Concrete containing an admixture shall be first placed at a location determined by the Engineer. If the use of an admixture is producing an inferior end result, the Contractor shall discontinue use of the admixture. Admixtures specified herein shall conform to the requirements of ASTM C 494. The required quantity of cement shall be used in the mix regardless of whether or not an admixture is used. Admixtures shall contain no free chloride ions, be non-toxic after 30 days, and shall be compatible with and made by the same manufacturer as the air entraining admixture.
 1. Set controlling admixture shall be either with or without water-reducing properties. Where the air temperature at the time of placement is expected to be consistently over 80 degrees Fahrenheit, a set retarding admixture such as Sika Chemical Corporation's Plastiment, Master Builder's Pozzoloth 200R or equal shall be used. Where the air temperature at the time of placement is expected to be consistently under 40 degrees Fahrenheit, a set accelerating admixture such as Sika Chemical Corporation's Plastocrete 161 FL, Master Builder's Pozzoloth 50C, or equal shall be used.
 2. Low range water reducer shall be added to all structural concrete, and shall conform to ASTM C 494, Type A. It shall be either a hydroxylated carboxylic acid type or a hydroxylated polymer type. The quantity of admixture used and the method of mixing shall be in accordance with the manufacturer's instructions and recommendations.
 3. Water reducing and retarding admixture shall be in conformance with ASTM C 494 Type D free of chlorides, "MB-HC" by Master Builders, "WRDA-79" by Grace or equal.
 4. High range water reducer shall be sulfonated polymer conforming to ASTM C 494, Type For G.
 5. If the high range water reducing agent is added to the concrete at the batch plant, it shall be second generation type, Daracem 100, as manufactured by W.R. Grace & Co., Pozzolith 430R, as manufactured by Master Builders; or equal. High range water reducer shall be added to the concrete after all other ingredients have been mixed and initial slump has been verified.
 6. If the high range water reducer is added to the concrete at the job site, it shall be used in conjunction with a low range water reducer and shall be Pozzolith 400N and Pozzolith MBL82, as manufactured by Master Builders; WRDA 19 and WRDA 79, as manufactured by W.R. Grace & Co., or equal. Concrete shall have a slump of 3 inches. ± 1/2 inch prior to adding the high range water reducing admixture at

the job site. The high range water reducing admixture shall be accurately measured and pressure injected into the mixer as a single dose by an experienced technician. A standby system shall be provided and tested prior to each day's operation of the job site system.

7. Concrete shall be mixed at mixing speed for a minimum of 30 mixer revolutions after the addition of the high range water reducer.
8. The Contractor shall submit certification from each admixture manufacturer that all admixtures utilized in the design mix are compatible with one another and properly proportioned.
9. Prohibited Admixtures: Calcium chloride, thiocyanate or admixtures containing more than 0.05 percent chloride ions are not permitted.
10. Certification: Written conformance to the above mentioned requirements and the chloride ion content of the admixture will be required from the admixture manufacturer prior to Mix design review by the Engineer.
11. For Class A, Class B and Class C Concrete, no flyash may be added.

1.03 ACCESSORIES

- A. Epoxy adhesives shall be the following products for the applications specified to be used in strict accordance with manufacturer's recommendations.
 1. For bonding freshly-mixed, plastic concrete to hardened concrete, Sikadur 32 Hi-Mod, LPL Epoxy Adhesive, as manufactured by Sika Chemical Corporation; Concesive 1001-LPL, as manufactured by Adhesive Engineering Company; or equal.
 2. For bonding hardened concrete or masonry to steel, Colma-Our Gel, Sikadur Hi-Mod Gel, or equal.
 3. Epoxy grouting of vertical and horizontal dowels in existing concrete: A two-component structural epoxy gel such as Rawl/Sika Foil-Fast Epoxy Injection Gel, Sikadur injection gel as manufactured by Sika Chemical Corp., EPCON G5 or approved equal. Place with pneumatic or manual injection gun.

1.04 CONCRETE MIX

- A. Concrete shall be composed of cement, admixtures, aggregates and water. These materials shall be of the qualities specified. The exact proportions in which these materials are to be used for different parts of the work will be determined by the Contractor. In general, the mix shall be designed to produce a concrete capable of being deposited so as to obtain maximum density and minimum shrinkage and, where deposited in forms, to have good consolidation properties and maximum smoothness of surface. Mix designs with more than 41 percent of sand of the total weight of fine and coarse aggregate shall not be used for Class A Concrete. The aggregate gradations shall be formulated to provide fresh concrete that will not promote rock pockets around reinforcing steel or embedded items. The proportions shall be changed whenever necessary or desirable to meet the required results at no additional cost to the Owner. All changes shall be subject to review by the Engineer.
- B. The proportions of cement, aggregates, admixtures and water used in the concrete shall be based on tests of grading and moisture content of materials, slump of concrete mixture, strength of concrete and the following factors:

1. Class A Concrete (All cast-in-place, tremied concrete and precast concrete unless otherwise noted).

Minimum cementitious materials content, per cubic yard	without flyash added: 611 lbs.
Maximum water-cementitious materials ratio, by weight	0.40
Slump range	3 inches to 4 inches with water reducing admixture 3-inch maximum before addition of high range water reducing admixture. 8-inch maximum after addition of high range water reducing admixture
Coarse Aggregate	#57 per ASTM C33
Compressive strength at 28 days F'c -	5,500 psi
Air Content	3% ± 1 %

2. Class B Concrete (At locations shown on the Drawings or specified herein).

Minimum cementitious materials content, per cubic yard	517 lbs.
Maximum water-cementitious materials ratio, by weight	0.50
Slump, maximum	5 inches
Compressive strength at 28 days - F'c	3,000 psi
Coarse Aggregate	Pearock
Air Content	3% ± 1%

3. Class C Concrete (Sidewalks)

Minimum cementitious materials content, per cubic yard	500 lbs.
Maximum water-cementitious materials ratio, by weight	0.55
Slump, maximum	5 inches
Compressive strength at 28 days - F'c	3,000 psi
Compressive strength at 28 days – F'c (Sidewalk only)	2,500 psi

Coarse Aggregate	#57 per ASTM C33
Air Content	2 ½ % ± 5 ½ %

- C. All Class A concrete, unless noted otherwise on the Drawings, shall be air entrained concrete and contain the high range water-reducing admixture (superplasticizer). A water reducing admixture may be added to the mix at the Contractor's option.
- D. The mix proportions used shall be changed subject to the limitation specified herein, whenever such change is necessary or desirable to secure the required strength, density, workability, and surface finish and the Contractor shall be entitled to no additional compensation because of such changes.

1.05 CONSISTENCY

- A. The quantity of water entering into a batch of concrete shall be just sufficient, with a normal mixing period, to produce a concrete which can be worked properly into place without segregation, and which can be compacted by the vibratory methods herein specified to give the desired density, impermeability and smoothness of surface. The quantity of water shall be changed as necessary, with variations in the nature or moisture content of the aggregates, to maintain uniform production of a desired consistency. The consistency of the concrete in successive batches shall be determined by slump tests in accordance with ASTM C 143. Slumps shall be 4 inches ± 1 inch measured at the form. Slump with high range water reducers shall be 6 inches ± 1 inch at the form.

1.06 READY-MIXED CONCRETE

- A. Ready-mixed concrete shall be used meeting the requirements as to materials, batching, mixing, transporting, and placing as specified herein and in accordance with ASTM C 94.
- B. Ready-mixed concrete shall be delivered to the site of the work, and discharge shall be completed within one and one-half hour after the addition of the cement to the aggregates or before the drum has been revolved 250 revolutions, whichever is first. Upon delivery from the truck concrete temperature shall not exceed 90 degrees Fahrenheit.
- C. Truck mixers shall be equipped with electrically-actuated counters by which the number of revolutions of the drum or blades may be readily verified. The counter shall be of the resettable, recording type. The counters shall be actuated at the time of starting mixers at mixing speeds.
- D. Each batch of concrete shall be mixed in a truck mixer for not less than 70 revolutions of the drum or blades at the rate of rotation designated by the manufacturer of equipment. Additional mixing, if any, shall be at the speed designated by the manufacturer of the equipment as agitating speed. All materials including mixing water shall be in the mixer drum before actuating the revolution counter for determining the number of revolution of mixing.

PART 3 - EXECUTION

1.01 PROPORTIONING AND MIXING

- A. Proportioning of the concrete mix shall conform to the requirements of Chapter 3 "Proportioning" of ACI 301; provided, that the maximum slump for any concrete shall not exceed the limits specified in this Section of the Specifications.
- B. Mixing of concrete shall conform to the requirements of Chapter 7 of ACI 301 Specifications.
- C. Retempering of concrete or mortar which has partially hardened will not be permitted.

1.02 PREPARATION

- A. Earth surfaces shall be thoroughly wetted by sprinkling, prior to the placing of any concrete, and these surfaces shall be kept moist by frequent sprinkling up to the time of placing concrete thereon. A vapor barrier specified in Section 07190 entitled "Vapor Barrier" shall be placed. The surface shall be free from standing water, mud, and debris at the time of placing concrete.
- B. No concrete shall be placed until the reinforcement steel and formwork have been erected in a manner acceptable to the Engineer. The Contractor shall notify the Engineer not less than two working days prior to Concrete Placement, allowing one day for review and any corrective measures which are required.
- C. Joints in Concrete
 - 1. Concrete surfaces upon or against which concrete is to be placed shall be given a roughened surface for good bond and a bonding agent shall be placed.
 - 2. After the surfaces have been prepared all approximately horizontal construction joints shall be covered with a layer of mortar approximately one-inch thick. The mortar shall have the same proportions of cement and sand as the regular concrete mixture. The water-cement ratio of the mortar in place shall not exceed that of the concrete to be placed upon it, and the consistency of the mortar shall be suitable for placing and working in the manner hereinafter specified. The mortar shall be spread uniformly and shall be worked thoroughly into all irregularities of the surface. Wire brooms shall be used where possible to scrub the mortar into the surface. Concrete shall be placed immediately upon the fresh mortar.
- D. Placing Interruptions
 - 1. When placing of concrete is to be interrupted long enough for the concrete to take a set, the working face shall be given a shape by the use of forms or other means, that will secure proper union with subsequent work; provided that construction joints shall be made only where acceptable to the Engineer. Cold joints will be sufficient cause for rejection of the work.
- A. Embedded Items
 - 1. No concrete shall be placed until all formwork, installation of parts to be embedded, reinforcing steel, and preparation of surfaces involved in the placing have been completed and accepted by the Engineer at least four hours before placement of concrete. All surfaces of forms and embedded items that have

become encrusted with dried grout from concrete previously placed shall be cleaned of all such grout before the surrounding or adjacent concrete is placed.

2. All inserts or other embedded items shall conform to the requirements herein.
- B. All reinforcement, anchor bolts, sleeves, inserts, and similar items shall be set and secured in the forms where shown on the Drawings or by shop drawings and shall be acceptable to the Engineer before any concrete is placed. Accuracy of placement is the responsibility of the Contractor.
- G. All anchor bolts called for on the drawings shall be cast-in-place in the concrete. Drilled, impact, adhesive or other types of anchors shall not be substituted for anchor bolts unless otherwise shown on the Drawings. Anchor bolts shall conform to the requirements set forth in Section 05500 entitled "Miscellaneous Fabrications."
- H. Casting New Concrete Against Old
1. Where concrete is to be cast against old concrete (any concrete which is greater than 60 days of age), the surface of the old concrete shall be thoroughly cleaned and roughened by sand-blasting (exposing aggregate) to an amplitude of $\frac{1}{4}$ " prior to the application of an epoxy bonding agent.
- I. No concrete shall be placed in any structure until all water entering the space to be filled with concrete has been properly cut off or has been diverted by pipes, or other means, and carried out of the forms, clear of the work. No concrete shall be deposited underwater, except where shown on the Drawings to be placed by the tremie method, nor shall the Contractor allow still water to rise on any concrete until the concrete has attained its initial set. Water shall not be permitted to flow over the surface of any concrete in such manner and at such velocity as will injure the surface finish of the concrete. Pumping or other necessary dewatering operations for removing ground water, if required, will be subject to the review of the Engineer.
- J. Corrosion Protection
1. Pipe, conduit, dowels, and other ferrous items required to be embedded in concrete construction shall be so positioned and supported prior to placement of concrete that there will be a minimum of 2 inches clearance between said items and any part of the concrete reinforcement. Securing such items in position by wiring or welding them to the reinforcement will not be permitted.
 2. Openings for pipes, inserts for pipe hangers and brackets, and the setting of anchors shall, where practicable, be provided for during the placing of concrete.
 3. Anchor bolts shall be accurately set, and shall be maintained in position by templates while being embedded in concrete.

4. The surfaces of all metalwork to be in contact with concrete shall be thoroughly cleaned of all dirt, grease, loose scale and rust, grout, mortar, and other foreign substances immediately before the concrete is placed.

1.03 PLACING CONCRETE

- A. Placing of concrete shall conform to the applicable requirements of Chapter 8 of ACI 301 and the requirements of this Section.
- C. Non-Conforming Work or Materials
 1. Concrete which upon or before placing is found not to conform to the requirements specified herein shall be rejected and immediately removed from the Work. Concrete which is not placed in accordance with these Specifications, or which is of inferior quality, shall be removed and replaced by and at the expense of the Contractor.
- D. Unauthorized Placement
 1. No concrete shall be placed except in the presence of duly authorized representative of the Engineer. The Contractor shall notify the Engineer at least 24 hours in advance of placement of any concrete.
- E. Placement in Wall Forms
 1. Concrete shall not be dropped through reinforcement steel or into any deep form, whether reinforcement is present or not, causing separation of the coarse aggregate from the mortar on account of repeatedly hitting rods or the sides of the form as it falls, nor shall concrete be placed in any form in such a manner as to leave accumulation of mortar on the form surfaces above the placed concrete. In such cases, some means such as the use of hoppers and, if necessary, vertical ducts of canvas, rubber, or metal shall be used for placing concrete in the forms in a manner that it may reach the place of final deposit without separation. In no case shall the free fall of concrete exceed 4 feet below the ends of ducts, chutes, or buggies.
 2. Concrete shall be uniformly distributed during the process of depositing and in no case after depositing shall any portion be displaced in the forms more than 6 feet in horizontal direction. Concrete in forms shall be deposited in uniform horizontal layers not deeper than 2 feet; and care shall be taken to avoid inclined layers or inclined construction joints except where such are required for sloping members. Each layer shall be placed while the previous layer is still soft. The rate of placing concrete in forms shall not exceed 5 feet of vertical rise per hour.
- F. Casting New Concrete Against Old
 1. An epoxy adhesive bonding agent shall be applied to set surfaces of construction joints according to the manufacturer's written recommendations.

G. Conveyor Belts and Chutes

1. All ends of chutes, hopper gates, and all other points of concrete discharge throughout the Contractor's conveying, hoisting and placing system shall be so designed and arranged that concrete passing from them will not fall separated into whatever receptacle immediately receives it. Conveyor belts, if used, shall be of a type acceptable to the Engineer. Chutes longer than 50 feet will not be permitted. Minimum slopes of chutes shall be such that concrete of the specified consistency will readily flow in them. If a conveyor belt is used, it shall be wiped clean by a device operated in such a manner that none of the mortar adhering to the belt will be wasted. All conveyor belts and chutes shall be covered. Sufficient illumination shall be provided in the interior of all forms so that the concrete at the places of deposit is visible from the deck or runway.

H. Placement in Slabs

1. Concrete placed in sloping slabs shall proceed uniformly from the bottom of the slab to the top, for the full width of the pour. As the work progresses, the concrete shall be vibrated and carefully worked around the slab reinforcement, and the surface of the slab shall be screeded in an up-slope direction.

I. Temperature of Concrete

1. The temperature of concrete when it is being placed shall be not more than 90 degrees F. Concrete ingredients shall not be heated to a temperature higher than that necessary to keep the temperature of the mixed concrete, as placed, from falling below the specified minimum temperature. If concrete is placed when the weather is such that the temperature of the concrete would exceed 90 degrees Fahrenheit, the Contractor shall employ effective means, such as precooling of aggregates and mixing water using ice or placing at night, as necessary to maintain the temperature of the concrete, as it is placed, below 90 degrees F. The Contractor shall be entitled to no additional compensation on account of the foregoing requirements. During summer months concrete pours shall be scheduled in the morning or early part of the day when temperatures are cooler.

J. Pumping Equipment

1. Pumping equipment and procedures if used shall conform to the recommendations contained in the report of ACI Committee 304 on Placing Concrete by Pumping Methods, ACI 304.2R. The specified slump shall be measured at the point of discharge. The loss of slump in pumping shall not exceed 1-1/2 inches.

- K. The order of placing concrete in all parts of the work shall be acceptable to the Engineer. In order to minimize the effects of shrinkage, the concrete shall be placed in units as bounded by construction joints shown on the Drawings. The placing of units shall be done by placing alternate units in a manner such that each unit placed shall have cured at least

7 days before the contiguous unit or units are placed, except that the corner sections of vertical walls shall not be placed until the 2 adjacent wall panels have cured at least 14 days.

- L. The surface of the concrete shall be level whenever a run of concrete is stopped. To insure a level, straight joint on the exposed surface of walls, a wood strip at least 3/4-inch thick shall be tacked to the forms on these surfaces. The concrete shall be carried about 1/2-inch above the underside of the strip. About one hour after the concrete is placed, the strip shall be removed and any irregularities in the edge formed by the strip shall be leveled with a trowel and ailaitance shall be removed.
- M. As concrete is placed in the forms or in excavations, it shall be thoroughly settled and compacted, throughout the entire depth of the layer which is being consolidated, into a dense, homogeneous mass, filling all corners and angles, thoroughly embedding the reinforcement, eliminating rock pockets, and bringing only a slight excess of water to the exposed surface of concrete during placement. Vibrators shall be high speed power vibrators (8000 to 10,000 rpm) of an immersion type in sufficient number and with (at least one) standby units as required.
- N. Care shall be used in placing concrete around waterstops. The concrete shall be carefully worked by rodding and vibrating to make sure that all air and rock pockets have been eliminated. Where flat-strip type waterstops are placed horizontally, the concrete shall be worked under the waterstops by hand, making sure that all air and rock pockets have been eliminated. Concrete surrounding the waterstops shall be given additional vibration, over and above that used for adjacent concrete placement to assure complete embedment of the waterstops in the concrete.
- O. Concrete in walls shall be internally vibrated and at the same time, stirred, or worked with suitable appliances, tamping bars, shovels, or forked tools until it completely fills the forms or excavations and closes snugly against all surfaces. Subsequent layers of concrete shall not be placed until the layers previously placed have been worked thoroughly as specified. Vibrators shall be provided in sufficient numbers, with standby units as required, to accomplish the results herein specified within 15 minutes after concrete of the prescribed consistency is placed in the forms. The vibrating head shall be kept from contact with the surfaces of the forms. Care shall be taken not to vibrate concrete excessively or to work it in any manner that causes segregation of its constituents.

1.04 CONCRETE FINISHING

- A. Concrete finishes are specified in Section 03 35 0 entitled "Concrete Finishes".

1.05 CURING AND PROTECTION

- A. Curing is specified in Section 03 37 0 entitled "Concrete Curing".

1.06 PLACING CONCRETE UNDER PRESSURE (PUMPING)

- A. Where concrete is conveyed and placed by mechanically applied pressure, the equipment shall have the capacity for the operation. The operation of the pump shall be such that a continuous stream of concrete without air pockets is produced. To obtain the least line resistance, the layout of the pipeline system shall contain a minimum number of bends with no change in pipe size. If two sizes of pipe must be used, the smaller diameter should be used at the pump end and the larger at the discharge end. When pumping is completed, the concrete remaining in the pipelines, if it is to be used, shall be ejected in such a manner that there will be no contamination of the concrete or separation of the ingredients.
- B. No aluminum parts shall be in contact with the concrete during the entire placing of concrete under pressure at any time.
- C. Prior to placing concrete under pressure, the Contractor shall submit the concrete mix design together with test results from a recognized testing laboratory proving the proposed mix meets all requirements. In addition, at the Contractor's option, an actual pumping test under field conditions may be performed prior to use of the accepted mix. This test requires a duplication of anticipated site conditions from beginning to end. The batching and truck mixing shall be the same as will be used; the same pump and operator shall be present and the pipe and pipe layouts will reflect the maximum height and distance contemplated.
- D. If the pumped concrete does not produce satisfactory end results, the Contractor shall discontinue the Pumping operation and proceed with the placing of concrete using conventional methods.
- E. The pumping equipment must have two cylinders and be designed to operate with one cylinder only in case the other one is not functioning. In lieu of this requirement, the Contractor may have a standby pump on the site during pumping.
- F. The minimum diameter of the hose (conduits) shall be four inches.
- G. Pumping equipment and hoses (conduits) that are not functioning properly shall be replaced.

1.07 ORDER OF PLACING CONCRETE

- A. In order to minimize the effects of shrinkage, the concrete shall be placed in units as bounded by construction joints shown on the Drawings and maximum lengths as indicated on Drawings. The placing of units shall be done by placing alternate units in a manner such that each unit placed shall be have cured at least seven days before the contiguous unit or units are placed, except that the corner sections of vertical walls shall not be placed until the two adjacent wall panels have cured at least 14 days.
- B. The surface of the concrete shall be level whenever a run of concrete is stopped.

1.08 DEFECTIVE CONCRETE

- A. As soon as forms are removed, all exposed surfaces shall be carefully examined and any irregularities shall be immediately rubbed or ground in a satisfactory manner in order to secure a smooth, uniform, and continuous surface. Plastering or coating of surfaces to be smoothed will not be permitted. No repairs shall be made until reviewed by the Engineer. In no case will extensive patching of honeycombed concrete be permitted. Concrete containing minor voids, holes, honeycombing, or similar depression defects shall have them repaired as specified herein. Concrete containing extensive voids, holes,

honeycombing, or similar depression defects, shall be completely removed and replaced. All repairs and replacements herein specified shall be promptly executed by the Contractor at its own expense.

- B. Defective surfaces to be repaired as specified in Article 3.06, Paragraph A of this Section, shall be cut back from true line a minimum depth of 1/2 inch over the entire area. Feathered edges will not be permitted. Where chipping or cutting tools are not required in order to deepen the area properly, the surface shall be prepared for bonding by the removal of all laitance or soft material, and not less than 1/32-inch depth of the surface film from all hard portions. The material used for repair proposed shall consist of a mixture of one sack of cement to 3 cubic feet of sand. For exposed walls, the cement shall contain such a proportion of Atlas white portland cement as is required to make the color of the patch match the color of the surrounding concrete.
- C. Holes left by tie-rod cones shall be repaired in an acceptable manner with dry-packed cement grout or premixed patching material as accepted by the Engineer.
- D. All repairs shall be built up and shaped in such a manner that the completed work will conform to the requirements of Article 3.04 or 3.06 of this Section, as applicable, using acceptable methods which will not disturb the bond, cause sagging, or cause horizontal fractures. Surfaces of said repairs shall receive the same kind and amount of curing treatment as required for the concrete in the repaired section.
- E. Prior to backfilling, all cracks that may have developed shall be "vee'd" and filled with sealant conforming to the requirements of Section 03290 entitled, " Joints in Concrete". This repair method shall be done on the faces of members in contact with fill.

1.09 CARE AND REPAIR OF CONCRETE

- A. The Contractor shall protect all concrete against injury or damage from excessive heat, lack of moisture, overstress, or any other cause until final acceptance by the Owner. Particular care shall be taken to prevent the drying of concrete and to avoid roughening or otherwise damaging the surface. Any concrete found to be damaged, or which may have been originally defective, or which becomes defective at any time prior to the final acceptance of the completed work, or which departs from the established line or grade, or which, for any other reason, does not conform to the requirements of the Contract Documents, shall be satisfactorily repaired or removed and replaced with acceptable concrete at the Contractor's expense.

1.10 CONCRETE SEALER

- A. Contractor shall apply to the top surface of all finished concrete floor slabs and equipment pads a sealer specified in Section 09850 entitled "Painting".

- End of Section

-- End of Section --

SECTION 03 35 00

CONCRETE FINISHING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN CONCRETE INSTITUTE INTERNATIONAL (ACI)

ACI 301 (2010; ERTA 2015) Specifications for Structural Concrete

1.2 SUBMITTALS

CITY approval is required for submittals with a "G" designation; submittals not having a "G" designation are for [information only]. When used, a designation following the "G" designation identifies the office that will review the submittal for the CITY. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-06 Manufacturer's Instructions

Dry Shake Finish

1.3 QUALITY ASSURANCE

1.3.1 Field Test Panels

Construct field test panels prior to beginning of work using the materials and procedures proposed for use on the job, to demonstrate the results to be attained. The quality and appearance of each panel is subject to the approval of the Contracting Officer, and, if not judged satisfactory, construct additional panels until approval is attained. Formed or finished surfaces in the completed structure must match the quality and appearance of the approved field example.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 FINISHING FORMED SURFACES

Forms, form materials, and form construction are specified in Section 03 10 00 CAST-IN-PLACE CONCRETE FORMING. Finish formed surfaces as specified herein. Unless another type of

architectural or special finish is specified, leave surfaces with the texture imparted by the forms except that defective surfaces must be repaired.

Maintain uniform color of the concrete by use of only one mixture without changes in materials or proportions for any structure or portion of structure Class A finish. The form panels used to produce the finish must be orderly in arrangement, with joints between panels planned in approved relation to openings, building corners, and other architectural features.

Do not reuse forms if there is any evidence of surface wear or defects that would impair the quality of the surface.

3.1.1 Class A Finish

Class A finish is required on all visually exposed surfaces of the seawall cap. Formed surfaces meet the requirements of ACI 301, surface finish SF-3.0.

3.1.2 Class B Finish

Class B finish is required where concrete cap is not visible. Formed surfaces meet the requirements of ACI 301, surface finish SF-2.0.

3.1.3 Architectural and Special Finishes

Architectural concrete finishes are specified in Section 03 33 00 CAST-IN-PLACE ARCHITECTURAL CONCRETE. Conform special finishes to the requirements specified herein.

3.1.3.1 Smooth Finish

After other concrete construction is complete in each overall separate contiguous area of the structure, apply smooth finish to the areas indicated. Use a mortar mix consisting of one part portland cement and two parts well-graded sand passing a No. 30 sieve, with water added to give the consistency of thick paint. Where the finished surface will not receive other applied surface, use white cement to replace part of the job cement to produce an approved color, which must be uniform throughout the surfaces of the structure. After the surface has been thoroughly wetted and allowed to approach surface dryness, vigorously apply the mortar to the area by clean burlap pads or by cork or wood-floating, to completely fill all surface voids. Scrape off excess grout with a trowel. As soon as it can be accomplished without pulling the mortar from the voids, rub the area with burlap pads having on their surface the same sand-cement mix specified above but without any mixing water, until all of the visible grout film is removed. Tightly stretch the burlap pads used for this operation around a board to prevent dishing the mortar in the voids. Complete the finish of any area in the same day, and make the limits of a finished area at natural breaks in the surface. Continuously moist cure the surface for 48 hours commencing immediately after finishing operations in each area. The temperature of the air adjacent to the surface must be not less than 50 degrees F for 24 hours prior to, and 48 hours after, the application. In hot, dry weather apply the smooth finish in shaded areas or at night, and never be apply when there is significant hot, dry wind.

3.1.3.2 Tooled Finish

Dress the thoroughly cured concrete at an approved age with approved electric, air, or hand tools to a uniform texture with a hand-tooled surface texture. The finish must be similar to and closely match the finish on the approved preconstruction test panel.

3.2 REPAIRS

Repair in accordance with ACI 301, Section 5.

3.3 FINISHING UNFORMED SURFACES

The finish of all unformed surfaces must meet the requirements of 03 31 29 Marine Concrete, when tested as specified herein.

3.3.1 General

The ambient temperature of spaces adjacent to unformed surfaces being finished and of the base on which concrete will be placed must not be less than 50 degrees F. Float finish unformed surfaces that are not to be covered by additional concrete or backfill, with additional finishing as specified below, and true to the elevation indicated. Bring surfaces to receive additional concrete or backfill to the elevation indicated, properly consolidate, and leave true and regular. Unless otherwise indicated, evenly slope exterior surfaces for drainage. Where drains are provided, evenly slope interior floors to the drains. Carefully make joints with a jointing or edging tool. Protect the finished surfaces from stains or abrasions. Grate tampers or "jitterbugs" cannot be used for any surfaces. The dusting of surfaces with dry cement or other materials or the addition of any water during finishing is not be permitted. If bleedwater is present prior to finishing, carefully drag off the excess water or remove by absorption with porous materials such as burlap. During finishing operations, take extreme care to prevent over finishing or working water into the surface; this can cause "crazing" (surface shrinkage cracks which appear after hardening) of the surface. Remove and replace any slabs with surfaces which exhibit significant crazing. During finishing operations, check surfaces with a 10 foot straightedge, applied in both directions at regular intervals while the concrete is still plastic, to detect high or low areas.

3.3.2 Trowel Finish

In accordance with ACI 301, Section 5.

3.3.3 Non-Slip Finish

Construct non-slip floors in accordance with ACI 301, Section 5.

-- End of Section --

SECTION 31 23 00

EXCAVATION AND FILL

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C136/C136M	(2014) Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C33/C33M	(2013) Standard Specification for Concrete Aggregates
ASTM D1140	(2014) Amount of Material in Soils Finer than the No. 200 (75-micrometer) Sieve
ASTM D1556/D1556M	(2015; E 2016) Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
ASTM D1557	(2012; E 2015) Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ³) (2700 kN-m/m ³)
ASTM D1883	(2014) CBR (California Bearing Ratio) of Laboratory-Compacted Soils
ASTM D2487	(2011) Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D4318	(2010; E 2014) Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4759	(2011) Determining the Specification Conformance of Geosynthetics
ASTM D5084	(2010) Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter
ASTM D6938	(2015) Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D698	(2012; E 2014; E 2015) Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/cu. ft. (600 kN-m/cu. m.))

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

EPA SW-846.3-3	(1999, Third Edition, Update III-A) Test Methods for Evaluating Solid Waste: Physical/Chemical Methods
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1.2 DEFINITIONS

1.2.1 Capillary Water Barrier

A layer of clean, poorly graded crushed rock, stone, or natural sand or gravel having a high porosity which is placed between the existing and proposed bulkheads without a vapor barrier to cut off the capillary flow of pore water to the area near the mudline or through the wall weep holes or knuckles.

1.2.2 Degree of Compaction

Degree of compaction is expressed as a percentage of the maximum density obtained by the test procedure presented in [ASTM D698][ASTM D1557], for general soil types, abbreviated as percent laboratory maximum density.

1.2.3 Hard Materials

Weathered rock, dense consolidated deposits, or conglomerate materials which are not included in the definition of "rock" but which usually require the use of heavy excavation equipment, ripper teeth, or jack hammers for removal.

1.2.4 Rock

Solid homogeneous interlocking crystalline material with firmly cemented, laminated, or foliated masses or conglomerate deposits, neither of which can be removed without systematic drilling and blasting, drilling and the use of expansion jacks or feather wedges, or the use of backhoe-mounted pneumatic hole punchers or rock breakers; also large boulders, buried masonry, or concrete other than pavement exceeding 1/2 cubic yard in volume.

1.3 SUBMITTALS

CITY approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the CITY. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Shoring and Sheeting Plan, Submit 15 days prior to starting work.

Copies of all supplier cut sheets and field test reports within 24 hours of the completion of the test.

1.4 DELIVERY, STORAGE, AND HANDLING

Perform in a manner to prevent contamination or segregation of materials.

1.5 CRITERIA FOR BIDDING

Base bids on the following criteria:

- a. Surface elevations are as indicated.

- b. Pipes or other artificial obstructions, except those indicated, will not be encountered.
- c. Ground water elevations indicated by the boring log were those existing at the time subsurface investigations were made and do not necessarily represent ground water elevation at the time of construction.
- d. Ground water elevation is 4-5 feet below existing surface elevation.
- e. Material character is indicated by the boring logs.
- f. Hard materials will be encountered in 100 percent of the excavations starting at the surface and continuing to full depth of drive below existing surface elevations.
- g. Suitable backfill in the quantities required is available from local suppliers on Rockland Key just north (east) of Key West.
- h. Blasting will not be permitted. Remove material in an approved manner.

1.6 REQUIREMENTS FOR OFF SITE SOIL

Not Used.

1.7 QUALITY ASSURANCE

1.7.1 Dewatering Work Plan

Not used.

1.7.2 Utilities

Movement of construction machinery and equipment over pipes and utilities during construction shall be at the Contractor's risk. Excavation made with power-driven equipment is not permitted within two feet of known CITY-owned utility or subsurface construction. For work immediately adjacent to or for excavations exposing a utility or other buried obstruction, excavate by hand. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered or until clearance for the new grade is assured. Report damage to utility lines or subsurface construction immediately to the CITY.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

2.1.1 Satisfactory Materials

Any materials classified by ASTM D2487 as GW, SW, SP, free of debris, roots, wood, scrap material, vegetation, refuse, soft unsound particles, and deleterious, or objectionable materials. Unless

specified otherwise, the maximum particle diameter shall be specified by the engineer of record and shown on the plans for that location.

2.1.2 Unsatisfactory Materials

Materials which do not comply with the requirements for satisfactory materials. Unsatisfactory materials also include man-made fills, trash, refuse, construction debris, or backfills from previous construction. Unsatisfactory material also includes material classified as satisfactory which contains root and other organic matter, and stones larger than 3 inches. The CITY shall be notified of any contaminated materials.

2.1.3 Select Material

Provide materials classified as GW, GP, SW, SP, by ASTM D2487 where indicated. Coefficient of permeability shall be a minimum of 0.002 feet per minute when tested in accordance with ASTM D5084.

Bearing Ratio: At 0.1 inch penetration, the bearing ratio shall be determined in accordance with ASTM D1883 for a laboratory soaking period of not less than 4 days. The combined material shall conform to the following sieve analysis:]]

Sieve Size	Percent Passing by Weight
2 1/2 inches	100
No. 4	40 - 85
No. 10	20 - 80
No. 40	10 - 60
No. 200	5 - 25

2.2 POROUS FILL FOR CAPILLARY WATER BARRIER

Not Used.

2.3 BORROW

Obtain borrow materials required in excess of those furnished from excavations from sources outside of CITY property.

Obtain borrow materials required in excess of those furnished from excavations from sources outside of CITY property, except that borrow materials conforming to satisfactory material may be obtained from local suppliers. Dispose of materials from clearing and grubbing operations at the landfill indicated. If satisfactory borrow is used, strip top 12 inches of soil material and stockpile. After removal of borrow material, regrade borrow pit using stockpiled soil material to contours which will blend in with adjacent topography. Maximum side slopes shall be two horizontal to one vertical. Excavation and backfilling of borrow pit shall ensure proper drainage.

2.4 FILTER FABRIC

If the space between the existing wall and the proposed wall allows, provide a pervious sheet of polyester, nylon, glass or polypropylene filaments woven, spun bonded, fused, or otherwise manufactured into a nonraveling fabric with uniform thickness and strength. Fabric shall have the following manufacturer certified minimum average roll properties as determined by ASTM D4759:

PART 3 EXECUTION

3.1 PROTECTION

3.1.1 Drainage and Dewatering

Provide for the collection and disposal of surface and subsurface water encountered during construction.

3.1.1.1 Drainage

So that construction operations progress successfully, completely drain construction site during periods of construction to keep soil materials sufficiently dry. The Contractor shall establish/construct storm drainage features at the earliest stages of site development, and throughout construction grade the construction area to provide positive surface water runoff away from the construction activity and/or provide temporary drainage features and equipment as required to prevent erosion and undermining of existing seawall foundations and/or tie-back systems. When unsuitable working platforms for equipment operation and unsuitable soil support for subsequent construction features develop, remove unsuitable material and provide new soil material as specified herein. It is the responsibility of the Contractor to assess the soil and ground water conditions presented by the plans and specifications and to employ necessary measures to permit construction to proceed. Excavated slopes and backfill surfaces shall be protected to prevent erosion and sloughing. Excavation shall be performed so that the site, the area immediately surrounding the site, and the area affecting operations at the site shall be continually and effectively drained.

3.1.1.2 Dewatering

Groundwater flowing toward or into excavations shall be controlled to prevent sloughing of excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. French drains, sumps, ditches or trenches will not be permitted within 3 feet of the foundation of any structure, except with specific written approval, and after specific contractual provisions for restoration of the foundation area have been made. Control measures shall be taken by the time the excavation reaches the water level in order to maintain the integrity of the in situ material. While the excavation is open, the water level shall be maintained continuously, at least 1 feet below the working level.

3.1.2 Underground Utilities

Location of the existing utilities indicated is approximate. The Contractor shall physically verify the location and elevation of the existing utilities indicated prior to starting construction. The Contractor shall contact the "Sunshine 811 One-Call of Florida (www.sunshine811.com)" and or the local Public Works Department for assistance in locating existing utilities.

3.1.3 Machinery and Equipment

Movement of construction machinery and equipment over pipes during construction shall be at the Contractor's risk. Repair, or remove and provide new pipe for existing or newly installed pipe that has been displaced or damaged.

3.2 SURFACE PREPARATION

3.2.1 Clearing and Grubbing

Unless indicated otherwise, remove trees, stumps, logs, shrubs, brush and vegetation and other items that would interfere with construction operations within the clearing limits. Remove stumps entirely. Grub out matted roots and roots over 2 inches in diameter to at least 18 inches below existing surface.

3.2.2 Stripping

Strip suitable soil from the site where excavation or grading is indicated and stockpile separately from other excavated material.

3.2.3 Unsuitable Material

Remove vegetation, debris, decayed vegetable matter, sod, mulch, and rubbish underneath paved areas or concrete slabs.

3.3 EXCAVATION

Excavate to contours, elevation, and dimensions indicated. Reuse excavated materials that meet the specified requirements for the material type required at the intended location. This specifically applies to the areas excavated for tie-back installation. Keep excavations free from water. Excavate soil disturbed or weakened by Contractor's operations, soils softened or made unsuitable for subsequent construction due to exposure to weather. Excavations below indicated depths will not be permitted except to remove unsatisfactory material. Unsatisfactory material encountered below the grades shown shall be removed as directed. Refill with satisfactory material and compact to 95 percent of ASTM D698 maximum density. Unless specified otherwise, refill excavations cut below indicated depth with satisfactory material 95 percent of ASTM D698 maximum density. Satisfactory material removed below the depths indicated, without specific direction of the CITY, shall be replaced with satisfactory materials to the indicated excavation grade; except as specified for spread footings. Determination of elevations and measurements of approved overdepth excavation of unsatisfactory material below grades indicated shall be done under the direction of the CITY.

3.3.1 Tie-back Trenches

Excavate to the dimension indicated. Grade bottom of trenches to provide uniform support for each section of tie-back bedding placement. Tamp if necessary to provide a firm bed. Recesses shall be excavated to accommodate turnbuckles so that tie-backs will be uniformly supported for the entire

length. Rock, where encountered, shall be excavated to a depth of at least 6 inches below the bottom of the tie-back.

3.3.2 Hard Material and Rock Excavation

Remove hard material and rock to elevations indicated in a manner that will leave foundation material in an unshattered and solid condition. Roughen level surfaces and cut sloped surfaces into benches for bond with concrete. Protect shale from conditions causing decomposition along joints or cleavage planes and other types of erosion. Removal of hard material and rock beyond lines and grades indicated will not be grounds for a claim for additional payment unless previously authorized by the CITY. Excavation of the material claimed as rock shall not be performed until the material has been cross sectioned by the Contractor and approved by the CITY. Common excavation shall consist of all excavation not classified as rock excavation.

3.3.3 Excavated Materials

Satisfactory excavated material required for fill or backfill shall be placed in the proper section of the permanent work required or shall be separately stockpiled if it cannot be readily placed. Satisfactory material in excess of that required for the permanent work and all unsatisfactory material shall be disposed of as specified in Paragraph "DISPOSITION OF SURPLUS MATERIAL."

3.3.4 Final Grade of Surfaces to Support Concrete

Excavation to final grade shall not be made until just before concrete is to be placed. For pile foundations, the excavation shall be stopped at an elevation 6 to 12 inches above the bottom of the footing before driving piles. After pile driving has been completed, the remainder of the excavation shall be completed to the elevations shown. Only excavation methods that will leave the foundation rock in a solid and unshattered condition shall be used. Approximately level surfaces shall be roughened, and sloped surfaces shall be cut as indicated into rough steps or benches to provide a satisfactory bond. Shales shall be protected from slaking and all surfaces shall be protected from erosion resulting from ponding or flow of water.

3.4 SUBGRADE PREPARATION

Unsatisfactory material in surfaces to receive fill or in excavated areas shall be removed and replaced with satisfactory materials as directed by the CITY. The surface shall be scarified to a depth of 6 inches before the fill is started. Sloped surfaces steeper than 1 vertical to 4 horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When subgrades are less than the specified density, the ground surface shall be broken up to a minimum depth of 6 inches, pulverized, and compacted to the specified density. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches and compacted as specified for the adjacent fill. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. Compaction shall be accomplished by sheepsfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, or other approved equipment well suited to the soil being compacted. Material shall be moistened or aerated as necessary to provide the moisture content that will readily facilitate obtaining the specified compaction with the equipment used. Minimum subgrade density shall be as specified herein.

3.5 SUBGRADE FILTER FABRIC

Place synthetic fiber filter fabric as indicated directly on prepared subgrade free of vegetation, stumps, rocks larger than 2 inches diameter and other debris which may puncture or otherwise damage the fabric. Repair damaged fabric by placing an additional layer of fabric to cover the damaged area a minimum of 3 feet overlap in all directions. Overlap fabric at joints a minimum of 3 feet. Obtain approval of filter fabric installation before placing fill or backfill. Place fill or backfill on fabric in the direction of overlaps and compact as specified herein. Follow manufacturer's recommended installation procedures.

3.6 FILLING AND BACKFILLING

Fill and backfill to contours, elevations, and dimensions indicated. Compact each lift before placing overlaying lift.

3.6.1 Common Fill Placement

Use satisfactory materials. Place in 6 inch lifts. Compact areas not accessible to rollers or compactors with mechanical hand tampers. Aerate material excessively moistened by rain to a satisfactory moisture content. Finish to a smooth surface by blading, rolling with a smooth roller, or both.

3.6.2 Backfill and Fill Material Placement

Provide for paved areas and under concrete slabs, except where select material is provided. Place in 6 inch lifts. Do not place over wet or frozen areas. Place backfill material adjacent to structures as the structural elements are completed and accepted. Backfill against concrete only when approved. Place and compact material to avoid loading upon or against the structure.

3.6.3 Select Material Placement

Provide under porous fill of structures not pile supported. Place in 6 inch lifts. Backfill adjacent to structures shall be placed as structural elements are completed and accepted. Backfill against concrete only when approved. Place and compact material to avoid loading upon or against structure.

3.6.4 Backfill and Fill Material Placement Over Conduit and at walls

Backfilling shall not begin until construction below finish grade has been approved, underground utilities systems have been inspected, tested and approved, forms removed, and the excavation cleaned of trash and debris. Backfill shall be brought to indicated finish grade and shall include backfill for outside grease interceptors and underground fuel tanks. Where pipe is coated or wrapped for protection against corrosion, the backfill material up to an elevation 2 feet above sewer lines and 1 foot above other utility lines shall be free from stones larger than 1 inch in any dimension. Heavy equipment for spreading and compacting backfill shall not be operated closer to foundation or retaining walls than a distance equal to the height of backfill above the top of footing; the area remaining shall be compacted in layers not more than 4 inches in compacted thickness with power-driven hand tampers suitable for the material being compacted. Backfill shall be placed carefully around pipes or tanks to avoid damage to coatings, wrappings, or tanks. Backfill shall not be placed

against foundation walls prior to 7 days after completion of the walls. As far as practicable, backfill shall be brought up evenly on each side of the wall and sloped to drain away from the wall.

3.6.5 Porous Fill Placement

Provide between existing and proposed seawall. Place in 4 inch lifts with a minimum of two passes of a hand plate-type compactor (as space allows).

3.6.6 Trench Backfilling

Backfill as rapidly as construction, testing, and acceptance of work permits. Place and compact backfill in 6 inch lifts to top of trench.

3.7 COMPACTION

Determine in-place density of existing subgrade; if required density exists, no compaction of existing subgrade will be required. Density requirements specified herein are for cohesionless materials. When cohesive materials are encountered or used, density requirements may be reduced by 5 percent.

3.7.1 General Site

Compact underneath areas designated for vegetation and areas outside the 5 foot line of the paved area or structure to 90percent of ASTM D698.

3.7.2 Structures, Spread Footings, and Concrete Slabs

Compact top 12 inches of subgrades to 95 percent of ASTM D698. Compact select material to 95 percent of ASTM D698.

3.7.3 Adjacent Area

Compact areas within 5 feet of structures to 90percent of ASTM D698.

3.8 FINISH OPERATIONS

3.8.1 Grading

Finish grades as indicated within one-tenth of one foot. Grade areas to drain water away from structures. Maintain areas free of trash and debris. For existing grades that will remain but which were disturbed by Contractor's operations, grade as directed.

3.8.2 Protection of Surfaces

Protect newly backfilled, graded, and/or topsoiled areas from traffic, erosion, and settlements that may occur. Repair or reestablish damaged grades, elevations, or slopes.

3.9 DISPOSITION OF SURPLUS MATERIAL

Remove from CITY property surplus or other soil material not required or suitable for filling or backfilling, and brush, refuse, stumps, roots, and timber.

3.10 FIELD QUALITY CONTROL

3.10.1 Sampling

Take the number and size of samples required to perform the following tests.

3.13.2 Testing

Perform one of each of the following tests for each material used. Provide additional tests for each source change.

3.13.2.1 Fill and Backfill Material Testing

Provide certifications from material supplier or test fill and backfill material in accordance with ASTM C136/C136M for conformance to ASTM D2487 gradation limits; ASTM D1140 for material finer than the No. 200 sieve; ASTM D4318 for liquid limit and for plastic limit; ASTM D698 or ASTM D1557 for moisture density relations, as applicable.

3.13.2.2 Select Material Testing

Provide certifications from the material supplier, or test select material in accordance with ASTM C136/C136M for conformance to ASTM D2487 gradation limits; ASTM D1140 for material finer than the No. 200 sieve; ASTM D698 or ASTM D1557 for moisture density relations, as applicable.

3.13.2.3 Porous Fill Testing

Test porous fill in accordance with ASTM C136/C136M for conformance to gradation specified in ASTM C33/C33M.

3.13.2.4 Density Tests

Test density in accordance with ASTM D1556/D1556M, or ASTM D6938.

-- End of Section --

SECTION 31 41 16

METAL SHEET PILING

08/09

PART 1 GENERAL

1.1 UNIT PRICES

1.1.1 Steel Sheet Piling, Grade 50, Type ASTM A690 (Marine Steel), minimum length and size as specified in the plans, Cold Rolled.

1.1.1.1 Payment

Payment for sheet piling quantities will be lump sum for fully furnished and installed project wall. Payment will cover all cost of shipping, furnishing, handling, storing and installing piling including placing, driving, cutting holes and other materials and work incident thereto.

1.1.1.2 Measurement

Lump sum.

1.1.1.3 Unit of Measure

Unit of measure: lump sum.

1.1.2 Cut-Offs

1.1.2.1 Payment

When pilings which have not been driven to penetration depths shown are directed to be cut off, except for cut-offs due to excessive battering, no payment will be made for cutting off each piling.

1.1.2.2 Measurement

No payment will be made for cut-off portions of pilings.

1.1.2.3 Unit of Measure

Unit of measure: N/A.

1.1.3 Splices

1.1.3.1 Payment

Payment will be lump sum part of wall installation.

1.1.3.2 Measurement

Lump sum.

1.1.3.3 Unit of Measure

Unit of measure: each.

1.2 ESTIMATED QUANTITIES

The estimated quantities of sheet piling listed in the unit price schedule of the contract, as to be furnished by the Contractor, are given for bidding purposes only. Sheet piling quantities for payment will consist of the linear feet of piling acceptably installed. Installed quantities will consist of all piling including fabricated sections driven between the required top and bottom elevations of pilings plus any additions thereto resulting from changes in design or alignment as provided in paragraph DRIVING.

1.3 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M (2015; Errata 2015) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A6/A6M (2014) Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling

ASTM A690/A690M (2013a) Standard Specification for High-Strength Low-Alloy Nickel, Copper, Phosphorus Steel H-Piles and Sheet Piling with Atmospheric Corrosion Resistance for Use in Marine Environments

1.4 SUBMITTALS

CITY approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

- SD-02 Shop Drawings
 - Metal Sheet Piling; G
- SD-03 Product Data
 - Driving
 - Pile Driving Equipment; G
 - Pulling and Redriving; G
- SD-08 Closeout Submittals
 - Pile Driving Record

1.5 QUALITY ASSURANCE

Not Used.

1.6 DELIVERY, STORAGE, AND HANDLING

Materials delivered to the site shall be new and undamaged and shall be accompanied by certified test reports. Provide the manufacturer's logo and mill identification mark on the sheet piling as required by the referenced specifications. Store and handle sheet piling in the manner recommended by the manufacturer to prevent permanent deflection, distortion or damage to the interlocks; as a minimum, support on level blocks or racks spaced not more than 10 feet apart and not more than 2 feet from the ends. Storage of sheet piling should also facilitate required inspection activities and prevent damage to coatings and corrosion prior to installation.

PART 2 PRODUCTS

2.1 METAL SHEET PILING

Submit detail drawings for sheet piling, including fabricated sections, showing complete piling dimensions and details, driving sequence and location of installed piling.

- a. Include in the drawings details of top protection, special reinforcing tips, tip protection, lagging, splices, fabricated additions to plain piles, cut-off method, corrosion protection, and dimensions of templates and other temporary guide structures for installing piling. Provide details of the method for handling piling to prevent permanent deflection, distortion or damage to piling interlocks.
- b. Metal sheet piling shall be Grade 50, Type ASTM A690/A690M cold-formed.

2.1.1 Interlocks

The interlocks of sheet piling shall be free-sliding, provide a swing angle suitable for the intended installation but not less than 5 degrees when interlocked, and maintain continuous interlocking when installed.

2.1.2 General Requirements

Sheet piling including special fabricated sections shall be full-length sections of the dimensions shown. Provide fabricated sections conforming to the requirement and the piling manufacturer's recommendations for fabricated sections. Fabricated tees, wyes and cross pieces shall be fabricated of piling sections with a minimum web thickness specified by the EOR. Provide sheet piling with standard pulling holes.

2.2 APPURTENANT METAL MATERIALS

Provide metal plates, shapes, bolts, nuts, rivets and other appurtenant fabrication and installation materials conforming to manufacturer's standards and to the requirements specified in the respective sheet piling standards.

2.3 TESTS, INSPECTIONS, AND VERIFICATIONS

Requirements for material tests, workmanship and other measures for quality assurance shall be as specified.

2.3.1 Materials Tests

Submit certified materials tests reports showing that sheet piling and appurtenant metal materials meet the specified requirements, for each shipment and identified with specific lots prior to installing materials. Material test reports shall meet the requirements of ASTM A6/A6M. Perform materials tests conforming to the following requirements. Sheet piling and appurtenant materials shall be tested and certified by the manufacturer to meet the specified chemical, mechanical and section property requirements prior to delivery to the site. Testing of sheet piling for mechanical properties shall be performed after the completion of all rolling and forming operations. Testing of sheet piling shall meet the requirements of ASTM A6/A6M.

PART 3 EXECUTION

3.1 EARTHWORK

Perform in accordance with Section 31 23 00 EXCAVATION AND FILL. Pre-excavation will not be permitted. Backfill as indicated.

3.2 INSTALLATION

3.2.1 Pile Driving Equipment

Submit complete descriptions of sheet piling driving equipment including hammers (and vibratory hammers), extractors, protection caps and other installation appurtenances, prior to commencement of work. Descriptive information includes manufacturer's name, model numbers, capacity, rated energy, hammer details, cushion material, helmet, and templates. Provide pile driving equipment conforming to the following requirements.

3.2.1.1 Driving Hammers

Hammers shall be steam, air, or diesel drop, single-acting, double-acting, differential-acting, or vibratory type. The driving energy of the hammers shall be selected by the contractor according to the sheet selection and as recommended by the manufacturer for the piling weights and subsurface materials to be encountered. Repair damage to piling caused by use of a pile hammer with excess delivered force or energy.

3.2.1.2 Jetting Equipment

Jetting will not be permitted.

3.2.2 Placing and Driving

3.2.2.1 Placing

Any excavation required within the area where sheet pilings are to be installed shall be completed prior to placing sheet pilings. Pilings properly placed and driven shall be interlocked throughout their

length with adjacent pilings to form a continuous diaphragm throughout the length or run of piling wall.

- a. Pilings shall be carefully located as indicated. Pilings shall be placed plumb with out-of-plumbness not exceeding 1/4 inch per foot of length and true to line. Place the pile so the face will not be more than 6 inches from vertical alignment at any point. Top of pile at elevation of cut-off shall be within 1/2 inch horizontally and 2 inches vertically of the location indicated. Manipulation of piles to force them into position will not be permitted. Check all piles for heave. Re-drive all heaved piles to the required tip elevation.
- b. Provide temporary wales, templates, master pilings or guide structures to ensure that the pilings are placed and driven to the correct alignment. Use a system of structural framing sufficiently rigid to resist lateral and driving forces and to adequately support the sheet piling until design tip elevation is achieved. Use two templates, at least, when placing each piling not less than 20 feet apart. Templates shall not move when supporting sheet piling. Fit templates with wood blocking to bear against the web of each alternate sheet pile and hold the sheet pile at the design location alignment. Provide outer template straps or other restraints as necessary to prevent the sheets from warping or wandering from the alignment. Mark template for the location of the leading edge of each alternate sheet pile. If in view, also mark the second level to assure that the piles are vertical and in position. If two guide marks cannot be seen, other means shall be used to keep the sheet pile vertical along its leading edge.

3.2.2.2 Driving

Submit records of the completed sheet piling driving operations, including a system of identification which shows the disposition of approved piling in the work, driving equipment performance data, piling penetration rate data, piling dimensions and top and bottom elevations of installed piling. The format for driving records shall be as directed. Prior to driving pilings in water, paint a horizontal line on both sides of each piling at a fixed distance from the bottom so that it will be visible above the water line after installation. This line shall indicate the profile of the bottom elevation of installed pilings and potential problem areas can be identified by abrupt changes in its elevation. Drive pilings with the proper size hammer and by approved methods so as not to subject the pilings to damage and to ensure proper interlocking throughout their lengths.

- a. Maintain driving hammers in proper alignment during driving operations by use of leads or guides attached to the hammer. Caution shall be taken in the sustained use of vibratory hammers when a hard driving condition is encountered to avoid interlock-melt or damages. Discontinue the use of vibratory hammers and impact hammers employed when the penetration rate due to vibratory loading is one foot or less per minute.
- b. Employ a protecting cap in driving when using impact hammers to prevent damage to the tops of pilings. Remove and replace pilings damaged during driving or driven out of interlock at the Contractor's expense.
- c. Drive pilings without the aid of a water jet. Before commencing the driving of the final 5 feet, firmly seat the pile in place by the application of a number of reduced energy hammer blows.

- d. Take adequate precautions to ensure that pilings are driven plumb. Where possible, drive Z-pile with the ball end leading. If an open socket is leading, a bolt or similar object placed in the bottom of the interlock will minimize packing material into it and ease driving for the next sheet. If at any time the forward or leading edge of the piling wall is found to be out-of-plumb in the plane of the wall the piling being driven shall be driven to the required depth and tapered pilings shall be provided and driven to interlock with the out-of-plumb leading edge or other approved corrective measures shall be taken to insure the plumbness of succeeding pilings. The maximum permissible taper for any tapered piling shall be 1/8 inch per foot of length.
- e. Pilings in each run or continuous length of piling wall shall be driven alternately in increments of depth to the required depth or elevation. No piling shall be driven to a lower elevation than those behind it in the same run except when the pilings behind it cannot be driven deeper. Incrementally sequence driving of individual piles such that the tip of any sheet pile shall not be more than 4 feet below that of any adjacent sheet pile. When the penetration resistance exceeds five blows per inch, the tip of any sheet pile shall not be more than 2 feet below any adjacent sheet pile. If the piling next to the one being driven tends to follow below final elevation it may be pinned to the next adjacent piling.
- f. If obstructions restrict driving a piling to the specified penetration, the obstructions shall be removed or penetrated with a chisel beam. If the Contractor demonstrates that removal or penetration is impractical, make changes in the design alignment of the piling structure as directed to ensure the adequacy and stability of the structure. Pilings shall be driven to depths shown and shall extend up to the elevation indicated for the top of pilings. Piling driven to rock shall be seated individually on the rock. Pilings shall not be driven within 100 feet of concrete less than 7 days old.
- g. Pre-augering or spudding may be permitted if slopes cause the sheets to slide or as required by the EOR.

3.2.3 Cutting-Off and Splicing

Pilings driven to refusal or to the point where additional penetration cannot be attained and are extending above the required top elevation in excess of the specified tolerance shall be cut off to the required elevation. Pilings driven below the required top elevation and pilings damaged by driving and cut off to permit further driving shall be extended as required to reach the top elevation by splicing when directed at no additional cost to the CITY.

- a. Pilings adjoining spliced pilings shall be full length unless otherwise approved. Splicing of pilings shall be as indicated. Ends of pilings to be spliced shall be squared before splicing to eliminate dips or camber. Pilings shall be spliced together with concentric alignment of the interlocks so that there are no discontinuities, dips or camber at the abutting interlocks. Spliced pilings shall be free sliding and able to obtain the maximum swing with contiguous pilings. Shop and field welding, qualification of welding procedures, welders, and welding operators shall be in accordance with AWS D1.1/D1.1M.
- b. The tops of pilings excessively battered during driving shall be trimmed when directed, at no cost to the CITY. Piling cut-offs shall become the property of the Contractor and shall be removed from the site.

- c. Cut holes in pilings for bolts, rods, drains or utilities in a neat and workmanlike manner, as shown or as directed. Use a straight edge in cuts made by burning to avoid abrupt nicks. Bolt holes in steel piling shall be drilled or may be burned and reamed by approved methods which will not damage the surrounding metal. Holes other than bolt holes shall be reasonably smooth and the proper size for rods and other items to be inserted. All holes in steel pilings on the wet side of cofferdams shall be made watertight by welding steel plates over the holes after the piling installation is completed. Do not use explosives for cutting.

3.2.4 Inspection of Driven Piling

Perform continuous inspection during pile driving. Inspect all piles for compliance with tolerance requirements. Bring any unusual problems which may occur to the attention of the CITY. Inspect the interlocked joints of driven pilings extending above ground. Pilings found to be out of interlock shall be removed and replaced at the Contractor's expense. Use divers or pole mounted camera to inspect underwater interlocked joints of cofferdam sheet piling. CITY divers may also inspect the interlocked joints. The inspection of cofferdams shall be performed after driving is completed, prior to filling each cell and connecting arc, and within 48 hours after filling each cell and arc.

3.2.5 Pulling and Redriving

Submit the proposed method of pulling sheet piling, prior to pulling any piling. Pull, as directed, selected pilings after driving to determine the condition of the underground portions of pilings. Any piling so pulled and found to be damaged, to the extent that its usefulness in the structure is impaired, shall be removed and replaced at the Contractor's expense. Pilings pulled and found to be in satisfactory condition shall be redriven when directed.

3.3 REMOVAL

The removal of sheet pilings shall consist of pulling, sorting, cleaning the interlocks, inventorying and storing previously installed sheet pilings as shown and directed.

3.3.1 Pulling

The method of pulling piling shall be approved. Provide pulling holes in pilings, as required. Extractors shall be of suitable type and size. Care shall be exercised during pulling of pilings to avoid damaging piling interlocks and adjacent construction. If the CITY determines that adjacent permanent construction has been damaged during pulling, the Contractor will be required to repair this construction at no cost to the CITY. Pull pilings one sheet at a time. Pilings fused together shall be separated prior to pulling, unless the Contractor demonstrates, to the satisfaction of the CITY, that the pilings cannot be separated. The Contractor will not be paid for the removal of pilings damaged beyond structural use due to proper care not being exercised during pulling.

3.3.2 Sorting, Cleaning, Inventorying and Storing

Pulled pilings shall be sorted, cleaned, inventoried and stored by type into groups as:

- a. Piling usable without reconditioning.

- b. Piling requiring reconditioning.
- c. Piling damaged beyond structural use.

3.4 INSTALLATION RECORDS

Maintain a pile driving record for each sheet pile driven. Indicate on the installation record: installation dates and times, type and size of hammer, rate of operation, total driving time, dimensions of driving helmet and cap used, blows required per foot for each foot of penetration, or number of feet per minute if vibratory hammer is used, final driving resistance in blows for final 6 inches, pile locations, tip elevations, ground elevations, cut-off elevations, and any reheading or cutting of piles. Record any unusual pile driving problems during driving. Submit complete records to the CITY.

-- End of Section --

SECTION 31 62 19.13

WOOD MARINE PILES

04/06

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA A1	(2015) Standard Methods for Analysis of Creosote and Oil-Type Preservatives
AWPA A4	(2011) Standard Methods for Sampling Wood Preservatives
AWPA A5	(2015) Standard Methods for Analysis of Oil-Borne Preservatives
AWPA A6	(2015) Standard Method for the Determination of Oil-Type Preservatives from Small Samples
AWPA A8	(1990) Qualitative Recovery of Creosote or Creosote Solution from Freshly Treated Piles, Poles, or Timber (Squeeze Method)
AWPA A9	(2013) Standard Method for Analysis of Treated Wood and Treating Solutions by X-Ray Spectroscopy
AWPA C1	(2003) All Timber Products - Preservative Treatment by Pressure Processes
AWPA C3	(2003) Piles - Preservative Treatment by Pressure Processes
AWPA M2	(2015) Standard for Inspection of Treated Wood Products
AWPA M4	(2015) Standard for the Care of Preservative-Treated Wood Products
AWPA M6	(2013) Brands Used on Preservative Treated Materials

ASTM INTERNATIONAL (ASTM)

ASTM A1011/A1011M	(2015) Standard Specification for Steel, Sheet, and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability and Ultra-High Strength
ASTM D25	(2012) Round Timber Piles
ASTM D390	(1992; R 1999) Coal-Tar Creosote for the Preservative Treatment of Piles, Poles and Timbers for Marine, Land, and Fresh Water Use
ASTM D450/D450M	(2007; E 2013; R 2013) Coal-Tar Pitch Used in Roofing, Dampproofing, and Waterproofing

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

WESTERN WOOD PRESERVERS INSTITUTE (WWPI)

WWPI Mgt Practices (1996; R 2011) Best Management Practices for the Use of Treated Wood in Aquatic Environments

1.2 SUBMITTALS

CITY approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Piles; G
Pile driving equipment; G
Piling and cleat mounting fasteners (Stainless Steel Only)

Submit complete descriptions of pile driving equipment, including hammers, leads, driving helmets, cushion blocks, driving blocks, collars, extractors, and other appurtenances for approval prior to commencement of work.

Pile caps; G]
Pile shoes; G]
Jetting equipment; G]
Spudding equipment; G]
Predrilling equipment; G]
Preservative treated piles; G

A certified test assay analysis from an approved testing organization attesting that the piles to be used in the work have been given the preservative treatment required by these specifications shall be submitted prior to commencement of the work.

SD-08 Closeout Submittals

Job piles driving records; G
Submit pile driving records within 15 calendar days after completion of driving.

1.3 QUALITY ASSURANCE**1.3.1 Preservative Treated Piles - Timber**

The Contractor shall be responsible for the quality of treated wood products. The Contractor shall provide the CITY's Representative with the inspection report of an independent inspection agency, approved by the CITY that offered products comply with applicable AWPA standards. Identify

treatment on each piece by the quality mark of an agency accredited by the Board of Review of the American Lumber Standard Committee. Inspect all preservative-treated wood visually to ensure there are no excessive residual materials or preservative deposits. Materials shall be clean and dry or it will be rejected because of environmental concerns.

1.3.2 MSDS and CIS

Provide Materials and Safety Data Sheets (MSDS) and Consumer Information Sheets (CIS) associated with timber pile preservative treatment. Contractor shall comply with all safety precautions indicated on MSDS and CIS.

1.3.3 Pesticide Applicators

Provide certifications for all individuals (applicators) who will be working with creosote products on site. All applicators shall be certified by the State or Environmental Protection Agency (EPA) (under the provisions of 40 CFR 171) to use wood preservatives, and have completed an approved EPA training program on the use of creosote products.

1.3.4 Best Management Practices (BMPs)

The producer of the treated wood products shall provide certification that Best Management Practices (BMPs) for the use of Treated Wood in Aquatic Environments were utilized including a written description and appropriate documentation of the BMPs utilized.

1.4 DELIVERY, STORAGE, AND HANDLING

Handle and store piles in accordance with AWWA M4. Comply with paragraph entitled "MSDS and CIS." Special care shall be taken in supporting piles to prevent the including of excessive bending stresses in the piles. Piles shall be carefully handled without dropping, breaking of outer fibers, and penetrating the surface with tools. Peaveys, can't hooks, pikes, and other pointed tools shall not be used in handling treated piles.

1.5 BASIS OF BIDS

1.5.1 for Mooring Piles

Base bids on the number, circumference, and length of piles from tip to cutoff as indicated. The number of piles to be relocated and replaced is dependent upon the contractor's means and methods. It is expected that these piles will to be reinstalled using a suitable pre-drilling method. **The length of the piles is not certain. If piles are found to be in poor condition, they shall be replaced with new piles of similar dimension and material at no additional cost to the contract.**

1.6 UNIT PRICES

1.6.1 Round Timber Piles

1.6.5.1 Payment

Payment will be made for satisfactorily driven piles which are pulled at the direction of the CITY or as required to construct the project and found to be in good condition. Payment will be made for pulled timber piles which are replaced with new piles. Where piles are pulled at the direction of the CITY and found to be damaged, no payment will be made for originally furnishing and driving such piles nor for the operation of pulling, and damaged piles shall be replaced by new piles for which payment will be made. In the event that piles may be reused, the contractor shall provide the City with a credit.

1.6.5.2 Measurement

Satisfactorily driven piles which are pulled at the direction of the CITY and found to be in good condition will be measured for payment at the applicable contract unit price for furnishing and driving the pile at its original position plus 50 percent of this amount to cover the cost of pulling. Pulled timber piles shall not be redriven, but replaced by new piles which will be measured for payment at the applicable contract unit price for the lengths driven. Where piles are pulled at the direction of the CITY and found to be damaged, no measurement for payment will be made for originally furnishing and driving such piles nor for the operation of pulling, but the damaged piles shall be replaced by new piles which will be measured for payment at the applicable contract unit price for the lengths driven.

1.6.5.3 Unit of Measure

Unit of measure: linear foot.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Piles

Provide Douglas fir or Southern pine clean-peeled, and treated piles conforming to ASTM D25 and other requirements as specified. Piles shall be in one piece of the length[s] as shown. Splices will not be permitted. Each treated pile shall be branded by the producer, in accordance with AWPA M6. Pile circumferences shall be as follows:

- a. Mooring Piles: Minimum butt diameter shall match existing and if measured at 3 feet from the butt end shall be 12 inches.

2.1.2 Preservative Treatment

Treat piles by the full-cell pressure process in accordance with AWPA C1 and AWPA C3 to the retention and penetration for marine piling and produce in accordance with WWPI Mgt Practices, as follows:

- a. Mooring Piles: Waterborne preservative for marine piles (ACA - Ammoniacal Copper Arsenate, ACZA - Ammoniacal Copper Zinc Arsenate, CCA - Chromated Copper Arsenate).

2.1.3 Creosote

Not Used.

2.1.4 Coal-Tar Pitch

Not Used.

2.1.5 Pile Shoes

ASTM A1011/A1011M. Steel boot or welded-plate point shoe especially fabricated for pile driving. Shoes shall be the product of a manufacturer regularly engaged in the manufacture of pile fittings. Welding procedures shall be in accordance with a nationally recognized welding code. Provide size to fit pile tip. Fabricate boot type of 3/16 inch carbon steel fully welded, with at least three straps, each with three 3/16 inch nail holes. Fabricate welded-plate point type of four 3/16 inch or 1/4 inch steel plates, fully welded and sized to adequately cover full pointed area of pile; provide each plate with one 3/16 inch or one 1/4 inch nail hole. The length of the joints formed by the intersection of the sides shall not be less than one half of the height of the shoe. Shoes shall be cleaned and painted with at least one coat of paint. The color and paint shall be the manufacturer's standard. Provide on the point of each pile.

2.1.6 Pile Caps

Carefully remove, store and reuse the plastic pile caps.

2.2 TESTS, INSPECTIONS, AND VERIFICATIONS

2.2.1 Inspection of Piles

The Contractor shall provide the necessary facilities for the proper inspection of each pile prior to extraction. Pile inspection shall occur again after removal and before storage. Piles that appear to need retreatment with preservative will be flagged prior to storage and will be retreated in an environmentally sustainable way. Piles with specified variations in characteristics shall be placed in separate lots for inspection. Piles shall be so marked or segregated into marked lots that there will be no possibility of error in assignment after they have been inspected. Piles damaged during the removal stage shall be stored in separate lots.

Piles deemed unworthy for re-driving shall become the property of the contractor and shall be stored in a separate lot. All rejected piles shall be removed from the site as directed. **Contractor should be prepared to order replacement piles early in the construction process to allow adequate time for delivery to the site. Replacement piles will be paid on a linear foot basis.**

2.2.2 Inspection of the Preservative Treatment Process

Inspection of the preservative treatment process will be in accordance with AWWA M2. The Contractor shall notify the CITY where preservative treatment will be done not less than 15 days prior to the start of the treatment and shall provide the necessary facilities for the proper inspection of the treatment process. Allow the CITY unlimited access to the plant and inspection privileges for each facet of the treating process.

2.2.3 Sampling and Testing

Sampling and testing shall be performed by an approved testing organization adequately equipped to perform such services.

2.2.3.1 Sampling

Representative samples of preservatives for testing shall be obtained from storage containers using the methods described in AWPA A4. The recovery of creosote and creosote solution and oil-borne preservatives from piles for testing shall be in accordance with the methods described in AWPA A8 and AWPA A6, respectively. The analysis of wood treated with waterborne preservatives shall be done in accordance with AWPA A9.

2.2.3.2 Testing

Creosote and creosote solutions, waterborne preservatives, and oil-borne preservatives shall be tested for conformance to AWPA A1, AWPA A9, and AWPA A5, respectively. The net retention and the penetration of preservatives in piles shall be determined as specified in AWPA M2 and the additional requirements listed. The determination of the net retention of waterborne preservatives in piles which have received the dual treatment of waterborne preservatives and creosote or creosote solutions shall be made after the extraction of the creosote or creosote solutions.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Pile Driving Equipment

Pile driving equipment shall meet the following requirements.

3.1.1.1 Pile Driving Hammers

Pile driving hammers shall be steam, air or diesel drip, single-action, double-acting, differential-acting, type. The use of vibratory hammers is strictly dependent upon satisfactory driving and load testing of piles. Embedment depths shall match the existing embedment depths for the piles that are being extracted. All elevations are to remain the same. The size or capacity of hammers shall be as recommended by the manufacturer for the pile weights and solid formation to be penetrated. The pile hammer shall be of sufficient weight and energy to install the specified pile without damage into the soils expected to be encountered. The maximum driving energy of hammers shall be 12,000 foot-pounds for piles for any length. Test piles shall be driven with the same size and type hammer, operating with the same effective energy and efficiency as that to be used in driving job piles. Diesel powered hammers shall be operated at the rate recommended by the manufacturer throughout the entire driving period. Sufficient pressure shall be maintained at the hammer so that:

- a. For double-acting hammers, the number of blows per minute during and at the completion of driving of a pile is equal approximately to that at which the hammer is rated;

- b. For single-acting hammers, there is a full upward stroke of the ram; and,
- c. For differential-type hammers, there is a slight rise of the hammer base during each upward stroke.

3.1.1.2 Leads

Leads are required and shall be fixed at the top and adjustable at the bottom. Swinging leads may be allowed if site conditions merit their use and are approved.

3.1.1.3 Driving Cap or Helmet and Cushion Block

Driving cap or helmet shall be an approved design and shall be capable of protecting pile heads, minimizing energy absorption, and transmitting hammer energy uniformly and consistently to piles. Place driving helmet or cap and cushion block combination between top of pile and the ram. Driving cap shall fit snugly on the top of piles and shall employ a cushion block to prevent impact damage to piles. The cushion block may be a solid or laminated softwood block with the grain parallel to the pile axis and enclosed in a close-fitting steel housing. The thickness of the block shall be suitable for the length of pile to be driven and the character of subsurface material to be encountered. Generally, thicker blocks are required for longer piles and softer subsurface material. If block is damaged, split, highly compressed, charred or burned, or has become spongy or deteriorated, replace with new block. Under no circumstances will the use of small wood blocks, wood chips, rope, or other material permitting excessive loss of hammer energy be permitted.

3.1.1.4 Pile Collars

Collars or bands for protecting pile butts against splitting, brooming, and other damage while being driven shall be of an approved design.

3.1.1.5 Jetting Equipment

Jetting equipment shall not be used adjacent to the seawall.

3.1.2 Mooring Piles

Inspect piles when delivered and when in the leads immediately before driving. Secure piles in their proper alignment and cut piles at cutoff grade with pneumatic tools by sawing or other approved method. Pile heads at cutoff shall be sound. Counterbore holes for bolts where indicated for countersinking bolt heads and washers. After installation of bolts, fill counterbored holes with an approved bituminous material. Drill holes for drift bolts 1/8 inch smaller than bolt diameter. Drill holes for through bolts 1/16 inch larger than diameter of bolt shank. Drill holes for lag bolts not larger than body of bolt at base of tread. Fender piles shall have tops beveled outboard as indicated.

3.1.2.1 Driving Mooring Piles

Pile hammers shall be air, steam, or diesel powered, and of an approved type with a capacity at least equal to the hammer manufacturer's recommendation for the total weight of pile and character of

subsurface material to be encountered. Minimum driving energy shall be specified by the engineer of record with a range of 8,000 foot-pounds with maximum driving energy of 12,000 foot-pounds. Weight of the hammer for drop hammers shall not be less than 2,000 pounds.

3.1.2.2 Fastening

All fasteners used on this project shall be stainless steel. Use washers of the size and type specified under bolt heads and nuts which would otherwise come in contact with wood.

3.1.2.3 Tolerances in Driving

Piles shall be driven in the locations indicated. Fender piles may be manipulated a maximum of 0.50 inch per foot of pile length in a direction parallel to the pier face and 0.25 inch per foot of pile length in a direction perpendicular to the pier face. Remove and replace with new piles those damaged, mislocated, driven below the design cutoff, or driven out of alignment.

3.1.3 Jetting of Piles

Water jets shall not be permitted to assist in driving.

3.1.4 Spudding of Piles

Spudding will be permitted. Discontinue driving and withdraw the spudding mandrel approximately 15 feet above the indicated pile tip elevation. Drive pile the final 15 feet of penetration to the maximum penetration per blow established by the CITY. Obtain CITY's approval of spudding equipment, prior to commencing spudding operations.

3.1.5 Predrilling of Piles

Predrilling will be permitted. Discontinue predrilling when pile tip is approximately 15 feet above the indicated pile tip elevation. Drive pile the final 15 feet of penetration to the maximum penetration per blow established by the CITY. Obtain CITY's approval of predrilling equipment prior to commencing predrilling operations.

3.2 PROTECTION

3.2.1 Protection of Piles

Square the heads and tips of piles to the driving axis. Laterally support piles during driving, but do not unduly restrain piles from rotation in the leads. Swinging leads will be permitted. Where pile orientation is essential, take precautionary measures to maintain the orientation during driving. Handle, protect, and field treat piles in accordance with AWPA M4.

3.2.1.1 Damaged Piles

Piles pulled and found to be sound and in a satisfactory condition shall be stored and redriven. Pulled piles found to be unsound, shall be cataloged and shown to the CITY. The contractor will need to order replacement piles at that time and will be paid accordingly for those piles.

Driving of piles shall not subject them to damage. Piles which are damaged, split, broomed, or broken by reason of internal defects or by improper driving below cutoff elevation so as to impair them for the purpose intended shall be removed and replaced; a second pile may be driven adjacent thereto at the Contractor's expense. Minor damaged areas of treated piles shall be brush-coated with creosote or the same preservative used to treat the piles. The CITY may require the Contractor to pull certain selected piles after driving for test and inspection to determine the conditions of the piles. Any pile so pulled and found to be damaged to such extent as to impair its usefulness in the completed structure shall be removed from the work and the Contractor shall furnish and drive a new pile to replace the damaged pile.

3.2.1.2 On Site Application of Wood Preservatives

All on site application of wood preservatives must be performed by a person certified through an EPA approved training program for the application of wood treatment products in accordance with 40 CFR 171, regulated under 7 U.S.C.A. Sections 136 to 136y, Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). On site treatment shall also be in accordance with AWPA M4, Sections 1.5, 2.2, 2.3, and 3.1.

3.3 FIELD QUALITY CONTROL

3.3.1 Inspections

When CITY inspections result in product rejection, the Contractor shall promptly segregate and remove rejected material from the premises. The CITY may also charge the Contractor an additional cost of inspection or test when prior rejection makes reinspection or retest necessary.

-- End of Section --

SECTION 33 11 00

WATER UTILITY DISTRIBUTION PIPING

PART 1 GENERAL

1.1 SUBMITTALS

CITY approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Pipe, Fittings, Joints and Couplings; G Valves; G

Valve Boxes; G

SD-06 Test Reports

Bacteriological Samples; G

SD-08 Manufacturer's Instructions
Manufacturer's Instructions

1.2 QUALITY CONTROL

1.2.1 Regulatory Requirements

Comply with NSF/ANSI 61 and NSF 372 for materials for potable water piping, components and specialties for domestic water; comply with lead content requirements for "lead-free" plumbing as defined by the U.S. Safe Drinking Water Act effective January 2014.

Comply with NSF/ANSI 14 for plastic potable water piping and components. Provide plastic pipe and fittings, bearing the seal of the National Sanitation Foundation (NSF) for potable water service from the same manufacturer.

Comply with NFPA 24 for materials, installation, and testing of fire main piping and components.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery and Storage

Inspect materials delivered to site for damage. Unload and store with minimum handling and in accordance with manufacturer's instructions. Store materials on site in enclosures or under protective covering. Store plastic piping, jointing materials and rubber gaskets under cover out of

direct sunlight. Do not store materials directly on the ground. Keep inside of pipes, fittings, valves, and other accessories free of dirt and debris.

1.3.2 Handling

Handle pipe, fittings, valves, and other accessories in accordance with manufacturer's instructions and in a manner to ensure delivery to the trench in sound undamaged condition. Avoid injury to coatings and linings on pipe and fittings; make repairs if coatings or linings are damaged. Do not place other material, hooks, or pipe inside a pipe or fitting after the coating has been applied. Inspect the pipe for defects before installation. Carry, do not drag pipe to the trench. Use of pinch bars and tongs for aligning or turning pipe will be permitted only on the bare ends of the pipe. Clean the interior of pipe and accessories of foreign matter before being lowered into the trench and keep them clean during laying operations by plugging. Replace material found to be defective before or after laying with sound material without additional expense to the CITY. Store rubber gaskets that are not to be installed immediately, under cover out of direct sunlight.

Handle PVC pipe, fittings, and accessories in accordance with AWWA C605. Handle PE pipe, fittings, and accessories in accordance with AWWA M55.

PART 2 PRODUCTS

2.1 SYSTEM DESCRIPTION

2.1.1 Water Distribution Mains

Provide water distribution mains indicated as through 12 inch lines of PVC pipe. Provide water main accessories and valves as specified and where indicated.

2.2 PIPE, FITTINGS, JOINTS AND COUPLINGS

Submit manufacturer's standard drawings or catalog cuts, except submit both drawings and cuts for push-on joints. Include information concerning gaskets with submittal for joints and couplings.

2.3 VALVES

2.3.1 Rubber-Seated Butterfly Valves

Provide PVC rubber-seated butterfly valves and wafer type valves that match the performance requirements of AWWA C504. Wafer type valves not meeting laying length requirements are acceptable if supplied and installed with a spacer, providing the specified laying length. Meet all tests required by AWWA C504. Flanged-end valves are required in a pit. Provide a union or sleeve-type coupling in the pit to permit removal. Direct-bury mechanical-end valves 3 through 10 inches in diameter. Provide a valve box, means for manual operation, and an adjacent pipe joint to facilitate valve removal. Provide valve operators that restrict closing to a rate requiring approximately 60 seconds, from fully open to fully closed.

2.3.2 Valve Pits

Construct the valve pits at locations indicated or as required above and in accordance with the details shown.

2.4 DISINFECTION

Chlorinating materials are to conform to: Chlorine, Liquid: AWWA B301; Hypochlorite, Calcium and Sodium: AWWA B300.

PART 3 EXECUTION

3.1 PRECAUTIONS

3.1.1 Connections to Existing System

Perform all connections to the existing water system in the presence of the CITY.

3.1.2 Operation of Existing Valves

Do not operate valves within or directly connected to the existing water system unless expressly directed to do so by the CITY.

3.2 INSTALLATION OF PIPELINES

3.2.1 General Requirements for Installation of Pipelines

Submit manufacturer's instructions for pipeline installations. These manufacturer's instructions apply to all pipeline installation except as noted herein.

3.2.1.1 Location of Water Lines

Terminate the work covered by this section at a point approximately 5 feet from the building, unless otherwise indicated.

Do not lay water lines in the same trench with gas lines, fuel lines, electric wiring, or any other utility. Where nonferrous metallic pipe, e.g. copper tubing, cross any ferrous piping, provide a minimum vertical separation of 12 inches between pipes.

3.2.1.1.1 Water Piping Installation Parallel With Sewer Piping

3.2.1.1.1.1 Normal Conditions

Lay water piping at least 10 feet horizontally from a sewer or sewer manhole whenever possible. Measure the distance edge-to-edge. Provide at least 18 inches above the top (crown) of the sewer piping and the bottom (invert) of the water piping. The sewer piping is to be constructed of AWWA-compliant water pipe and pressure tested in place without leakage prior to backfilling where this vertical separation cannot be obtained. Shop drawings for the waste water disposal method are required. Test the sewer manhole in place to ensure watertight construction.

3.2.1.1.2 Installation of Water Piping Crossing Sewer Piping

- a. Normal Conditions: Provide a separation of at least 18 inches between the bottom of the water piping and the top of the sewer piping in cases where water piping crosses above sewer piping.

- b. Unusual Conditions: When local conditions prevent a vertical separation described above, construct sewer piping passing over or under water piping of AWWA-compliant ductile iron water piping, pressure tested in place without leakage prior to backfilling. Protect water piping passing under sewer piping by providing a vertical separation of at least 18 inches between the bottom of the sewer piping and the top of the water piping; adequate structural support for the sewer piping to prevent excessive deflection of the joints and the settling on and breaking of the water piping; and that the length, minimum 20 feet, of the water piping be centered at the point of the crossing so that joints are equidistant and as far as possible from the sewer piping.

3.2.1.2 Connections to Existing Water Lines

Make connections to existing water lines after coordination with the facility and with a minimum interruption of service on the existing line. Make connections to existing lines under pressure in accordance with the recommended procedures of the manufacturer of the pipe being tapped and as indicated on the utility plan.

3.2.2 Disinfection

Disinfection of systems supplying nonpotable water is not required.

Prior to disinfection, provide disinfection procedures, proposed neutralization and disposal methods of waste water from disinfection procedures as part of the disinfection submittal. Disinfect new water piping and existing water piping affected by Contractor's operations in accordance with AWWA C651. Fill piping systems with solution containing minimum of 50 parts per million of available chlorine and allow solution to stand for minimum of 24 hours. Flush solution from the systems with domestic water until maximum residual chlorine content is within the range of 0.2 and 0.5 parts per million, or the residual chlorine content of domestic water supply. Obtain at least two consecutive bacteriological samples from new water piping. Analyze samples by a certified laboratory, and submit the results of the bacteriological samples. Obtain approval by the CITY prior to the new water piping being placed into service.

3.3 FIELD QUALITY CONTROL

3.3.1 Field Tests and Inspections

Notify the CITY a minimum of five days in advance of hydrostatic testing. Coordinate the proposed method for disposal of waste water from hydrostatic testing. Perform field tests, and provide labor, equipment, and incidentals required for testing. Provide documentation that all items of work have been constructed in accordance with the Contract documents.

3.3.2 Testing Procedure

3.3.2.1 Hydrostatic Testing

Test the water system in accordance with the applicable CITY standard.

3.3.2.2 Leakage Testing

For leakage test, use a hydrostatic pressure not less than the maximum working pressure of the system. Leakage test may be performed at the same time and at the same test pressure as the pressure test.

3.4 CLEANUP

Upon completion of the installation of water lines and appurtenances, remove all debris and surplus materials resulting from the work.

- End of Section -

SECTION 33 40 00

STORM DRAINAGE UTILITIES

PART 1 GENERAL

1.1 MEASUREMENT AND PAYMENT

1.1.1 Pipe Culverts and Storm Drains

The length of pipe installed will be measured along the centerlines of the pipe from end to end of pipe. Pipe will be paid for at the contract unit price for the number of linear feet of culverts or storm drains placed in the accepted work.

1.1.2 Walls and Headwalls

Walls and headwalls will be measured by the number of cubic yards of reinforced concrete, plain concrete, or masonry used in the construction of the walls and headwalls. Wall and headwalls will be paid for at the contract unit price for the number of walls and headwalls constructed in the completed work.

1.2 SUBMITTALS

CITY approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data Placing Pipe

Submit printed copies of the manufacturer's recommendations for installation procedures of the material being placed, prior to installation.

SD-04 Samples

Pipe for Culverts and Storm Drains

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Before, during, and after installation, plastic pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. Keep a copy of the manufacturer's instructions available at the construction site at all times and follow these

instructions unless directed otherwise by the CITY. Solvents, solvent compounds, lubricants, elastomeric gaskets, and any similar materials required to install plastic pipe shall be stored in accordance with the manufacturer's recommendations and shall be discarded if the storage period exceeds the recommended shelf life. Solvents in use shall be discarded when the recommended pot life is exceeded.

1.3.2 Handling

Materials shall be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

PART 2 PRODUCTS

2.1 PIPE FOR CULVERTS AND STORM DRAINS

Pipe for culverts and storm drains shall be of the sizes indicated and shall conform to the requirements specified.

2.1.1 Concrete Pipe

Manufactured in accordance with and conforming to ASTM C76, or ASTM C655. 2.2
MISCELLANEOUS MATERIALS

2.2.1 Concrete

Unless otherwise specified, concrete and reinforced concrete shall conform to the requirements for concrete under Section 03 30 00.00 10 CAST-IN-PLACE CONCRETE. The concrete mixture shall have air content by volume of concrete, based on measurements made immediately after discharge from the mixer, of 5 to 7 percent when maximum size of coarse aggregate exceeds 1-1/2 inches. Air content shall be determined in accordance with ASTM C231/C231M. Concrete covering deposited directly against the ground shall have a thickness of at least 3 inches between steel and ground. Expansion-joint filler material shall conform to ASTM D1751, or ASTM D1752, or shall be resin-impregnated fiberboard conforming to the physical requirements of ASTM D1752.

2.2.2 Mortar

Mortar for pipe joints, connections to other drainage structures, and brick or block construction shall conform to ASTM C270, Type M, except that the maximum placement time shall be 1 hour. The quantity of water in the mixture shall be sufficient to produce a stiff workable mortar. Water shall be clean and free of harmful acids, alkalis, and organic impurities. The mortar shall be used within 30 minutes after the ingredients are mixed with water. The inside of the joint shall be wiped clean and finished smooth. The mortar head on the outside shall be protected from air and sun with a proper covering until satisfactorily cured.

2.2.3 Brick

Brick shall conform to ASTM C62, Grade SW; ASTM C55, Grade S-I or S-II; or ASTM C32, Grade MS. Mortar

for jointing and plastering shall consist of one part portland cement and two parts fine sand. Lime may be added to the mortar in a quantity not more than 25 percent of the volume of cement. The joints shall be filled completely and shall be smooth and free from surplus mortar on the inside of the structure. Brick structures shall be plastered with 1/2 inch of mortar over the entire outside surface of the walls. For square or rectangular structures, brick shall be laid in stretcher courses with a header course every sixth course. For round structures, brick shall be laid radially with every sixth course a stretcher course.

PART 3 EXECUTION

3.1 EXCAVATION FOR PIPE CULVERTS, STORM DRAINS, AND DRAINAGE STRUCTURES

Excavation of trenches, and for appurtenances and backfilling for culverts and storm drains, shall be in accordance with the applicable portions of Section 31 00 00 EARTHWORK and the requirements specified below.

3.1.1 Trenching

The width of trenches at any point below the top of the pipe shall be not greater than the outside diameter of the pipe plus 12 inches to permit satisfactory jointing and thorough tamping of the bedding material under and around the pipe. Sheeting and bracing, where required, shall be placed within the trench width as specified, without any overexcavation. Where trench widths are exceeded, redesign with a resultant increase in cost of stronger pipe or special installation procedures will be necessary. Cost of this redesign and increased cost of pipe or installation shall be borne by the Contractor without additional cost to the CITY.

3.1.2 Removal of Unstable Material

Where wet or otherwise unstable soil incapable of properly supporting the pipe, as determined by the CITY, is unexpectedly encountered in the bottom of a trench, such material shall be removed to the depth required and replaced to the proper grade with select granular material, compacted as provided in paragraph BACKFILLING. When removal of unstable material is due to the fault or neglect of the Contractor while performing shoring and sheeting, water removal, or other specified requirements, such removal and replacement shall be performed at no additional cost to the CITY.

3.2 BEDDING

The bedding surface for the pipe shall provide a firm foundation of uniform density throughout the entire length of the pipe.

3.2.1 Concrete Pipe Requirements

When no bedding class is specified or detailed on the drawings, concrete pipe shall be bedded in granular material minimum 4 inch in depth in trenches with soil foundation. Depth of granular bedding in trenches with rock foundation shall be 1/2 inch in depth per foot of depth of fill, minimum depth of bedding shall be 8 inch up to maximum depth of 24 inches. The middle third of the granular bedding shall be loosely placed. Bell holes and depressions for joints shall be removed and formed so entire barrel of pipe is uniformly supported. The bell hole and depressions for the joints shall be

not more than the length, depth, and width required for properly making the particular type of joint.

3.3 BACKFILLING

3.3.1 Backfilling Pipe in Fill Sections

For pipe placed in fill sections, backfill material and the placement and compaction procedures shall be as specified below. The fill material shall be uniformly spread in layers longitudinally on both sides of the pipe, not exceeding 6 inches in compacted depth, and shall be compacted by rolling parallel with pipe or by mechanical tamping or ramming. Prior to commencing normal filling operations, the crown width of the fill at a height of 12 inches above the top of the pipe shall extend a distance of not less than twice the outside pipe diameter on each side of the pipe or 12 feet, whichever is less.

3.3.2 Compaction

3.3.2.1 General Requirements

Cohesionless materials include gravels, gravel-sand mixtures, sands, and gravelly sands. Cohesive materials include clayey and silty gravels, gravel-silt mixtures, clayey and silty sands, sand-clay mixtures, clays, silts, and very fine sands. When results of compaction tests for moisture-density relations are recorded on graphs, cohesionless soils will show straight lines or reverse-shaped moisture-density curves, and cohesive soils will show normal moisture-density curves.

3.3.2.2 Minimum Density

Backfill over and around the pipe and backfill around and adjacent to drainage structures shall be compacted at the approved moisture content to the following applicable minimum density, which will be determined as specified below.

- a. Under airfield and heliport pavements, paved roads, streets, parking areas, and similar-use pavements including adjacent shoulder areas, the density shall be not less than 90 percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material, up to the elevation where requirements for pavement subgrade materials and compaction shall control.
- b. Under unpaved or turfed traffic areas, density shall not be less than 90 percent of maximum density for cohesive material and 95 percent of maximum density for cohesionless material.
- c. Under nontraffic areas, density shall be not less than that of the surrounding material.

- End of Section -

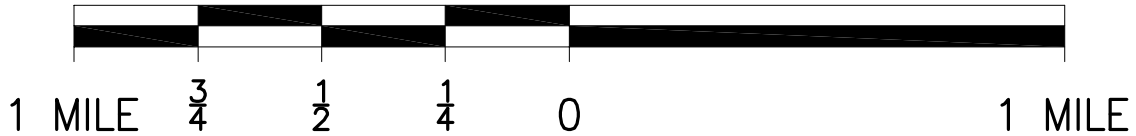
PART 5

SURVEYS / GEOTECH

SPECIFIC PURPOSE SURVEY
MODIFIED SOVEREIGNTY SUBMERGED LAND LEASE No. 440030665

Waterward of Lot 5, Square 3, William A. Whitehead's Map of Key West
 SECTION 6, TOWNSHIP 68 S, RANGE 25 E
 CITY OF KEY WEST

KEY WEST QUADRANGLE
 FLORIDA – MONROE COUNTY
 7.5 MINUTE SERIES (TOPOGRAPHIC)
 SCALE 1:48,000



(GEODETIC COORDINATE WAS ESTABLISHED BY A REAL TIME NETWORK GPS SURVEY)

REVISIONS

06-11-18: Revised Legal
 07-07-18: Revised Legal



AVIROM & ASSOCIATES, INC.
SURVEYING & MAPPING

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 BOCA RATON, FLORIDA 33432
 (561) 392-2594 / www.AVIROMSURVEY.com

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JOB #: **10754-1**

SCALE: 1" = 20'

DATE: 04/10/18

BY: K.M.C.

CHECKED: K.M.C.

F.B. 1797 PG. 48

SHEET: **1 OF 5**

SPECIFIC PURPOSE SURVEY
MODIFIED SOVEREIGNTY SUBMERGED LAND LEASE No. 440030665

Waterward of Lot 5, Square 3, William A. Whitehead's Map of Key West
SECTION 6, TOWNSHIP 68 S, RANGE 25 E
CITY OF KEY WEST

SURVEYOR'S REPORT:

1. The specific purpose of this survey is to delineate the boundary of the sovereignty submerged land lease area and the riparian rights line, relative to the upland boundary.
2. Reproductions of this Sketch are not valid without the signature and the original raised seal of a Florida licensed surveyor and mapper.
3. No Title Opinion or Abstract to the subject property has been provided. It is possible that there are Deeds, Easements, or other instruments (recorded or unrecorded) which may affect the subject property. No search of the Public Records has been made by the Surveyor.
4. During the course of the field survey no shoreline vegetation was observed.
5. The land description shown hereon was prepared by the Surveyor.
6. Riparian Rights Line: Navigable waters are immediately adjacent to the shoreline, therefore the Riparian Rights line was established by the accepted principle of the extension of the common boundary lines.
7. No underground improvement were located.
8. Bearings shown hereon are relative to the previous Sovereignty Submerged Land Lease No. 440030665 based on the south right-of-way line of David Wolkowsky Street (formerly Whitehead Street) having a bearing of N 70°27'37" W.
9. The Grid coordinates shown hereon are based on the North American Datum of 1983, adjustment of 2011 (NAD 83/2011) Epoch 2010.00, of the Florida State Plane Coordinate System (Transverse Mercator Projection), East Zone established by a Real-time Network (RTN) GPS Control Survey which is certified to a 2 centimeter local accuracy,
 - a. Method: Wide Area Continuously Operating GPS Reference Station Network
 - b. Equipment Used: Trimble R8 GNSS, Serial Number 4347129118 (Dual Frequency Receiver)
 - c. Processing Software: Trimble Business Center, Version 3.70
10. Elevations shown hereon are in decimals of a foot based on the North American Vertical Datum of 1988 (NAVD 88). To convert elevations from NAVD 88 to NGVD 29, add algebraically the model value of (+) 1.342 feet to the elevation.
11. Benchmark Description: National Geodetic Survey (NGS) Benchmark "872 4580 TIDAL 24" (PID# AA0003), Elevation= 5.049' (NAVD 88), National Geodetic Vertical Datum of 1929 (NGVD 29) Elevation= 6.391'.
12. Address: 1 Whitehead Street, Key West, FL. 33040.
13. (a) The Mean High Water Survey depicted hereon complies with Chapter 177, Part II Florida Statutes.
(b) Established Mean High Water Elevation is (-) 0.24 feet, NAVD 1988, as located on 02/27/2018.
(c) The Mean High Water Elevation as shown hereon was established by extending the elevation shown at Tide Station No. 872-4580, which was obtained from the Florida Department of Environmental Protection Web Site, <http://www.labins.org>.
14. Bathymetry data shown hereon are in tenths of a foot, showing depths below Mean Low Water (MLW). The Mean Low Water (MLW) elevation of (-) 1.52 feet (NAVD 88) is based on the Florida Department of Environmental Protection Tidal Datum relative to Tide Station Number 872-4580.
15. Linear distance along wet face of concrete seawall= 255 feet. Total linear distance of lease area= 451 feet.
16. This map is intended to be displayed at a scale of 1:240 (1"=20') or smaller.
17. Symbols shown hereon and in the legend may have been enlarged for clarity. These symbol have been plotted at the center of the field location and may not represent the actual shape and size of the feature.
18. Units of measurement are in U.S. Survey Feet and decimal parts thereof. Well identified features in this survey were field measured to a horizontal positional accuracy of 0.05'. The elevations on impervious surfaces were field measured to 0.04' and on ground surfaces to 0.1'.
19. Abbreviation Legend: Ac.= Acre; B.M.= Benchmark; CONC= Concrete; EL.= Elevation; MHW= Mean High Water Line; NAVD 88= North American Certical Datum of 1988; No.= Number; R/W= Right-of-Way; sq .ft.= Square Feet; ST.= Street; TYP= Typical.

REVISIONS

06-11-18: Revised Legal
07-07-18: Revised Legal



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JOB #: **10754-1**

SCALE: 1" = 20'

DATE: 04/10/18

BY: K.M.C.

CHECKED: K.M.C.

F.B. 1797 PG. 48

SHEET: **2 OF 5**

**SPECIFIC PURPOSE SURVEY
MODIFIED SOVEREIGNTY SUBMERGED LAND LEASE No. 440030665**

Waterward of Lot 5, Square 3, William A. Whitehead's Map of Key West
SECTION 6, TOWNSHIP 68 S, RANGE 25 E
CITY OF KEY WEST

TIDAL BENCHMARKS ESTABLISHED

HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD 83)
VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88)

TIDAL STATION	NORTHING (Y)	EASTING (X)	ELEVATION NAVD 88	DESCRIPTION
"B.M.-1"	82925.37	387615.30	6.648	SET NAIL & TRAVERSE DISK IN PAVERS
"B.M.-2"	83000.28	387623.86	4.148	SET NAIL & TRAVERSE DISK IN PAVERS

LEGAL DESCRIPTION:

A parcel of submerged land within the Key West Harbor being coincident with a portion of Lot 5 of Square 3, William A. Whitehead's Map or Plan of the Island of Key West, Monroe County, Florida (an unrecorded plan), described as:

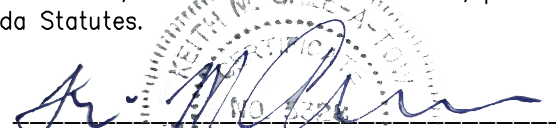
COMMENCING at the intersection of the westerly right-of-way line of Wall Street with the southerly right-of-way line of David Wolkowsky Street (formerly Whitehead Street); thence N 70°27'37" W along the northwesterly extension of the southerly right-of-way line of David Wolkowsky Street (formerly Whitehead Street), being the south boundary of the uplands, a distance of 183.84 feet to the Point of Beginning; thence continue N 70°27'37" W along the northwesterly extension of the south boundary of the uplands, 114.03 feet; thence N 16°57'37" E, 50.05 feet; thence N 70°27'37" W, a distance of 30.26 feet; thence N 18°57'13" E, a distance of 9.33 feet; thence meander along the Mean High Water Line, at the wet face of the centerline of a proposed sheet pile for the following four (4) courses: thence S 71°42'13" E, a distance of 30.93 feet; thence S 70°07'28" E, a distance of 56.00 feet; thence S 23°04'55" W, a distance of 9.06 feet; thence S 70°14'39" E, a distance of 80.63 feet; thence meander along the Mean High Water Line, along the wet face of an existing seawall for the following three (3) courses: thence S 19°50'18" W, a distance of 41.70 feet; thence N 70°27'06" W, a distance of 20.13 feet; thence S 19°32'54" W, a distance of 8.62 feet to the Point of Beginning.


Said lands lying and being within Key West Harbor, City of Key West, Monroe County, Florida containing 7,480 square feet (0.17 acres) more or less.

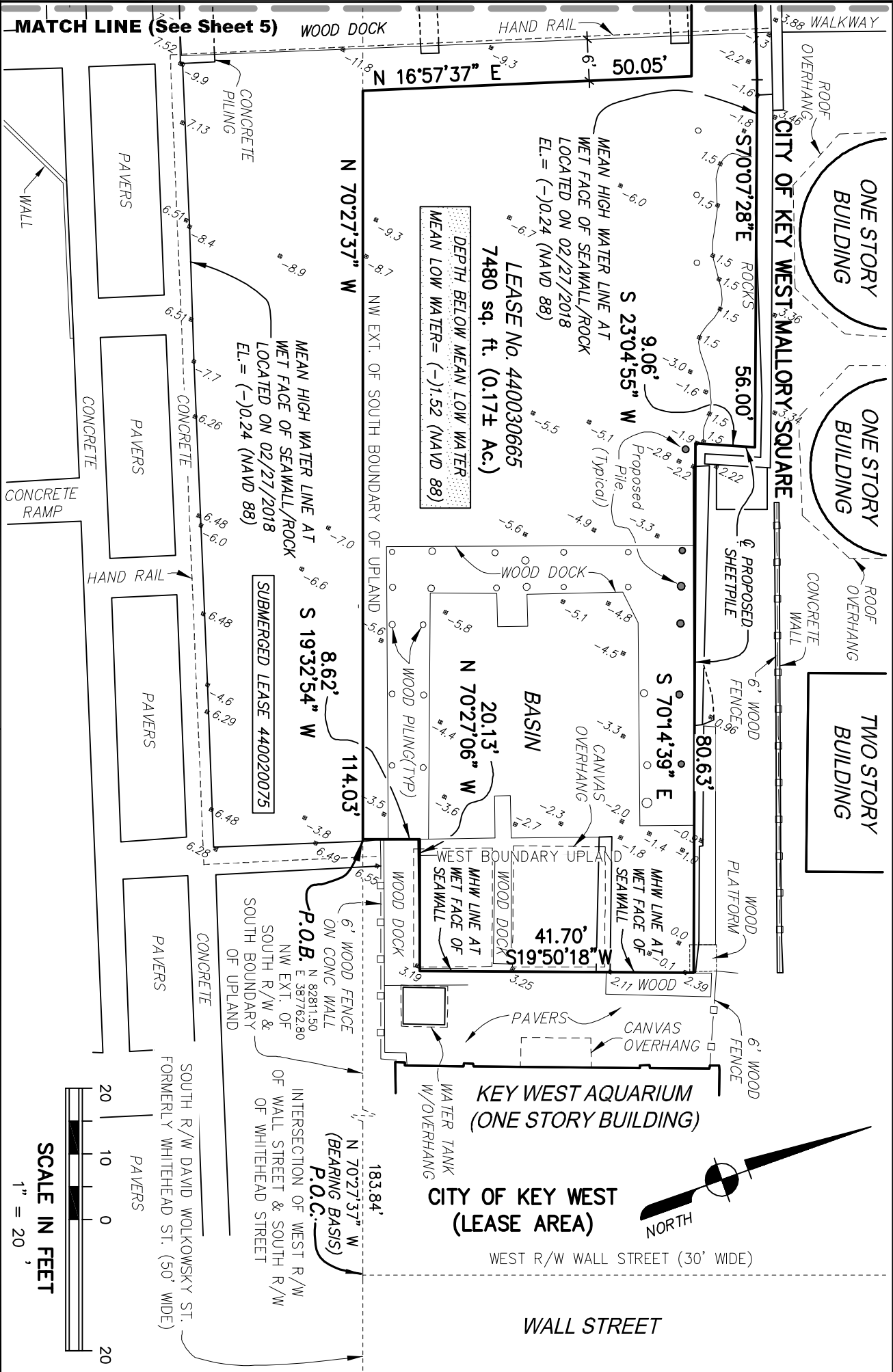
SURVEYOR'S CERTIFICATION:

I HEREBY CERTIFY to the Board of Trustees of the Internal Improvement Fund (TIIF) and the City of Key West that the attached Specific Purpose and Mean High Water Survey of the hereon described property is true and correct to the best of my knowledge and belief as surveyed in the field under my direction. I FURTHER CERTIFY that this Specific Purpose and Mean High Water Survey meets the Standards of Practice set forth in Chapter 5J-17, Florida Administrative Code, pursuant to Chapter 472, Florida Statutes, it complies with Chapter 177, Part II Florida Statutes.

Date: July 07, 2018


 KEITH M. CHEE-A-TOW, P.L.S.
 Florida Registration No. 5328
 AVIROM & ASSOCIATES, INC.
 L.B. No. 3300

REVISIONS 06-11-18: Revised Legal 07-07-18: Revised Legal		AVIROM & ASSOCIATES, INC. SURVEYING & MAPPING 50 S.W. 2nd AVENUE, SUITE 102 BOCA RATON, FLORIDA 33432 (561) 392-2594 / www.AVIROMSURVEY.com	JOB #: 10754-1
		© 2018 AVIROM & ASSOCIATES, INC. all rights reserved. This sketch is the property of AVIROM & ASSOCIATES, INC. and should not be reproduced or copied without written permission.	SCALE: N/A
		SHEET: 3 OF 5	
		DATE: 04/10/18	
		BY: K.M.C.	
		CHECKED: K.M.C.	
F.B. 1797 PG. 48			



REVISIONS

06-11-18:	Revised Legal
07-07-18:	Revised Legal

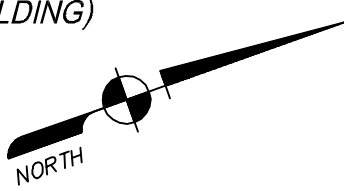
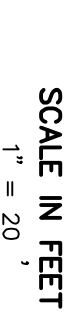


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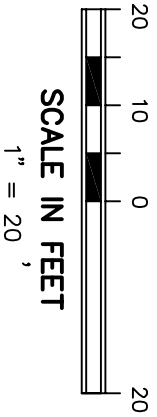
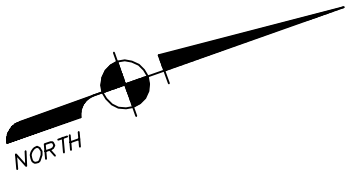
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SUBMERGED LAND LEASE No. 440030665
 MODIFIED SOVEREIGNTY SUBMERGED LAND LEASE
 William A. Whitehead's Map of Key West
 SECTION 6, TOWNSHIP 68 S, RANGE 25 E
 CITY OF KEY WEST
 MONROE COUNTY, FLORIDA.

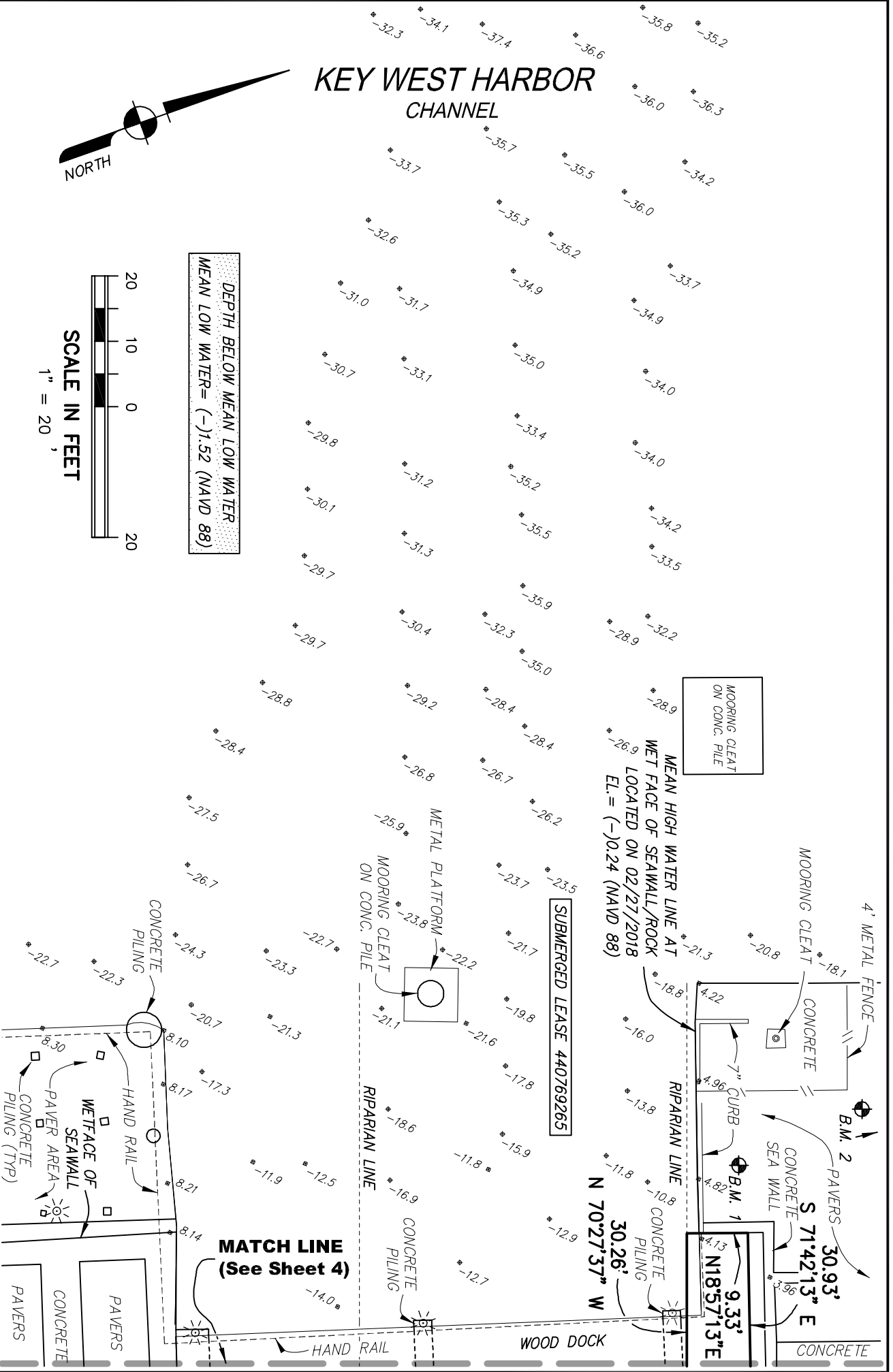
SPECIFIC PURPOSE SURVEY
10754-1
 SCALE: 1" = 20'
 DATE: 04/10/2018
 BY: K.M.C.
 CHECKED: K.M.C.
 F.B. 1797 PG. 48
 SHEET: 4 OF 5



KEY WEST HARBOR CHANNEL



DEPTH BELOW MEAN LOW WATER
MEAN LOW WATER = (-)1.52 (NAVD 88)



MATCH LINE
(See Sheet 4)

REVISIONS

06-11-18: Revised Legal
07-07-18: Revised Legal



AVIROM & ASSOCIATES, INC.
SURVEYING & MAPPING

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SPECIFIC PURPOSE SURVEY

SUBMERGED LAND LEASE NO. 440030665

MODIFIED SOVEREIGNTY SUBMERGED LAND LEASE
William A. Whitehead's Map of Key West
SECTION 6, TOWNSHIP 68 S, RANGE 25 E
CITY OF KEY WEST
MONROE COUNTY, FLORIDA.

JOB #: 10754-1

SCALE: 1" = 20'

DATE: 04/10/2018

BY: K.M.C.

CHECKED: K.M.C.

F.B. 1797 PG. 48

SHEET: 5 OF 5

**REPORT OF
GEOTECHNICAL EXPLORATION**

**KEY WEST AQUARIUM
1 WHITEHEAD STREET
KEY WEST, FLORIDA**

FOR

**TETRA TECH
759 S. FEDERAL HIGHWAY, SUITE 314
STUART, FLORIDA 34994**

PREPARED BY

**NUTTING ENGINEERS OF FLORIDA, INC.
2051 NW 112TH AVENUE, SUITE 126
MIAMI, FLORIDA 33172**

PROJECT No. 2245.1

APRIL 2018



Geotechnical & Construction Materials
Engineering, Testing, & Inspection
Environmental Services

Offices throughout the state of Florida

www.nuttingengineers.com info@nuttingengineers.com

April 4, 2018

Mr. Dave Frodsham, P.E.
Tetra Tech
759 S. Federal Highway, Suite 314
Stuart, Florida 34994
Phone: (772) 781-3400
Email: dave.frodsham@tetrattech.com

Subject: Report of Geotechnical Exploration
Key West Aquarium
1 Whitehead Street
Key West, Florida

Dear Mr. Frodsham:

Nutting Engineers of Florida, Inc. (NE) has performed a geotechnical exploration for the proposed construction at the above referenced site. This exploration was performed in accordance with the Tetra Tech Subcontract Order No. 1148507. The purpose of this exploration was to obtain information concerning the site and subsurface conditions at specific locations in order to provide foundation design recommendations for support of the proposed construction. This report presents our findings and recommendations.

PROJECT INFORMATION

Per our conversation on January 12, 2018 and review of the site plan and documents provided, we understand that plans for this project include the redesign and rehabilitation of the existing seawall at the referenced site. The seawall will be approximately 200 feet in length and will retain approximately eight feet of soil. We assume the new seawall will utilize steel “z” shaped sheet piles and owing to the presence of buried utilities tie-backs cannot be used. We note that if any of our understandings or assumptions are incorrect, we should be notified so that we may amend our recommendations accordingly.

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

In order to explore the subsurface conditions at the site, it was initially proposed to perform two (2) Standard Penetration Test (SPT) borings to depths of fifty feet below the existing ground surface. Due to the presence of numerous underground utilities at test borings B-1, only test boring B-2 was performed. The locations of the test borings are indicated on the attached Test Boring Location Plan. Individual test boring reports are presented in the Appendix of this report. The boring locations were established in the field using approximate methods; namely, a measuring wheel and available surface controls.

The appended test boring log presents information and descriptions of the subsurface conditions as well as "N" values at each specific test boring location. The number of successive blows required to drive the sampler into the soil constitutes the test result commonly referred to as the "N" value. The "N" value has been empirically correlated with various soil properties and is considered to be indicative of the relative density of cohesion-less soils and the consistency of cohesive soils.

Test Boring Results

In general, the test boring B-2 revealed a layer of fill generally consisting of loose sand and limestone fragments to a depth of approximately thirteen feet. Thereafter, loose to very loose silty sand was encountered to a depth of thirty-three feet. Beneath this, the boring encountered soft to very hard limestone to a depth of fifty feet, the maximum depth explored. Note that local limestone formation may vary significantly in hardness within short vertical and horizontal distances and may be difficult to excavate. Furthermore, the surface of the limestone may vary in elevation as well.

Representative samples collected from the SPT borings were visually reviewed in the laboratory by a geotechnical engineer to confirm the field classifications. A detailed description of the soil/rock profile is presented in the test boring records provided in the Appendix.

Groundwater Information

The immediate groundwater level was measured at the boring locations at the time of drilling. The groundwater level was encountered at a depth of approximately three and a half feet below the existing ground surface. The immediate depth to groundwater measurements presented in this report may not provide a reliable indication of stabilized or longer term depth to groundwater at this site. Water table elevations can vary dramatically with time through rainfall, droughts, storm events, flood control activities, nearby surface water bodies, tidal activity, pumping and many other factors. For these reasons, this immediate depth to water data **should not** be relied upon alone for project design considerations.

SHEET PILE ANALYSIS

The sheet pile analysis was performed utilizing the Pile Buck SPW911 version 2.40 computer software program. The analysis was performed assuming that the piles were installed vertically, with a worst case scenario of low tide within the basin and groundwater at the surface of the landside of the wall. We assumed a mud line of approximately seven and a half feet below the top of the wall and utilized a PZ27 sheet pile cross section. Based on the soil boring results and the assumed sheet pile data, we provided the necessary soil information for the program to reflect the subsurface conditions. We note that no bracing or whaler was modeled in the sheet pile analysis.

The results of our analysis indicate that the top of the sheets can be anticipated to deflect approximately 1.1-inches for the PZ27 sheet pile. The analysis also indicates that the sheets need to be installed to a depth of at least 28-feet below existing grades; but due to the very loose silty sands encountered at this depth, we recommend a 36-foot installation depth.

Rock Concerns During Installation

A *hard to refusal rock formation* may be encountered at approximate depths of 33 feet or more below existing grades during sheet pile installation. The sheet pile contractor must be fully aware of this condition and determine what appropriate measures need to be taken in order to properly install the sheet piles through this material.

Vibration and Settlement Discussion

Due to the fact that the sheets will be installed directly adjacent to existing concrete and paver brick sidewalks/curbing, during installation the vibratory effects of the installation may result in settlements of these adjacent features. The amount of settlement during installation cannot be determined as it is a factor of existing site conditions than can vary from one location to the next along the project limits.

We appreciate the opportunity to provide these services for you. If you should have any questions, or if we can be of any further assistance in this matter, please feel free to contact us.

GENERAL INFORMATION

The assessment of the site environmental conditions or the presence of pollutants in the soil, rock or groundwater of the site is beyond the proposed scope of this exploration.

Changes in the submitted project details or the discovery of any site or varying subsurface conditions prior to and/or during construction which deviate from the data obtained in this exploration should be immediately reported to us so that the condition or change can be evaluated and appropriate action taken. We request the opportunity to review the final plans and specifications to assure that the intent of the recommendations of this report is properly interpreted and incorporated.

Our client for this geotechnical evaluation was:

Mr. Dave Frodsham, P.E.
Tetra Tech
759 S. Federal Highway, Suite 314
Stuart, Florida 34994

This report is prepared exclusively for the uses of client, other members of the design & construction team and governmental authorities for specific application to this project at the above referenced site. The conclusions provided by Nutting Engineers of Florida, Inc., are based solely on the information presented in this report. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

NE shall bear no liability for the implementation of recommended inspection and testing services as described in this report if implemented by others. NE 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 prepared 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 you should have any questions, or if we can be of any further assistance in this matter, please feel free to contact us.

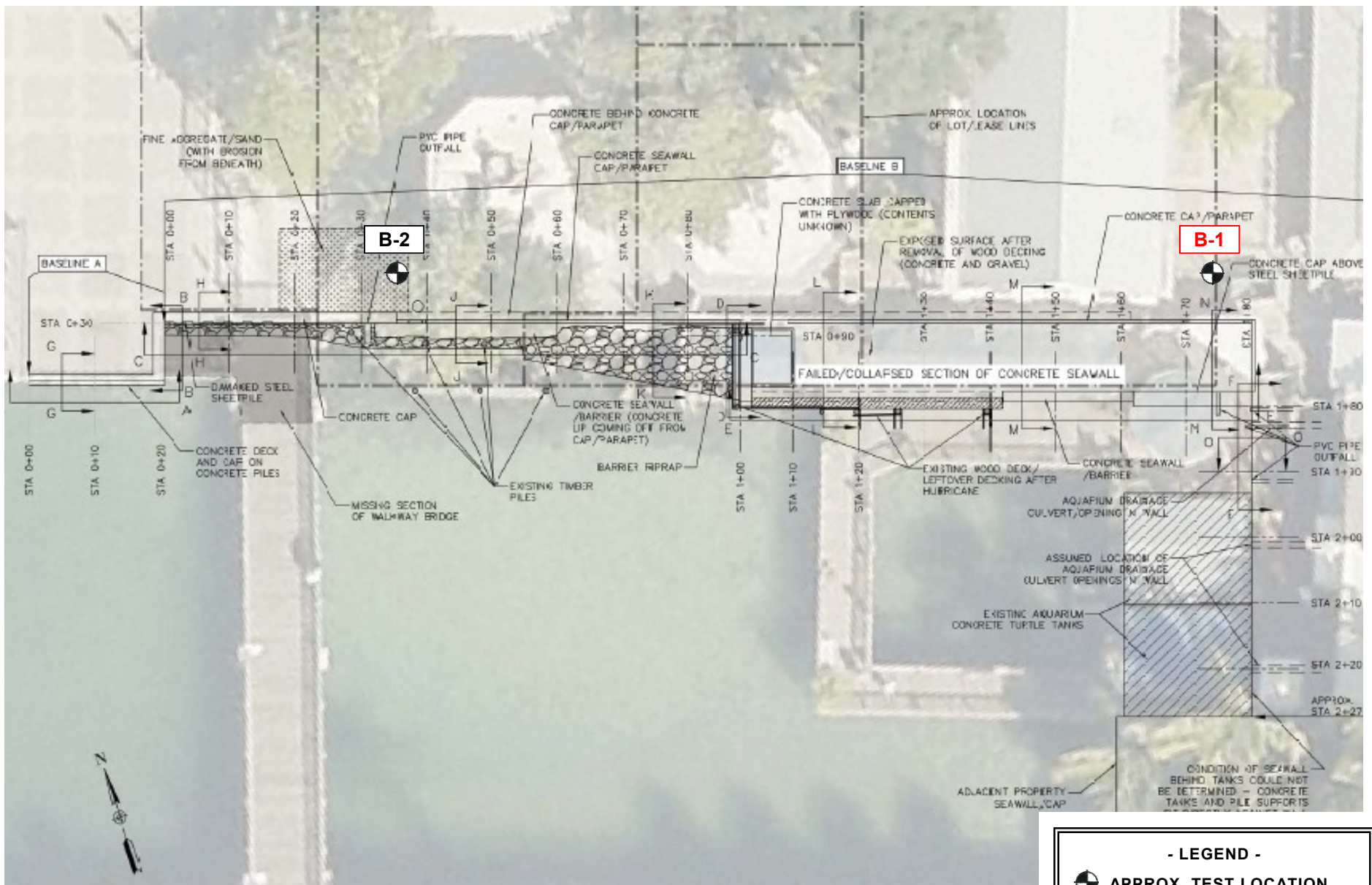
Sincerely,
NUTTING ENGINEERS OF FLORIDA, INC.

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



Stephen J. Mrachek, P.E. #70784
Senior Engineer

Attachments: Test Boring Location Plan
 Test Boring Reports
 Sheet Pile Analysis Results
 Soil Classification Criteria
 Limitations of Liability



- LEGEND -

 APPROX. TEST LOCATION



Tetra Tech
Key West Aquarium
 1 Whitehead Street
 Key West, Florida

ORDER NO. 2245.1

APPROXIMATE
 TEST
 LOCATION PLAN

GEOTECHNICAL EXPLORATION
 — *Not to Scale* —

FIG. 1



Nutting Engineer of Florida, Inc.
 1310 Neptune Drive
 Boynton Beach, FL 33426
 Telephone: 561.736.4900
 Fax: 561.737.9975

BORING NUMBER B-1

PAGE 1 OF 1

PROJECT NUMBER 2245.1

CLIENT Tetra Tech

PROJECT NAME Key West Aquarium

PROJECT LOCATION 1 Whitehead Street, Key West, FL 33040

DATE STARTED _____ COMPLETED _____ SURFACE ELEVATION REFERENCE _____

DRILLING METHOD _____ GROUND WATER LEVELS: _____

LOGGED BY _____ CHECKED BY _____ AT TIME OF DRILLING ---

APPROXIMATE LOCATION OF BORING _____

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			
						<input type="checkbox"/> FINES CONTENT (%) <input type="checkbox"/> 20 40 60 80			
		Boring abandoned due to presence of underground utilities. Bottom of hole at 0.0 feet.							



Nutting Engineer of Florida, Inc.
 1310 Neptune Drive
 Boynton Beach, FL 33426
 Telephone: 561.736.4900
 Fax: 561.737.9975

BORING NUMBER B-2

PAGE 1 OF 1

PROJECT NUMBER 2245.1

CLIENT Tetra Tech

PROJECT NAME Key West Aquarium

PROJECT LOCATION 1 Whitehead Street, Key West, FL 33040

DATE STARTED 3/8/18 COMPLETED 3/8/18 SURFACE ELEVATION REFERENCE Same as road crown

DRILLING METHOD Standard Penetration Boring GROUND WATER LEVELS:

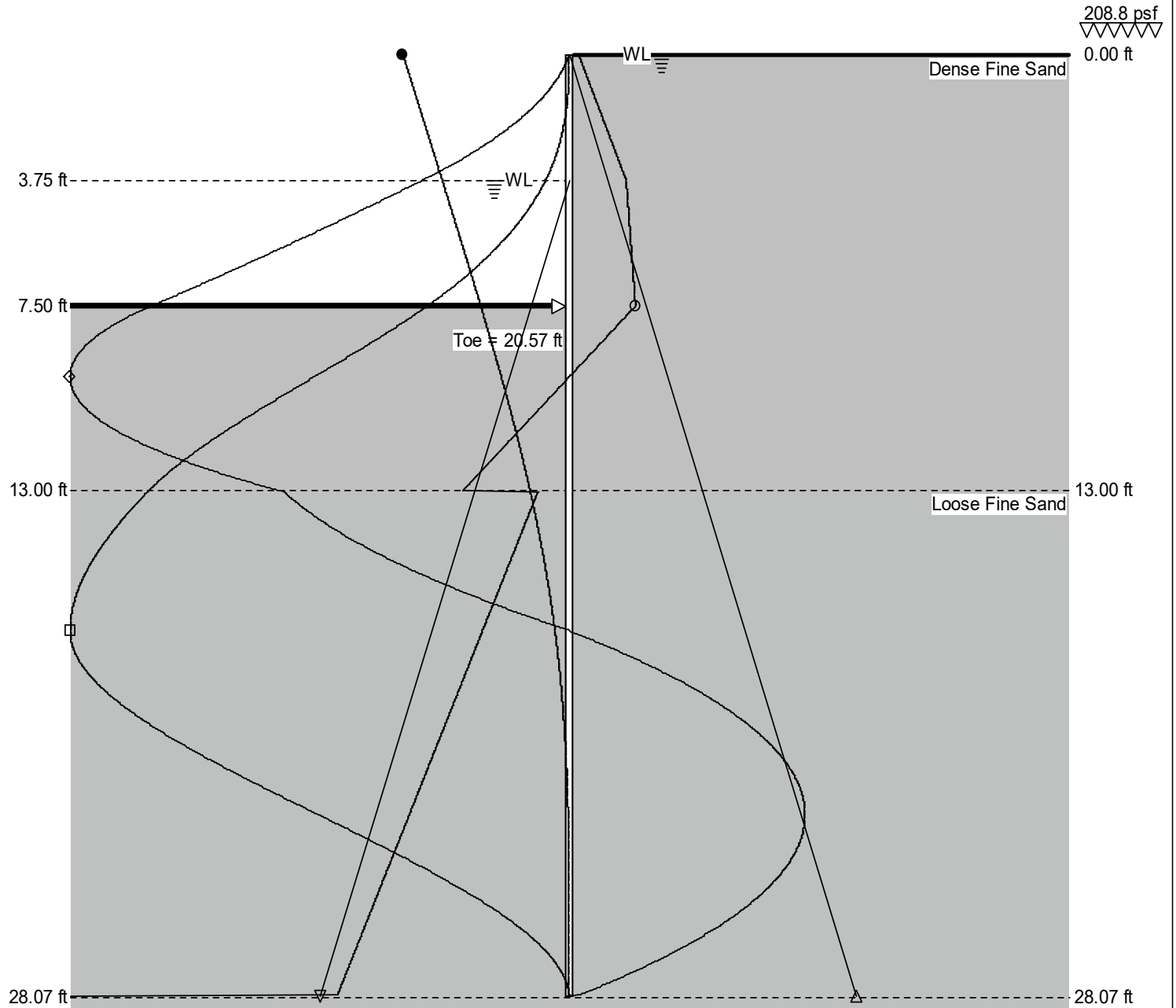
LOGGED BY JR Precision CHECKED BY S. Mrachek ∇ AT TIME OF DRILLING 3.5 ft

APPROXIMATE LOCATION OF BORING As located on site plan

TEST NUTTING BOREHOLE 2-2245.1 TETRA TECH - KEY WEST AQUARIUM.GPJ GINT US.GDT 3/21/18

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			
						<input type="checkbox"/> FINES CONTENT (%) <input type="checkbox"/> 20 40 60 80			
0		Lt. brown SAND and LIMESTONE FRAGMENTS (FILL)	SS 1	3-5-6-6	11	▲			
			SS 2	6-5-4-4	9	▲			
			SS 3	4-3-5-6	8	▲			
			SS 4	3-3-2-4	5	▲			
10			SS 5	4-2-3-2	5	▲			
			Gray slightly SILTY SAND	SS 6	3-2-3-2	5	▲		
20				SS 7	1-1-1-1	2	▲		
				SS 8	WOH x 24"				
				SS 9	WOH x 18"				
30			Lt. gray LIMESTONE	SS 10	7-4-5-7	9	▲		
				SS 11	6-8-7-6	15	▲		
40				SS 12	7-8-12-10	20	▲		
50			Bottom of hole at 50.0 feet.	SS 13	10-50/3"	100+			>>▲

Maximum	d (ft)
○ 403.8 psf	7.50
□ 22754.9 ftlb/ft	17.17
◇ 2591.3 lb/ft	9.59
● 1.4 in	0.00
△ 1752.6 psf	28.07
▽ 1518.5 psf	28.07



Page: 2
Date: 4.4.18

Sheet: PZ27
Pressure: Rankine
Toe: Cantilever

Input Data

Depth Of Excavation = 7.50 ft Depth Of Active Water = 0.00 ft Water Density = 62.43 pcf
Surcharge = 208.8 psf Depth Of Passive Water = 3.75 ft Minimum Fluid Density = 31.82 pcf

Soil Profile

Depth (ft)	Soil Name	γ (pcf)	γ' (pcf)	C (psf)	C_a (psf)	ϕ (°)	δ (°)	K_a	K_{ac}	K_p	K_{pc}
0.00	Dense Fine Sand	118.37	55.94	0.0	0.0	35.0	0.0	0.27	0.00	3.69	0.00
13.00	Loose Fine Sand	100.00	37.60	0.0	0.0	26.0	0.0	0.39	0.00	2.56	0.00
33.00	Dense Brick Hardcore	128.00	65.57	0.0	0.0	0.0	0.0	1.00	0.00	1.00	0.00
48.00	Dense Brick Hardcore	135.00	72.57	0.0	0.0	0.0	0.0	1.00	0.00	1.00	0.00

Solution

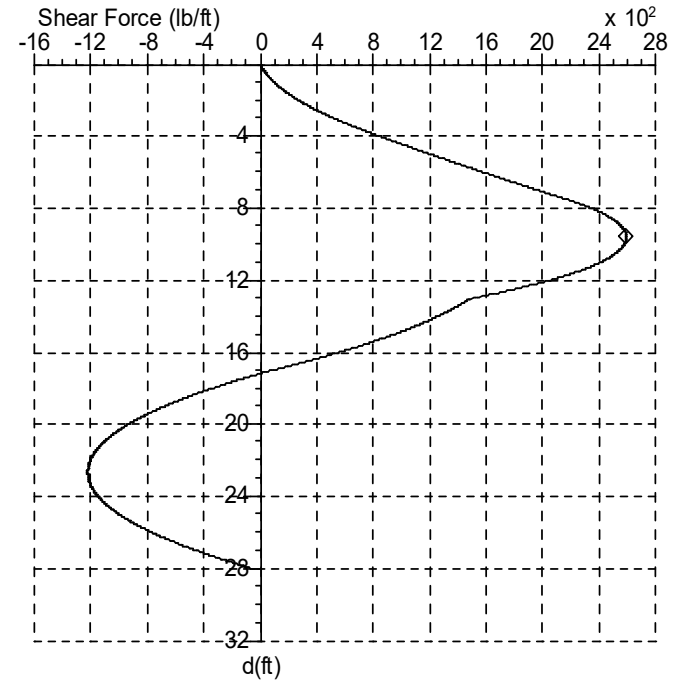
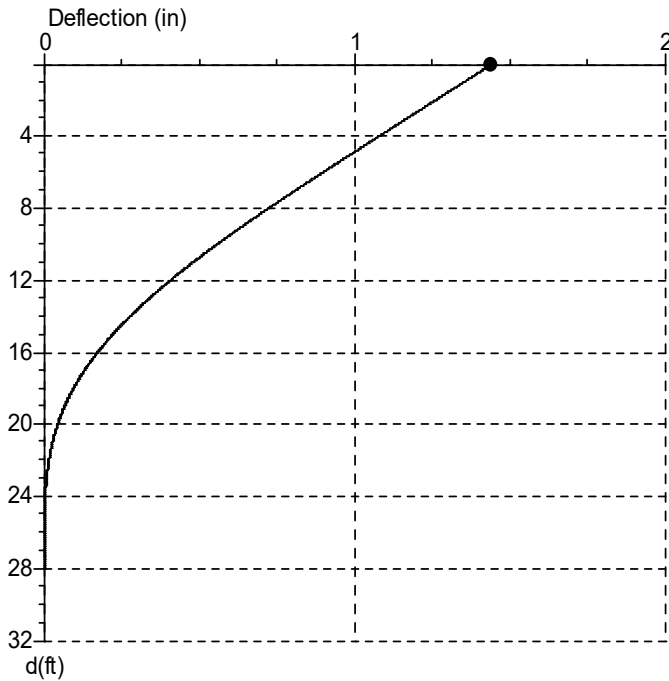
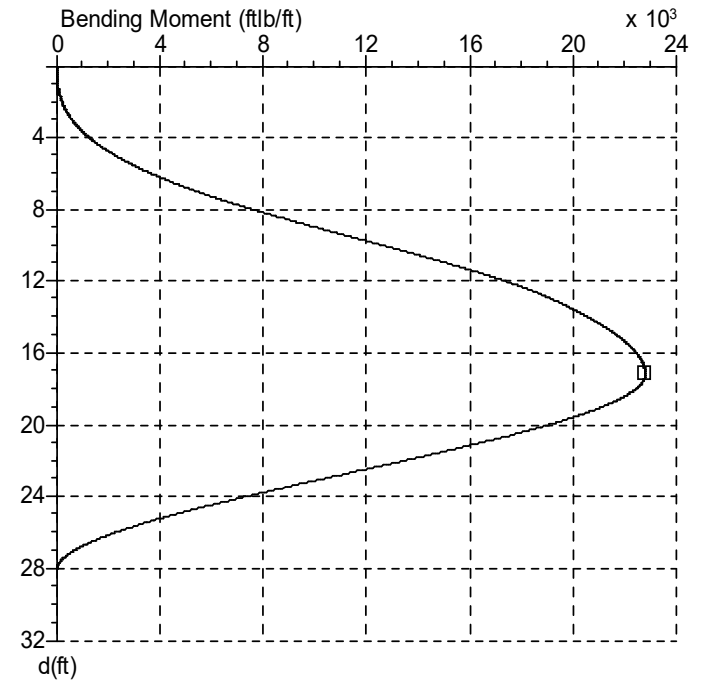
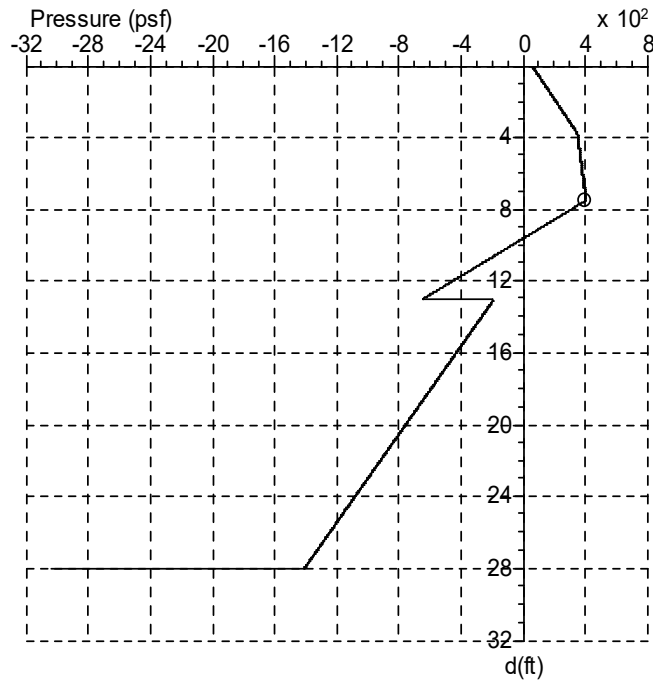
Sheet

Sheet Name	I (in ⁴ /ft)	E (psi)	Z (in ³ /ft)	f (psi)	Maximum Bending Moment (ftlb/ft)	Upstand (ft)	Toe (ft)	Pile Length (ft)
PZ27	187.50	3.04E+07	31.00	24970.3	64506.5	0.00	20.57	28.07

Maxima

	Maximum	Depth
Bending Moment	22754.9 ftlb/ft	17.17 ft
Deflection	1.4 in	0.00 ft
Pressure	403.8 psf	7.50 ft
Shear Force	2591.3 lb/ft	9.59 ft

	Maximum	d (ft)
○	403.8 psf	7.50
□	22754.9 ftlb/ft	17.17
◇	2591.3 lb/ft	9.59
●	1.4 in	0.00



Page: 4
Date: 4.4.18
Sheet: PZ27
Pressure: Rankine
Toe: Cantilever

depth (ft)	P (psf)	M (ftlb/ft)	D (in)	F (lb/ft)	depth (ft)	P (psf)	M (ftlb/ft)	D (in)	F (lb/ft)	depth (ft)	P (psf)	M (ftlb/ft)	D (in)	F (lb/ft)
0.00	56.4	0.0	1.4	0.0	9.44	30.5	11210.7	0.6	2589.2	18.88	-667.7	21289.6	0.1	-643.9
0.25	76.3	1.9	1.4	17.3	9.69	-14.3	11815.1	0.6	2590.9	19.13	-688.7	20845.1	0.1	-720.4
0.50	94.5	8.0	1.4	37.5	9.94	-63.5	12479.1	0.6	2581.5	19.38	-707.7	20398.9	0.1	-785.2
0.75	114.4	20.7	1.4	64.6	10.19	-108.2	13079.4	0.5	2561.9	19.63	-728.7	19865.0	0.1	-851.3
0.99	132.6	38.7	1.4	93.8	10.43	-157.5	13733.2	0.5	2528.3	19.87	-749.7	19289.4	0.0	-912.0
1.24	152.5	67.0	1.3	130.7	10.68	-206.7	14376.8	0.5	2482.1	20.12	-768.7	18733.0	0.0	-962.6
1.49	172.5	105.3	1.3	172.7	10.93	-251.5	14950.4	0.5	2429.0	20.37	-789.7	18087.6	0.0	-1013.0
1.74	190.6	150.0	1.3	215.4	11.18	-300.7	15565.8	0.5	2358.5	20.62	-808.8	17473.6	0.0	-1054.2
1.99	210.6	211.2	1.3	267.3	11.43	-345.4	16108.3	0.4	2283.5	20.87	-829.7	16771.4	0.0	-1094.3
2.24	230.5	286.4	1.2	324.3	11.68	-394.7	16683.4	0.4	2188.8	21.12	-850.7	16044.5	0.0	-1129.1
2.48	248.6	367.9	1.2	380.6	11.92	-443.9	17232.8	0.4	2081.5	21.36	-869.8	15365.2	0.0	-1156.0
2.73	268.6	473.2	1.2	447.4	12.17	-488.7	17707.2	0.4	1972.9	21.61	-890.7	14601.1	0.0	-1180.4
2.98	286.7	584.3	1.2	512.6	12.42	-537.9	18198.4	0.4	1841.4	21.86	-911.7	13822.5	0.0	-1199.5
3.23	306.7	724.7	1.1	589.3	12.67	-587.1	18654.3	0.4	1697.3	22.11	-930.8	13105.2	0.0	-1212.1
3.48	326.6	885.3	1.1	671.0	12.92	-631.9	19035.6	0.3	1555.2	22.36	-951.7	12308.9	0.0	-1220.8
3.73	344.8	1050.1	1.1	749.8	13.17	-202.7	19419.1	0.3	1452.8	22.61	-970.8	11581.4	0.0	-1224.1
3.97	350.6	1252.9	1.1	839.6	13.42	-221.7	19752.9	0.3	1403.4	22.86	-991.7	10780.3	0.0	-1222.6
4.22	354.4	1478.9	1.1	930.4	13.66	-242.7	20106.2	0.3	1343.9	23.10	-1012.7	9981.9	0.0	-1215.6
4.47	358.0	1704.7	1.0	1013.8	13.91	-263.6	20443.5	0.3	1279.0	23.35	-1031.8	9261.3	0.0	-1204.6
4.72	361.9	1975.6	1.0	1106.5	14.16	-282.7	20735.3	0.3	1215.3	23.60	-1052.7	8477.7	0.0	-1187.4
4.97	365.4	2242.6	1.0	1191.6	14.41	-303.7	21038.5	0.3	1140.1	23.85	-1071.8	7776.4	0.0	-1167.0
5.22	369.3	2559.4	1.0	1286.3	14.66	-324.6	21321.8	0.2	1059.5	24.10	-1092.8	7020.5	0.0	-1139.5
5.47	373.2	2900.6	0.9	1381.9	14.91	-343.7	21560.8	0.2	981.6	24.35	-1113.7	6284.2	0.0	-1106.5
5.71	376.7	3232.2	0.9	1469.7	15.15	-364.7	21802.2	0.2	890.7	24.59	-1132.8	5634.8	0.0	-1071.9
5.96	380.6	3620.6	0.9	1567.2	15.40	-383.7	22000.9	0.2	803.4	24.84	-1153.8	4945.8	0.0	-1028.7
6.21	384.1	3995.6	0.9	1656.7	15.65	-404.7	22195.3	0.2	702.2	25.09	-1174.7	4286.7	0.0	-980.0
6.46	388.0	4432.3	0.9	1756.2	15.90	-425.7	22363.2	0.2	595.6	25.34	-1193.8	3716.4	0.0	-931.1
6.71	391.9	4894.6	0.8	1856.6	16.15	-444.7	22491.6	0.2	494.0	25.59	-1214.8	3124.2	0.0	-872.2
6.96	395.4	5337.4	0.8	1948.8	16.40	-465.7	22604.8	0.2	377.1	25.84	-1233.8	2620.7	0.0	-813.9
7.20	399.3	5849.4	0.8	2051.2	16.64	-486.7	22687.4	0.1	254.8	26.08	-1254.8	2108.2	0.0	-744.7
7.45	403.2	6387.7	0.8	2154.5	16.89	-505.7	22734.8	0.1	139.0	26.33	-1275.7	1642.7	0.0	-670.1
7.70	366.2	6900.0	0.8	2245.0	17.14	-526.7	22754.8	0.1	6.4	26.58	-1294.8	1263.2	0.0	-597.5
7.95	316.9	7486.5	0.7	2332.4	17.39	-545.7	22732.8	0.1	-92.2	26.83	-1315.8	897.1	0.0	-512.6
8.20	272.2	8038.0	0.7	2400.8	17.64	-566.7	22640.1	0.1	-200.1	27.08	-1336.7	588.2	0.0	-422.3
8.45	223.0	8661.7	0.7	2464.0	17.89	-587.7	22478.4	0.1	-302.5	27.33	-1355.8	359.9	0.0	-335.5
8.69	173.7	9300.1	0.7	2514.4	18.14	-606.7	22274.5	0.1	-390.9	27.58	-1376.8	170.0	0.0	-234.8
8.94	129.0	9890.5	0.6	2549.3	18.38	-627.7	21990.9	0.1	-483.0	27.82	-1395.8	55.8	0.0	-138.7
9.19	79.7	10548.0	0.6	2575.6	18.63	-646.8	21682.1	0.1	-562.1	28.07	-3042.0	0.0	0.0	0.0

Nutting Engineers of Florida

SPW911, v2.40

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LIMITATIONS OF LIABILITY

WARRANTY

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

SUBSURFACE EXPLORATION

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

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

LABORATORY AND FIELD TESTS

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

ANALYSIS AND RECOMMENDATIONS

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

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

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

CONSTRUCTION OBSERVATION

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

SOIL AND 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	Stiff
16 – 30	2.00 – 4.00	v. Stiff
>30	>4.00	Hard

ROCK

N-VALUE (bpf)	RELATIVE HARDNESS	ROCK CHARACTERISTICS
$N \geq 100$	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.
$25 \leq N \leq 100$	Medium hard to hard	
$5 \leq N \leq 25$	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	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3 Not meeting all gradation requirements for GW Atterberg limits below "A" line or P.I. less than 4 Atterberg limits above "A" line with P.I. greater than 7 $C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3 Not meeting all gradation requirements for SW 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 symbols.	
		Poorly graded gravels, gravel-sand mixtures, little or no fines	GP			
		Gravels with fines (Appreciable amount of fines)	GW*	d		Silty gravels, gravel-sand-silt mixtures
			u			
	GC	Clayey gravels, gravel-sand-clay mixtures				
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines		
Poorly graded sands, gravelly sands, little or no fines		SP				
Sands with fines (Appreciable amount of fines)		SM*	d	Silty sands, sand-silt mixtures		
		u				
SC	Clayey sands, sand-clay mixtures					
Fine-grained soils (More than half of material is smaller than No. 200 sieve size)	Silt 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	<p style="text-align: center;">Plasticity Chart</p>		
		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			
	Silt and clays (Liquid limit greater than 50)	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts			
		CH	Inorganic clays or high plasticity, fat clays			
		OH	Organic clays of medium to high plasticity, organic silts			
	Highly organic soils	PT	Peat and other highly organic soils			

PART 6

PERMITS



FLORIDA DEPARTMENT OF Environmental Protection

South District
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SouthDistrict@FloridaDEP.gov

Rick Scott
Governor
Carlos Lopez-Cantera
Lt. Governor
Noah Valenstein
Secretary

Permittee/Authorized Entity:

City of Key West Aquarium
Jim Bouquet; Director of Engineering
3140 Flagler Ave.
Key West, Fl. 33040
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City of Key West Aquarium ERP

Authorized Agent:

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**Environmental Resource Permit
State-owned Submerged Lands Authorization –Granted Pending Document
Execution**

**U.S. Army Corps of Engineers Authorization –Separate Corps Authorization
Required**

Permit No.: 0224891-003 EI
Lease File No.: 440030665

**Permit Issuance Date: August 10, 2018
Permit Construction Phase Expiration Date: August 10, 2023**

Consolidated Environmental Resource Permit and State-owned Submerged Lands Authorization

Permittee: City of Key West Aquarium
Permit No: 0224891-003 EI

PROJECT LOCATION

The activities authorized by this permit and sovereignty submerged lands authorization are located at (parcel ID #00072082 001900) Key West, Florida 33040, in Section 06, Township 68 South, Range 25 East in Monroe County.

PROJECT DESCRIPTION

The permittee is authorized for the following activities:

1. Install approximately 177 linear feet of new sheet pile seawall and concrete cap no further than three (3) feet waterward from the current existing structure; and,
2. Repair and replace three (3) pilings adjacent to the seawall; and,
3. Repair and replace existing approximately 890 square foot observation deck pilings and decking within Key West Harbor, a Class III, Outstanding Florida Waterbody. Those activities include the construction and use of 7,480 square feet of preemption of state-owned sovereignty submerged lands. Authorized activities are depicted on the attached exhibits.

AUTHORIZATIONS

003 – Install 177 linear feet of seawall, replace pilings and observation deck

Environmental Resource Permit

The Department has determined that the activity qualifies for an Environmental Resource Permit. Therefore, the Environmental Resource Permit is hereby granted, pursuant to Part IV of Chapter 373, Florida Statutes (F.S.), and Chapter 62-330, Florida Administrative Code (F.A.C.).

Sovereignty Submerged Lands Authorization

The installation of approximately 177 linear feet of new sheet pile seawall and concrete cap is located on sovereignty submerged lands owned by the State of Florida. It therefore also requires authorization from the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees), pursuant to Article X, Section 11 of the Florida Constitution, and Section 253.77, F.S. As staff to the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees) under Sections 253.002, F.S., the Department has determined that the activity requires and qualifies for a Letter of Consent, as long as the work performed is located within the boundaries as described and is consistent with the terms and conditions herein

The activity (repair and replacement of the three (3) piling adjacent to the seawall and repair and replacement existing approximately 890 square foot observation deck pilings) is located on sovereignty submerged lands owned by the State of Florida. It therefore also requires

authorization from the Board of Trustees of the Internal Improvement Trust Fund (Board of Trustees), pursuant to Article X, Section 11 of the Florida Constitution, and Section 253.77, F.S., Based on the information submitted within the application, the Department understands that an emergency proprietary authorization as defined in Chapter 18-21.005(1)(c)(14), F.A.C. is necessary **to repair the pilings and docking facility that were damaged during Hurricane Irma**. Therefore, consider this the authority sought under Section 253.77, Florida Statutes, to repair and replacement of the three (3) piling adjacent to the seawall and repair and replacement existing approximately 890 square foot observation deck pilings). **This emergency Letter of Consent does not eliminate the need for the permittee to obtain the appropriate form of proprietary authorization (a modified executed lease) within a year from the date of this letter.**

The final documents required to execute the modified lease will be sent to the permittee by the Department's Division of State Lands for execution. The Department intends to issue the lease, upon satisfactory execution of those documents, including payment of required fees and compliance with the conditions in this permit.

Federal Authorization

Your proposed activity as outlined on your application and attached drawings **does not qualify** for Federal authorization pursuant to the State Programmatic General Permit and a **SEPARATE permit** or authorization **may be required** from the Corps. A copy of your permit application has been forwarded to the Corps for their review. The Corps will issue their authorization directly to you or contact you if additional information is needed. If you have not heard from the Corps within 30 days from the date your application was received at the local FDEP Office, contact the Corps at Miami Permits Section at SEAppls@usace.army.mil or 305-526-7181, for status and further information. **Failure to obtain Corps authorization prior to construction could subject you to federal enforcement action by that agency.**

Authority for review - an agreement with the USACOE entitled "Coordination Agreement Between the U. S. Army Corps of Engineers (Jacksonville District) and the Florida Department of Environmental Protection, or Duly Authorized Designee, State Programmatic General Permit", Section 10 of the Rivers and Harbor Act of 1899, and Section 404 of the Clean Water Act.

Coastal Zone Management

Issuance of this authorization also constitutes a finding of consistency with Florida's Coastal Zone Management Program, as required by Section 307 of the Coastal Zone Management Act.

Water Quality Certification

This permit also constitutes a water quality certification under Section 401 of the Clean Water Act, 33 U.S.C. 1341

Other Authorizations

You are advised that authorizations or permits for this activity may be required by other federal, state, regional, or local entities including but not limited to local governments or municipalities.

This permit does not relieve you from the requirements to obtain all other required permits or authorizations.

The activity described may be conducted only in accordance with the terms, conditions and attachments contained in this document. Issuance and granting of the permit and authorizations herein do not infer, nor guarantee, nor imply that future permits, authorizations, or modifications will be granted by the Department.

PERMIT/SOVEREIGNTY SUBMERGED LANDS CONDITIONS

The activities described must be conducted in accordance with:

- **The Specific Conditions**
- **The General Conditions**
- **The General Conditions for Sovereignty Submerged Lands Authorization**
- **The limits, conditions and locations of work shown in the attached drawings**
- **The term limits of this authorization**

You are advised to read and understand these conditions and drawings prior to beginning the authorized activities, and to ensure the work is conducted in conformance with all the terms, conditions, and drawings herein. If you are using a contractor, the contractor also should read and understand these conditions and drawings prior to beginning any activity. Failure to comply with these conditions, including any mitigation requirements, shall be grounds for the Department to revoke the permit and authorization and to take appropriate enforcement action.

Operation of the facility is not authorized except when determined to be in conformance with all applicable rules and this permit and sovereignty submerged lands authorization, as described.

SPECIFIC CONDITIONS – ADMINISTRATIVE

1. All required submittals, such as certifications, monitoring reports, notifications, etc., shall be submitted to the Florida Department of Environmental Protection, South District Office, Submerged Lands and Environmental Resource Permitting, P.O. Box 2549, Fort Myers, FL 33902-2549 or via e-mail to FTMERP_Compliance@dep.state.fl.us. All submittals shall include the project name and indicated permit number when referring to this project.

Note: In the event of an emergency, the Permittee should contact the Department by calling (800)320-0519. During normal business hours, the permittee should call (239)344-5600.

2. The project shall comply with applicable State Water Quality Standards, namely:

Rule 62-302.500, F.A.C. – Surface Waters: Minimum Criteria, General Criteria;

Rule 62-302.530, F.A.C. – Table: Surface Water Quality Criteria.

Rule 62-330.700, F.A.C. - Special Protection, Outstanding Florida Waters, Outstanding National Resource Waters.

SPECIFIC CONDITIONS - CONSTRUCTION

3. All CCA-treated pilings associated with the permitted structure shall be wrapped with impermeable plastic or PVC sleeves in such a manner as to reduce the leaching of deleterious substances from the pilings. The sleeves shall be installed concurrently with the installation of the pilings, shall extend from at least 6" below the level of the substrate to at least 1' above the seasonal high water line, as shown in the permit drawings and shall be maintained over the life of the facility. All future replacement pilings shall be non-CCA-leaching (recycled plastic, concrete, greenheart, or wrapped with impermeable plastic or PVC sleeves.

4. There shall be no overboard discharges of trash, human or animal waste, or fuel from the dock.

SPECIFIC MANATEE PROTECTION CONDITIONS

5. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with, and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.

6. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels shall follow routes of deep water whenever possible.

7. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers shall not impede manatee movement.

8. All on-site project personnel are responsible for observing water-related activities for the presence of manatees. All in-water operations, including vessels, shall be shutdown if a manatee comes within 50 feet of the operation. Activities shall not resume until every manatee has moved beyond the 50-foot radius of the project operation, or until 30 minutes has elapsed wherein a manatee has not reappeared within 50 feet of the operation. Animals shall not be herded away or harassed into leaving.

9. Any collision with or injury to a manatee shall be reported immediately to the FWC Hotline at 1-888-404-FWCC. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or Vero Beach (1-772-562-3909) for south Florida.

10. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Awareness signs that have already been approved for this use by the Florida Fish

and Wildlife Conservation Commission (FWC) must be used. One sign measuring at least 3 ft. by 4 ft. which reads *Caution: Manatee Area* must be posted. A second sign measuring at least 8 1/2" by 11" explaining the requirements for "Idle Speed/No Wake" and the shutdown of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. Please see the Florida Fish and Wildlife Conservation Commission website for information on how to obtain appropriate signs: http://www.myfwc.com/docs/WildlifeHabitats/Manatee_EducationalSign.pdf

GENERAL CONDITIONS FOR INDIVIDUAL PERMITS

The following general conditions are binding on all individual permits issued under chapter 62-330, F.A.C., except where the conditions are not applicable to the authorized activity, or where the conditions must be modified to accommodate project-specific conditions.

1. All activities shall be implemented following the plans, specifications and performance criteria approved by this permit. Any deviations must be authorized in a permit modification in accordance with Rule 62-330.315, F.A.C. Any deviations that are not so authorized may subject the permittee to enforcement action and revocation of the permit under Chapter 373, F.S.
2. A complete copy of this permit shall be kept at the work site of the permitted activity during the construction phase, and shall be available for review at the work site upon request by the Agency staff. The permittee shall require the contractor to review the complete permit prior to beginning construction.
3. Activities shall be conducted in a manner that does not cause or contribute to violations of state water quality standards. Performance-based erosion and sediment control best management practices shall be installed immediately prior to, and be maintained during and after construction as needed, to prevent adverse impacts to the water resources and adjacent lands. Such practices shall be in accordance with the *State of Florida Erosion and Sediment Control Designer and Reviewer Manual (Florida Department of Environmental Protection and Florida Department of Transportation June 2007)*, and the *Florida Stormwater Erosion and Sedimentation Control Inspector's Manual (Florida Department of Environmental Protection, Nonpoint Source Management Section, Tallahassee, Florida, July 2008)*, which are both incorporated by reference in subparagraph 62-330.050(9)(b)5., F.A.C., unless a project-specific erosion and sediment control plan is approved or other water quality control measures are required as part of the permit.
4. At least 48 hours prior to beginning the authorized activities, the permittee shall submit to the Agency a fully executed Form 62-330.350(1), "Construction Commencement Notice," [October 1, 2013], which is incorporated by reference in paragraph 62-330.350(1)(d), F.A.C., indicating the expected start and completion dates. A copy of this form may be obtained from the Agency, as described in subsection 62-330.010(5), F.A.C. If available, an Agency website that fulfills this notification requirement may be used in lieu of the form.

5. Unless the permit is transferred under Rule 62-330.340, F.A.C., or transferred to an operating entity under Rule 62-330.310, F.A.C., the permittee is liable to comply with the plans, terms and conditions of the permit for the life of the project or activity.
6. Within 30 days after completing construction of the entire project, or any independent portion of the project, the permittee shall provide the following to the Agency, as applicable:
 - a. For an individual, private single-family residential dwelling unit, duplex, triplex, or quadruplex “Construction Completion and Inspection Certification for Activities Associated With a Private Single-Family Dwelling Unit” [Form 62-330.310(3)]; or
 - b. For all other activities “As-Built Certification and Request for Conversion to Operational Phase” [Form 62-330.310(1)].
 - c. If available, an Agency website that fulfills this certification requirement may be used in lieu of the form.
7. If the final operation and maintenance entity is a third party:
 - a. Prior to sales of any lot or unit served by the activity and within one year of permit issuance, or within 30 days of as- built certification, whichever comes first, the permittee shall submit, as applicable, a copy of the operation and maintenance documents (see sections 12.3 thru 12.3.3 of Volume I) as filed with the Department of State, Division of Corporations and a copy of any easement, plat, or deed restriction needed to operate or maintain the project, as recorded with the Clerk of the Court in the County in which the activity is located.
 - b. Within 30 days of submittal of the as- built certification, the permittee shall submit “Request for Transfer of Environmental Resource Permit to the Perpetual Operation Entity” [Form 62-330.310(2)] to transfer the permit to the operation and maintenance entity, along with the documentation requested in the form. If available, an Agency website that fulfills this transfer requirement may be used in lieu of the form.
8. The permittee shall notify the Agency in writing of changes required by any other regulatory agency that require changes to the permitted activity, and any required modification of this permit must be obtained prior to implementing the changes.
9. This permit does not:
 - a. Convey to the permittee any property rights or privileges, or any other rights or privileges other than those specified herein or in Chapter 62-330, F.A.C.;
 - b. Convey to the permittee or create in the permittee any interest in real property;
 - c. Relieve the permittee from the need to obtain and comply with any other required federal, state, and local authorization, law, rule, or ordinance; or
 - d. Authorize any entrance upon or work on property that is not owned, held in easement, or controlled by the permittee.
10. Prior to conducting any activities on state-owned submerged lands or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund, the permittee must receive all necessary approvals and authorizations under Chapters 253 and 258, F.S. Written authorization that requires formal execution by the Board of Trustees of the Internal Improvement Trust Fund shall not be considered received until it has been fully executed.

11. The permittee shall hold and save the Agency harmless from any and all damages, claims, or liabilities that may arise by reason of the construction, alteration, operation, maintenance, removal, abandonment or use of any project authorized by the permit.

12. The permittee shall notify the Agency in writing:

- a. Immediately if any previously submitted information is discovered to be inaccurate; and
- b. Within 30 days of any conveyance or division of ownership or control of the property or the system, other than conveyance via a long-term lease, and the new owner shall request transfer of the permit in accordance with Rule 62-330.340, F.A.C. This does not apply to the sale of lots or units in residential or commercial subdivisions or condominiums where the stormwater management system has been completed and converted to the operation phase.

13. Upon reasonable notice to the permittee, Agency staff with proper identification shall have permission to enter, inspect, sample and test the project or activities to ensure conformity with the plans and specifications authorized in the permit.

14. If any prehistoric or historic artifacts, such as pottery or ceramics, stone tools or metal implements, dugout canoes, or any other physical remains that could be associated with Native American cultures, or early colonial or American settlement are encountered at any time within the project site area, work involving subsurface disturbance in the immediate vicinity of such discoveries shall cease. The permittee or other designee shall contact the Florida Department of State, Division of Historical Resources, Compliance and Review Section, at (850) 245-6333 or (800) 847-7278, as well as the appropriate permitting agency office. Such subsurface work shall not resume without verbal or written authorization from the Division of Historical Resources. If unmarked human remains are encountered, all work shall stop immediately and notification shall be provided in accordance with Section 872.05, F.S.

15. Any delineation of the extent of a wetland or other surface water submitted as part of the permit application, including plans or other supporting documentation, shall not be considered binding unless a specific condition of this permit or a formal determination under Rule 62-330.201, F.A.C., provides otherwise.

16. The permittee shall provide routine maintenance of all components of the stormwater management system to remove trapped sediments and debris. Removed materials shall be disposed of in a landfill or other uplands in a manner that does not require a permit under Chapter 62-330, F.A.C., or cause violations of state water quality standards.

17. This permit is issued based on the applicant's submitted information that reasonably demonstrates that adverse water resource-related impacts will not be caused by the completed permit activity. If any adverse impacts result, the Agency will require the permittee to eliminate the cause, obtain any necessary permit modification, and take any necessary corrective actions to resolve the adverse impacts.

18. A Recorded Notice of Environmental Resource Permit may be recorded in the county public records in accordance with subsection 62-330.090(7), F.A.C. Such notice is not an encumbrance upon the property.

GENERAL CONDITIONS FOR SOVEREIGNTY SUBMERGED LANDS AUTHORIZATION

Any use of sovereignty submerged lands is subject to the following general conditions are binding upon the applicant and are enforceable under Chapter 253, F.S. and Chapter 258, F.S.

1. Sovereignty submerged lands may be used only for the specified activity or use. Any unauthorized deviation from the specified activity or use and the conditions for undertaking that activity or use will constitute a violation. Violation of the authorization will result in suspension or revocation of the applicant's use of the sovereignty submerged lands unless cured to the satisfaction of the Board of Trustees.
2. Authorization under Rule 18-21.005, F.A.C., conveys no title to sovereignty submerged lands or water column, nor does it constitute recognition or acknowledgment of any other person's title to such land or water.
3. Authorizations under Rule 18-21.005, F.A.C., may be modified, suspended or revoked in accordance with its terms or the remedies provided in Sections 253.04, F.S. and Chapter 18-14, F.A.C.
4. Structures or activities will be constructed and used to avoid or minimize adverse impacts to resources.
5. Construction, use, or operation of the structure or activity will not adversely affect any species which is endangered, threatened or of special concern, as listed in Rules 68A-27.003, 68A-27.004, and 68A-27.005, F.A.C.
6. Structures or activities will not unreasonably interfere with riparian rights. When a court of competent jurisdiction determines that riparian rights have been unlawfully affected, the structure or activity will be modified in accordance with the court's decision.
7. Structures or activities will not create a navigational hazard.
8. Structures will be maintained in a functional condition and will be repaired or removed if they become dilapidated to such an extent that they are no longer functional.
9. Structures or activities will be constructed, operated, and maintained solely for water dependent purposes.
10. The applicant agrees to indemnify, defend and hold harmless the Board of Trustees and the State of Florida from all claims, actions, lawsuits and demands in any form arising out of the authorization to use sovereignty submerged lands or the applicant's use and construction of

structures on sovereignty submerged lands. This duty to indemnify and hold harmless will include any and all liabilities that are associated with the structure or activity including special assessments or taxes that are now or in the future assessed against the structure or activity during the period of the authorization.

11. Failure by the Board of Trustees to enforce any violation of a provision of the authorization or waiver by the Board of Trustees of any provision of the authorization will not invalidate the provision not enforced or waived, nor will the failure to enforce or a waiver prevent the Board of Trustees from enforcing the unenforced or waived provision in the event of a violation of that provision.

12. Applicant binds itself and its successors and assigns to abide by the provisions and conditions set forth in the authorization. If the applicant or its successors or assigns fails or refuses to comply with the provisions and conditions of the authorization, the authorization may be terminated by the Board of Trustees after written notice to the applicant or its successors or assigns. Upon receipt of such notice, the applicant or its successors or assigns will have thirty (30) days in which to correct the violations. Failure to correct the violations within this period will result in the automatic revocation of this authorization.

13. All costs incurred by the Board of Trustees in enforcing the terms and conditions of the authorization will be paid by the applicant. Any notice required by law will be made by certified mail at the address shown on page one of the authorization. The applicant will notify the Board of Trustees in writing of any change of address at least ten days before the change becomes effective.

14. This authorization does not allow any activity prohibited in a conservation easement or restrictive covenant that prohibits the activity.

NOTICE OF RIGHTS

This action is final and effective on the date filed with the Clerk of the Department unless a petition for an administrative hearing is timely filed under Sections 120.569 and 120.57, F.S., before the deadline for filing a petition. On the filing of a timely and sufficient petition, this action will not be final and effective until further order of the Department. Because the administrative hearing process is designed to formulate final agency action, the hearing process may result in a modification of the agency action or even denial of the application.

Petition for Administrative Hearing

A person whose substantial interests are affected by the Department's action may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57, F.S. Pursuant to Rule 28-106.201, F.A.C., a petition for an administrative hearing must contain the following information:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name, address, any email address, any facsimile number, and telephone number of the petitioner; the name, address, and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests are or will be affected by the agency determination;

(c) A statement of when and how the petitioner received notice of the agency decision;

(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;

(e) A concise statement of the ultimate facts alleged, including the specific facts that the petitioner contends warrant reversal or modification of the agency's proposed action;

(f) A statement of the specific rules or statutes that the petitioner contends require reversal or modification of the agency's proposed action, including an explanation of how the alleged facts relate to the specific rules or statutes; and

(g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wishes the agency to take with respect to the agency's proposed action.

The petition must be filed (received by the Clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000. Also, a copy of the petition shall be mailed to the applicant at the address indicated above at the time of filing.

Time Period for Filing a Petition

In accordance with Rule 62-110.106(3), F.A.C., petitions for an administrative hearing by the applicant must be filed within 14 days of receipt of this written notice. Petitions filed by any persons other than the applicant, and other than those entitled to written notice under Section 120.60(3), F.S., must be filed within 14 days of publication of the notice or within **14** days of receipt of the written notice, whichever occurs first. Under Section 120.60(3), F.S., however, any person who has asked the Department for notice of agency action may file a petition within **14** days of receipt of such notice, regardless of the date of publication. The failure to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

Extension of Time

Under Rule 62-110.106(4), F.A.C., a person whose substantial interests are affected by the Department's action may also request an extension of time to file a petition for an administrative hearing. The Department may, for good cause shown, grant the request for an extension of time. Requests for extension of time must be filed with the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, before the applicable deadline for filing a petition for an administrative hearing. A timely request for extension of time shall toll the running of the time period for filing a petition until the request is acted upon.

Mediation

Mediation is not available in this proceeding.

FLAWAC Review

The applicant, or any party within the meaning of Section 373.114(1)(a) or 373.4275, F.S., may also seek appellate review of this order before the Land and Water Adjudicatory Commission under Section 373.114(1) or 373.4275, F.S. Requests for review before the Land and Water Adjudicatory Commission must be filed with the Secretary of the Commission and served on the Department within 20 days from the date when this order is filed with the Clerk of the Department.

Judicial Review

Once this decision becomes final, any party to this action has the right to seek judicial review pursuant to Section 120.68, F.S., by filing a Notice of Appeal pursuant to Rules 9.110 and 9.190, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General

[THIS PORTION INTENTIONALLY LEFT BLANK]

Counsel, 3900 Commonwealth Boulevard, M.S. 35, Tallahassee, Florida 32399-3000; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this action is filed with the Clerk of the Department.

Executed in Lee County, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION



Jon M. Iglehart
District Director
South District Office

JMI/jsg

Attachments:

11 project drawing(s)

'Post Issuance' forms: <http://www.dep.state.fl.us/water/wetlands/erp/forms.htm>

Copies furnished to:

U.S. Army Corps of Engineers, [Miami](#) Corp

Kathy Griffin, Division of State Lands, BOT # 440030665, Kathy.Griffin@dep.state.fl.us

Monroe County Property Appraiser, rshaw@mcpafl.org

FWC, Imperiled Species Management Section FWCConservationPlanningServices@myfwc.com;

CERTIFICATE OF SERVICE

The undersigned hereby certifies that this permit and authorization to use sovereignty submerged lands, including all copies, were mailed before the close of business on August 10, 2018, to the above listed persons.

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section 120.52(7), F.S., with the designated Department clerk, receipt of which is hereby acknowledged.



Clerk

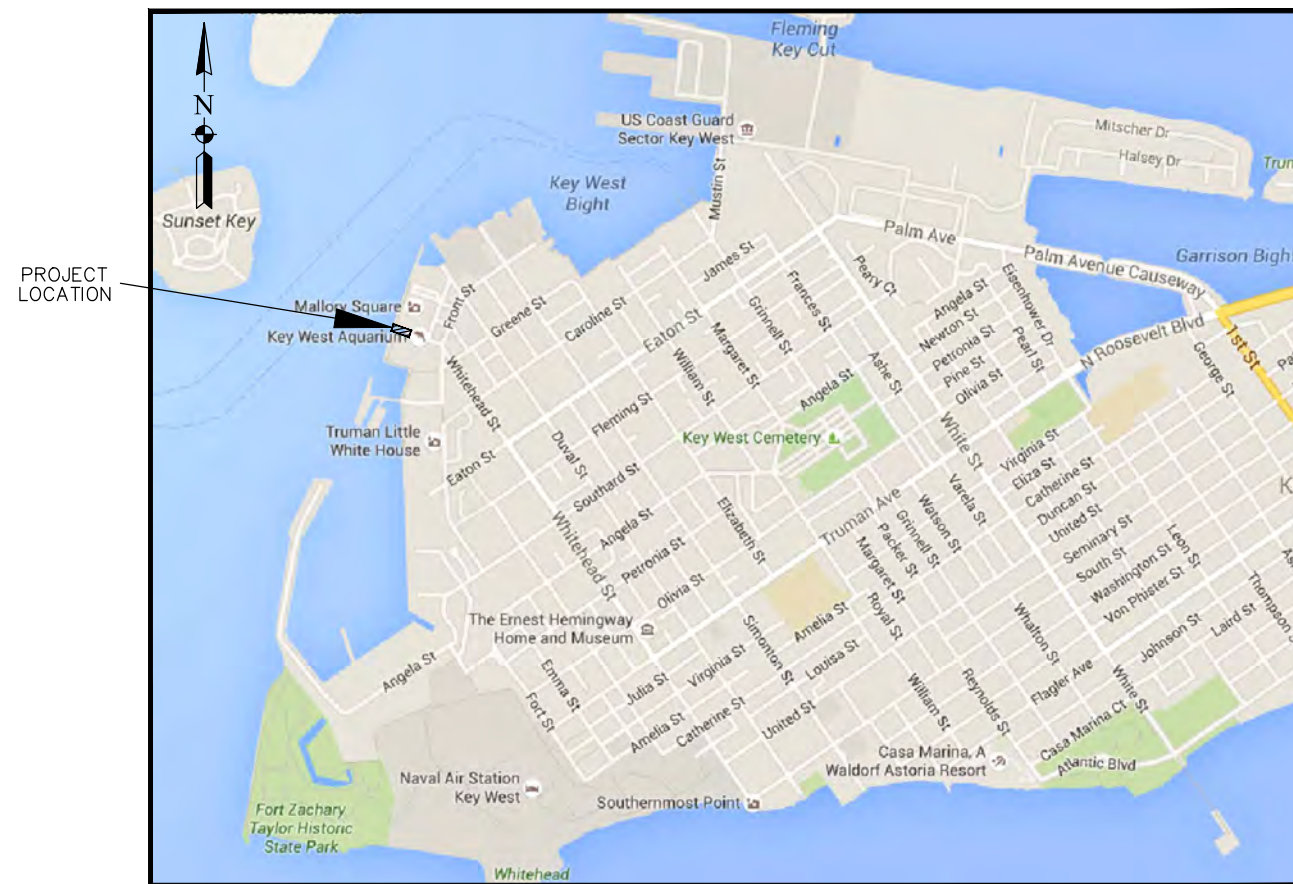
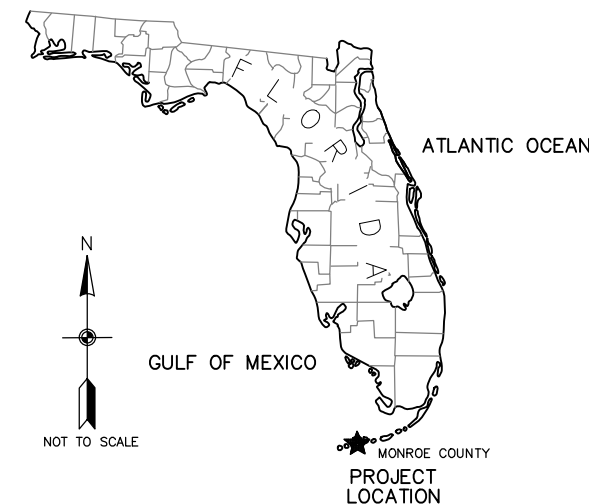
August 10, 2018

Date

Received Electronically
July 10, 2018
South District



CITY OF KEY WEST KEY WEST SEWERAGE SYSTEM REPAIR CONSTRUCTION DRAWINGS



VICINITY MAP

KEY WEST SEWERAGE SYSTEM REPAIR

INDEX OF SHEETS

SHEET #	TITLE	LATEST UPDATE	REV.
G-001	COVER SHEET AND VICINITY MAP	5/9/2018	0
G-002	CONSTRUCTION NOTES	5/9/2018	0
G-003	EXISTING CONDITIONS SURVEY	5/9/2018	0
C-101	DEMOLITION PLAN	5/9/2018	0
C-102	SHEETPILE SEAWALL INSTALLATION PLAN	5/9/2018	0
C-103	SEAWALL CROSS-SECTIONS	5/9/2018	0
C-104	SEAWALL CROSS-SECTIONS	5/9/2018	0
C-105	SEAWALL CROSS-SECTIONS	5/9/2018	0
C-106	GENERAL DETAILS	5/9/2018	0
C-107	REFERENCE PHOTOGRAPHS	5/9/2018	0

REFERENCE

FDEP FILE NO. - APPLICATION NO: 0224891-003 (PERMIT PENDING)

ACOE FILE NO. - SAJ-2017-03332

NOAA - EXEMPT PER 15 CFR 922.163(a)(3)



David W. Frodsham
Florida PE No. 75507

Mark	Description	Date	Appr.

Designed by: D. FRODSHAM
Drawn by: C. MARTINEZ
Checked by: S. WOGATIEE
Date: 7/10/2018
Design file no: KWA01 DESIGN_V7.DWG
Scale: AS SHOWN

TETRA TECH INC.
759 SOUTH FEDERAL HWY
SUITE 314 34984-2936
TULSA, OK 74114
TEL: (773) 781-3400
FAX: (773) 781-3411
CERTIFICATE OF AUTHORIZATION
NO. 2429



CITY OF KEY WEST
KEY WEST SEWERAGE SYSTEM REPAIR
COVER SHEET AND VICINITY MAP
KEY WEST MONROE COUNTY, FLORIDA

Sheet Reference:
G-001
Sheet 1 of 11

GENERAL NOTES:

- ELEVATIONS REFERENCED HEREIN ARE SHOWN RELATIVE TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1988 (NAVD88).
- TO CONVERT NAVD29 ELEVATIONS TO NATIONAL GEODETIC VERTICAL DATUM OF 1988 (NAVD88) FOR THIS PROPERTY, THE MODEL VALUE OF 1.342 MUST BE SUBTRACTED ALGEBRAICALLY FROM THE NAVD29 HEIGHT (ELEVATION - NAVD88).
- HORIZONTAL COORDINATES ARE BASED ON THE NAD83 DATUM OF 1983 (NAD83), FLORIDA STATE PLANE COORDINATE SYSTEM, EAST ZONE.
- THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO PERFORMING ANY WORK UNDER THIS CONTRACT AND NOTIFY THE CITY/ENGINEER IN WRITING OF ANY DIFFERENCES BEFORE COMMENCING WITH CONSTRUCTION.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FAMILIARIZE HIMSELF/HERSELF WITH THE SITE, ACCESS CONSTRAINTS, CRUISE SCHEDULE, AND OTHER UNIQUE CONSIDERATIONS AS IDENTIFIED IN THE SPECIFICATIONS. CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, AND TO PROTECT THEM FROM DAMAGE. THE CONTRACTOR SHALL BEAR ALL EXPENSE FOR REPAIR OR REPLACEMENT OF UTILITIES AND OTHER PROPERTY DAMAGED BY OPERATIONS IN CONJUNCTION WITH THE COMPLETION OF THIS WORK. THE CONTRACTOR SHALL LOCATE ALL UTILITIES IN THE AREA OF WORK PRIOR TO CONSTRUCTION. THE APPROPRIATE UTILITY COMPANY SHALL BE NOTIFIED BY THE CONTRACTOR AT LEAST 48 HOURS IN ADVANCE OF CONSTRUCTION ACTIVITIES SO THAT A UTILITY COMPANY REPRESENTATIVE CAN BE PRESENT.
- THE LOCATION OF UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ALL UTILITY LOCATIONS BOTH HORIZONTALLY AND VERTICALLY AND DETERMINING IF ANY CONFLICTS EXIST BETWEEN THE PROPOSED WORK AND THE EXISTING UTILITIES. THIS SHALL BE ACCOMPLISHED PRIOR TO CONSTRUCTION ACTIVITY COMMENCING.
- THE CONTRACTOR SHALL REVIEW THE CONTRACT DOCUMENTS AND, IN CASE OF ANY CONFLICT BETWEEN ANY PORTION OF THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL REQUEST CLARIFICATION IN WRITING PRIOR TO BIDDING OR BASE HIS/HER BID ON THE MORE STRINGENT REQUIREMENTS.
- THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL MATERIALS USED TO THE CITY/ENGINEER FOR APPROVAL PRIOR TO ORDER, SHIPMENT, OR INSTALLATION. THE CONTRACTOR SHALL ALSO SUBMIT SHOP DRAWINGS FOR CLOSURE POURS AT EACH END OF THE PROJECT.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL REQUIRED PERMITS ARE OBTAINED AND IN HAND BEFORE BEGINNING ANY CONSTRUCTION. NO CONSTRUCTION OR FABRICATION OF ANY ITEM SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED ALL PERMITS AND ANY OTHER DOCUMENTATION FROM ALL OF THE PERMITTING AND ANY OTHER REGULATORY AUTHORITIES. ANY PENALTIES, STOP WORK ORDERS ON ADDITIONAL WORK RESULTING FROM THE CONTRACTOR BEING IN VIOLATION OF THE REQUIREMENTS ABOVE SHALL BE FULLY BORNE BY THE CONTRACTOR. THE CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS OF THE PERMITS, INCLUDING ALL APPLICABLE STANDARD CONDITIONS FOR IN-WATER WORK.
- BEST MANAGEMENT PRACTICES FOR EROSION AND TURBIDITY CONTROL SHALL BE UTILIZED AT ALL TIMES DURING CONSTRUCTION. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE USE OF STAKED FILTER CLOTH, STAKED SILT FENCE, AND ANY OTHER SUITABLE METHOD AROUND DRAINAGE STRUCTURES AND AT ALL AREAS SUBJECT TO EROSION. FLOATING OR STAKED TURBIDITY BARRIERS SHALL BE USED IF APPROPRIATE. THE CONSTRUCTION SHALL PROVIDE DAILY INSPECTION OF THE EROSION PROTECTION ITEMS AND MAINTAIN THEM DURING THE ENTIRE PERIOD OF CONSTRUCTION.
- ALL SURFACE WATER DISCHARGES FROM THE SITE SHALL MEET STATE WATER QUALITY STANDARDS (LESS THAN 29 NTU ABOVE BACKGROUND) PRIOR TO REACHING ANY WATERS OF THE STATE.
- THE CONTRACTOR SHALL MAINTAIN A CURRENT SET OF CONSTRUCTION PLANS AND PERMITS ON THE JOB DURING ALL PHASES OF CONSTRUCTION.
- ALL FIELD LAYOUT AND SURVEYING FOR CONSTRUCTION OF THE PROJECT SHALL BE PROVIDED BY THE CONTRACTOR AT HIS/HER EXPENSE.
- AFTER CONSTRUCTION IS COMPLETE, THE CONTRACTOR SHALL PROVIDE THE CITY WITH SIGNED & SEALED 'AS-BUILT' RECORD DRAWINGS OF HIS/HER WORK.

PROJECT SUMMARY:

- THE PROJECT CONSISTS OF THE INSTALLATION OF APPROXIMATELY 177 LF OF STEEL CANTILEVER SHEETPILE SEAWALL WITH APPROXIMATELY 177 LF (~21.5) CY OF REINFORCED CONCRETE CAP AND ALL INCIDENTAL WORK NECESSARY TO PROVIDE A COMPLETE AND SERVICEABLE PROJECT. THE TOP OF THE CAP SHALL BE SET AT +5.0' NAVD29 WITH A TOLERANCE OF +/- 0.25 INCH. SHEETS SHALL BE DZ-95 ASTM A690 GR 50 FOR THE WESTERN 96 LF AND EZ-95 ASTM A690 GR 50 FOR THE EASTERN 81 LF. THE CONCRETE CAP SHALL BE A MINIMUM OF 30" WIDE BY 18" TALL FOR THE DZ-95 SHEETPILE AND 26" WIDE BY 18" TALL FOR THE EZ-95 SHEETPILE.
- ADDITIONAL WORK ITEMS THAT WILL BE REQUIRED AND ARE PART OF THE BID INCLUDE, BUT ARE NOT LIMITED TO: SINGLE SPAN REMOVAL OF THE NORTHERN PORTION OF THE PEDESTRIAN BRIDGE PRIOR TO CONSTRUCTION AND REPLACEMENT OF THE SINGLE SPAN AFTER SEAWALL COMPLETION (DRAWINGS BY OTHERS); PRE-CONDITION AND POST-CONSTRUCTION VIDEO SURVEYS OF STRUCTURES WITHIN 50 LF OF PILE DRIVING OPERATIONS; VIBRATION MONITORING OF STRUCTURES WITHIN 50 LF OF THE PROJECT DURING PILE DRIVING ACTIVITY; UTILITY EXTENSIONS THROUGH THE NEW SEAWALL; REMOVAL AND REPLACEMENT OF WOODEN PILINGS; GRADING; RESTORATION
- THE CITY OF KEY WEST WILL MAKE A STAGING AREA AVAILABLE FOR USE BY THE CONTRACTOR AT NO COST. THE CONTRACTOR SHALL RESTORE THE STAGING AREAS AT THE COMPLETION OF CONSTRUCTION.
- THE CONTRACTOR WILL PROVIDE TEMPORARY SITE SECURITY FENCING TO SECURE THE CONSTRUCTION SITE. THE CONTRACTOR WILL NOT ALLOW PUBLIC ACCESS TO THE SITE DURING CONSTRUCTION.
- THE CONTRACTOR WILL MAINTAIN TRAFFIC IN MALLORY SQUARE DURING ALL PHASES OF CONSTRUCTION IN ACCORDANCE WITH FDOT SPECIFICATION SECTION 102. CONSTRUCTION ACTIVITIES WILL NOT IMPEDE TRAFFIC UNLESS AUTHORIZED IN WRITING BY THE CITY.
- THE CONTRACTOR SHALL FIELD STAKE THE BULKHEAD ALIGNMENT AT THE INFLECTION POINTS SHOWN ON THE PLANS; CITY AND ENGINEER SHALL APPROVE THE STAKED ALIGNMENT PRIOR TO THE CONTRACTOR INITIATING SITE PREPARATION FOR SHEET PILE INSTALLATION. THE PROPOSED SEAWALL SHALL NOT EXCEED 3 LF WATERWARD OF THE EXISTING SEAWALL.

DEMOLITION

21. DEMOLITION ACTIVITIES FOR THIS PROJECT INCLUDE:
- DEMOLITION OF +/- 18 LF OF CORRODED SHEETPIILING
 - DEMOLITION OF PORTIONS OF THE EXISTING SEAWALL AFTER THE NEW SHEETPIILING HAS BEEN INSTALLED
 - REMOVAL OF A PORTION OF THE AQUARIUM'S DECKING TO FACILITATE ACCESS TO THE EASTERN SIDE OF THE SITE
22. THE CONTRACTOR SHALL FIELD VERIFY THE EXACT LOCATION OF ALL OBSTRUCTIONS ALONG THE STEEL SHEETPILE'S ALIGNMENT PRIOR TO CONSTRUCTION. THE QUANTITY OF ITEMS REQUIRING DEMOLITION AND REPLACEMENT MAY VARY DEPENDING UPON THE CONTRACTOR'S MEANS AND METHODS.
23. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES OR LOCAL AUTHORITIES FURNISHING GAS, WATER, ELECTRICAL, TELEPHONE, OR SEWER SERVICE SO THEY CAN REMOVE, RELOCATE, DISCONNECT, CAP OR PLUG THEIR EQUIPMENT IN ORDER TO FACILITATE DEMOLITION & INSTALLATION OF THE STEEL SHEETPILE.
24. THE CONTRACTOR SHALL PROTECT ALL UTILITIES AND OTHER IMPROVEMENTS SHOWN ON THESE PLANS AND UTILITIES AND OTHER IMPROVEMENTS NOT SHOWN. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR REPAIRS OF UTILITIES AND OTHER IMPROVEMENTS DAMAGED DURING CONSTRUCTION AND SHALL MAINTAIN SUFFICIENT PROTECTION FOR ALL UTILITIES REQUIRED TO PROTECT THEM FROM DAMAGE AND TO PROTECT THE PUBLIC DURING CONSTRUCTION. CONTRACTOR SHALL ALSO SUPPORT EXISTING UTILITIES AS REQUIRED FOR INSTALLATION OF ALL PROPOSED IMPROVEMENTS. ALL COSTS ASSOCIATED WITH PROTECTING, SUPPORTING, REPAIRING, AND OTHER ACTIVITIES RESULTING FROM CONTRACTOR DAMAGING UTILITIES SHALL BE THE CONTRACTOR'S RESPONSIBILITY AT NO ADDITIONAL COST TO THE CITY.
25. THE CONTRACTOR SHALL SAW-CUT A SMOOTH STRAIGHT EDGE ON ANY CONCRETE PROPOSED FOR DEMOLITION PRIOR TO ITS REMOVAL.

STEEL SHEETPILE:

- AN ESTIMATED TOTAL OF 177 LF OF SHEET PILINGS SHALL BE REQUIRED. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXACT QUANTITY REQUIRED PRIOR TO BIDDING. STEEL SHEETPILE SHALL BE DZ-95 AND EZ-95 AS IDENTIFIED IN THE PLANS, IN ALL CASES ASTM A690 GRADE 50 STEEL
- ALL STEEL SHEETPILE UTILIZED ON THIS PROJECT SHALL BE NEW.
- INSTALLATION ACTIVITIES SHALL BE DONE IN SUCH A WAY AS TO NOT DISTURB SURROUNDING STRUCTURES.
- VIBRATION MONITORING OF ADJACENT STRUCTURES SHALL BE CONDUCTED DURING ALL DRIVING ACTIVITIES.
- SHEETPILES SHALL BE SET IN A STRAIGHT LINE BETWEEN INFLECTION POINTS.
- STEEL SHEETS WILL BE VIBRATED INTO PLACE FROM THE WATER AND WILL BE INTER-LOCKED PER MANUFACTURER'S SPECIFICATIONS.
- DESIGN SURCHARGE LOAD FOR SHEET PILE = 250 PSF

CONCRETE:

- CONCRETE CAP SHALL MEET SPECIFICATION SECTION 03 30 00 CAST-IN-PLACE CONCRETE EXCEPT AS AMENDED BELOW.
 - ENVIRONMENT = EXTREMELY AGGRESSIVE
 - CLASS IV, MINIMUM 28 DAY STRENGTH: f'c = 6,000 PSI
 - MINIMUM COVER = 3 INCHES
 - NO FLYASH OR SLAG WILL BE PERMITTED AS A SUBSTITUTE FOR CEMENT.
 - MAXIMUM W/C RATIO = 0.40
- ALL REINFORCING BARS SHALL COMPLY WITH ASTM A615/A615M GRADE 60 AND HAVE AT LEAST 3 INCHES OF CONCRETE COVER.
- ALL REINFORCEMENT SHALL BE EPOXY COATED TO CONFORM TO ASTM A934/A934M
- TIE WIRE SHALL BE EPOXY COATED TO CONFORM TO ASTM A884/884M.
- FABRICATION AND JOBSITE HANDLING SHALL BE IN ACCORDANCE WITH ASTM D3963/D3963M.
- TOUCH UP SHALL BE REQUIRED WHERE EPOXY COATING HAS BEEN COMPROMISED DURING HANDLING AND INSTALLATION. EPOXY SHALL BE CURED TACK FREE PRIOR TO CONCRETE PLACEMENT.
- MINIMUM LAP SPLICE LENGTH FOR #5 REINFORCING BARS IS 2 FT.
- REINFORCEMENT SHALL BE CAREFULLY PLACED, RIGIDLY SUPPORTED, AND WELL TIED WITH BAR SUPPORTS AND SPACERS.
- CONTRACTOR SHALL PROVIDE 1 INCH CHAMFERS ON ALL EDGES AND CORNERS.
- CONTRACTOR SHALL PROVIDE MATERIALS TESTING FOR 8, 14, AND 28 DAY BREAKS TO CONFIRM CONCRETE STRENGTH.
- CONTROL JOINTS TO BE 1/8" x 1" DEEP TOOLED JOINT @ 100'-0" O.C. (MAX.).

SEAWALL PENETRATIONS:

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE NUMBER AND LOCATIONS OF SEAWALL PENETRATIONS
- ALL EXISTING SEAWALL PENETRATIONS FOR DRAINAGE AND OTHER UTILITIES SHALL BE MADE THROUGH THE PROPOSED SEAWALL WITH SIMILAR MATERIALS AND INCLUDE ALL COUPLINGS, CONNECTION HARDWARE, MATERIALS, AND LABOR IN ACCORDANCE WITH THE MATERIAL MANUFACTURER'S RECOMMENDATIONS.

FILL MATERIAL:

- CLEAN IMPORTED FILL WILL BE USED FOR BACKFILLING BETWEEN THE EXISTING CONCRETE SEAWALL AND THE NEW STEEL SHEETPILE SEAWALL, AS WELL AS FOR SURFACE GRADING TO ELEVATIONS AS DESIGNATED ON THE PLAN SET.

PILINGS:

- CONTRACTOR SHALL REMOVE PILINGS AND DEMOLISH AND DISPOSE OF DECKING AS REQUIRED TO FACILITATE BARGE ACCESS AND CONSTRUCTION.

- CONTRACTOR SHALL REPLACE REMOVED PILINGS WITH NEW PILINGS IN THE SAME LOCATIONS AT THE PRIOR TO THE CONCLUSION OF CONSTRUCTION.
- CONTRACTOR SHALL BID PROJECT FOR 40' LONG SOUTHERN YELLOW PINE TIMBER PILES TO REPLACE ANY EXISTING PILINGS RELOCATED BY THE PROJECT. IN THE EVENT THAT EXISTING PILINGS MAY BE RE-USED, CONTRACTOR SHALL PROVIDE A DEDUCTION TO THE CITY. NO GREENHEART PILES SHALL BE PERMITTED.
- PILINGS SHALL BE DRIVEN 5' MINIMUM INTO LIMESTONE (APPROXIMATE TIP ELEVATION -33.0FT NAVD). PILINGS SHALL NOT BE CUTOFF.

FILTER FABRIC

- FILTER FABRIC TO BE MIRAFI 700X OR EQUIVALENT, CONTINUOUS ALONG UPLAND SIDE OF STEEL SHEETS. EXTEND TO MUDLINE AND WRAP BENEATH FILL AS SHOWN ON CROSS-SECTIONS.



David W. Frodsham
Florida PE No. 75507

Mark	Date	Description
-	-	-
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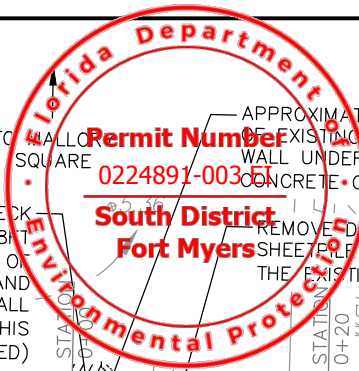
Designed by: D. FRODSHAM
 Drawn by: C. MARTINEZ
 Checked by: S. MOGATIEE
 Date: 7/10/2018
 Design file no: KWA000 DESIGN_V7.DWG
 Scale: AS SHOWN

TETRA TECH INC.
 759 SOUTH FEDERAL HWY
 SUITE 314 34984-2936
 TAMPA, FL 33630
 TEL: (772) 781-3400
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 CERTIFICATE OF AUTHORIZATION
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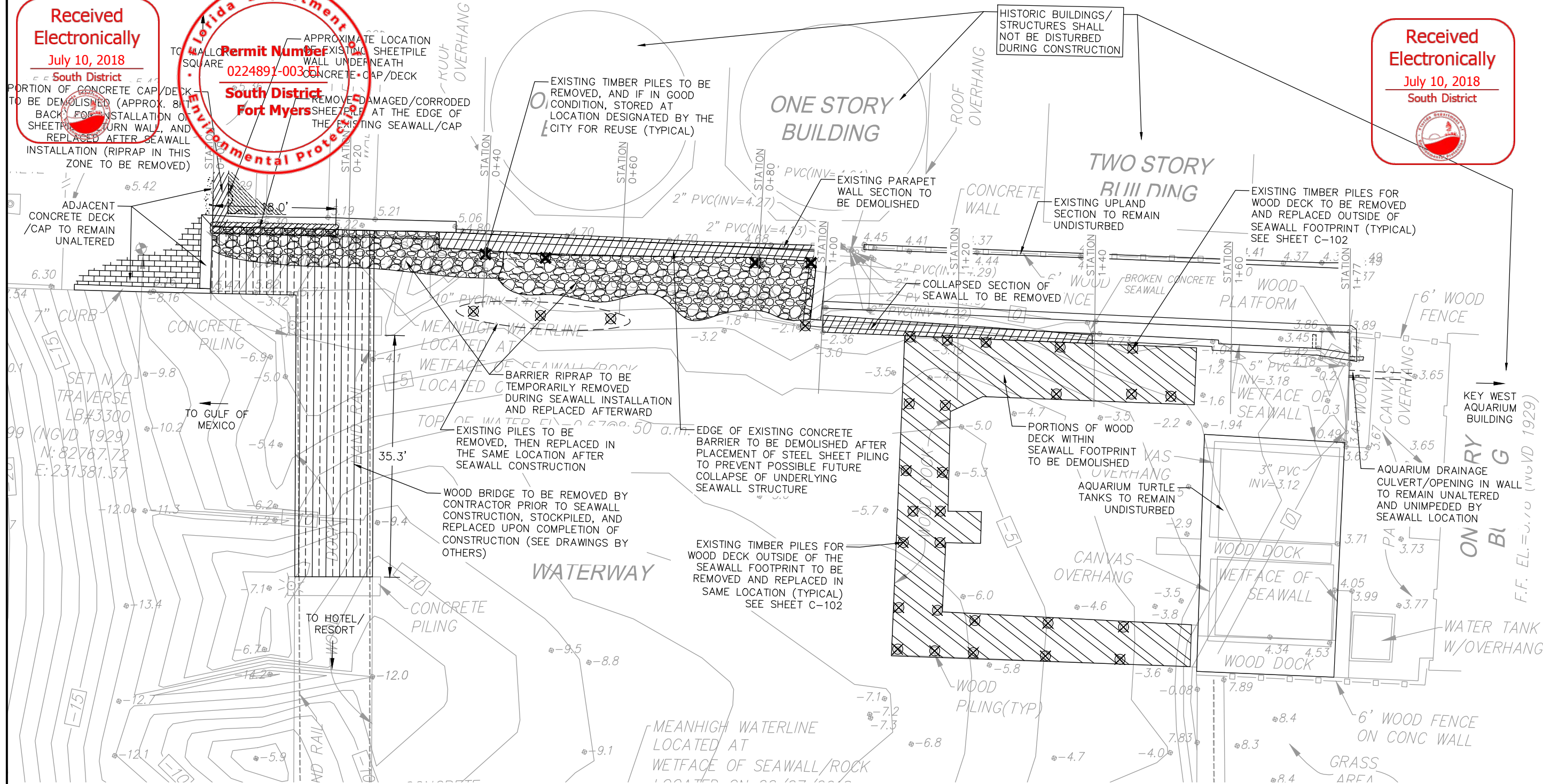
CITY OF KEY WEST
 ESTIMARIUM SEWER REPAIR
 CONSTRUCTION NOTES
 ESTIMARIUM COUNTY, FLORIDA



Received Electronically
July 10, 2018

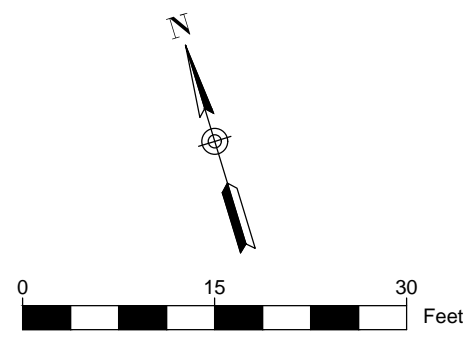


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- LEGEND**
- EXISTING SHEETPILE TO BE REMOVED
 - EXISTING CONCRETE TO BE REMOVED/DEMOLISHED
 - EXISTING WOOD DECK (TO BE REMOVED AND STOCKPILED DURING CONSTRUCTION & REPLACED)
 - WOOD BRIDGE (TO BE REMOVED DURING CONSTRUCTION & REPLACED)
 - RIPRAP (TO BE REMOVED/RELOCATED DURING CONSTRUCTION & REPLACED)
 - EXISTING TIMBER PILE (TO BE REMOVED)
 - EXISTING TIMBER PILE (TO BE REMOVED DURING CONSTRUCTION & REPLACED)

- NOTES:**
1. THE BATHYMETRY AND SURVEY DATA WAS PROVIDED BY AVIROM & ASSOCIATES, INC., DATED 2/27/18.
 2. SURVEY DATUM: NGVD29
 3. DEMOLITION ACTIVITIES FOR THIS PROJECT INCLUDE THE FOLLOWING:
 - 3.1. TEMPORARY REMOVAL OF HALF OF THE WOOD BRIDGE SPANNING FROM MALLORY SQUARE ON THE NORTH TOWARD THE HOTEL ON THE SOUTH.
 - 3.2. REMOVAL OF EXISTING DAMAGED SHEETPILE SECTIONS LOCATED BENEATH THE WOOD BRIDGE.
 - 3.3. REMOVAL OF THE RIPRAP IN FRONT OF THE EXISTING SEAWALL. RIPRAP WILL BE PLACED IN FRONT OF THE NEW SHEETPILE SEAWALL.
 - 3.4. REMOVAL OF THE COLLAPSED PORTION OF SEAWALL.
 - 3.5. REMOVAL OF TIMBER PILES ALONG THE NORTHWEST PORTION OF THE SEAWALL. THREE OF THE PILES DEPICTED WILL BE REPLACED IN THE SAME LOCATION AFTER CONSTRUCTION. (CONTRACTOR SHOULD ASSUME NEW 10" TIMBER PILES WILL BE REQUIRED, DEPENDING ON THE CONDITION OF THE EXISTING PILES).
 - 3.6. REMOVAL AND RELOCATION OF AQUARIUM WOOD DECK AND ASSOCIATED TIMBER PILES CURRENTLY WITHIN THE NEW SEAWALL FOOTPRINT. (CONTRACTOR SHOULD ASSUME NEW 10" TIMBER PILES WILL BE REQUIRED, DEPENDING ON THE CONDITION OF THE EXISTING PILES).
 - 3.7. CONTRACTOR SHOULD PLAN TO PARTIALLY DEMOLISH/CHIP OFF PORTIONS OF THE EXISTING CONCRETE SEAWALL BARRIER LOCATED BEHIND THE BARRIER RIPRAP.



David W. Frodsham
Florida PE No. 75507

Mark	Description	Date	Appr.

Designed by: D. FRODSHAM
 Drawn by: C. MARTINEZ
 Checked by: S. MOGATHEE
 Date: 7/10/2018
 Design file no: KWA010 DESIGN_V7.DWG
 Scale: AS SHOWN

TETRA TECH INC.
 759 SOUTH FEDERAL HWY
 SUITE 314 34984-2936
 TAMPA, FL 33630
 TEL: (772) 781-3410
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 CERTIFICATE OF AUTHORIZATION
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TE

CITY OF KEY WEST
 ESTIMATED SEWER REPAIR
 DEMOLITION PLAN

ESTIMATED MONROE COUNTY, FLORIDA

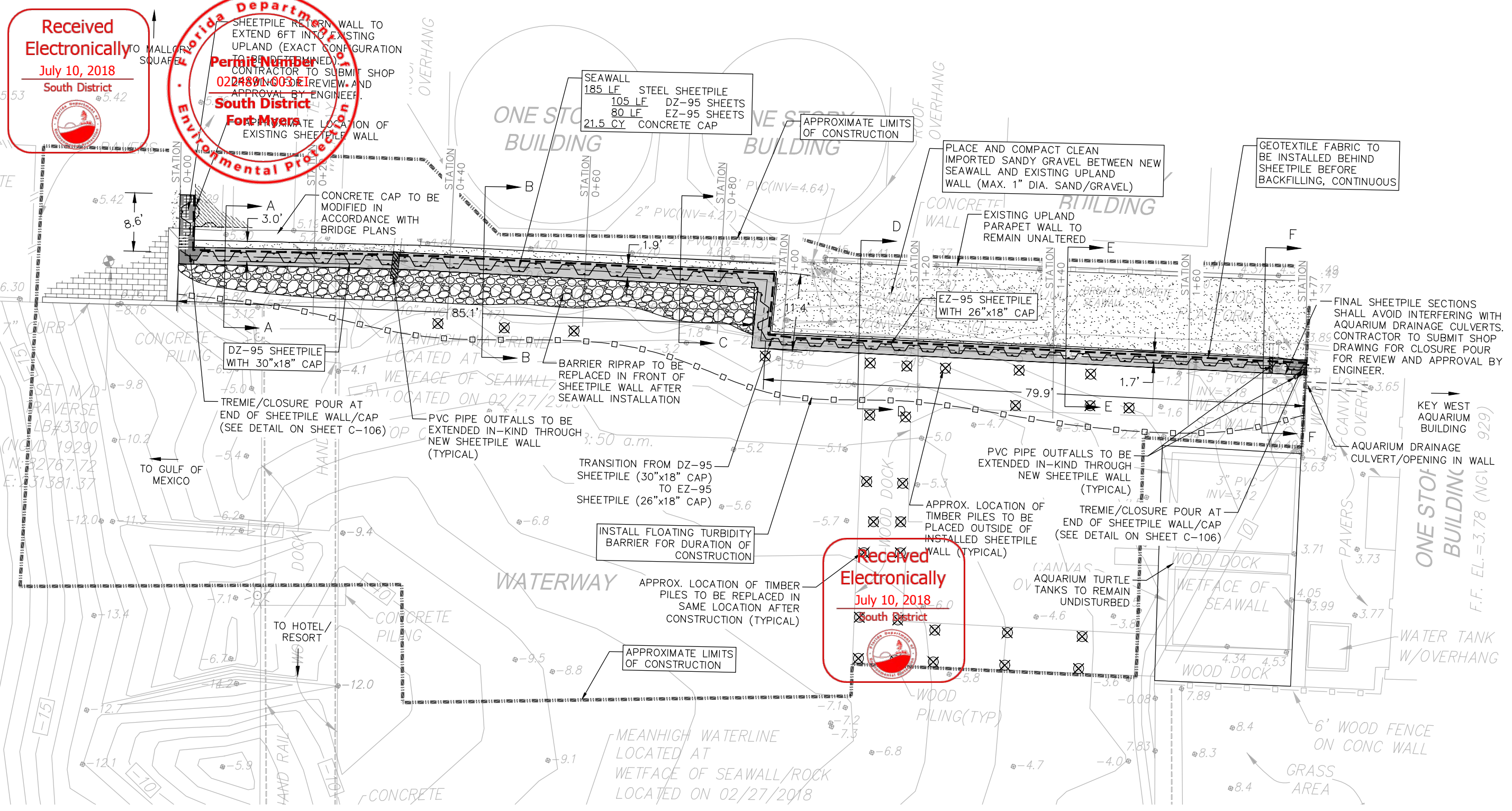
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C-101
Sheet 5 of 11

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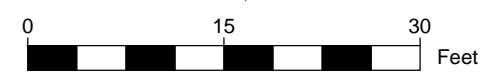
Florida Department of Environmental Protection
Permit Number 0224891-003-E
South District
Fort Myers



David W. Frodsham
Florida PE No. 75507



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South District



NOTES:

1. THE BATHYMETRY AND SURVEY DATA WAS PROVIDED BY AVIROM & ASSOCIATES, INC., DATED 2/27/18.
2. SURVEY DATUM: NGVD29
3. THE PROPOSED SEAWALL WILL CONSIST OF A STEEL SHEETPILE WALL, LOCATED AS SHOWN, WITH A CONCRETE CAP.
4. A TURBIDITY CURTAIN SHALL BE UTILIZED TO PREVENT ANY CONSTRUCTION DEBRIS FROM ESCAPING OUTSIDE OF THE CONSTRUCTION ZONE.
5. ALL CONSTRUCTION ACTIVITIES WILL BE PERFORMED IN ACCORDANCE WITH THE NMFS SEA TURTLE AND SAWFISH CONSTRUCTION GUIDELINES/BMPs AND THE NMFS SECTION 7 CHECKLIST AND INSTRUCTIONS.
6. TIMBER PILE INSTALLATION WILL OCCUR TO THE SAME DEPTH AS THE REMOVED PILES, AT THE APPROXIMATE LOCATIONS SHOWN.
7. CROSS SECTIONS A-A THROUGH F-F ARE SHOWN ON SHEETS C-103 THROUGH C-105.

Mark	Description	Date	Appr.

Designed by: D. FRODSHAM
Drawn by: C. MARTINEZ
Checked by: S. MOGATHEE
Date: 7/10/2018
Design file no: KWA001_DWG
Scale: AS SHOWN

TETRA TECH INC.
759 SOUTH FEDERAL HWY
SUITE 314 34984-2936
FORT MYERS, FL 34901
TEL: (772) 781-3400
FAX: (772) 781-3411
CERTIFICATE OF AUTHORIZATION
NO. 2429



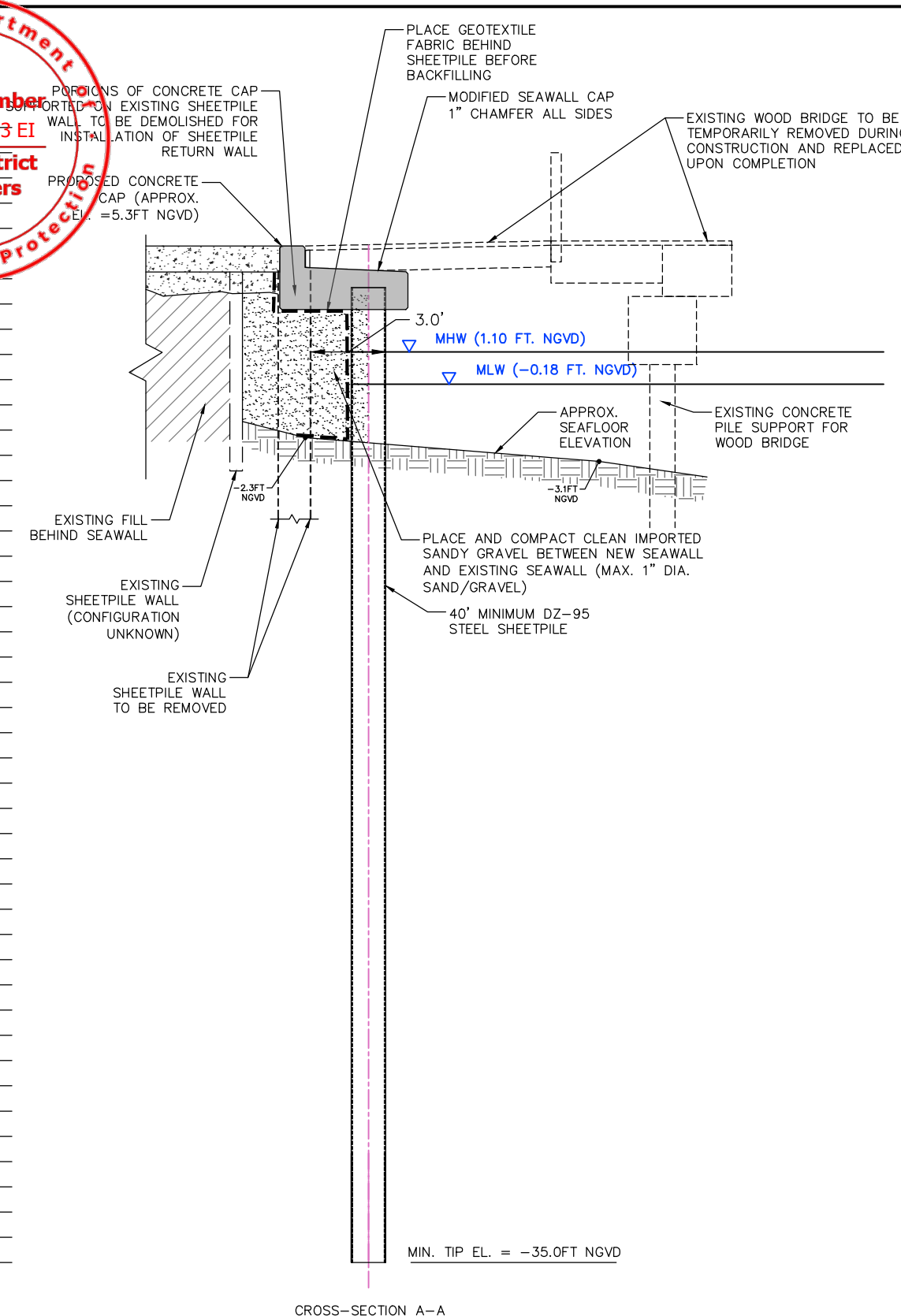
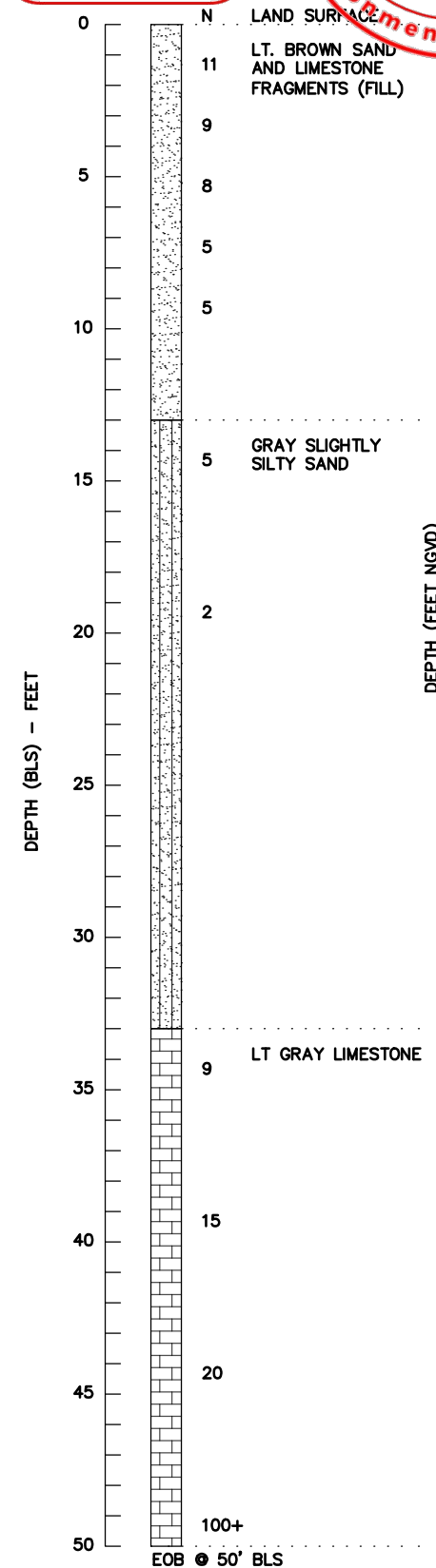
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EST MONROE COUNT FL OR

Sheet Reference:
C-102
Sheet 6 of 11

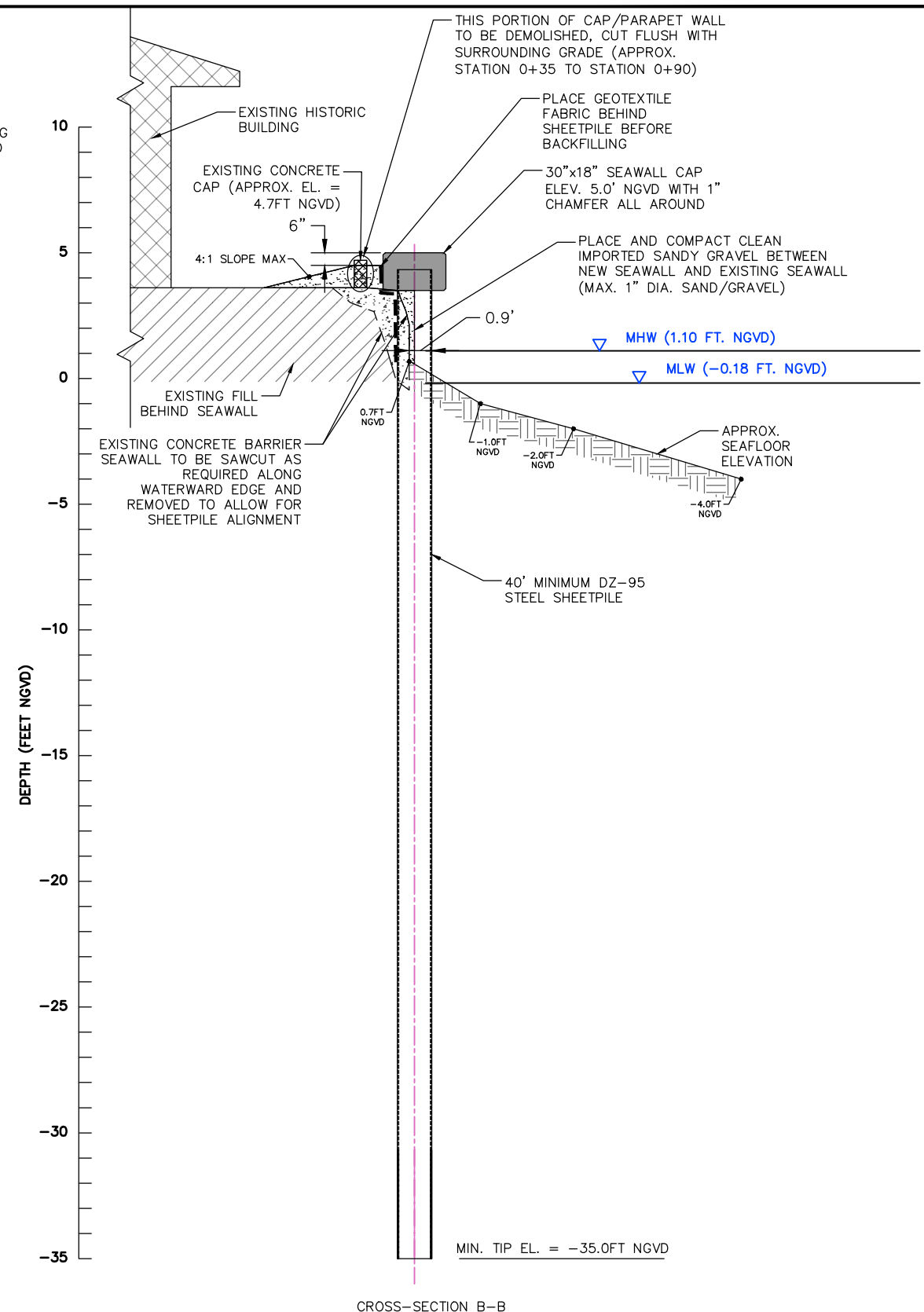
Received
Electronically
July 10, 2018
South District

Florida Department
Environmental Protection
Permit Number
0224891003 EI
South District
Fort Myers

DATE: 03/08/18



CROSS-SECTION A-A



CROSS-SECTION B-B



David W. Frodsham
Florida PE No. 75507

Mark	Description	Date	Appr.

Designed by:
D. FRODSHAM
Drawn by:
C. MARTINEZ
Checked by:
S. MCGATHIE
7/10/2018
Design file no:
KWA001 DESIGN_V7.DWG
Scale:
AS SHOWN

TETRA TECH INC.
759 SOUTH FEDERAL HWY
SUITE 314 34984-2936
TAMPA, FL 33629
TEL: (772) 781-3400
FAX: (772) 781-3411
CERTIFICATE OF AUTHORIZATION
NO. 2429

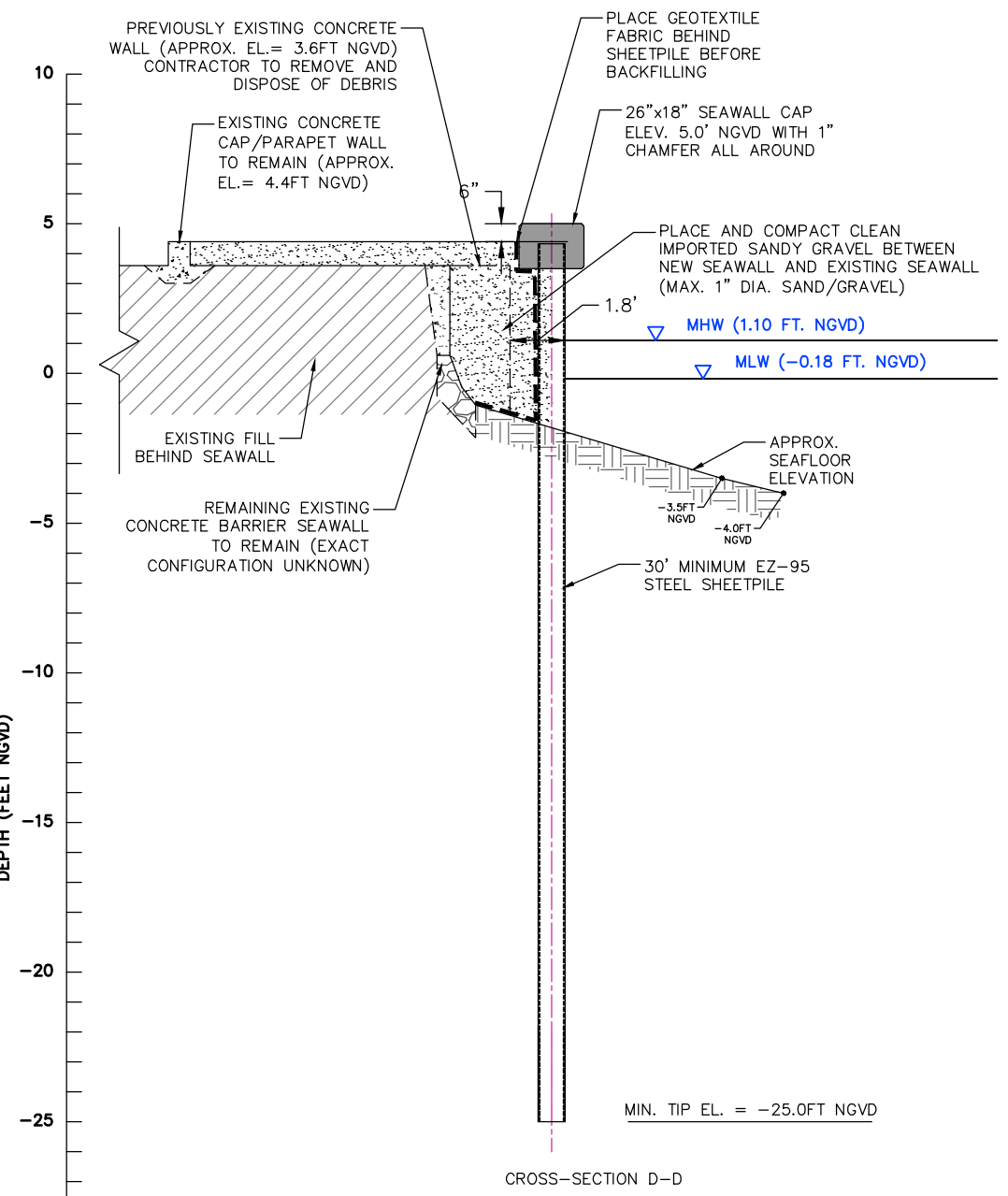
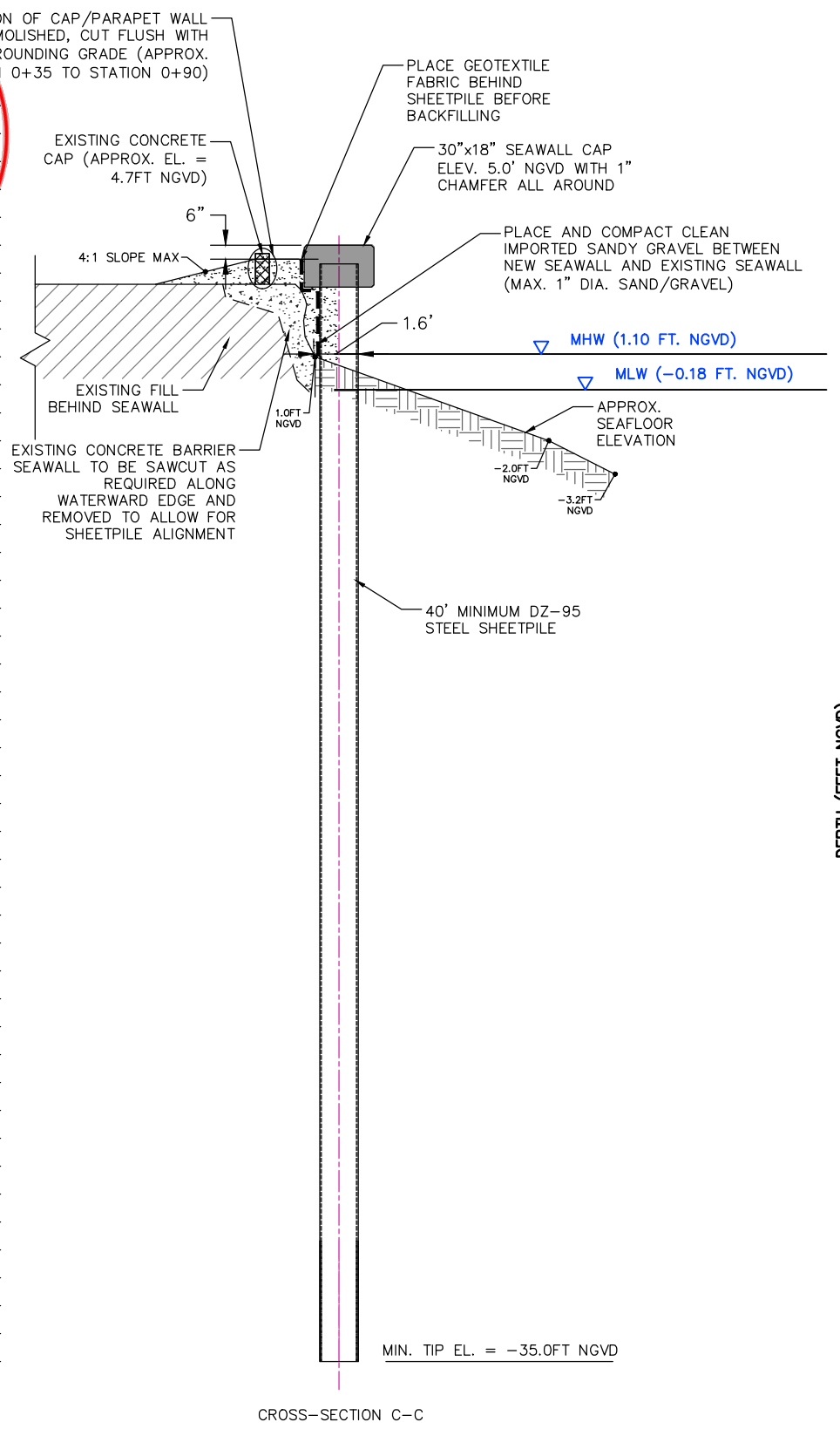
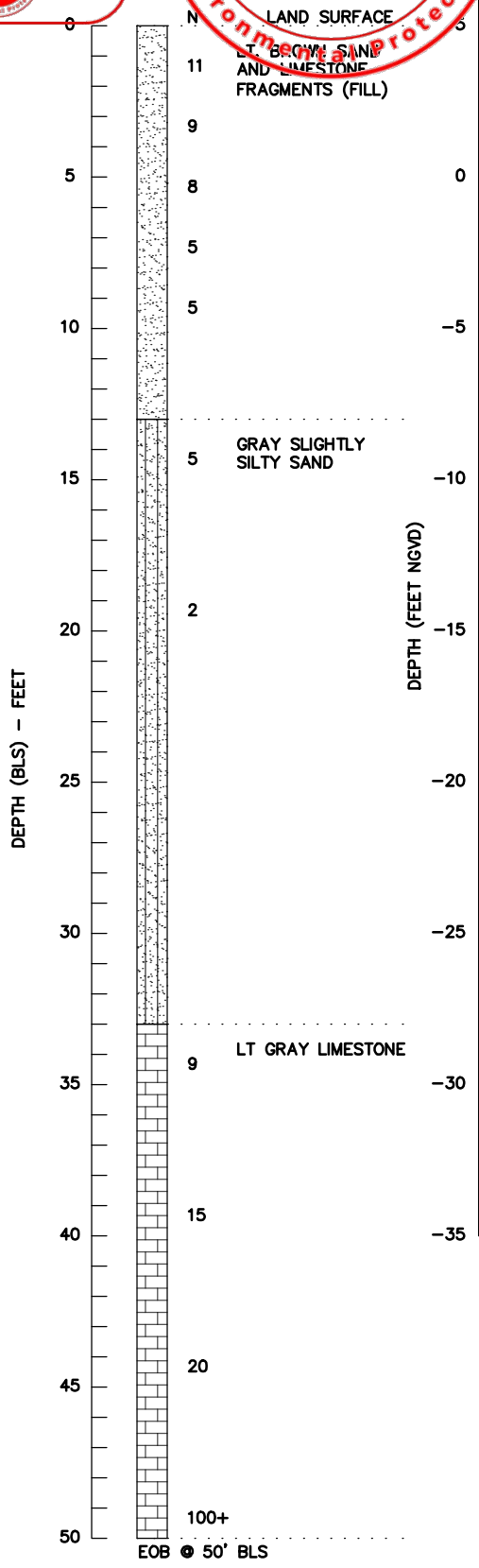
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SEAWALL CROSS-SECTIONS
EST EST MONROE COUNT F OR

Sheet Reference:
C-103
Sheet 7 of 11

Received Electronically
 July 16, 2018
 South District

Florida Department of Environmental Protection
Permit Number
 0224891-003 EI
South District
Fort Myers

DATE: 03/08/18



David W. Frodsham
 Florida PE No. 75507

Mark	Description	Date	Appr.

Designed by: D. FRODSHAM
 Drawn by: C. MARTINEZ
 Checked by: S. MCGATHIE
 Date: 7/10/2018
 Design file no: KWAD DESIGN_V7.DWG
 Scale: AS SHOWN

TETRA TECH INC.
 759 SOUTH FEDERAL HWY
 SUITE 314 34984-2936
 TAMPA, FL 33629
 TEL: (772) 781-3400
 FAX: (772) 781-3411
 CERTIFICATE OF AUTHORIZATION
 NO. 2429



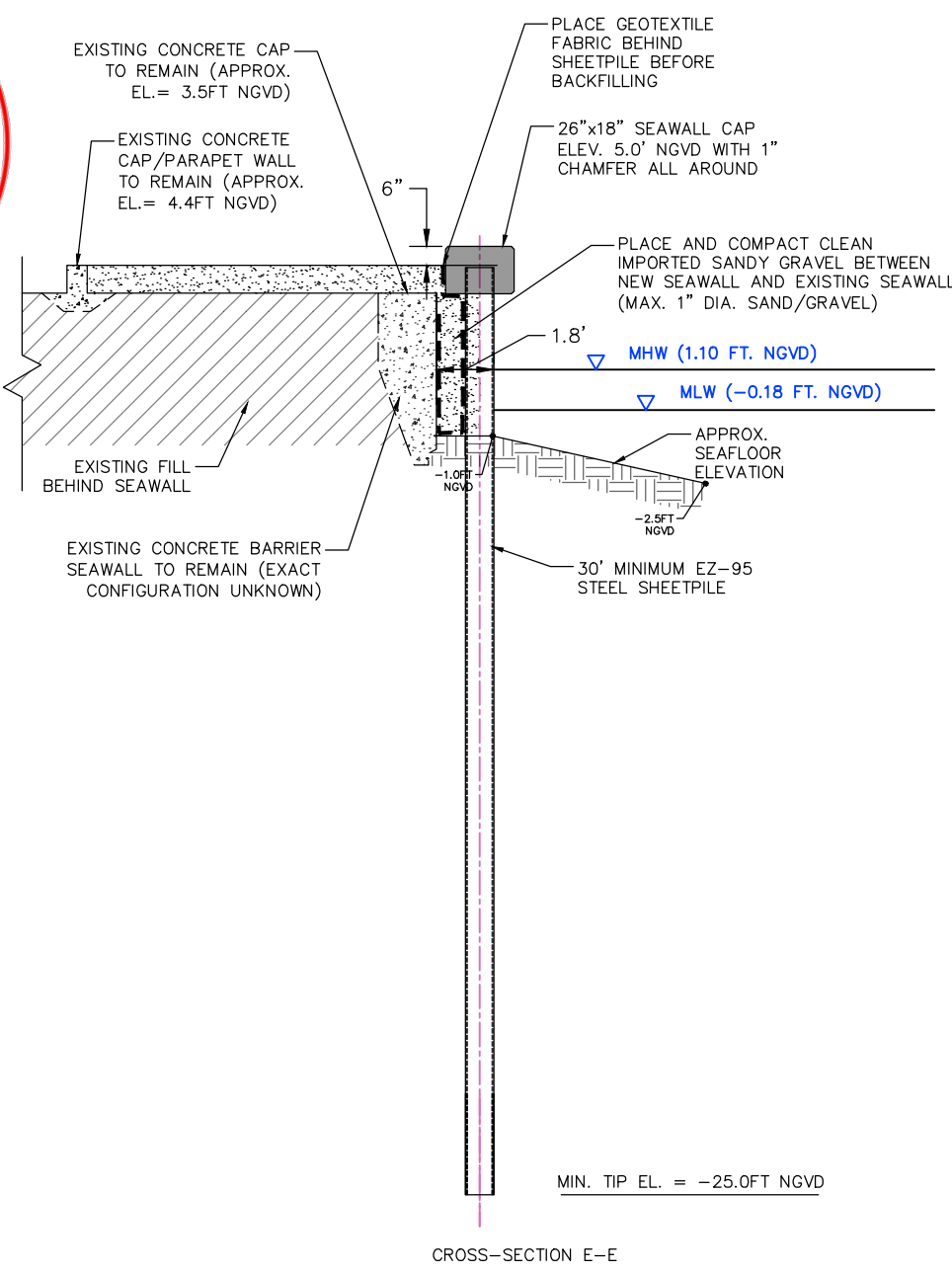
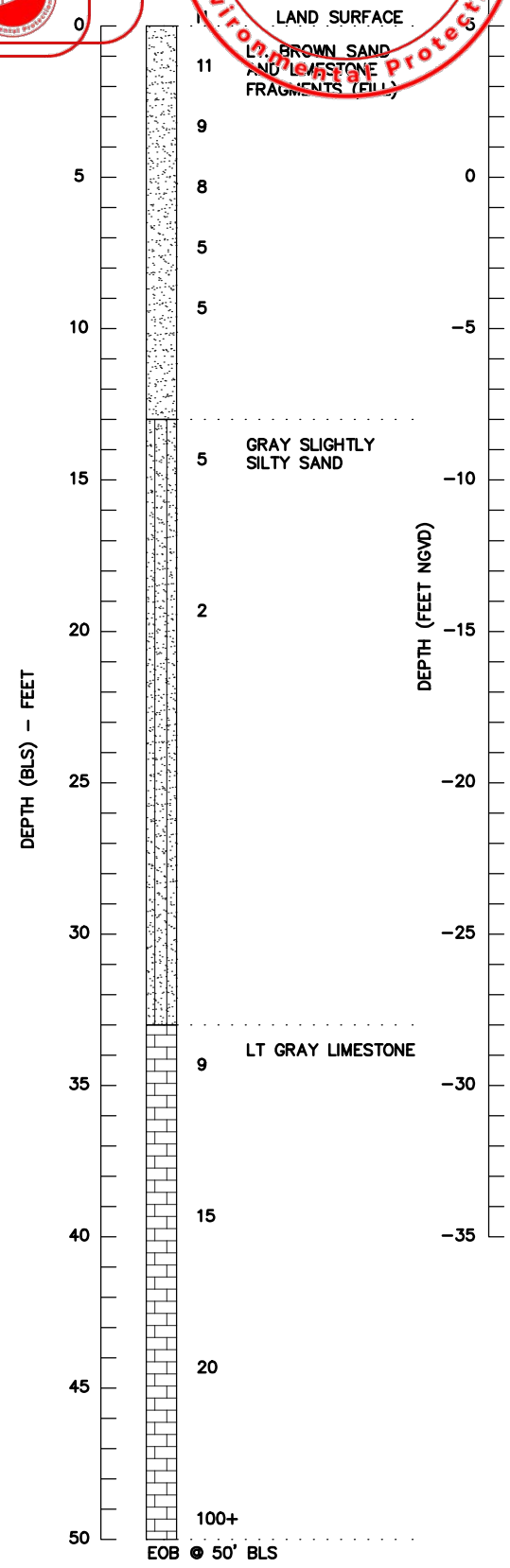
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Sheet Reference:
C-104
 Sheet 8 of 11

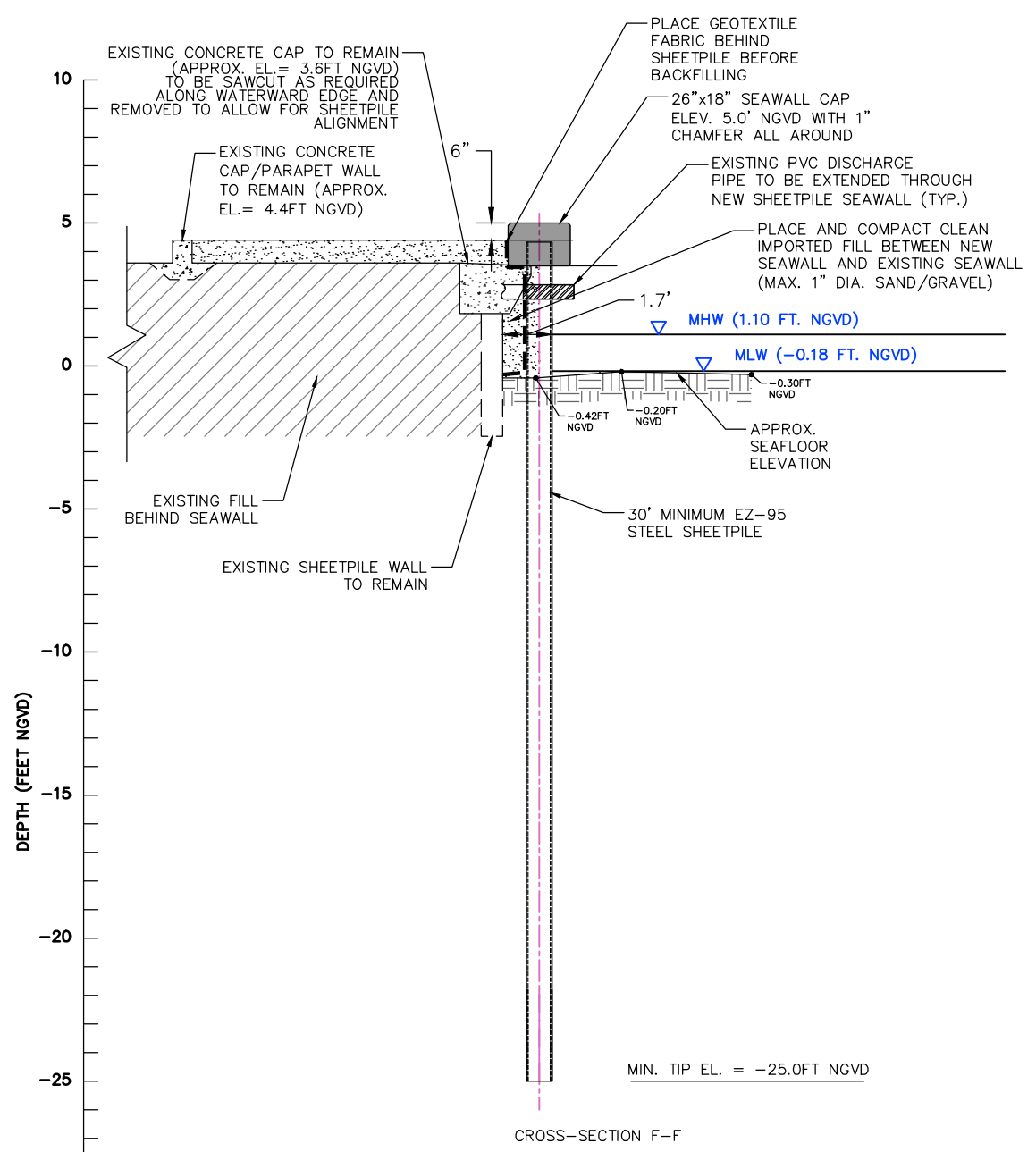
Received Electronically
 July 10, 2018
 South District

Florida Department of Environmental Protection
Permit Number
 0224891-003 EI
South District Fort Myers

B-2
 DATE: 03/08/18



CROSS-SECTION E-E



CROSS-SECTION F-F



David W. Frodsham
 Florida PE No. 75507

Mark	Description	Date	Appr.

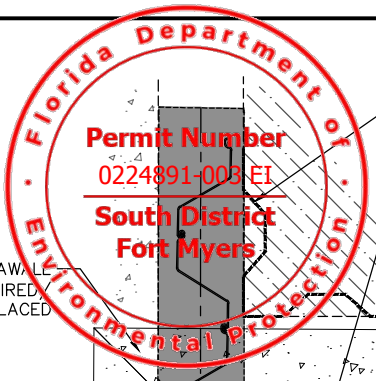
Designed by: D. FRODSHAM
 Drawn by: C. MARTINEZ
 Checked by: S. MCGATHIE
 Date: 7/10/2018
 Design file no: KWAD DESIGN_V7.DWG
 Scale: AS SHOWN

TETRA TECH INC.
 759 SOUTH FEDERAL HWY
 SUITE 314 34984-2936
 TAMPA, FL 33609
 TEL: (772) 781-3400
 FAX: (772) 781-3411
 CERTIFICATE OF AUTHORIZATION
 NO. 2429

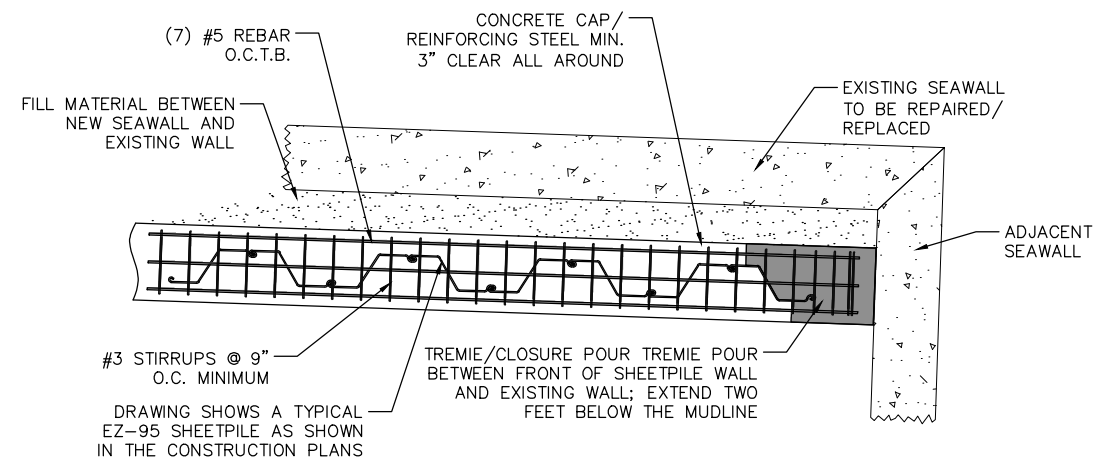
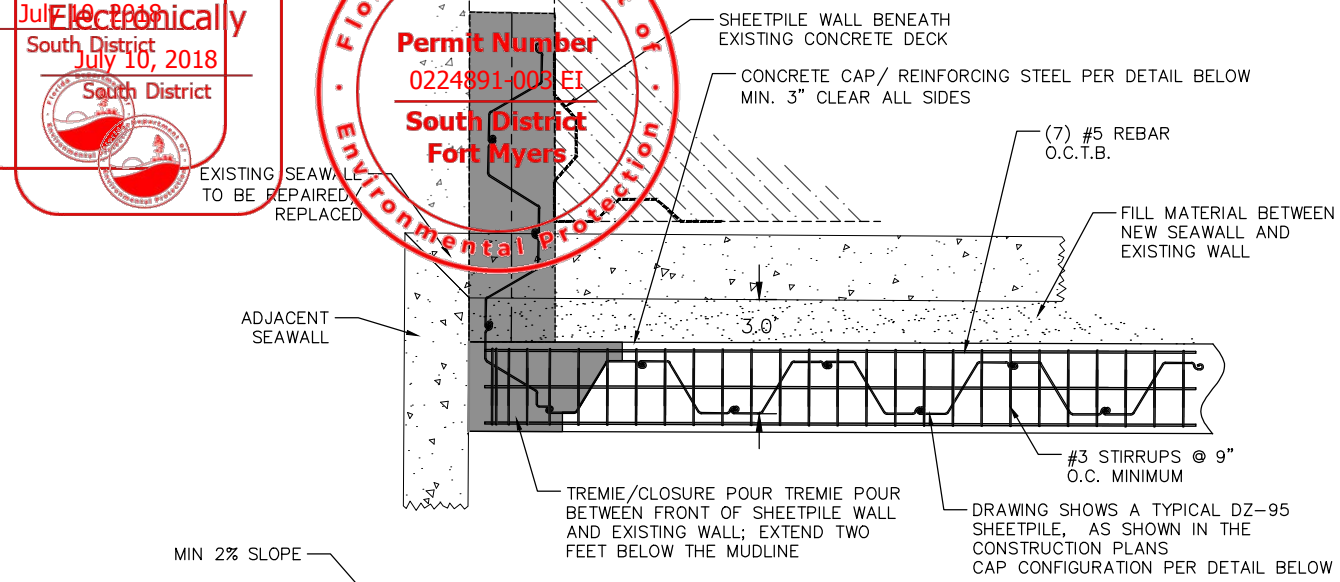
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 SEAWALL CROSS-SECTIONS
 EST MONROE COUNT F OR

Sheet Reference:
C-105
 Sheet 9 of 11

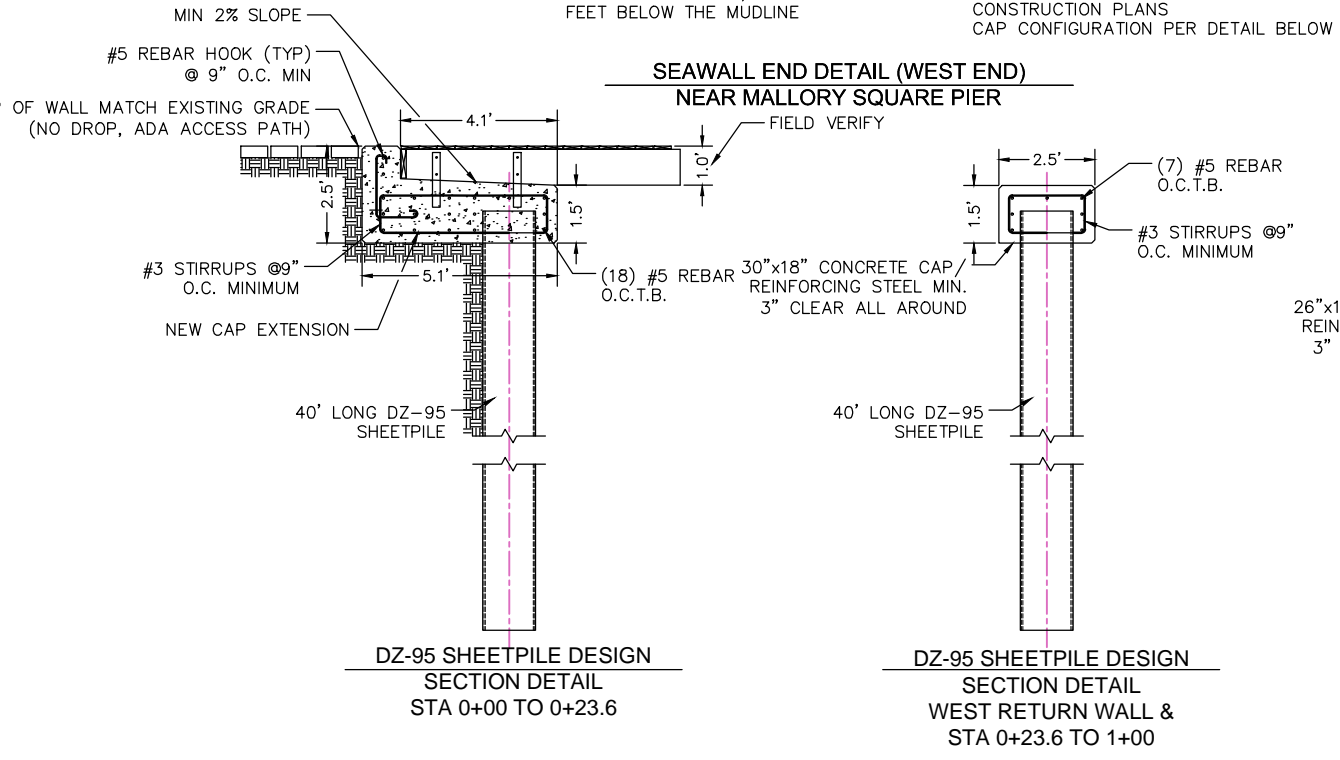
Received
Electronically
July 10, 2018
South District
South District



David W. Frodsham
Florida PE No. 75507



SEAWALL END DETAIL (EAST END)
NEAR AQUARIUM



SEAWALL END DETAIL (WEST END)
NEAR MALLORY SQUARE PIER

DZ-95 SHEETPILE DESIGN
SECTION DETAIL
STA 0+00 TO 0+23.6

DZ-95 SHEETPILE DESIGN
SECTION DETAIL
WEST RETURN WALL &
STA 0+23.6 TO 1+00

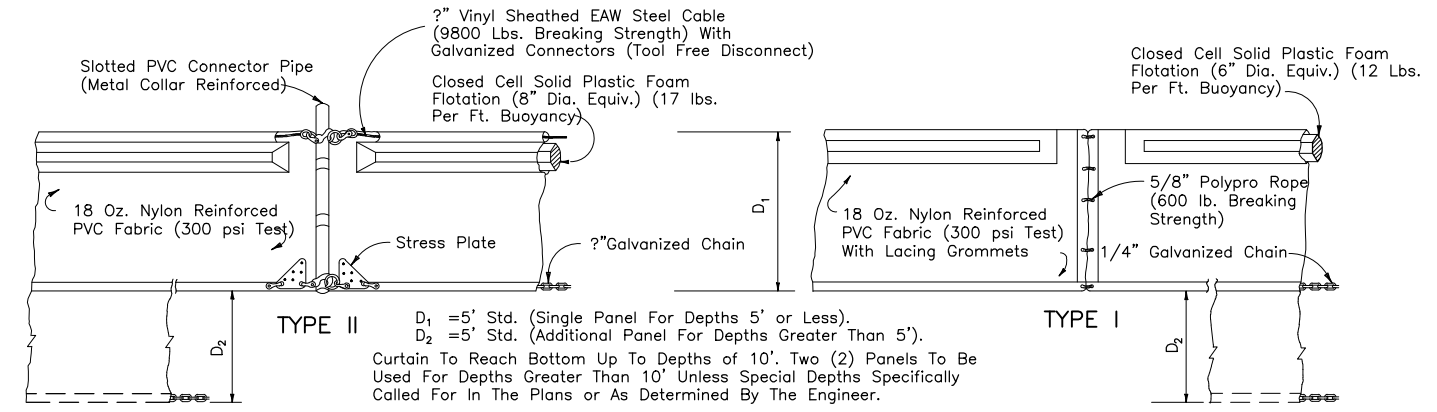
EZ-95 SHEETPILE DESIGN
SECTION DETAIL
STA 1+00 TO 1+77

TYPICAL STEEL SHEETPILE SEAWALL:

CONCRETE CAP
- CONCRETE $f_c = 6,000$ PSI IN 28-DAYS
- 1" CHAMFER ALL EXPOSED EDGES
- 3" MIN. COVER OVER STEEL

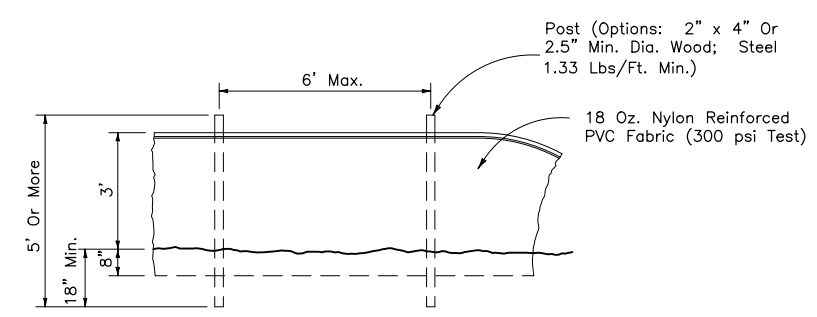
DZ-95 STEEL SHEET PILE SPECIFICATIONS
- WIDTH 29.00 IN.
- HEIGHT 16.50 IN.
- THICKNESS 0.375 IN.
- SECTIONAL AREA 17.15 SQ. IN. PER LIN. FT.
- WEIGHT OF PILE 58.40 LB. PER LIN. FT.
- WEIGHT OF WALL 24.20 LB. PER SQ. FT.
- SECTION MODULUS 37.72 IN.³ PER LIN. FT.
- MOMENT OF INERTIA 311.22 IN.⁴ PER LIN. FT.

EZ-95 STEEL SHEET PILE SPECIFICATIONS
- WIDTH 25.00 IN.
- HEIGHT 10.81 IN.
- THICKNESS 0.375 IN.
- SECTIONAL AREA 14.40 SQ. IN. PER LIN. FT.
- WEIGHT OF PILE 48.90 LB. PER LIN. FT.
- WEIGHT OF WALL 23.50 LB. PER SQ. FT.
- SECTION MODULUS 24.40 IN.³ PER LIN. FT.
- MOMENT OF INERTIA 131.00 IN.⁴ PER LIN. FT.

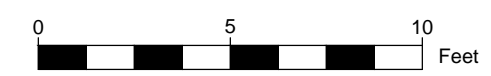


TYPE II
D₁ = 5' Std. (Single Panel For Depths 5' or Less).
D₂ = 5' Std. (Additional Panel For Depths Greater Than 5').
Curtain To Reach Bottom Up To Depths of 10'. Two (2) Panels To Be Used For Depths Greater Than 10' Unless Special Depths Specifically Called For In The Plans or As Determined By The Engineer.

FLOATING TURBIDITY BARRIERS



STAKED TURBIDITY BARRIER



Mark	Date	Description

Designed by: D. FRODSHAM
Drawn by: C. MARTINEZ
Checked by: S. WOGATILE
Date: 7/10/2018
Design file no: KWADN DESIGN_V7.DWG
Scale: AS SHOWN



TETRA TECH INC.
759 SOUTH FEDERAL HWY
SUITE 314 34984-2936
FORT MYERS, FL 34901
TEL: (772) 781-3400
FAX: (772) 781-3411
CERTIFICATE OF AUTHORIZATION
NO. 2429

CITY OF FORT MYERS
EST URBAN SEWER REPAIR
GENERAL DETAILS
EST MONROE COUNTY FLORIDA

Received Electronically
July 10, 2018
South District



Florida Department of Environmental Protection
Permit Number
0224891-003 EI
South District
Fort Myers



VIEW NEAR CROSS-SECTION A-A



VIEW NEAR CROSS-SECTION C-C

Received Electronically
July 10, 2018
South District



David W. Frodsham
Florida PE No. 75507

Mark	Description	Date	Appr.

Designed by:
D. FRODSHAM
Drawn by:
C. MARTINEZ
Checked by:
S. MCGATHEE
Date:
7/10/2018
Design file no:
KWA01 DESIGN_V7.DWG
Scale:
AS SHOWN



VIEW UNDERNEATH CROSS- SECTION A-A



VIEW NEAR CROSS-SECTION D-D



VIEW NEAR CROSS-SECTION F-F




VIEW NEAR CROSS-SECTION B-B



VIEW NEAR CROSS-SECTION E-E

TETRA TECH INC.
759 SOUTH FEDERAL HWY
SUITE 314 34984-2936
FORT MYERS, FL 33901
TEL: (772) 781-3400
FAX: (772) 781-3411
CERTIFICATE OF AUTHORIZATION
NO. 2429



CIT OF EST
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REFERENCE PHOTOGRAPHS
EST MONROE COUNT F OR



Sheet Reference:
C-107
Sheet 11 of 11

Hurricane Irma Emergency USACE Authorization-SAJ-2017-03332 (City of Key West-Key West Aquarium Basin) Loc. @ 1 Whitehead St., Key West, Monroe County, FL 33040- Seawall Repair

-----Original Message-----

From: Guardia-Montoya, Gletys CIV USARMY CESAJ (US) <Gletys.Guardia-Montoya@usace.army.mil>

Sent: Tuesday, March 6, 2018 12:15 PM

To: jbouquet@cityofkeywest-fl.gov; Frodsham, Dave <Dave.Frodsham@tetrattech.com>; MartinezRivera, Francisco <Francisco.MartinezRivera@tetrattech.com>

Cc: SAJ-RD <saj-rd@usace.army.mil>

Subject: Hurricane Irma Emergency USACE Authorization-SAJ-2017-03332 (City of Key West-Key West Aquarium Basin) Loc. @ 1 Whitehead St., Key West, Monroe County, FL 33040- Seawall Repair

Good Morning Mr. Bouquet, Mr. Frodsham and Mr. Martinez,;

Thank you for your request for an emergency permit. Your request is to repair 940.5-square feet of the previously existing seawall within the Key West Aquarium Basin that failed as a result of Hurricane Irma. A maximum of 200 cubic yards of backfill material will be used to accomplish the work. Upon review of the information you have submitted, the Corps has determined that the proposed activity is verified by Nationwide 3. Information regarding Nationwide 3 and its requirements may be viewed at http://www.saj.usace.army.mil/Portals/44/docs/regulatory/sourcebook/permitting/nationwide_permit/20170106-Federal-Register-NWPs.pdf?ver=2017-03-17-083957-430

Please be aware this Internet address is case sensitive and should be entered as it appears above.

Attached to this message there is a list of the General Conditions, which apply to all Department of the Army authorizations. You must comply with all of the general and the enclosed Special Conditions and the associated attachments or you may be subject to enforcement action. Also included with this authorization are NOAA-PRD conservation recommendations, please implement these to the best of your abilities. Please note, the work shall be conducted on a manner that adheres to all enclosed best management practices/special conditions/ NMFS General recommendations and all associated attachments:

SPECIAL CONDITIONS:

1. REPORTING ADDRESS: The Permittee shall submit all reports, notifications, documentation and correspondence required by the conditions of this permit shall be submitted to the following address:

a. For standard mail: U.S. Army Corps of Engineers, Regulatory Division, Enforcement Branch, 9900 Southwest 107th Avenue, Suite 203, Miami, Florida 33176.

b. For electronic mail: SAJ-RD-Enforcement@usace.army.mil (not to exceed 10 MB).

The Permittee shall reference this permit number, (SAJ-2017-03332 H. Irma EP-NW-GGM), on all submittals.

2. SELF-CERTIFICATION: Within sixty (60) days of completion of the authorized work or at the expiration of the construction authorization of this permit, whichever occurs first, the Permittee shall complete the attached "Self- Certification Statement of Compliance" form (attached) and submit to the Corps. In the event that the completed work deviates, in any manner, from the authorized work, the Permittee shall describe, on the Self-Certification Form, the deviations between the work authorized by the permit and

the work as constructed. Please note that the description of any deviations on the Self-Certification Form does not constitute approval of any deviations by the Corps.

3. ASSURANCE OF NAVIGATION AND MAINTENANCE: The Permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structures or work herein authorized, or if in the opinion of the Secretary of the Army or his authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the Permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

4. SEA TURTLE AND SMALLTOOTH SAWFISH CONDITIONS: The Permittee shall comply with National Marine Fisheries Service's "Sea Turtle and Smalltooth Sawfish Construction Conditions," dated March 23, 2006, attached to this permit.

5. MANATEE CONDITIONS: The Permittee shall abide by the enclosed standard construction conditions designed to protect the endangered West Indian manatee, 2011, attached to this permit.

6. POSTING OF PERMIT: The Permittee shall ensure that all contractors, sub-contractors, and entities associated with the implementation of the project review, understand, and comply with the approved plans and special conditions made part of this permit. The Permittee shall inform all parties associated with the activity of the construction area boundaries. Complete copies of the permit and approved plans shall be available at the construction site at all times. Failure to comply with the approved plans and permit special conditions may subject the Permittee to enforcement action.

7. AGENCY CHANGES/APPROVALS: Should any other agency require and/or approve changes to the work authorized or obligated by this permit, the Permittee is advised a re-verification to this permit instrument is required prior to initiation of those changes. It is the Permittee's responsibility to request a re-verification of this permit from the Miami Permits Section. The Corps reserves the right to fully evaluate, amend, and approve or deny the request for re-verification of this permit.

8. HISTORIC PROPERTIES:

a. No structure or work shall adversely affect impact or disturb properties listed in the National Register of Historic Places

(NRHP) or those eligible for inclusion in the NRHP.

b. If during the ground disturbing activities and construction work within the permit area, there are archaeological/cultural materials encountered which were not the subject of a previous cultural resources assessment survey (and which shall include, but not be limited to: pottery, modified shell, flora, fauna, human remains, ceramics, stone tools or metal implements, dugout canoes, evidence of structures or any other physical remains that could be associated with Native American cultures or early colonial or American settlement), the Permittee shall immediately stop all work and ground-disturbing activities within a 100-meter diameter of the discovery and notify the Corps within the same business day (8 hours). The Corps shall then notify the Florida State Historic Preservation Officer (SHPO) and the appropriate Tribal Historic Preservation Officer(s) (THPO(s)) to assess the significance of the discovery and devise appropriate actions.

c. Additional cultural resources assessments may be required of the permit area in the case of unanticipated discoveries as referenced in accordance with the above Special Condition ; and if deemed

necessary by the SHPO, THPO(s), or Corps, in accordance with 36 CFR 800 or 33 CFR 325, Appendix C (5). Based, on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume on non-federal lands without written authorization from the SHPO for finds under his or her jurisdiction, and from the Corps.

d. In the unlikely event that unmarked human remains are identified on non-federal lands, they will be treated in accordance with Section 872.05 Florida Statutes. All work and ground disturbing activities within a 100-meter diameter of the unmarked human remains shall immediately cease and the Permittee shall immediately notify the medical examiner, Corps, and State Archeologist within the same business day (8-hours). The Corps shall then notify the appropriate SHPO and THPO(s). Based, on the circumstances of the discovery, equity to all parties, and considerations of the public interest, the Corps may modify, suspend or revoke the permit in accordance with 33 CFR Part 325.7. Such activity shall not resume without written authorization from the State Archeologist and from the Corps.

9. **FILL MATERIAL:** The Permittee shall use only clean fill material for this project. The fill material shall be free from items such as trash, debris, automotive parts, asphalt, construction materials, concrete block with exposed reinforcement bars, and soils contaminated with any toxic substance, in toxic amounts in accordance with Section 307 of the Clean Water Act.

10. **BEST MANAGEMENT PRACTICE (BMP):** Environmental controls and BMP must be implemented to properly contain construction materials and prevent fugitive particulates from entering surrounding waters during the construction. . Prior to the initiation of any work authorized by this permit, the Permittee shall install erosion control measures along the perimeter of all work areas to prevent the displacement of fill material outside the work area into waters of the United States.

11. **DAYLIGHT HOURS:** All activities must be completed during daylight hours.

12. **SPECIES REPORTING:** Any collision(s) with and/or injuries to any sea turtle, sawfish, whale, or sturgeon occurring during the construction of a project, shall be reported immediately to NMFS's Protected Resources Division (PRD) at (727-824-5312) or by email to takereport.nmfs@noaa.gov and CESAJComplyDocs@usace.army.mil. Sea turtle and marine mammal stranding/rescue organizations' contact information is available by region at <http://www.nmfs.noaa.gov/pr/health/networks.htm>. Smalltooth sawfish encounters shall be reported to <http://www.flmnh.ufl.edu/fish/sharks/sawfish/sawfishencounters.html>.

*Failure to report take of a federally listed threatened or endangered species may lead to suspension, revocation, or modification of this authorization. (From Section 3(18) of the Federal Endangered Species Act: The term 'take' means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.)

13. **MARINE LIFE ENTRAPMENT:** Neither structure nor material or the method of construction shall pose more than minimal risk of entrapping fish, marine turtles, or marine mammals. In-water lines must be industrial grade metal or heavy cables that do not readily loop and tangle. All in-water lines (rope and cable) must be rigid and cannot have excess line in the water. Lines may be enclosed in a plastic or rubber sleeve/tube to add rigidity.

14. NOISE EFFECTS BMPS: All projects shall comply with the requirements of the attached “Noise Best Management Practices (BMPs) for Piling Installation” (Attached).

15. TURBIDITY CONTROLS:

- a. Shall be used throughout construction to control erosion and siltation and ensure that turbidity levels within the project area do not exceed background conditions.
- b. Shall be made of material in which listed species cannot become entangled (i.e., reinforced impermeable polycarbonate vinyl fabric [PVC]), and shall be monitored to ensure listed species are not entangled or trapped in the project area.
- c. Shall be removed promptly when the work is complete and the water quality in the project area has returned to background conditions.
- d. Shall not block entry to or exit from designated critical habitat.

16. PROJECT APPROVED DRAWINGS: The project must be completed in accordance with the attached submitted plans (10 pages) date stamped March 06, 2018 by the Corps and the general and special conditions which are incorporated in, and made a part of this authorization.

This authorization does not include conditions that would prevent the ‘take’ of a state-listed fish or wildlife species. These species are protected under sec. 379.411, Florida Statutes, and listed under Rule 68A-27, Florida Administrative Code. With regard to fish and wildlife species designated as species of special concern or threatened by the State of Florida, you are responsible for coordinating directly with the Florida Fish and Wildlife Conservation Commission (FWC). Permittees can visit the FWC license and permitting webpage (<http://www.myfwc.com/license/wildlife/>) for more information, including a list of those fish and wildlife species designated as species of special concern or threatened. The Florida Natural Areas Inventory (<http://www.fnai.org/>) also maintains updates lists, by country, of documented occurrences of those species.

This letter of authorization does not give absolute Federal authority to perform the work as specified on your application. The proposed work may be subject to local building restrictions mandated by the National Flood Insurance Program. You should contact your local office that issues building permits to determine if your site is located in a flood-prone area, and if you must comply with the local building requirements mandated by the National Flood Insurance Program.

If you are unable to access the internet or require a hardcopy of any of the conditions, limitations, or expiration date for the above referenced NW please contact me.

Please save this email message for your records. Should you have any question, please do not hesitate to contact me.

Thank you for your cooperation with our permit program

Respectfully,

Gletys Guardia-Montoya
Project Manager

U.S. Army Corps of Engineers
Miami Permits Section
9900 SW 107th Avenue, Suite 203
Miami, FL 33176
(O) 305-526-2515
(C) 786-428-4889

*NOTICE: As of October 01, 2017, the Corps will no longer accept joint applications from the Florida Department of Environmental Protection and Water Management Districts. All applications must be made via the ENG 4345 form and submitted to tampareg@usace.army.mil. Download the ENG 4345 application form here:

http://www.saj.usace.army.mil/Portals/44/docs/regulatory/sourcebook/permitting/forms/Applications/Eng_Form_4345_DEC_2014.pdf

Download the application checklist here:

http://www.saj.usace.army.mil/Portals/44/docs/regulatory/sourcebook/permitting/forms/Checklists/Checklist_ENG4345fillable.pdf

ELECTRONIC SUBMITTAL OPTIONS:

Send NEW PERMIT APPLICATIONS and MODIFICATION REQUESTS to SEAPPLS@usace.army.mil.

Send all COMPLIANCE-RELATED documents to SAJ-RD-Enforcement@usace.army.mil.

Emailing a File over 10MB? Please use our Safe Access File Exchange: <https://safe.amrdec.army.mil/safe>.

Let us know how we're doing! Complete this brief survey:

http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey

From: [Joanne Delaney - NOAA Affiliate](#)
To: [Frodsham, Dave](#)
Cc: [McGahee, Stuart](#); [MartinezRivera, Francisco](#); [Steve McAlearney \(smcalearney@cityofkeywest-fl.gov\)](#); [Gus Rios \(Gus.Rios@dep.state.fl.us\)](#); [Guardia-Montoya, Gletys CIV USARMY CESAJ \(US\)](#)
Subject: [Non-DoD Source] Re: Permit Applications for Seawall - Key West Aquarium
Date: Wednesday, January 31, 2018 11:31:30 AM

Thank you, Dave, for this additional information. I understand from our previous conversations that the wall is extremely deteriorated and risks damaging water quality of the sanctuary if left unrepaired much longer. As I noted below, there is extremely small likelihood that corals would be present in this partially enclosed basin.

The seawall repairs themselves are exempt from FKNMS regulations at 15 CFR 922.163(a)(3). Therefore, this project may proceed without further review or approval from NOAA FKNMS.

Please contact me if the project plans change or you have any questions about this determination.

Thank you for your continued cooperation with FKNMS.

Sincerely,
Joanne

Joanne Delaney
Resource Protection and Permit Coordinator
NOAA/Florida Keys National Marine Sanctuary
joanne.delaney@noaa.gov <<mailto:joanne.delaney@noaa.gov>>
(305) 809-4714
floridakeys.noaa.gov <Blockedhttp://floridakeys.noaa.gov>
Join us on Facebook <Blockedhttps://www.facebook.com/floridakeysnoaa.gov>
Follow us on Twitter <Blockedhttps://twitter.com/FloridaKeysNMS>

On Wed, Jan 31, 2018 at 11:26 AM, Frodsham, Dave <Dave.Frodsham@tetrattech.com> <<mailto:Dave.Frodsham@tetrattech.com>> wrote:

Good Morning Joanne,

I can assure you there are no seagrasses or mangroves within the repair footprint. However, with regard to corals I am uncertain; I did not see any, though I did not have a good vantage point. This wall is in a significantly deteriorated, and we are making a case for an emergency repair for hurricane damages per the Governor's Executive Order at that location to shore up the property adjacent to the damaged wall and prevent the uplands from falling in the water. Please see attached photos.

Thank you,

From: Guardia-Montoya, Gletys CIV USARMY CESAJ (US)
To: ["nmfs.ser_statewideprogrammatic - NOAA Service Account"](#)
Cc: [Jaxbo](#)
Subject: Hurricane Irma Emergency Permit Request-JAXBO-PDCs-SAJ-2017-03332 (City of Key West-Key West Aquarium) Loc. @ 1 Whitehead St., Key West, Monroe County, FL 33040- Seawall Repair
Date: Thursday, February 1, 2018 1:21:00 PM
Attachments: [20180201-H_Irma_Emergency_Permit_Request_PCN-.pdf](#)
[20180201-JaxBO_PDC_Checklist-Activity_1.SHORELINE_STABILIZATION - Copy.pdf](#)
[20180201-JaxBO_PDC_Checklist-Summary_Sheet-KW_Aquarium.pdf](#)
[20180126-PLANS \(10 Pages\).pdf](#)
[20180131-FKNMS_EXEMPT_Seawall_Repair- Key West Aquarium..pdf](#)
[20180131-Site_Images_provided_by_the_Applicant..docx](#)

Good afternoon,

Please see attached subject documents. The project is being reviewed under the Hurricane Irma Emergency Response, Yellow category. As proposed the project qualifies under the NW 3 review. Should you have any question, please do not hesitate to contact me.

Respectfully,

Gletys Guardia-Montoya
Project Manager
U.S. Army Corps of Engineers
Miami Permits Section
9900 SW 107th Avenue, Suite 203
Miami, FL 33176
(O) 305-526-2515
(C) 786-428-4889

*NOTICE: As of October 01, 2017, the Corps will no longer accept joint applications from the Florida Department of Environmental Protection and Water Management Districts. All applications must be made via the ENG 4345 form and submitted to tampareg@usace.army.mil. Download the ENG 4345 application form here:
http://www.saj.usace.army.mil/Portals/44/docs/regulatory/sourcebook/permitting/forms/Applications/Eng_Form_4345_DEC_2014.pdf

Download the application checklist here:
http://www.saj.usace.army.mil/Portals/44/docs/regulatory/sourcebook/permitting/forms/Checklists/Checklist_ENG4345fillable.pdf

ELECTRONIC SUBMITTAL OPTIONS:

Send NEW PERMIT APPLICATIONS and MODIFICATION REQUESTS to SEAPPLS@usace.army.mil.
Send all COMPLIANCE-RELATED documents to SAJ-RD-Enforcement@usace.army.mil.
Emailing a File over 10MB? Please use our Safe Access File Exchange: <https://safe.amrdec.army.mil/safe>.

Let us know how we're doing! Complete this brief survey:
http://corpsmapu.usace.army.mil/cm_apex/f?p=regulatory_survey

GENERAL CONDITIONS
33 CFR PART 320-330
PUBLISHED FR DATED 13 NOVEMBER 1986

1. The time limit for completing the work authorized ends on **September 10, 2019**. If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.
2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.
3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.
4. If you sell the property associated with this permit you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.
5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.
6. You must allow a representative from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit.

STANDARD MANATEE CONDITIONS FOR IN-WATER WORK

2011

The permittee shall comply with the following conditions intended to protect manatees from direct project effects:

- a. All personnel associated with the project shall be instructed about the presence of manatees and manatee speed zones, and the need to avoid collisions with and injury to manatees. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the Marine Mammal Protection Act, the Endangered Species Act, and the Florida Manatee Sanctuary Act.
- b. All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while in the immediate area and while in water where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will follow routes of deep water whenever possible.
- c. Siltation or turbidity barriers shall be made of material in which manatees cannot become entangled, shall be properly secured, and shall be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.
- d. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.
- e. Any collision with or injury to a manatee shall be reported immediately to the Florida Fish and Wildlife Conservation Commission (FWC) Hotline at 1-888-404-3922. Collision and/or injury should also be reported to the U.S. Fish and Wildlife Service in Jacksonville (1-904-731-3336) for north Florida or Vero Beach (1-772-562-3909) for south Florida, and to FWC at ImperiledSpecies@myFWC.com
- f. Temporary signs concerning manatees shall be posted prior to and during all in-water project activities. All signs are to be removed by the permittee upon completion of the project. Temporary signs that have already been approved for this use by the FWC must be used. One sign which reads *Caution: Boaters* must be posted. A second sign measuring at least 8 ½" by 11" explaining the requirements for "Idle Speed/No Wake" and the shut down of in-water operations must be posted in a location prominently visible to all personnel engaged in water-related activities. These signs can be viewed at MyFWC.com/manatee. Questions concerning these signs can be sent to the email address listed above.

CAUTION: MANATEE HABITAT

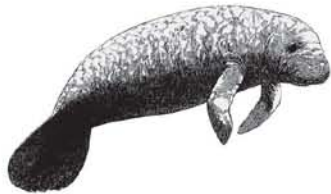
All project vessels

IDLE SPEED / NO WAKE

When a manatee is within 50 feet of work
all in-water activities must

SHUT DOWN

Report any collision with or injury to a manatee:



Wildlife Alert:

1-888-404-FWCC(3922)

cell *FWC or #FWC

U.S. Army Corps of Engineers Jacksonville District's Programmatic Biological Opinion (JaxBO) Project Design Criteria (PDCs) for In-Water Activities

November 20, 2017

- 1) **(AP.7.) Education and Observation:** The permittee must ensure that all personnel associated with the project are instructed about the potential presence of species protected under the ESA and the Marine Mammal Protection Act (MMPA). All on-site project personnel are responsible for observing water-related activities for the presence of protected species. All personnel shall be advised that there are civil and criminal penalties for harming, harassing, or killing ESA-listed species or marine mammals. To determine which species may be found in the project area, please review the relevant Protected Species List at:
http://sero.nmfs.noaa.gov/protected_resources/section_7/threatened_endangered/index.html
- 2) **(AP.8.) Reporting** of interactions with protected species:
 - a) Any collision(s) with and/or injury to any sea turtle, sawfish, whale, or sturgeon occurring during the construction of a project, shall be reported immediately to NMFS's Protected Resources Division (PRD) at (1-727-824-5312) or by email to takereport.nmfs@noaa.gov and SAJ-RD-Enforcement@usace.army.mil.
 - b) Smalltooth sawfish: Report sightings to 1-844-SAWFISH or email Sawfish@MyFWC.com
 - c) Sturgeon: Report dead sturgeon to 1-844-STURG 911 (1-844-788-7491) or email nmfs.ser.sturgeonnetwork@noaa.gov
 - d) Sea turtles and marine mammals: Report stranded, injured, or dead animals to 1-877-WHALE HELP (1-877-942-5343).
 - e) North Atlantic right whale: Report injured, dead, or entangled right whales to the USCG via VHF Channel 16.
- 3) **(AP.9.) Vessel Traffic and Construction Equipment:** All vessel operators must watch for and avoid collision with species protected under the ESA and MMPA. Vessel operators must avoid potential interactions with protected species and operate in accordance with the following protective measures:
 - a) *Construction Equipment:*
 - i) All vessels associated with the construction project shall operate at "Idle Speed/No Wake" at all times while operating in water depths where the draft of the vessel provides less than a 4-foot (ft) clearance from the bottom, and in all depths after a protected species has been observed in and has departed the area.
 - ii) All vessels will follow marked channels and/or routes using the maximum water depth whenever possible.
 - iii) Operation of any mechanical construction equipment, including vessels, shall cease immediately if a listed species is observed within a 50-ft radius of

construction equipment and shall not resume until the species has departed the area of its own volition.

- iv) If the detection of species is not possible during certain weather conditions (e.g., fog, rain, wind), then in-water operations will cease until weather conditions improve and detection is again feasible.

b) *All Vessels:*

- i) Sea turtles: Maintain a minimum distance of 150 ft.
- ii) North Atlantic right whale: Maintain a minimum 1,500-ft distance (500 yards).
- iii) Vessels 65 ft in length or longer must comply with the Right Whale Ship Strike Reduction Rule (50 CFR 224.105) which includes reducing speeds to 10 knots or less in Seasonal Management Areas (<http://www.fisheries.noaa.gov/pr/shipstrike/>).
- iv) Mariners shall check various communication media for general information regarding avoiding ship strikes and specific information regarding right whale sightings in the area. These include NOAA weather radio, USCG NAVTEX broadcasts, and Notices to Mariners.
- v) Marine mammals (i.e., dolphins, whales [other than North Atlantic right whales], and porpoises): Maintain a minimum distance of 300 ft.
- vi) When these animals are sighted while the vessel is underway (e.g., bow-riding), attempt to remain parallel to the animal's course. Avoid excessive speed or abrupt changes in direction until they have left the area.
- vii) Reduce speed to 10 knots or less when mother/calf pairs or groups of marine mammals are observed, when safety permits.

- 4) **(AP.10.) Turbidity Control Measures during Construction:** Turbidity must be monitored and controlled. Prior to initiating any of the work covered under this Opinion, the Permittee shall install turbidity curtains as described below. In some instances, the use of turbidity curtains may be waived by the USACE project manager if the project is deemed too minimal to generate turbidity (e.g., certain ATON installation, scientific survey device placement, marine debris removal) or if the current is too strong for the curtains to stay in place. Turbidity curtains specifications:

- a) Install floating turbidity barriers with weighted skirts that extend to within 1 ft of the bottom around all work areas that are in, or adjacent to, surface waters.
- b) Use these turbidity barriers throughout construction to control erosion and siltation and ensure that turbidity levels within the project area do not exceed background conditions.
- c) Position turbidity barriers in a way that does not block species' entry to or exit from designated critical habitat.
- d) Monitor and maintain turbidity barriers in place until the authorized work has been completed and the water quality in the project area has returned to background conditions.
- e) In the range of ESA-listed corals (St. Lucie Inlet, Martin County south to the Dry Tortugas and the U.S. Caribbean) and Johnson's seagrass (Turkey Creek/Palm

Bay south to central Biscayne Bay in the lagoon systems on the east coast of Florida):

- i) Projects that include upland earth moving (e.g., grading to install a building or parking lot associated with a dock and seawall project), must install sediment control barriers to prevent any upland sediments from reaching estuarine or marine waters.
 - ii) The turbidity curtain requirement cannot be waived for any project that moves or removes sediment (e.g., dredging, auger to create a pile, trenching to install a cableline). If turbidity curtains are not feasible in an area based on site conditions such as water current, high wave action, or stormy conditions, the project must undergo individual Section 7 consultation and is not covered under this Programmatic Opinion.
- 5) **(AP.11.) Entanglement:** All turbidity curtains and other in-water equipment must be properly secured with materials that reduce the risk of entanglement of marine species (described below). Turbidity curtains likewise must be made of materials that reduce the risk of entanglement of marine species.
- a) In-water lines (rope, chain, and cable, including the lines to secure turbidity curtains) must be stiff, taut, and non-looping. Examples of such lines are heavy metal chains or heavy cables that do not readily loop and tangle. Flexible in-water lines, such as nylon rope or any lines that could loop or tangle, must be enclosed in a plastic or rubber sleeve/tube to add rigidity and prevent the line from looping and tangling. In all instances, no excess line is allowed in the water.
 - b) Turbidity curtains and other in-water equipment must be placed in a manner that does not entrap species within the construction area or block access for them to navigate around the construction area.

Noise Best Management Practices (BMPs) for Piling Installation

The following best management practices are designed to reduce the exposure to sea turtles, smalltooth sawfish, and sturgeon to potential harmful daily noise exposure levels associated with pile driving during dock and seawall construction activities.

Noise BMP Plan A (For all projects): Sea Turtle, Smalltooth Sawfish, and Sturgeon Construction Conditions

The permittee shall comply with the following protected species construction conditions:

- a. All construction personnel are responsible for observing water-related activities to detect the presence of these species.
- b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing species protected under the Endangered Species Act of 1973.
- c. Siltation barriers shall be made of material in which protected species cannot become entangled, be properly secured, and be regularly monitored to avoid protected species' entrapment. Barriers may not block protected species entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service's Protected Resources Division, St. Petersburg, Florida.
- d. If a protected species is seen within 100 yd of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 ft of a protected species. Operation of any mechanical construction equipment shall cease immediately if a protected species is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.
- e. Any injury to a protected species shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.
- f. All work must occur during daylight hours.

Noise BMP Plan B (for Impact Pile-Driving Installation of 6 or More Concrete Piles per Day)

The permittee shall follow all conditions defined in the Noise BMP Plan A above plus the conditions provided below:

1. It must be determined if the project occurs in open water or a confined space. This differentiation is important because if a project occurs in a confined space, an animal may not move through or past a noise source to escape it. A *confined space* is defined as any area that has a solid object (e.g., shoreline, seawall, jetty) or structure within 150 feet (ft) of the pile installation site that would effectively serve as a barrier or otherwise prevent animals from moving past it to exit the area. This does not include objects such as docks or other pile-supported structures that would not stop animal movement or significantly reflect noise.
2. If the project is located in open water, up to 10 concrete piles measuring up to 24-in diameter may be installed per day.
3. If the project is located in a confined space, up to 5 concrete piles measuring up to 24-in diameter may be installed per day.
4. If more than 5 piles will be installed per day in a confined space, noise abatement measures (below) are required for all of the concrete piles installed that day with a maximum of 10 piles installed per day.

Noise Abatement Measures: Approved noise abatement measures include noise attenuation piles (TNAP) and/or bubble curtains.

TNAP design must be constructed of a double-walled tubular casing (a casing within a larger casing), with at least a 5-in-wide hollow space completely filled with closed-cell foam or other noise dampening material between the walls. The TNAP must be long enough to be seated firmly on the sea bottom, fit over the pile being driven, and extend at least 3 ft above the surface of the water.

Bubble curtain design must adhere to the guidelines for unconfined and confined bubble curtains defined below, and be followed as detailed in the USACE permit application. The use of *any* other alternative noise control method must receive prior approval by NMFS and the USACE.

If the required noise abatement measure discussed above cannot be used, then the pile must be installed by a different method using the appropriate noise BMPs defined in this document. (e.g., concrete piles may be installed by vibratory hammer instead, following BMP Plan A).

Bubble Curtain Specifications for Pile Driving

When using an impact hammer to drive or proof concrete piles, use one of the following sound attenuation methods:

1. If water velocity is equal to or less than 1.6 ft per second (1.1 miles per hour) for the entire installation period, surround the pile being driven by a confined or

unconfined bubble curtain that will distribute small air bubbles around 100% of the pile perimeter for the full depth of the water column.

- a. General - An unconfined bubble curtain is composed of an air compressor(s), supply lines to deliver the air, distribution manifolds or headers, perforated aeration pipe, and a frame. The frame facilitates transport and placement of the system, keeps the aeration pipes stable, and provides ballast to counteract the buoyancy of the aeration pipes in operation.
- b. The aeration pipe system shall consist of multiple layers of perforated pipe rings, stacked vertically in accordance with the following:

Water Depth (m)	No. of Layers
0 to less than 5	2
5 to less than 10	4
10 to less than 15	7
15 to less than 20	10
20 to less than 25	13

- c. The pipes in all layers shall be arranged in a geometric pattern which shall allow for the pile being driven to be completely enclosed by bubbles for the full depth of the water column and with a radial dimension such that the rings are no more than 0.5 m from the outside surface of the pile.
 - i. The lowest layer of perforated aeration pipe shall be designed to ensure contact with the substrate without burial and shall accommodate sloped conditions.
 - ii. Air holes shall be 1.6 millimeter (mm) (1/16-in) in diameter and shall be spaced approximately 20 mm (3/4 in) apart. Air holes with this size and spacing shall be placed in 4 adjacent rows along the pipe to provide uniform bubble flux.
 - iii. The system shall provide a bubble flux 3.0 m³ per minute per linear meter of pipe in each layer (32.91 ft³ per minute per lin ft of pipe in each layer). The total volume of air per layer is the product of the bubble flux and the circumference of the ring:

$$V_t = 3.0 \text{ m}^3/\text{min}/\text{m} * \text{Circumference of the aeration ring in m}$$
 or

$$V_t = 32.91 \text{ ft}^3/\text{min}/\text{ft} * \text{Circumference of the aeration ring in ft}$$
 - iv. Meters shall be provided as follows:

- Pressure meters shall be installed at all inlets to aeration pipelines and at points of lowest pressure in each branch of the aeration pipeline.

- Flow meters shall be installed in the main line at each compressor and at each branch of the aeration pipelines at each inlet. In applications where the feed line from the compressor is continuous from the compressor to the aeration pipe inlet, the flow meter at the compressor can be eliminated.

Flow meters shall be installed according to the manufacturer's recommendation based on either laminar flow or non-laminar flow.

2. If water velocity is greater than 1.6 ft per second (1.1 miles per hour) at any point during installation or if constructing a seawall, surround the pile or area being driven by a confined bubble curtain (e.g., a bubble ring surrounded by a fabric or non-metallic sleeve). The confined bubble curtain will distribute air bubbles around 100% of the pile perimeter for the full depth of the water column, according to specifications below.
 - a. General - A confined bubble curtain is composed of an air compressor(s), supply lines to deliver the air, distribution manifolds or headers, perforated aeration pipe(s), and a means of confining the bubbles.
 - b. The confinement shall extend from the substrate to a sufficient elevation above the maximum water level expected during pile installation such that when the air delivery system is adjusted properly, the bubble curtain does not act as a water pump (i.e., little or no water should be pumped out of the top of the confinement system).
 - c. The confinement shall contain resilient pile guides that prevent the pile and the confinement from coming into contact with each other and do not transmit vibrations to the confinement sleeve and into the water column (e.g., rubber spacers, air-filled cushions).
 - d. In-water less than 15 m deep, the system shall have a single aeration ring at the substrate level. In-waters greater than 15 m deep, the system shall have at least 2 rings: 1 at the substrate level and the other at mid-depth.
 - e. The lowest layer of perforated aeration pipe shall be designed to ensure contact with the substrate without sinking into the substrate and shall accommodate for sloped conditions.

- f. Air holes shall be 1.6 mm (1/16-in) in diameter and shall be spaced approximately 20 mm (3/4 in) apart. Air holes with this size and spacing shall be placed in 4 adjacent rows along the pipe to provide uniform bubble flux.
- g. The system shall provide a bubble flux of 2.0 m³ per minute per linear meter of pipe in each layer (21.53 ft³ per minute per lin ft of pipe in each layer). The total volume of air per layer is the product of the bubble flux and the circumference of the ring:

$$V_t = 2.0 \text{ m}^3/\text{min}/\text{m} * \text{Circumference of the aeration ring in m}$$

or

$$V_t = 21.53 \text{ ft}^3/\text{min}/\text{ft} * \text{Circumference of the aeration ring in ft}$$

- h. Flow meters shall be provided as follows:
Pressure meters shall be installed at all inlets to aeration pipelines and at points of lowest pressure in each branch of the aeration pipeline.
 - ii. Flow meters shall be installed in the main line at each compressor and at each branch of the aeration pipelines at each inlet. In applications where the feed line from the compressor is continuous from the compressor to the aeration pipe inlet, the flow meter at the compressor can be eliminated.
 - iii. Flow meters shall be installed according to the manufacturer's recommendation based on either laminar flow or non-laminar flow.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
263 13th Avenue South
St. Petersburg, FL 33701

SEA TURTLE AND SMALLTOOTH SAWFISH CONSTRUCTION CONDITIONS

The permittee shall comply with the following protected species construction conditions:

- a. The permittee shall instruct all personnel associated with the project of the potential presence of these species and the need to avoid collisions with sea turtles and smalltooth sawfish. All construction personnel are responsible for observing water-related activities for the presence of these species.
- b. The permittee shall advise all construction personnel that there are civil and criminal penalties for harming, harassing, or killing sea turtles or smalltooth sawfish, which are protected under the Endangered Species Act of 1973.
- c. Siltation barriers shall be made of material in which a sea turtle or smalltooth sawfish cannot become entangled, be properly secured, and be regularly monitored to avoid protected species entrapment. Barriers may not block sea turtle or smalltooth sawfish entry to or exit from designated critical habitat without prior agreement from the National Marine Fisheries Service's Protected Resources Division, St. Petersburg, Florida.
- d. All vessels associated with the construction project shall operate at "no wake/idle" speeds at all times while in the construction area and while in water depths where the draft of the vessel provides less than a four-foot clearance from the bottom. All vessels will preferentially follow deep-water routes (e.g., marked channels) whenever possible.
- e. If a sea turtle or smalltooth sawfish is seen within 100 yards of the active daily construction/dredging operation or vessel movement, all appropriate precautions shall be implemented to ensure its protection. These precautions shall include cessation of operation of any moving equipment closer than 50 feet of a sea turtle or smalltooth sawfish. Operation of any mechanical construction equipment shall cease immediately if a sea turtle or smalltooth sawfish is seen within a 50-ft radius of the equipment. Activities may not resume until the protected species has departed the project area of its own volition.
- f. Any collision with and/or injury to a sea turtle or smalltooth sawfish shall be reported immediately to the National Marine Fisheries Service's Protected Resources Division (727-824-5312) and the local authorized sea turtle stranding/rescue organization.
- g. Any special construction conditions, required of your specific project, outside these general conditions, if applicable, will be addressed in the primary consultation.

Revised: March 23, 2006

O:\forms\Sea Turtle and Smalltooth Sawfish Construction Conditions.doc



SELF-CERTIFICATION STATEMENT OF COMPLIANCE

Permit Number: SAJ- - (-)

Permittee's Name & Address (please print or type): _____

Telephone Number: _____

Location of the Work: _____

Date Work Started: _____ Date Work Completed: _____

**PROPERTY IS INACCESSIBLE WITHOUT PRIOR NOTIFICATION: YES _____ NO _____
TO SCHEDULE AN INSPECTION PLEASE CONTACT _____
AT _____**

Description of the Work (e.g. bank stabilization, residential or commercial filling, docks, dredging, etc.): _____

Acreage or Square Feet of Impacts to Waters of the United States: _____

Describe Mitigation completed (if applicable): _____

Describe any Deviations from Permit (attach drawing(s) depicting the deviations):

I certify that all work, and mitigation (if applicable) was done in accordance with the limitations and conditions as described in the permit. Any deviations as described above are depicted on the attached drawing(s).

Signature of Permittee

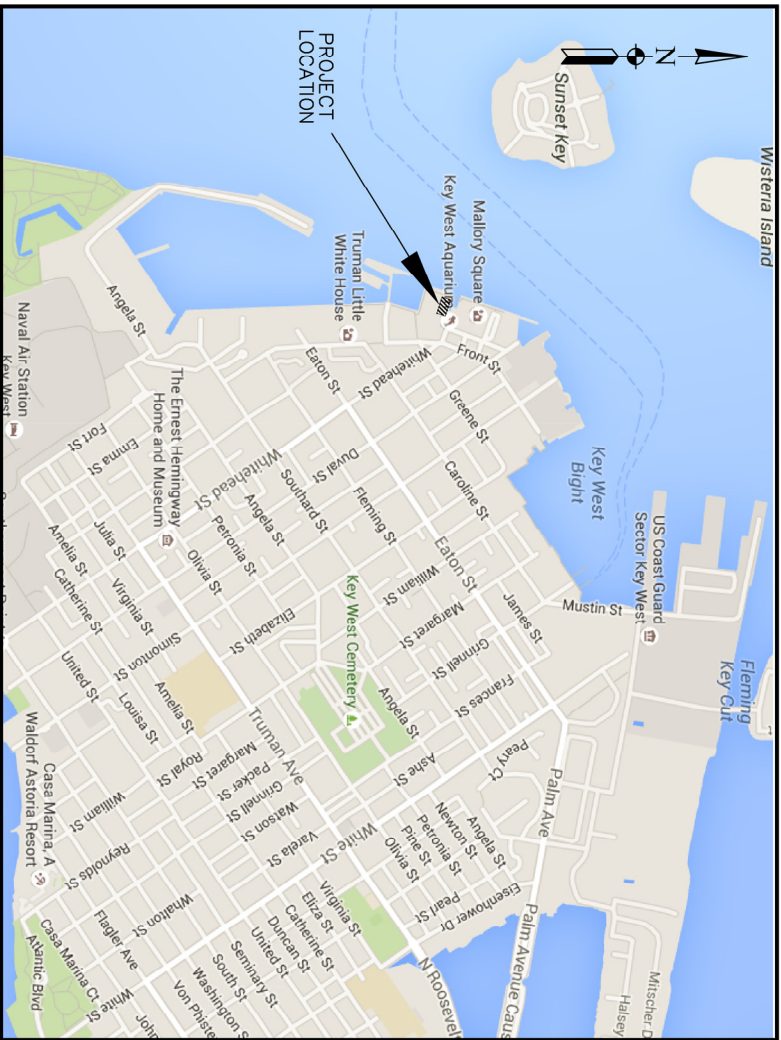
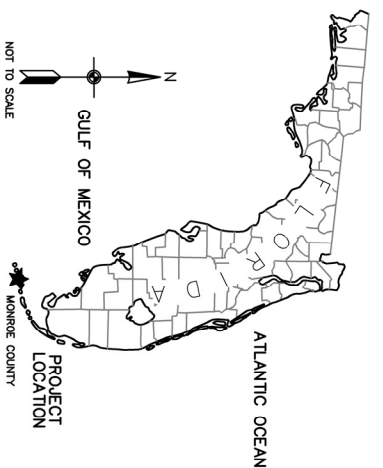
Full Name of Permittee (printed or typed)

Date



CITY OF KEY WEST KEY WEST AQUARIUM SEAWALL REPAIR

SEAWALL REPAIR PERMITTING



VICINITY MAP

KEY WEST AQUARIUM, KEY WEST, FLORIDA



CITY OF KEY WEST
KEY WEST AQUARIUM SEAWALL REPAIR
COVER SHEET AND VICINITY MAP
KEY WEST, MONROE COUNTY, FLORIDA



TETRA TECH, INC.
759 SOUTH FEDERAL HWY
SUITE 314
MIAMI, FL 33130
TEL: (772) 781-3400
FAX: (772) 781-3411
CERTIFICATE OF AUTHORIZATION
NO. 2429

INDEX OF SHEETS

SHEET #	TITLE	LATEST UPDATE	REV.
G-001	COVER SHEET AND VICINITY MAP	1/25/2018	0
G-002	KEY WEST AQUARIUM LOCATION AND ACCESS	1/24/2018	0
G-003	VICINITY MAP AND DIRECTIONS TO SITE	1/24/2018	0
G-004	USDA/NRCS SOL MAP	1/24/2018	0
C-101	SEAWALL PLAN VIEW (EXISTING CONDITIONS)	1/24/2018	0
C-102	SEAWALL DEMOLITION PLAN VIEW	1/24/2018	0
C-103	SEAWALL REPAIR DESIGN PLAN VIEW	1/24/2018	0
C-104	SEAWALL REPAIR CROSS-SECTIONS	1/24/2018	0
C-105	SEAWALL REPAIR CROSS-SECTIONS	1/24/2018	0
C-106	DETAILS	1/24/2018	0

FOR PERMITTING
NOT FOR CONSTRUCTION

Designed by:
Drawn By: F. MARTINEZ
Reviewed By: D. FRODISHAM
Date: 1/25/18
Design file no.: KMWPRBL_Cover_1.dwg
Scale: AS SHOWN

Sheet Reference:
G-001
Sheet 1 of 10



CITY OF KEY WEST
KEY WEST AQUARIUM SEAWALL REPAIR
 KEY WEST AQUARIUM LOCATION AND ACCESS
 KEY WEST, MONROE COUNTY, FLORIDA

TETRA TECH, INC.
 759 SOUTH FEDERAL HWY
 SUITE 314
 MIAMI, FL 33130
 TEL: (772) 781-3400
 FAX: (772) 781-3411
 NO. 2429

DESIGNED BY:
 F. MARTINEZ
 REVIEWED BY:
 D. FRODOSHAM
 DATE:
 1/24/18
 DESIGN FILE NO.:
 KMW/SEA_WALL/CONSTR/180101
 SCALE:
 AS SHOWN

SHEET REFERENCE:
G-002
 SHEET 2 OF 10





CITY OF KEY WEST
KEY WEST AQUARIUM SEAWALL REPAIR
 VICINITY MAP AND DIRECTIONS TO SITE
 KEY WEST, MONROE COUNTY, FLORIDA

TETRA TECH, INC.
 759 SOUTH FEDERAL HWY
 SUITE 317
 MIAMI, FL 33130
 TEL: (772) 781-3400
 FAX: (772) 781-3411
 CERTIFICATE OF AUTHORIZATION
 NO. 2429

Designed by:
 Drawn By: F. MARTINEZ
 Reviewed By: D. FRODOSHAM
 Date: 1/24/18
 Design file no.: KMW_PRRM_COVER_V1.DWG
 Scale: AS SHOWN

Sheet Reference:
G-003
 Sheet 3 of 10

10 min (1.8 miles)
 Via Eaton St
 Fastest route, despite the usual traffic

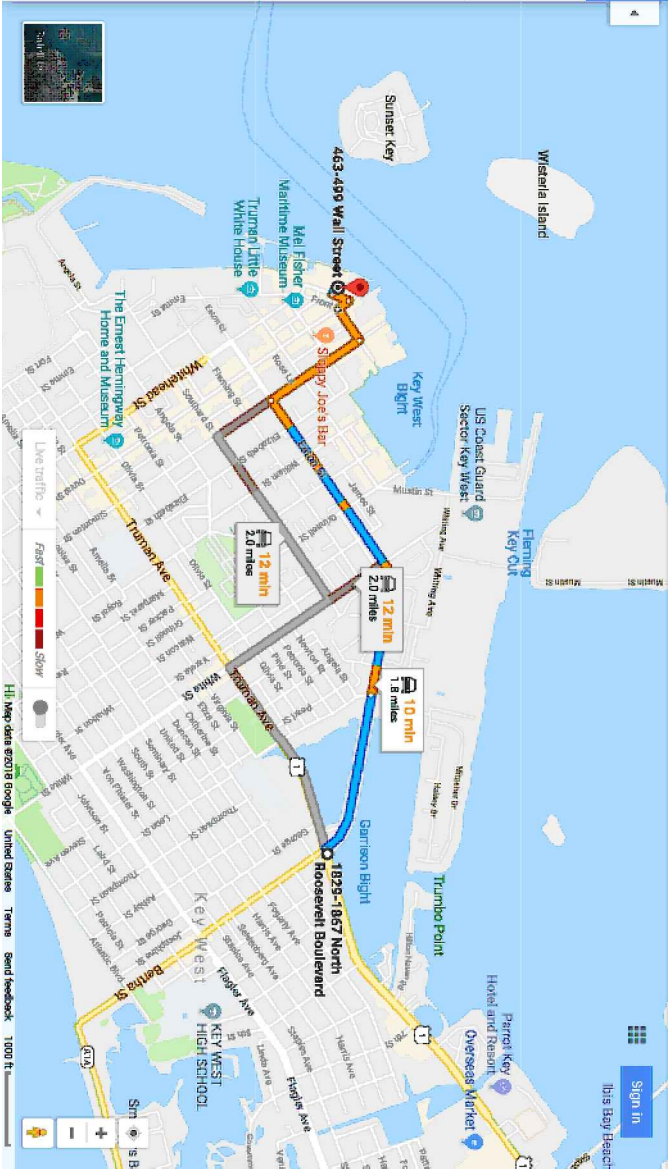
1829-1867 N Roosevelt Blvd
 Key West, FL 33040

Take Palm Avenue Causeway and Eaton St to
 Simonon St
 5 min (1.3 mi)

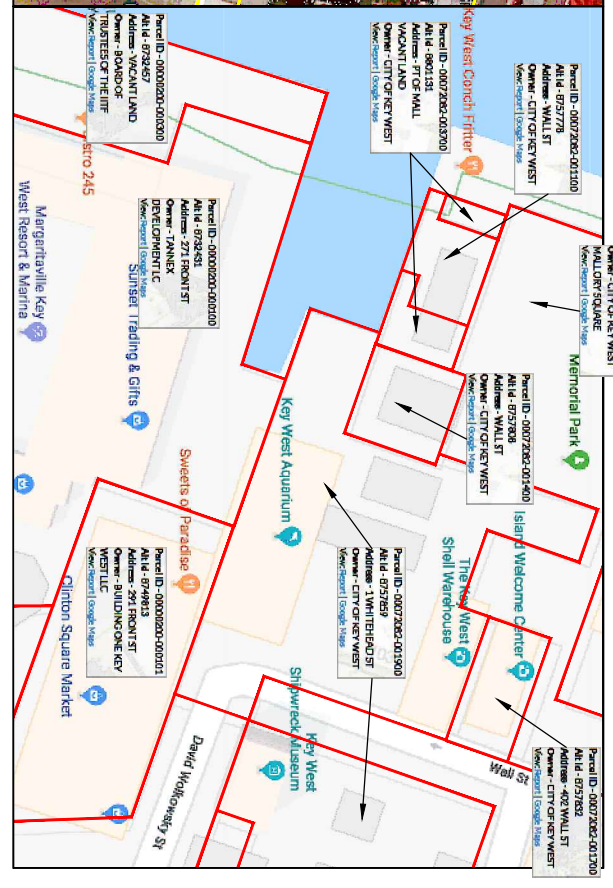
Continue on Simonon St to your destination
 5 min (0.5 mi)

463-499 Wall St
 Key West, FL 33040

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results and you should plan your route accordingly. You must obey all signs or notices regarding your route.



**FOR PERMITTING
 NOT FOR CONSTRUCTION**





Monroe County, Keys Area, Florida (FL987)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
5	Island/uda muck, tidal	9.5	0.2%
7	Udorthentic-Urban land complex	2172.0	6.3%
11	Urban land	1,539.2	35.2%
13	Keywaca very gravelly loam, extremely stony	21.5	0.5%
18	Beaches	10.5	0.2%
99	Water	18.2	0.4%
100	Waters of the Atlantic Ocean	2,181.5	50.2%
Subtotals for Soil Survey Area		4,042.3	93.0%
Totals for Area of Interest		4,345.4	100.0%

**PROJECT LOCATION -
RELEVANT SOIL
CLASSIFICATIONS:
#11 & #100**

11—Urban land
Map Unit Setting
 National map unit symbol: vth
 Elevation: 0 to 10 feet
 Frost-free period: 365 to 365 days
 Mean annual air temperature: 72 to 82 degrees F
 Frost-free period: 368 to 365 days
 Parent material: Urban land
 Formative classification: Not prime farmland

Map Unit Composition
 Urban land: 95 percent
 Water: 5 percent
 Estimates are based on observations, descriptions, and fragments of the mapunit.

Description of Urban Land
Setting
 Landform position (three-dimensional): Interfure, tall
 Down-slope shape: Linear
 Parent material: Urban land
Properties and qualities
 Slope: 0 to 1 percent
 Frequency of flooding: Rare
Inappropriate groups
 Land capability classification (rangeland): None specified
 Land capability classification (cropland): Foreign suitability group not assigned
 (G155AC099FL)

Minor Components
Usortments
 Landform position of map unit: 3 percent
 Landform position (three-dimensional): Interfure
 Down-slope shape: Convex
 Parent material: Urban land
 Other repetitive classification: Foreign suitability group not assigned
 (G155AC099FL)

Baches, tidal
 Landform position of map unit: 2 percent
 Landform position (three-dimensional): Rise
 Down-slope shape: Convex
 Parent material: Urban land
 Other repetitive classification: Foreign suitability group not assigned
 (G155AC099FL)

100—Waters of the Atlantic Ocean
Map Unit Composition
 Waters of the atlantic ocean: 100 percent
 Estimates are based on observations, descriptions, and fragments of the mapunit.

Description of Waters of the Atlantic Ocean
Inappropriate groups
 Land capability classification (rangeland): None specified
 Land capability classification (cropland): Foreign suitability group not assigned
 (G155AC099FL)

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NOT FOR CONSTRUCTION**



CITY OF KEY WEST
KEY WEST AQUARIUM SEAWALL REPAIR
 USDAN/RCS SOIL MAP
 KEY WEST, MONROE COUNTY, FLORIDA

TETRA TECH, INC.
 759 SOUTH FEDERAL HWY
 SUITE 314
 MIAMI, FL 33130
 TEL: (772) 781-3400
 FAX: (772) 781-3411
 CERTIFICATE OF AUTHORIZATION
 NO. 2429

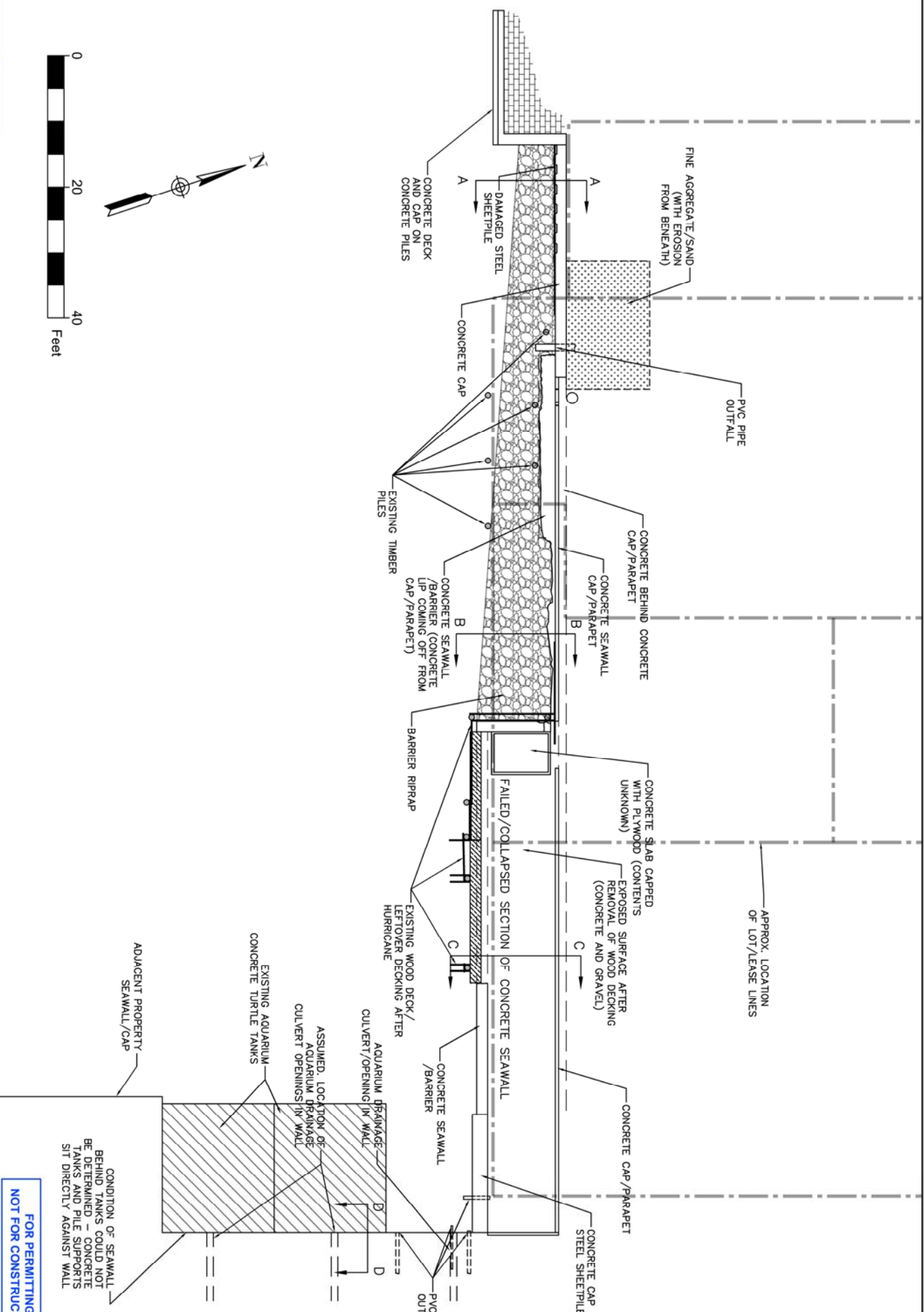
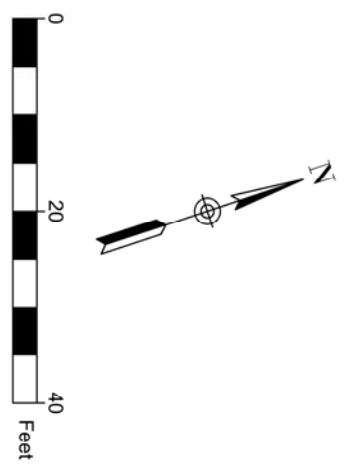
Designed by:
 Drawn By: F. MARTINEZ
 Reviewed By: D. FRODSHAM
 Date: 1/24/18
 Design file no.: KMW_PBL_DRAW_11.mxd
 Scale: AS SHOWN

Sheet Reference:
G-004
 Sheet 4 of 10



CITY OF KEY WEST
KEY WEST AQUARIUM SEAWALL REPAIR
 SEAWALL PLAN VIEW (EXISTING CONDITION)
 KEY WEST, MONROE COUNTY, FLORIDA

Tetra Tech, Inc.
 759 SOUTH FEDERAL HWY
 SUITE 314
 MIAMI, FL 33130
 TEL: (772) 781-3400
 FAX: (772) 781-3411
 NO. 2429
 CERTIFICATE OF AUTHORIZATION



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DESIGNED BY:
 F. MARTINEZ
 REVIEWED BY:
 D. FRODOSHAM
 DATE:
 1/24/18
 DESIGN FILE NO.:
 KMW/PRM/DESIGN/1806
 SCALE:
 AS SHOWN

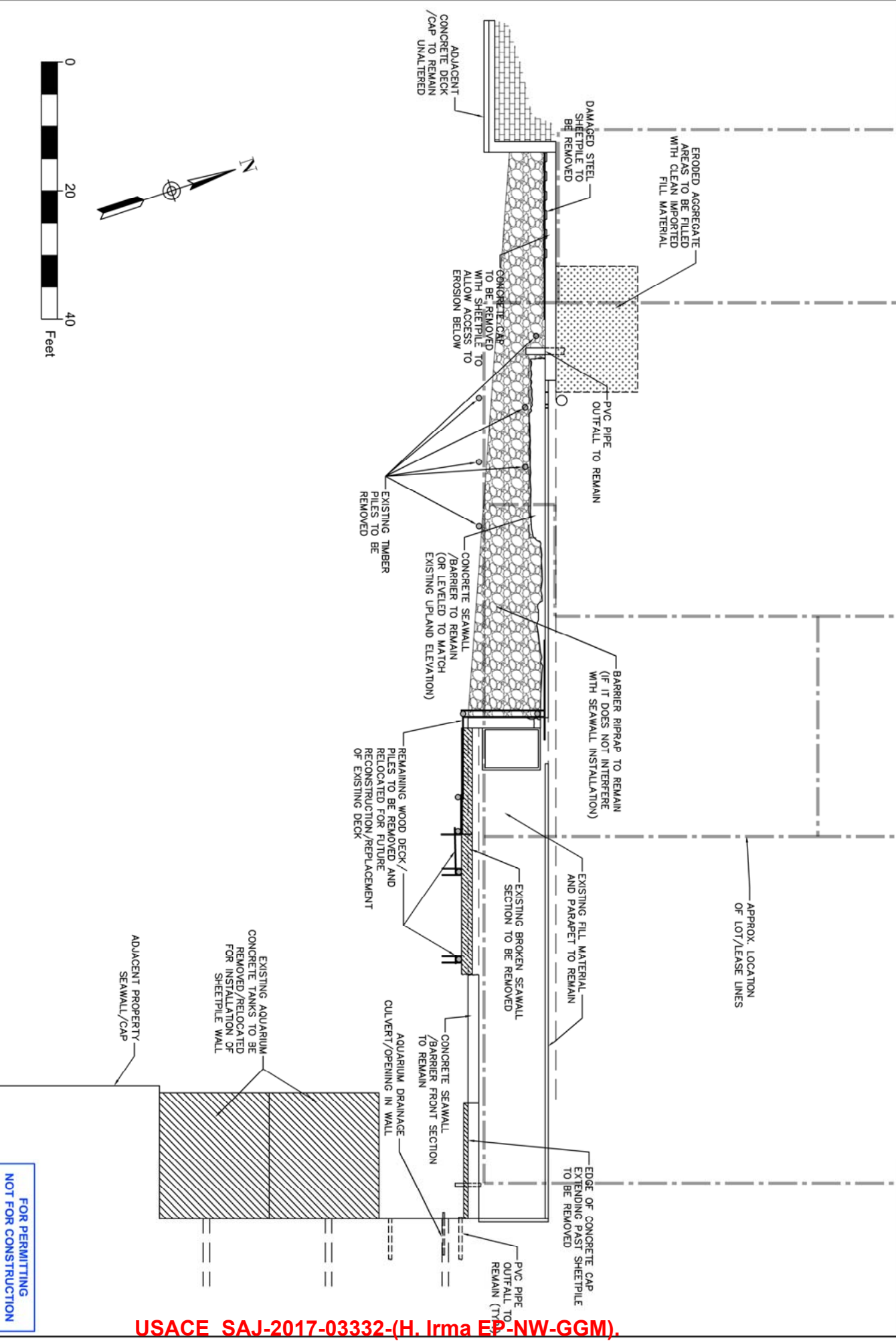
SHEET REFERENCE:
C-101
 SHEET 5 OF 10



CITY OF KEY WEST
 KEY WEST AQUARIUM SEAWALL REPAIR
 SEAWALL DEMOLITION PLAN VIEW
 KEY WEST, MONROE COUNTY, FLORIDA



TETRA TECH, INC.
 759 SOUTH FEDERAL HWY
 SUITE 314
 MIAMI, FL 33130
 TEL: (772) 781-3400
 FAX: (772) 781-3411
 NO. 2429
 CERTIFICATE OF AUTHORIZATION



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Designed by:

Drawn By: F. MARTINEZ

Reviewed By: D. FRODISHAM

Date: 1/24/18

Design file no.: KWA13848.DWG

Scale: AS SHOWN

Sheet Reference:

C-102

Sheet 6 of 10

P:\1071 OF KEY WEST\TASK 18_AQUARIUM SEAWALL\CAD\DWG\KWA13848.DWG



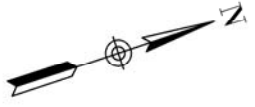
CITY OF KEY WEST
 KEY WEST AQUARIUM SEAWALL REPAIR
 SEAWALL REPAIR DESIGN PLAN VIEW
 KEY WEST, MONROE COUNTY, FLORIDA

TE TETRA TECH, INC.
 759 SOUTH FEDERAL HWY
 SUITE 314
 MIAMI, FL 33130
 TEL: (772) 781-3400
 FAX: (772) 781-3411
 NO. 2429
 CERTIFICATE OF AUTHORIZATION

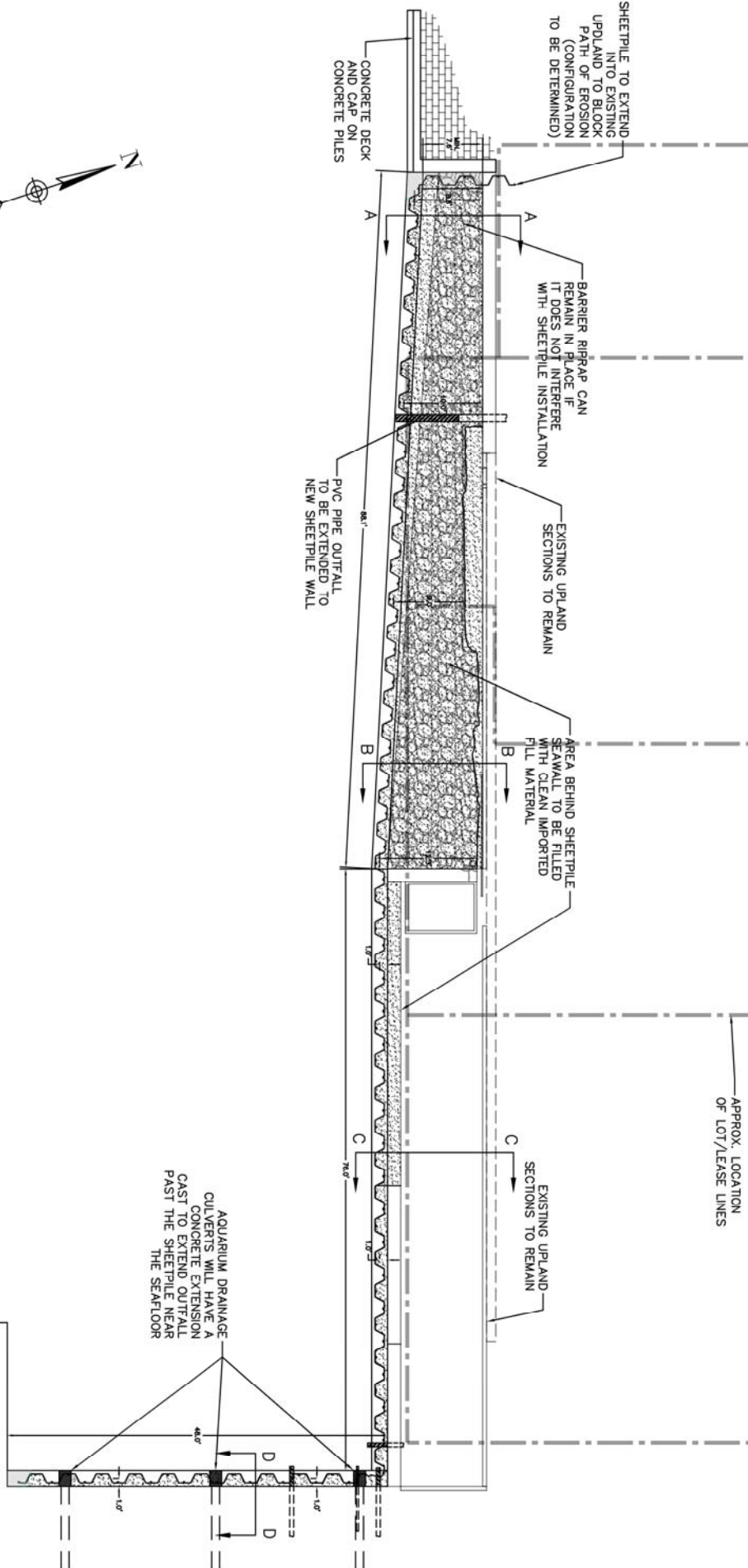
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 Drawn By: F. MARTINEZ
 Reviewed By: D. FRODOSHAM
 Date: 1/24/18
 Design file no.: KMWLPRR_Design_V17.rvt
 Scale: AS SHOWN

Sheet Reference:
C-103
 Sheet 7 of 10

**FOR PERMITTING
 NOT FOR CONSTRUCTION**



ADJACENT PROPERTY
 SEAWALL/CAP



AQUARIUM DRAINAGE
 CULVERTS WILL HAVE A
 CONCRETE EXTENSION
 CAST TO EXTEND OUTFALL
 PAST THE SHEETPILE NEAR
 THE SEAFLOOR

SHEETPILE TO EXTEND
 INTO EXISTING
 UPLAND TO BLOCK
 PATH OF EROSION
 (CONFIGURATION
 TO BE DETERMINED)

BARRIER RIPRAP CAN
 REMAIN IN PLACE IF
 IT DOES NOT INTERFERE
 WITH SHEETPILE INSTALLATION

EXISTING UPLAND
 SECTIONS TO REMAIN

AREA BEHIND SHEETPILE
 SEAWALL TO BE FILLED
 WITH CLEAN IMPORTED
 FILL MATERIAL

EXISTING UPLAND
 SECTIONS TO REMAIN

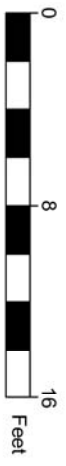
APPROX. LOCATION
 OF LOT/LEASE LINES



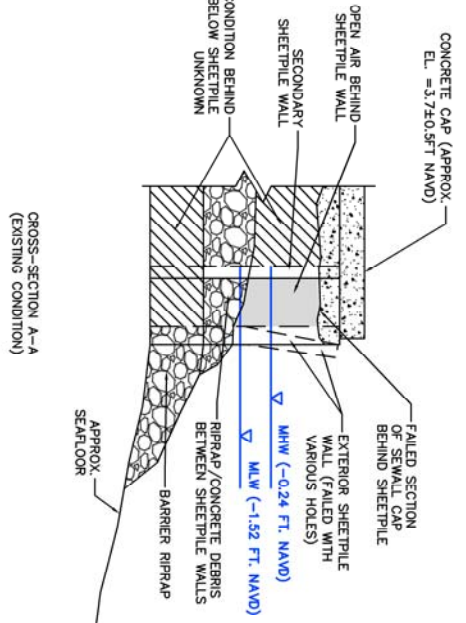
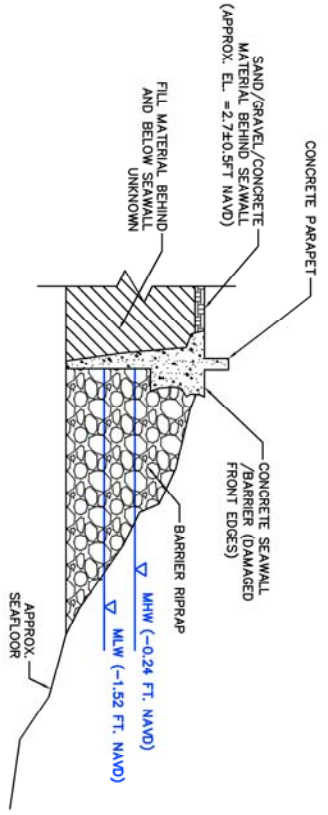
CITY OF KEY WEST
 KEY WEST AQUARIUM SEAWALL REPAIR
 SEAWALL REPAIR CROSS-SECTIONS
 KEY WEST, MONROE COUNTY, FLORIDA



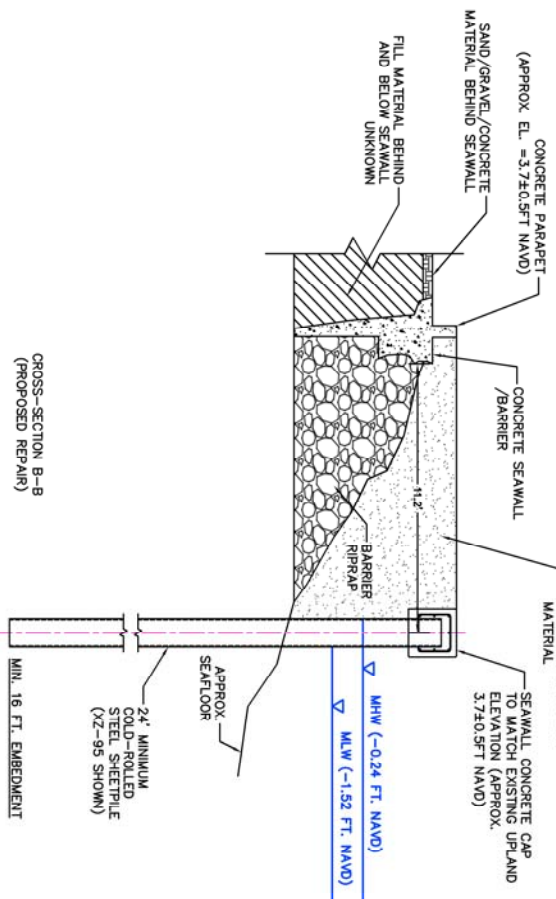
TETRA TECH, INC.
 759 SOUTH FEDERAL HWY
 SUITE 314
 MIAMI, FL 33130
 TEL: (772) 781-3400
 FAX: (772) 781-3411
 NO. 2429
 CERTIFICATE OF AUTHORIZATION



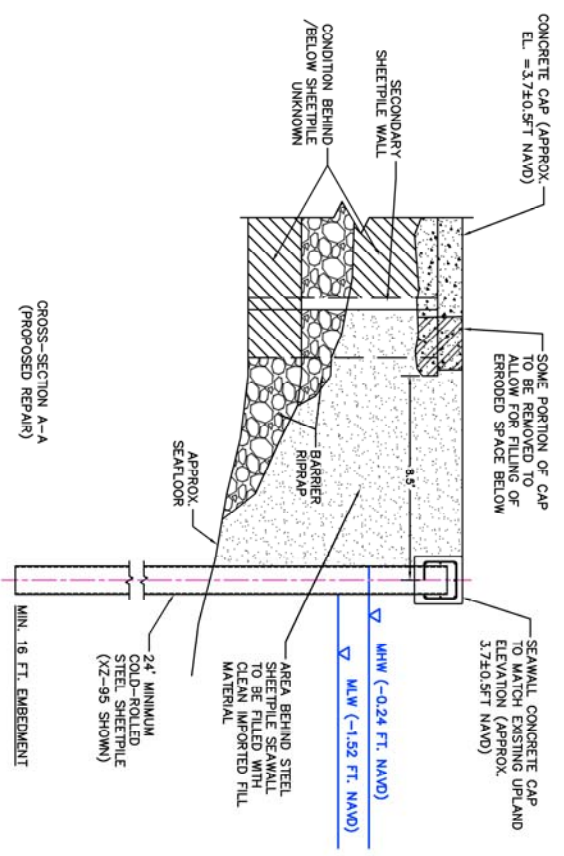
CROSS-SECTION B-B
(EXISTING CONDITION)



CROSS-SECTION B-B
(PROPOSED REPAIR)



CROSS-SECTION A-A
(PROPOSED REPAIR)



P:\0717 OF KEY WEST\18_AQUARIUM SEAWALL\CAD\WALL_DRAWING\JOBSET.dwg

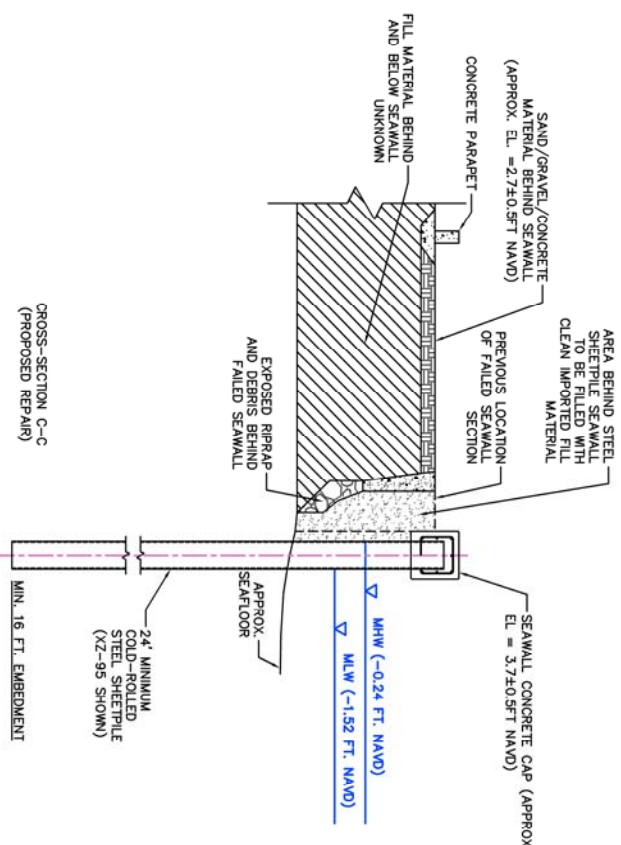
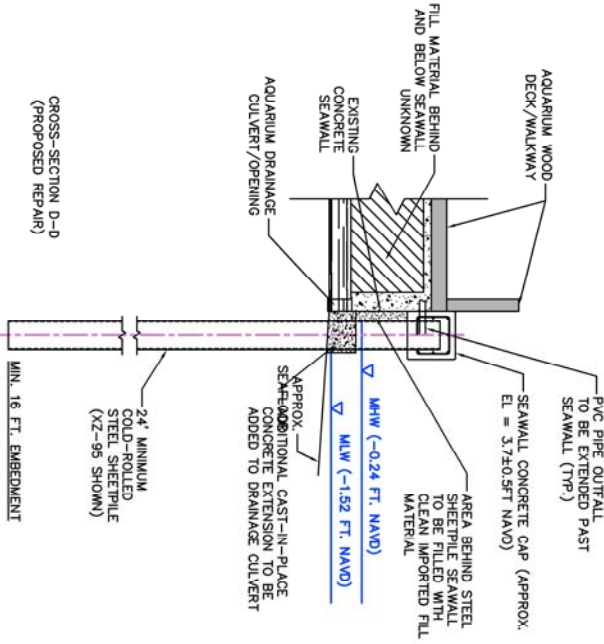
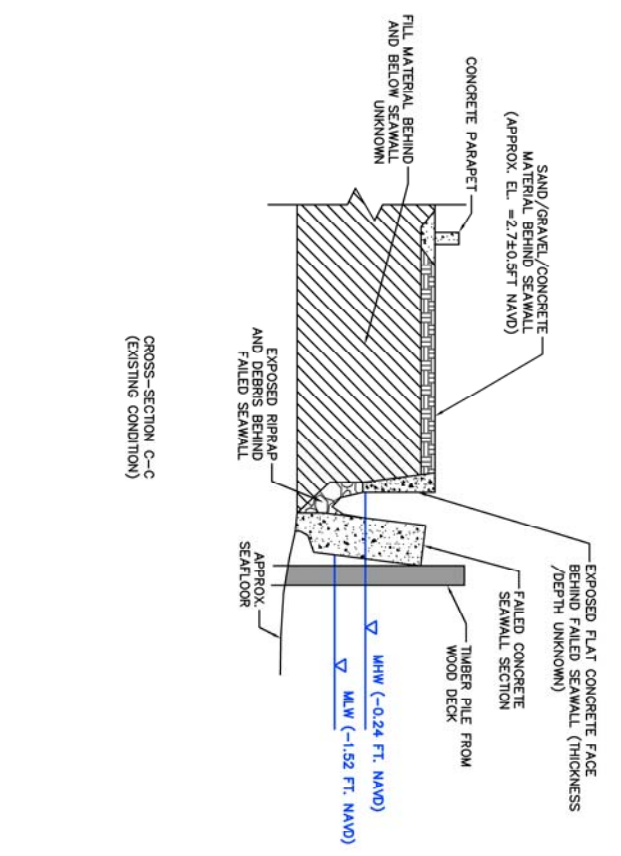
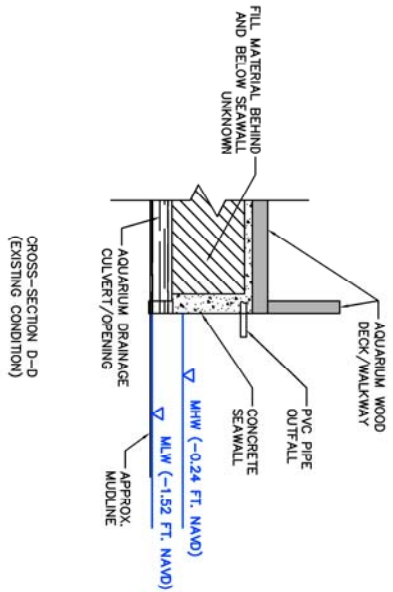
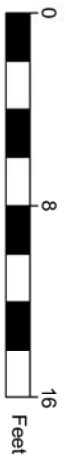


CITY OF KEY WEST
 KEY WEST AQUARIUM SEAWALL REPAIR
 SEAWALL REPAIR CROSS-SECTIONS
 KEY WEST, MONROE COUNTY, FLORIDA



TETRA TECH, INC.
 759 SOUTH FEDERAL HWY
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 MIAMI, FL 33130
 TEL: (772) 781-3400
 FAX: (772) 781-3411
 CERTIFICATE OF AUTHORIZATION
 NO. 2429

P:\1071 OF KEY WEST\1071-18_AQUARIUM SEAWALL\CAD\WALL_DRAWING_032518.dwg



Designed by:

Drawn By: F. MARTINEZ
 Reviewed By: D. FRODOSHAM
 Date: 1/24/18
 Design file no.: KMW\JRWAL_DRAWING\1071.dwg
 Scale: AS SHOWN

Sheet Reference:

C-105

Sheet 9 of 10



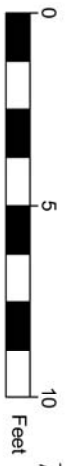
CITY OF KEY WEST
 KEY WEST AQUARIUM SEAWALL REPAIR
 DETAILS
 KEY WEST, MONROE COUNTY, FLORIDA



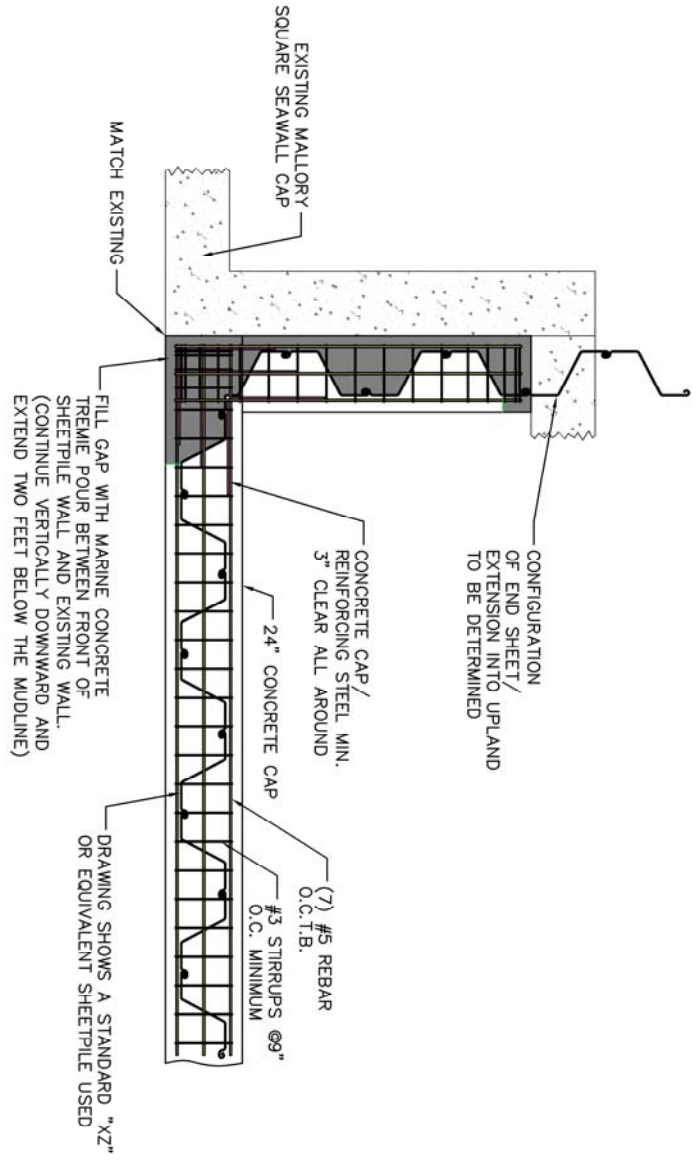
TETRA TECH, INC.
 759 SOUTH FEDERAL HWY
 SUITE 314
 MIAMI, FL 33130
 TEL: (772) 781-3400
 FAX: (772) 781-3411
 CERTIFICATE OF AUTHORIZATION
 NO. 2429

Designed by: _____
 Drawn By: F. MARTINEZ
 Reviewed By: D. FRODOSHAM
 Date: 1/24/18
 Design file no.: KWL/SAW_DET/03/18/18
 Scale: AS SHOWN

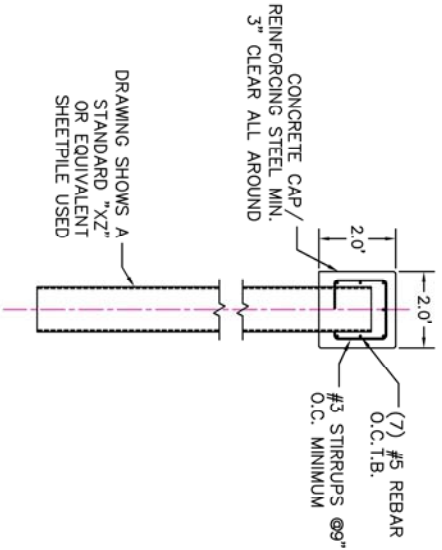
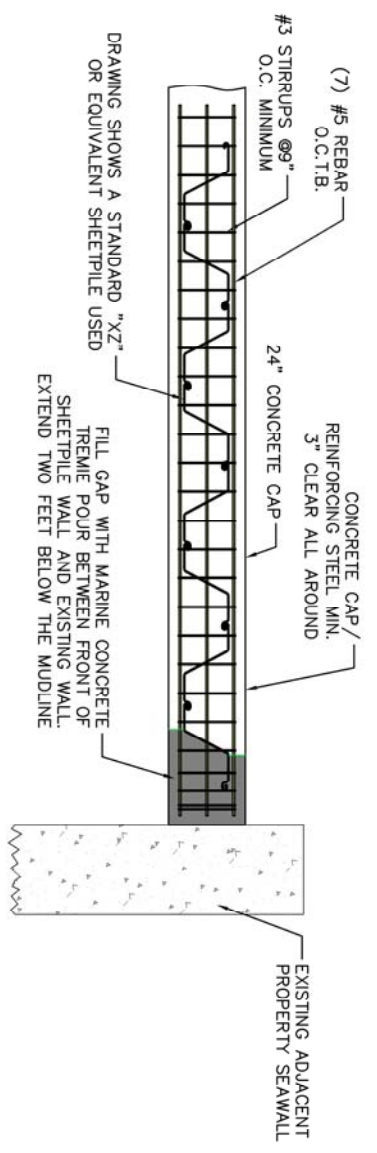
Sheet Reference:
C-106
 Sheet 10 of 10



WEST END DETAIL
ADJACENT TO MALLORY SQUARE SEAWALL



SOUTH EAST END DETAIL
NEXT TO ADJACENT PROPERTY SEAWALL



TYPICAL STEEL SHEETPILE SEAWALL:

- CONCRETE CAP
- CONCRETE $f'_c = 6,000$ PSI IN 28-DAYS
- 1" CHAMFER ALL EXPOSED EDGES

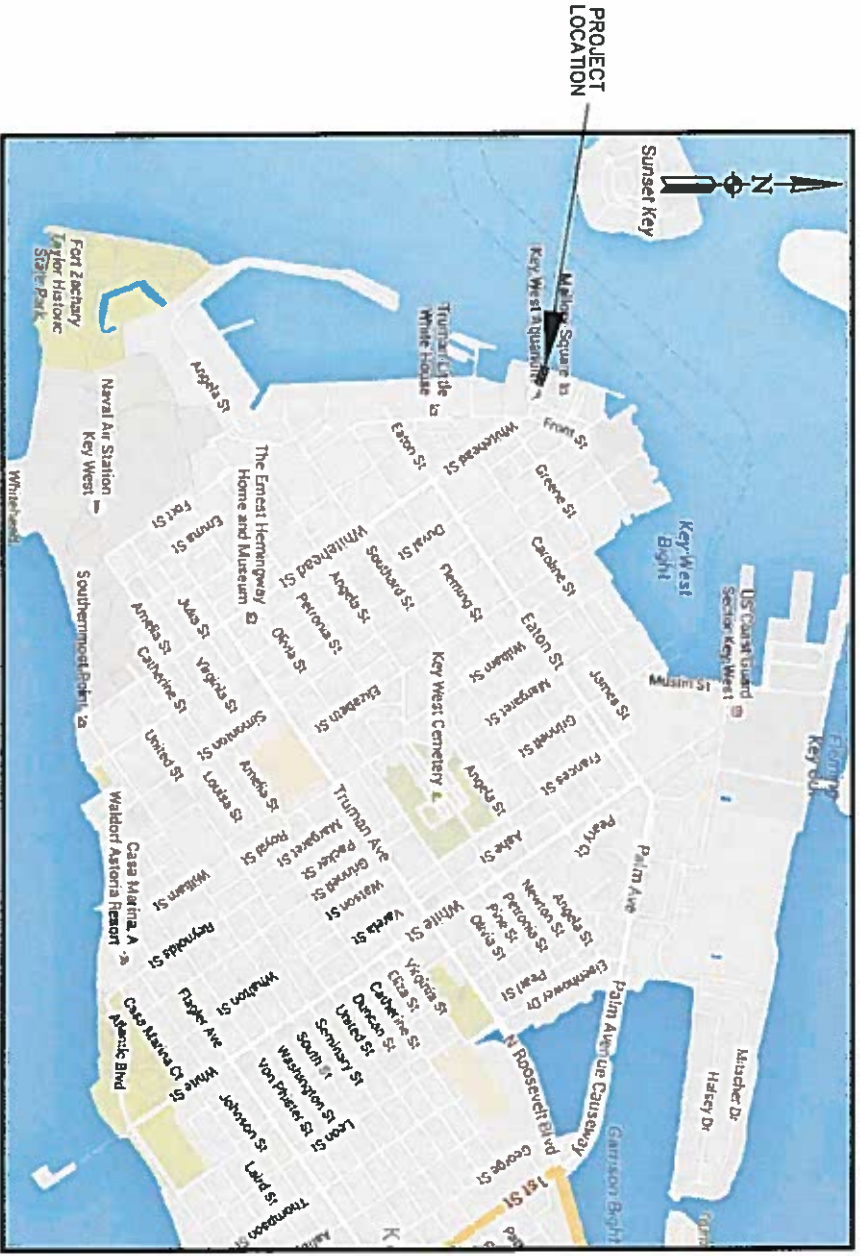
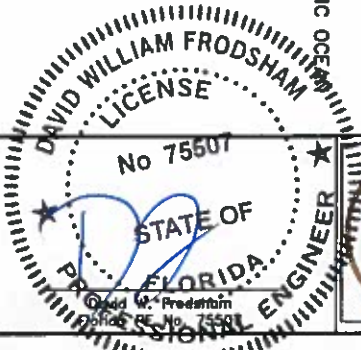
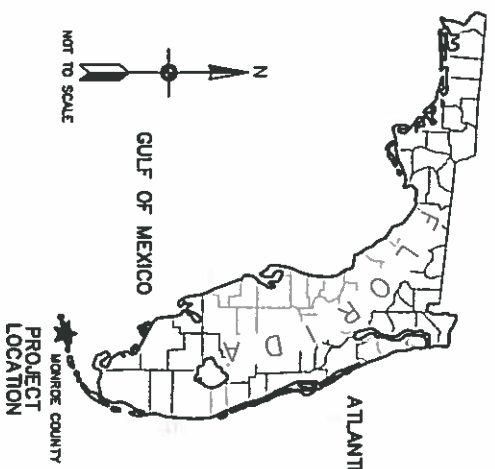
XZ-95 STEEL SHEET PILE SPECIFICATIONS:

- WIDTH: 25.00 IN.
- HEIGHT: 14.12 IN.
- THICKNESS: 0.375 IN.
- SECTIONAL AREA: 15.20 SQ. IN. PER LIN. FT.
- WEIGHT OF PILE: 51.70 LB. PER SQ. FT.
- WEIGHT OF WALL: 24.80 LB. PER SQ. FT.
- SECTION MODULUS: 33.50 IN.³ PER LIN. FT.
- MOMENT OF INERTIA: 237.0 IN.⁴ PER LIN. FT.
- COATING AREA BOTH SIDES: 6.03 SQ. FT. PER LIN. FT.

PART 7

DRAWINGS

CITY OF KEY WEST KEY WEST AQUARIUM SEAWALL REPAIR CONSTRUCTION DRAWINGS



VICINITY MAP
KEY WEST AQUARIUM, KEY WEST, FLORIDA

INDEX OF SHEETS

SHEET #	TITLE	LATEST UPDATE	REV.
G-001	COVER SHEET AND VICINITY MAP	5/9/2018	0
G-002	CONSTRUCTION NOTES	5/9/2018	0
G-003	EXISTING CONDITIONS SURVEY	5/9/2018	0
G-101	DEMOLITION PLAN	5/9/2018	0
G-102	SHEETPILE SEAWALL INSTALLATION PLAN	5/9/2018	0
G-103	SEAWALL CROSS-SECTIONS	5/9/2018	0
G-104	SEAWALL CROSS-SECTIONS	5/9/2018	0
G-105	SEAWALL CROSS-SECTIONS	5/9/2018	0
G-106	GENERAL DETAILS	5/9/2018	0
G-107	REFERENCE PHOTOGRAPHS	5/9/2018	0

REFERENCE:
 FDPF FILE NO. - APPLICATION NO: 0224891-003 (PERMIT PENDING)
 ACCE FILE NO. - SAJ-2017-03332
 NOAA - EXEMPT PER 15 CFR 922.163(d)(3)



CITY OF KEY WEST KEY WEST AQUARIUM SEAWALL REPAIR COVER SHEET AND VICINITY MAP KEY WEST, MONROE COUNTY, FLORIDA	TETRA TECH INC. 759 SOUTH FEDERAL HWY SUITE 314 STUART, FL 34994-2936 TEL: (772) 781-3400 FAX: (772) 781-3411 CERTIFICATE OF AUTHORIZATION NO. 2429	Designed by: D. FRODSHAM Drawn By: F. MARTINEZ Checked By: S. MCGAHEE Date: 7/10/2018 Design file no: KWAC_DESIGN_V7.DWG Scale: AS SHOWN			
Sheet Reference: G-001 Sheet 1 of 11					

GENERAL NOTES:

1. ELEVATIONS REFERENCED HEREIN ARE SHOWN RELATIVE TO THE NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29).
2. TO CONVERT NGVD29 ELEVATIONS TO NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) FOR THIS PROPERTY, THE MODEL VALUE OF 1.342 MUST BE SUBTRACTED ALGEBRAICALLY FROM THE NGVD29 HEIGHT (NGVD29 - 1.342 = NAVD88).
3. HORIZONTAL COORDINATES ARE BASED ON THE NORTH AMERICAN DATUM OF 1983 (NAD83), FLORIDA STATE PLANE COORDINATE SYSTEM, EAST ZONE.
4. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS PRIOR TO PERFORMING ANY WORK UNDER THIS CONTRACT AND NOTIFY THE CITY/ENGINEER IN WRITING OF ANY DIFFERENCES BEFORE COMMENCING WITH CONSTRUCTION.
5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FAMILIARIZE HIMSELF/HERSELF WITH THE SITE, ACCESS CONSTRAINTS, CRUISE SCHEDULE, AND OTHER UNIQUE CONSIDERATIONS AS IDENTIFIED IN THE SPECIFICATIONS. CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, AND TO PROTECT THEM FROM DAMAGE. THE CONTRACTOR SHALL BEAR ALL EXPENSE FOR REPAIR OR REPLACEMENT OF UTILITIES AND OTHER PROPERTY DAMAGED BY OPERATIONS IN CONJUNCTION WITH THE COMPLETION OF THIS WORK. THE CONTRACTOR SHALL LOCATE ALL UTILITIES IN THE AREA OF WORK PRIOR TO CONSTRUCTION. THE APPROPRIATE UTILITY COMPANY SHALL BE NOTIFIED BY THE CONTRACTOR AT LEAST 48 HOURS IN ADVANCE OF CONSTRUCTION ACTIVITIES SO THAT A UTILITY COMPANY REPRESENTATIVE CAN BE PRESENT.
6. THE LOCATION OF UTILITIES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ALL UTILITY LOCATIONS BOTH HORIZONTALLY AND VERTICALLY AND DETERMINING IF ANY CONFLICTS EXIST BETWEEN THE PROPOSED WORK AND THE EXISTING UTILITIES. THIS SHALL BE ACCOMPLISHED PRIOR TO CONSTRUCTION ACTIVITY COMMENCING.
7. THE CONTRACTOR SHALL REVIEW THE CONTRACT DOCUMENTS AND, IN CASE OF ANY CONFLICT BETWEEN ANY PORTION OF THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL REQUEST CLARIFICATION IN WRITING PRIOR TO BIDDING OR BASE HIS/HER BID ON THE MORE STRINGENT REQUIREMENTS.
8. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL MATERIALS USED TO THE CITY/ENGINEER FOR APPROVAL PRIOR TO ORDER, SHIPMENT, OR INSTALLATION. THE CONTRACTOR SHALL ALSO SUBMIT SHOP DRAWINGS FOR CLOSURE HOURS AT EACH END OF THE PROJECT.
9. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL REQUIRED PERMITS ARE OBTAINED AND IN HAND BEFORE BEGINNING ANY CONSTRUCTION. NO CONSTRUCTION OR FABRICATION OF ANY ITEM SHALL BEGIN UNTIL THE CONTRACTOR HAS RECEIVED ALL PERMITS AND ANY OTHER DOCUMENTATION FROM ALL OF THE PERMITTING AND ANY OTHER REGULATORY AUTHORITIES. ANY PENALTIES, STOP WORK ORDERS OR ADDITIONAL WORK RESULTING FROM THE CONTRACTOR BEING IN VIOLATION OF THE REQUIREMENTS ABOVE SHALL BE FULLY BORNE BY THE CONTRACTOR. THE CONTRACTOR SHALL COMPLY WITH ALL CONDITIONS OF THE PERMITS, INCLUDING ALL APPLICABLE STANDARD CONDITIONS FOR IN-WATER WORK.
10. BEST MANAGEMENT PRACTICES FOR EROSION AND TURBIDITY CONTROL SHALL BE UTILIZED AT ALL TIMES DURING CONSTRUCTION. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE USE OF STAKED FILTER CLOTH, STAKED SILT FENCE, AND ANY OTHER SUITABLE METHOD AROUND DRAINAGE STRUCTURES AND AT ALL AREAS SUBJECT TO EROSION. FLOATING OR STAKED TURBIDITY BARRIERS SHALL BE USED IF APPROPRIATE. THE CONSTRUCTION SHALL PROVIDE DAILY INSPECTION OF THE EROSION PROTECTION ITEMS AND MAINTAIN THEM DURING THE ENTIRE PERIOD OF CONSTRUCTION.
11. ALL SURFACE WATER DISCHARGES FROM THE SITE SHALL MEET STATE WATER QUALITY STANDARDS (LESS THAN 29 NTU ABOVE BACKGROUND) PRIOR TO REACHING ANY WATERS OF THE STATE.
12. THE CONTRACTOR SHALL MAINTAIN A CURRENT SET OF CONSTRUCTION PLANS AND PERMITS ON THE JOB DURING ALL PHASES OF CONSTRUCTION.
13. ALL FIELD LAYOUT AND SURVEYING FOR CONSTRUCTION OF THE PROJECT SHALL BE PROVIDED BY THE CONTRACTOR AT HIS/HER EXPENSE.
14. AFTER CONSTRUCTION IS COMPLETE, THE CONTRACTOR SHALL PROVIDE THE CITY WITH SIGNED & SEALED AS-BUILT RECORD DRAWINGS OF HIS/HER WORK.

PROJECT SUMMARY:

15. THE PROJECT CONSISTS OF THE INSTALLATION OF APPROXIMATELY 177 LF OF STEEL CANISTER SHEETPILE SEAWALL WITH APPROXIMATELY 177 LF (-11.5) CF OF REINFORCED CONCRETE CAP AND ALL INCIDENTAL WORK NECESSARY TO PROVIDE A COMPLETE AND SERVICEABLE PROJECT. THE TOP OF THE CAP SHALL BE SET AT +5.07 NGVD29 WITH A TOLERANCE OF +/- 0.25 INCH. SHEETS SHALL BE DZ-95 ASTM A690 GR 50 FOR THE WESTERN 96 LF AND E2-95 ASTM A690 GR 50 FOR THE EASTERN 81 LF. THE CONCRETE CAP SHALL BE A MINIMUM OF 30" WIDE BY 18" TALL FOR THE DZ-95 SHEETPILE AND 26" WIDE BY 18" TALL FOR THE E2-95 SHEETPILE.
16. ADDITIONAL WORK ITEMS THAT WILL BE REQUIRED AND ARE PART OF THE BID INCLUDE, BUT ARE NOT LIMITED TO: SINGLE SPAN REMOVAL OF THE NORTHERN PORTION OF THE PEDESTRIAN BRIDGE PRIOR TO CONSTRUCTION AND REPLACEMENT OF THE SINGLE SPAN AFTER SEAWALL COMPLETION (DRAWINGS BY OTHERS); PRE-CONDITION AND POST-CONSTRUCTION VIDEO SURVEYS OF STRUCTURES WITHIN 50 LF OF PILE DRIVING OPERATIONS; VIBRATION MONITORING OF STRUCTURES WITHIN 50 LF OF THE PROJECT DURING PILE DRIVING ACTIVITY; UTILITY EXTENSIONS THROUGH THE NEW SEAWALL; REMOVAL AND REPLACEMENT OF WOODEN PILINGS; GRADING; RESTORATION
17. THE CITY OF KEY WEST WILL MAKE A STAGING AREA AVAILABLE FOR USE BY THE CONTRACTOR AT NO COST. THE CONTRACTOR SHALL RESTORE THE STAGING AREA AT THE COMPLETION OF CONSTRUCTION.
18. THE CONTRACTOR WILL PROVIDE TEMPORARY SITE SECURITY FENCING TO SECURE THE CONSTRUCTION SITE.
19. THE CONTRACTOR WILL NOT ALLOW PUBLIC ACCESS TO THE SITE DURING CONSTRUCTION.
20. THE CONTRACTOR WILL MAINTAIN TRAFFIC IN MAJOR SQUARE DURING ALL PHASES OF CONSTRUCTION IN ACCORDANCE WITH FOOT SPECIFICATION SECTION 102. CONSTRUCTION ACTIVITIES WILL NOT IMPED TRAFFIC UNLESS AUTHORIZED IN WRITING BY THE CITY.
21. THE CONTRACTOR SHALL FIELD STAKE THE BUWHEAD ALIGNMENT AT THE INFLECTION POINTS SHOWN ON THE PLANS. CITY AND ENGINEER SHALL APPROVE THE STAKED ALIGNMENT PRIOR TO THE CONTRACTOR INITIATING SITE PREPARATION FOR SHEET PILE INSTALLATION. THE PROPOSED SEAWALL SHALL NOT EXCEED 3 LF WATERWARD OF THE EXISTING SEAWALL.

DEMOLITION

21. DEMOLITION ACTIVITIES FOR THIS PROJECT INCLUDE:
 - 21.1 DEMOLITION OF +/- 18 LF OF CORRODED SHEETPIILING
 - 21.2 DEMOLITION OF PORTIONS OF THE EXISTING SEAWALL AFTER THE NEW SHEETPIILING HAS BEEN INSTALLED
 - 21.3 REMOVAL OF A PORTION OF THE AQUARIUM'S DECKING TO FACILITATE ACCESS TO THE EASTERN SIDE OF THE SITE
22. THE CONTRACTOR SHALL FIELD VERIFY THE EXACT LOCATION OF ALL OBSTRUCTIONS ALONG THE STEEL SHEETPILE'S ALIGNMENT PRIOR TO CONSTRUCTION. THE QUANTITY OF ITEMS REQUIRING DEMOLITION AND REPLACEMENT MAY VARY DEPENDING UPON THE CONTRACTOR'S MEAS AND METHODS.
23. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES OR LOCAL AUTHORITIES FURNISHING GAS, WATER, ELECTRICAL, TELEPHONE, OR SEWER SERVICE SO THEY CAN REMOVE, RELOCATE, DISCONNECT, CAP OR PLUG THEIR EQUIPMENT IN ORDER TO FACILITATE DEMOLITION & INSTALLATION OF THE STEEL SHEETPILE.
24. THE CONTRACTOR SHALL PROTECT ALL UTILITIES AND OTHER IMPROVEMENTS SHOWN ON THESE PLANS AND UTILITIES AND OTHER IMPROVEMENTS NOT SHOWN. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR REPAIRS OF UTILITIES AND OTHER IMPROVEMENTS DAMAGED DURING CONSTRUCTION AND SHALL MAINTAIN SUFFICIENT PROTECTION FOR ALL UTILITIES REQUIRED TO PROTECT THEM FROM DAMAGE AND TO PROTECT THE PUBLIC DURING CONSTRUCTION. CONTRACTOR SHALL ALSO SUPPORT EXISTING UTILITIES AS REQUIRED FOR INSTALLATION OF ALL PROPOSED IMPROVEMENTS. ALL COSTS ASSOCIATED WITH PROTECTING, SUPPORTING, REPAIRING, AND OTHER ACTIVITIES RESULTING FROM CONTRACTOR DAMAGING UTILITIES SHALL BE THE CONTRACTOR'S RESPONSIBILITY AT NO ADDITIONAL COST TO THE CITY.
25. THE CONTRACTOR SHALL SAW-CUT A SMOOTH STRAIGHT EDGE ON ANY CONCRETE PROPOSED FOR DEMOLITION PRIOR TO ITS REMOVAL.

STEEL SHEETPILE:

26. AN ESTIMATED TOTAL OF 177 LF OF SHEET PILING SHALL BE REQUIRED. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXACT QUANTITY REQUIRED PRIOR TO BIDDING. STEEL SHEETPILE SHALL BE DZ-95 AND E2-95 AS IDENTIFIED IN THE PLANS, IN ALL CASES ASTM A690 GRADE 50 STEEL
27. ALL STEEL SHEETPILE UTILIZED ON THIS PROJECT SHALL BE NEW.
28. INSTALLATION ACTIVITIES SHALL BE DONE IN SUCH A WAY AS TO NOT DISTURB SURROUNDING STRUCTURES.
29. VIBRATION MONITORING OF ADJACENT STRUCTURES SHALL BE CONDUCTED DURING ALL DRIVING ACTIVITIES.
30. SHEETPILES SHALL BE SET IN A STRAIGHT LINE BETWEEN INFLECTION POINTS.
31. STEEL SHEETS WILL BE VIBRATED INTO PLACE FROM THE WATER AND WILL BE INTER-LOCKED PER MANUFACTURER'S SPECIFICATIONS.
32. DESIGN SURCHARGE LOAD FOR SHEET PILE = 250 PSF

CONCRETE:

33. CONCRETE CAP SHALL MEET SPECIFICATION SECTION 03 30 00 CAST-IN-PLACE CONCRETE EXCEPT AS AMENDED BELOW.
 - 33.1 ENVIRONMENT = EXTREMELY AGGRESSIVE
 - 33.2 CLASS IV, MINIMUM 28 DAY STRENGTH: $f'_c = 6,000$ PSI
 - 33.3 MINIMUM COVER = 3 INCHES
 - 33.4 NO FLYASH OR SLAG WILL BE PERMITTED AS A SUBSTITUTE FOR CEMENT.
 - 33.5 MAXIMUM W/C RATIO = 0.40
34. ALL REINFORCING BARS SHALL COMPLY WITH ASTM A615/A615M GRADE 60 AND HAVE AT LEAST 3 INCHES OF CONCRETE COVER.
35. ALL REINFORCEMENT SHALL BE EPOXY COATED TO CONFORM TO ASTM A934/A934M
36. THE WIRE SHALL BE EPOXY COATED TO CONFORM TO ASTM A884/A884M.
37. FABRICATION AND JOBSITE HANDLING SHALL BE IN ACCORDANCE WITH ASTM D3963/D3963M.
38. TOUCH UP SHALL BE REQUIRED WHERE EPOXY COATING HAS BEEN COMPROMISED DURING HANDLING AND INSTALLATION. EPOXY SHALL BE CURED TACK FREE PRIOR TO CONCRETE PLACEMENT.
39. MINIMUM LAP SPUCE LENGTH FOR #5 REINFORCING BARS IS 2 FT.
40. REINFORCEMENT SHALL BE CAREFULLY PLACED, RIGIDLY SUPPORTED, AND WELL TIED WITH BAR SUPPORTS AND SPACERS.
41. CONTRACTOR SHALL PROVIDE 1 INCH CHAMBERS ON ALL EDGES AND CORNERS.
42. CONTRACTOR SHALL PROVIDE MATERIALS TESTING FOR 8, 14, AND 28 DAY BREAKS TO CONFIRM CONCRETE STRENGTH.
43. CONTROL JOINTS TO BE 1/8" x 1" DEEP TOOLED JOINT @ 100'-0" O.C. (MAX.).

SEAWALL PENETRATIONS:

44. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE NUMBER AND LOCATIONS OF SEAWALL PENETRATIONS
45. ALL EXISTING SEAWALL PENETRATIONS FOR DRAINAGE AND OTHER UTILITIES SHALL BE MADE THROUGH THE PROPOSED SEAWALL WITH SIMILAR MATERIALS AND INCLUDE ALL COUPLINGS, CONNECTION HARDWARE, MATERIALS, AND LABOR IN ACCORDANCE WITH THE MATERIAL MANUFACTURER'S RECOMMENDATIONS.

FILL MATERIAL:

46. CLEAN IMPORTED FILL WILL BE USED FOR BACKFILLING BETWEEN THE EXISTING CONCRETE SEAWALL AND THE NEW STEEL SHEETPILE SEAWALL, AS WELL AS FOR SURFACE GRADING TO ELEVATIONS AS DESIGNATED ON THE PLAN SET.

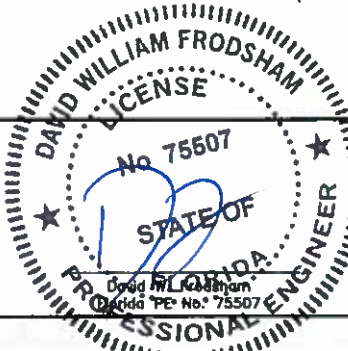
PILING:

47. CONTRACTOR SHALL REMOVE PILING AND DEMOLISH AND DISPOSE OF DECKING AS REQUIRED TO FACILITATE BARGE ACCESS AND CONSTRUCTION.


48. CONTRACTOR SHALL REPLACE REMOVED PILING WITH NEW PILING IN THE SAME LOCATIONS AT THE PRIOR TO THE CONCLUSION OF CONSTRUCTION.
49. CONTRACTOR SHALL BID PROJECT FOR 40' LONG SOUTHERN YELLOW PINE TIMBER PILES TO REPLACE ANY EXISTING PILING RELOCATED BY THE PROJECT. IN THE EVENT THAT EXISTING PILING MAY BE RE-USED, CONTRACTOR SHALL PROVIDE A DEDUCTION TO THE CITY. NO GREENHEART PILES SHALL BE PERMITTED.
50. PILING SHALL BE DRIVEN 5' MINIMUM INTO LIMESTONE (APPROXIMATE TIP ELEVATION -33.00 FT NGVD). PILING SHALL NOT BE CUT OFF.

FILTER FABRIC

51. FILTER FABRIC TO BE MIRAFI 700X OR EQUIVALENT, CONTINUOUS ALONG UPLAND SIDE OF STEEL SHEETS. EXTEND TO MUDLINE AND WRAP BENEATH FILL AS SHOWN ON CROSS-SECTIONS.



Mark	Description	Date	Appr.

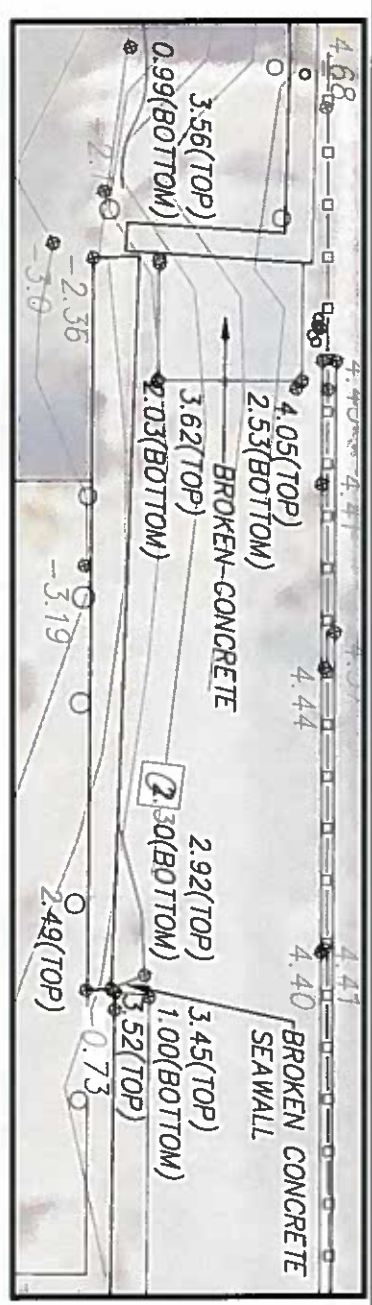
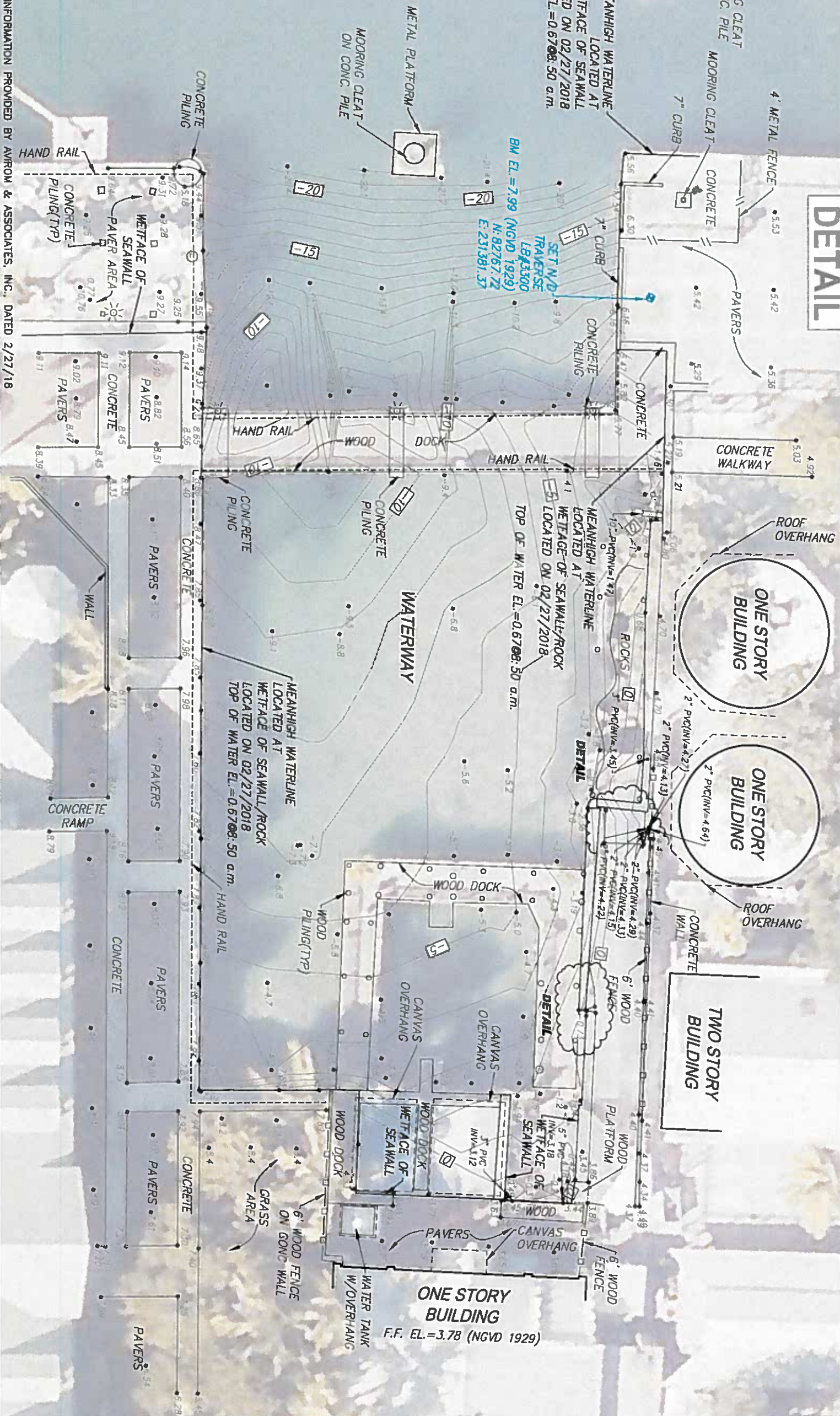

TETRA TECH INC.
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 CERTIFICATE OF AUTHORIZATION
 NO. 2429

CITY OF KEY WEST
KEY WEST AQUARIUM SEAWALL REPAIR

 CONSTRUCTION NOTES
 KEY WEST, MONROE COUNTY, FLORIDA

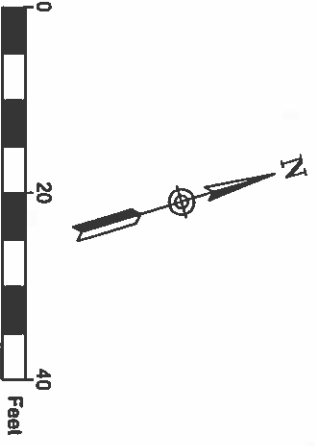


KEY WEST HARBOR



DETAIL

- NOTES**
1. ALL ELEVATIONS REFERENCED TO NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD 29).
 2. HORIZONTAL COORDINATES SHOWN ARE RELATIVE TO THE NORTH AMERICAN DATUM OF 1927 (NAD 27), STATE PLANE COORDINATE SYSTEM, EAST ZONE.
 3. MEAN HIGH WATER (MHW) AND MEAN LOW WATER (MLW) WERE ESTABLISHED FROM THE FDEP TIDAL DATUM BASED ON TIDE STATION 872-4580.
 4. MHW EL. = 1.10 FT NGVD
 5. MLW EL. = -0.18 FT NGVD
 6. PARTIAL SURVEY DEPICTED FOR CLARITY. FOR MORE INFORMATION, REFER TO FULL SURVEY BY AVIROM & ASSOCIATES, INC., LATEST EDITION, 2/27/18.



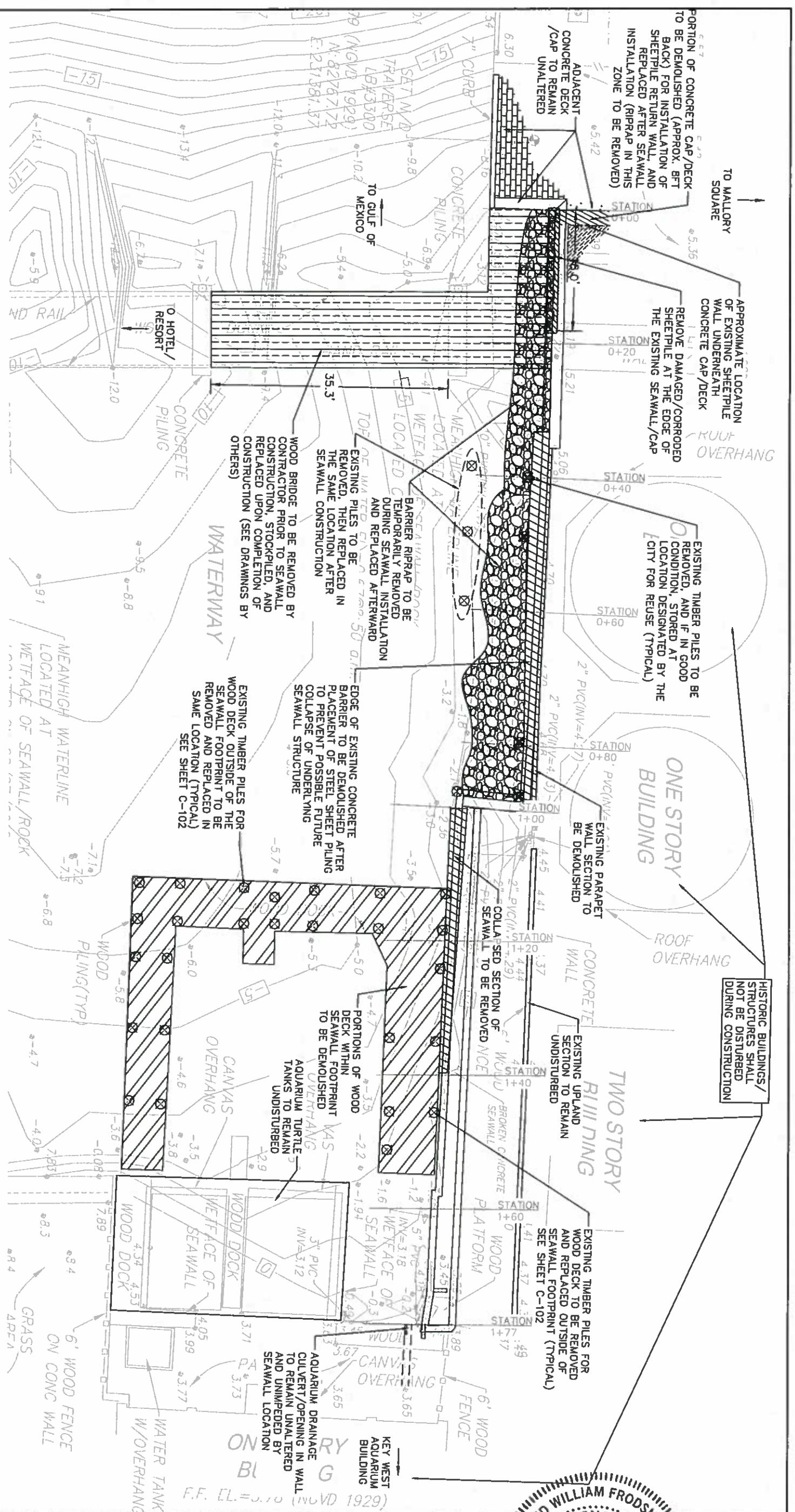
CITY OF KEY WEST
KEY WEST AQUARIUM SEAWALL REPAIR
EXISTING CONDITIONS SURVEY WITH AERIAL
KEY WEST, MONROE COUNTY, FLORIDA

Sheet Reference:
G-004
 Sheet 4 of 11

TETRA TECH INC.
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 STUART, FL 34994-2936
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CERTIFICATE OF AUTHORIZATION NO. 2429

Designed by: D. FROOSHAW	
Drawn by: S. MATHIEZ	
Checked by: S. MCCAFFEE	
Date: 7/10/2018	
Design file no: KWA00 DESIGN_V7.DWG	
Scale: AS SHOWN	



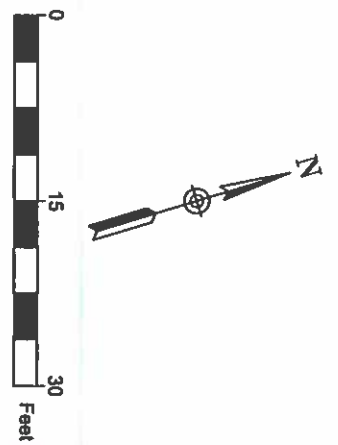


LEGEND

- EXISTING SHEETPILE TO BE REMOVED
- EXISTING CONCRETE TO BE REMOVED/DEMOLISHED
- EXISTING WOOD DECK (TO BE REMOVED AND STOCKPILED DURING CONSTRUCTION & REPLACED)
- WOOD BRIDGE (TO BE REMOVED DURING CONSTRUCTION & REPLACED)
- RIPPAP (TO BE REMOVED/RELOCATED DURING CONSTRUCTION & REPLACED)
- EXISTING TIMBER PILE (TO BE REMOVED)
- EXISTING TIMBER PILE (TO BE REMOVED DURING CONSTRUCTION & REPLACED)

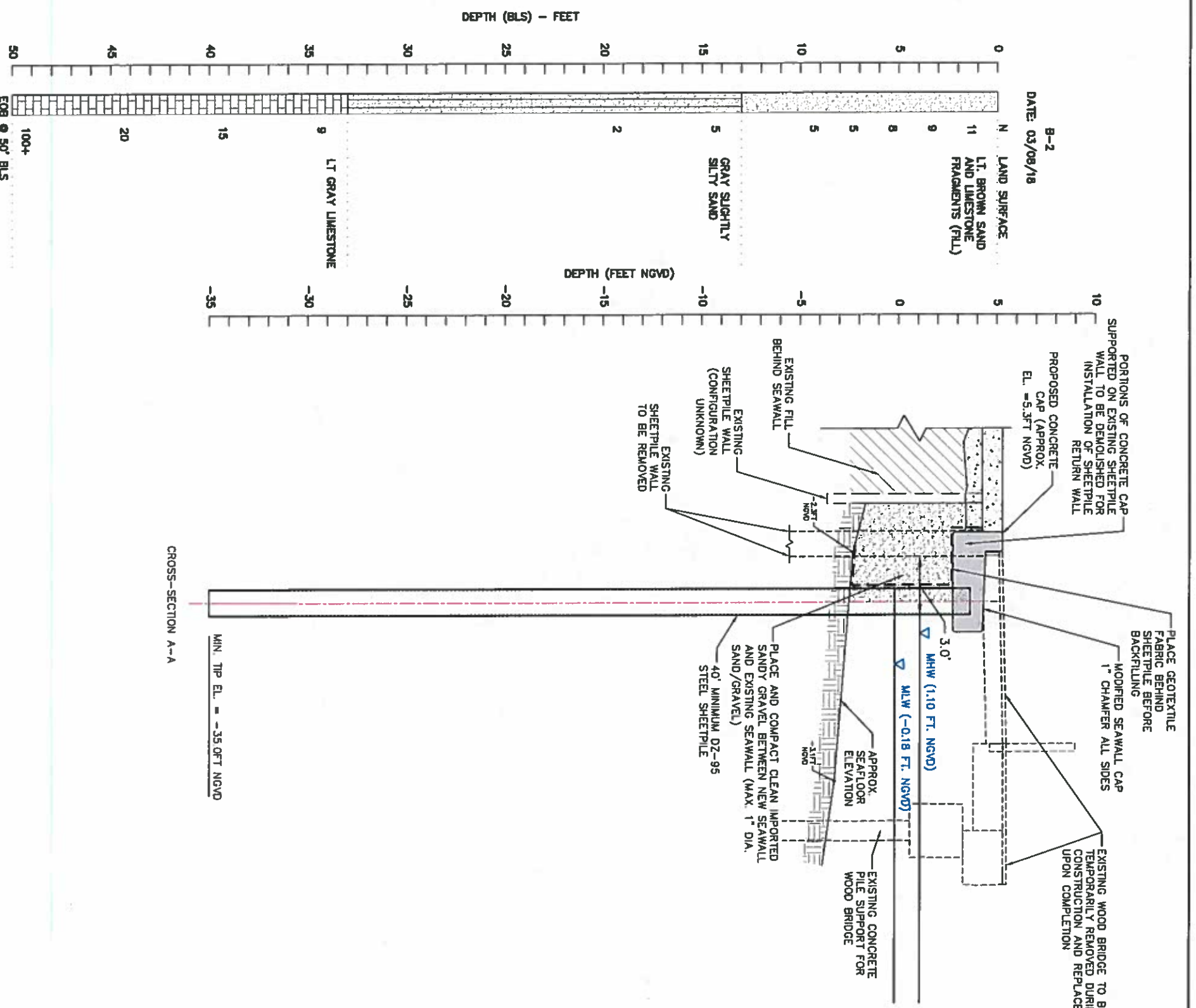
NOTES:

1. THE BATHYMETRY AND SURVEY DATA WAS PROVIDED BY AVROM & ASSOCIATES, INC., DATED 2/27/18.
2. SURVEY DATUM: NGVD29
3. DEMOLITION ACTIVITIES FOR THIS PROJECT INCLUDE THE FOLLOWING:
 - 3.1. TEMPORARY REMOVAL OF HALF OF THE WOOD BRIDGE SPANNING FROM MALLORY SQUARE ON THE NORTH TOWARD THE HOTEL ON THE SOUTH.
 - 3.2. REMOVAL OF EXISTING DAMAGED SHEETPILE SECTIONS LOCATED BENEATH THE WOOD BRIDGE.
 - 3.3. REMOVAL OF THE RIPPAP IN FRONT OF THE EXISTING SEAWALL. RIPPAP WILL BE PLACED IN FRONT OF THE NEW SHEETPILE SEAWALL.
 - 3.4. REMOVAL OF THE COLLAPSED PORTION OF SEAWALL.
 - 3.5. REMOVAL OF TIMBER PILES ALONG THE NORTHWEST PORTION OF THE SEAWALL. THREE OF THE PILES DEPICTED WILL BE REPLACED IN THE SAME LOCATION AFTER CONSTRUCTION. (CONTRACTOR SHOULD ASSUME NEW 10" TIMBER PILES WILL BE REQUIRED, DEPENDING ON THE CONDITION OF THE EXISTING PILES).
 - 3.6. REMOVAL AND RELOCATION OF AQUARIUM WOOD DECK AND ASSOCIATED TIMBER PILES CURRENTLY WITHIN THE NEW SEAWALL FOOTPRINT. (CONTRACTOR SHOULD ASSUME NEW 10" TIMBER PILES WILL BE REQUIRED, DEPENDING ON THE CONDITION OF THE EXISTING PILES).
 - 3.7. CONTRACTOR SHOULD PLAN TO PARTIALLY DEMOLISH/CHIP OFF PORTIONS OF THE EXISTING CONCRETE SEAWALL BARRIER LOCATED BEHIND THE BARRIER RIPPAP.

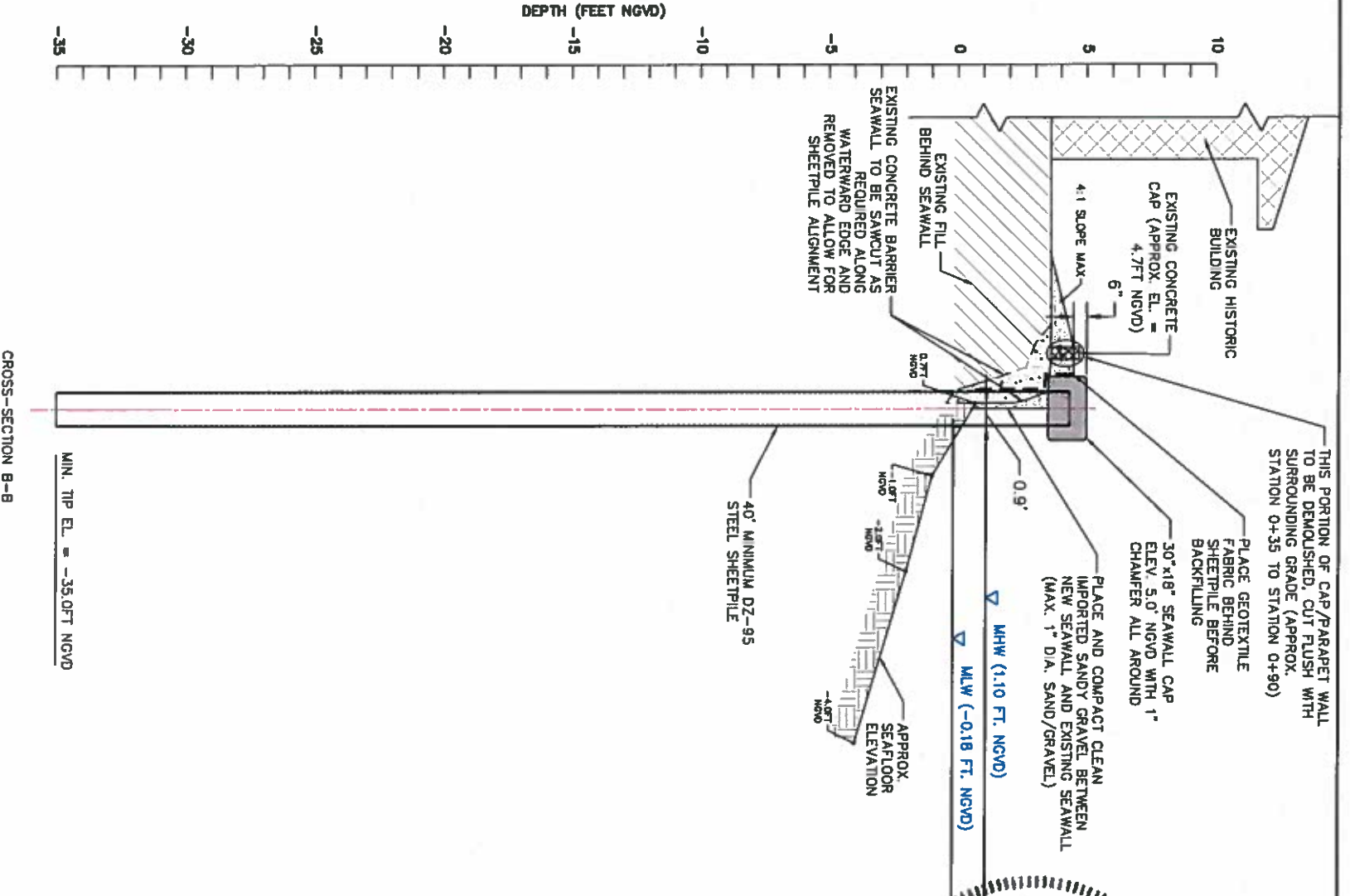


<p>CITY OF KEY WEST KEY WEST AQUARIUM SEAWALL REPAIR DEMOLITION PLAN KEY WEST, MONROE COUNTY, FLORIDA</p>	<p>TETRA TECH INC. 759 SOUTH FEDERAL HWY SUITE 314 STUART, FL 34994-2936 TEL: (772) 781-3400 FAX: (772) 781-3411 CERTIFICATE OF AUTHORIZATION NO. 2429</p>	<p>Designed by: D. FRODSHAM Drawn by: F. MARTINEZ Checked by: S. MCGAHEE Date: 7/10/2018 Design file no: KWAD_DESIGN_V7.DWG Scale: AS SHOWN</p>		
<p>Sheet Reference: C-101 Sheet 5 of 11</p>				

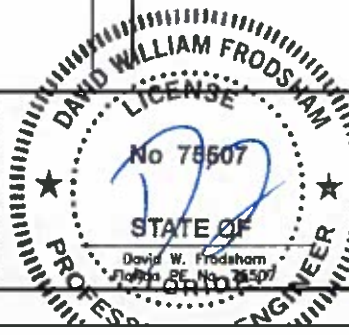
DATE: 03/08/18
B-2



CROSS-SECTION A-A



CROSS-SECTION B-B

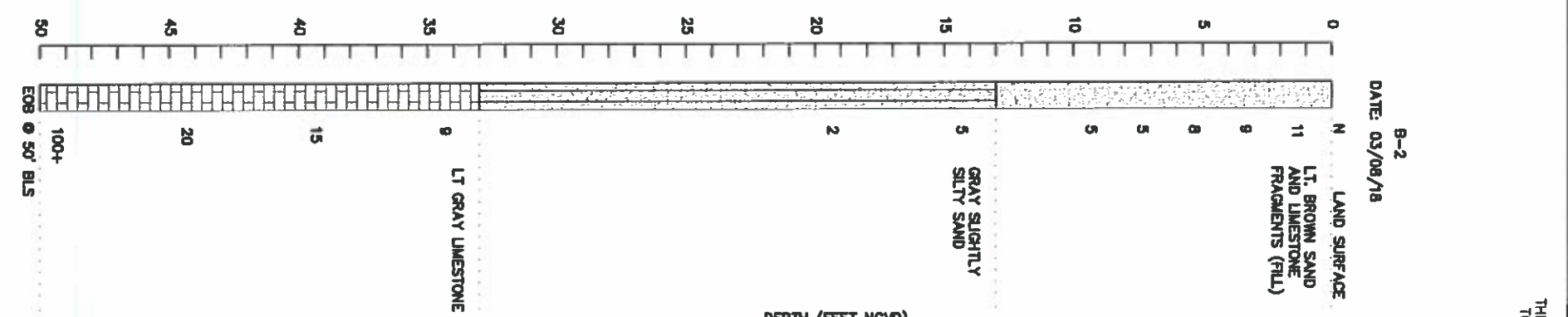
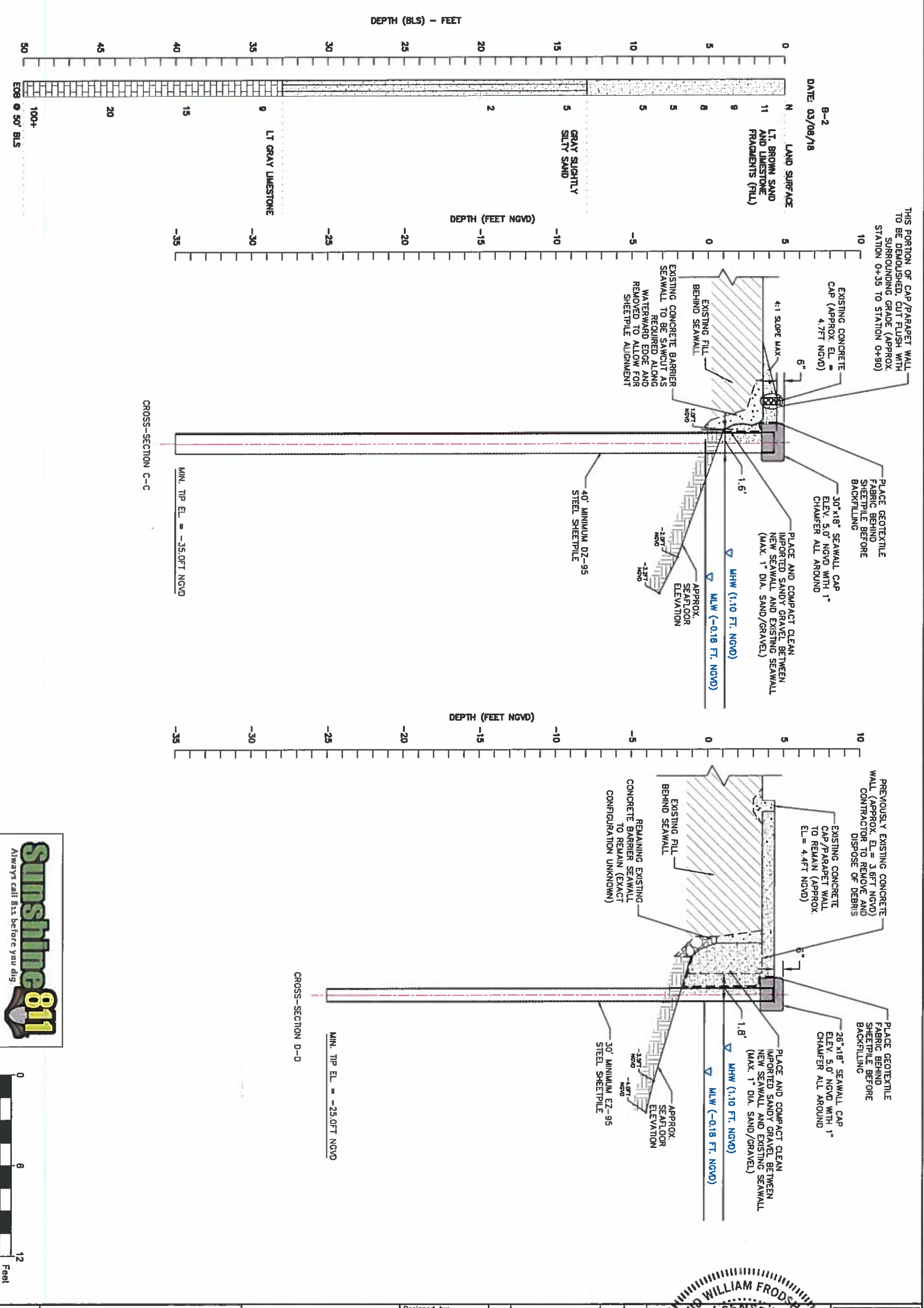


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 Drawn By: F. MARTINEZ
 Checked By: S. MCCAHEE
 Date: 7/10/2018
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CITY OF KEY WEST
KEY WEST AQUARIUM SEAWALL REPAIR
 SEAWALL CROSS-SECTIONS
 KEY WEST, MONROE COUNTY, FLORIDA

Sheet Reference:
C-103
 Sheet 7 of 11



DATE: 03/08/18

THIS PORTION OF CAP/PARAPET WALL TO BE DEMOLISHED, CUT FLUSH WITH SURROUNDING GRADE (APPROX. STATION 0+35 TO STATION 0+90)

EXISTING CONCRETE CAP (APPROX. EL. = 4.7 FT NGVD)

4:1 SLOPE MAX

EXISTING CONCRETE BEHIND SEAWALL

EXISTING CONCRETE BARRIER SEAWALL TO BE SAWCUT AS REQUIRED ALONG WATERWARD EDGE AND REMOVED TO ALLOW FOR SHEETPILE ALIGNMENT

PLACE GEOTEXTILE FABRIC BEHIND SHEETPILE BEFORE BACKFILLING

30"x18" SEAWALL CAP ELEV. 5.0' NGVD WITH 1" CHAMFER ALL AROUND

PLACE AND COMPACT CLEAN IMPORTED SANDY GRAVEL BETWEEN NEW SEAWALL AND EXISTING SEAWALL (MAX. 1" DIA. SAND/GRAVEL)

MHW (1.10 FT. NGVD)

MLW (-0.18 FT. NGVD)

APPROX. SEAFLOOR ELEVATION

40' MINIMUM D2-95 STEEL SHEETPILE

PREVIOUSLY EXISTING CONCRETE WALL (APPROX. EL. = 3.6 FT NGVD) CONTRACTOR TO REMOVE AND DISPOSE OF DEBRIS

EXISTING CONCRETE CAP/PARAPET WALL TO REMAIN (APPROX. EL. = 4.4 FT NGVD)

REMAINING EXISTING CONCRETE BARRIER SEAWALL CONFIGURATION UNKNOWN

PLACE GEOTEXTILE FABRIC BEHIND SHEETPILE BEFORE BACKFILLING

26"x18" SEAWALL CAP ELEV. 5.0' NGVD WITH 1" CHAMFER ALL AROUND

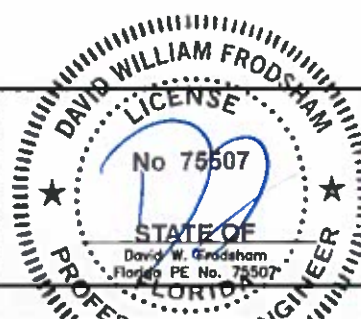
PLACE AND COMPACT CLEAN IMPORTED SANDY GRAVEL BETWEEN NEW SEAWALL AND EXISTING SEAWALL (MAX. 1" DIA. SAND/GRAVEL)

MHW (1.10 FT. NGVD)

MLW (-0.18 FT. NGVD)

APPROX. SEAFLOOR ELEVATION

30' MINIMUM E2-95 STEEL SHEETPILE



CITY OF KEY WEST
 KEY WEST AQUARIUM SEAWALL REPAIR
 SEAWALL CROSS-SECTIONS
 KEY WEST, MONROE COUNTY, FLORIDA

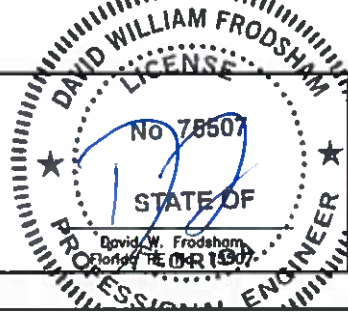
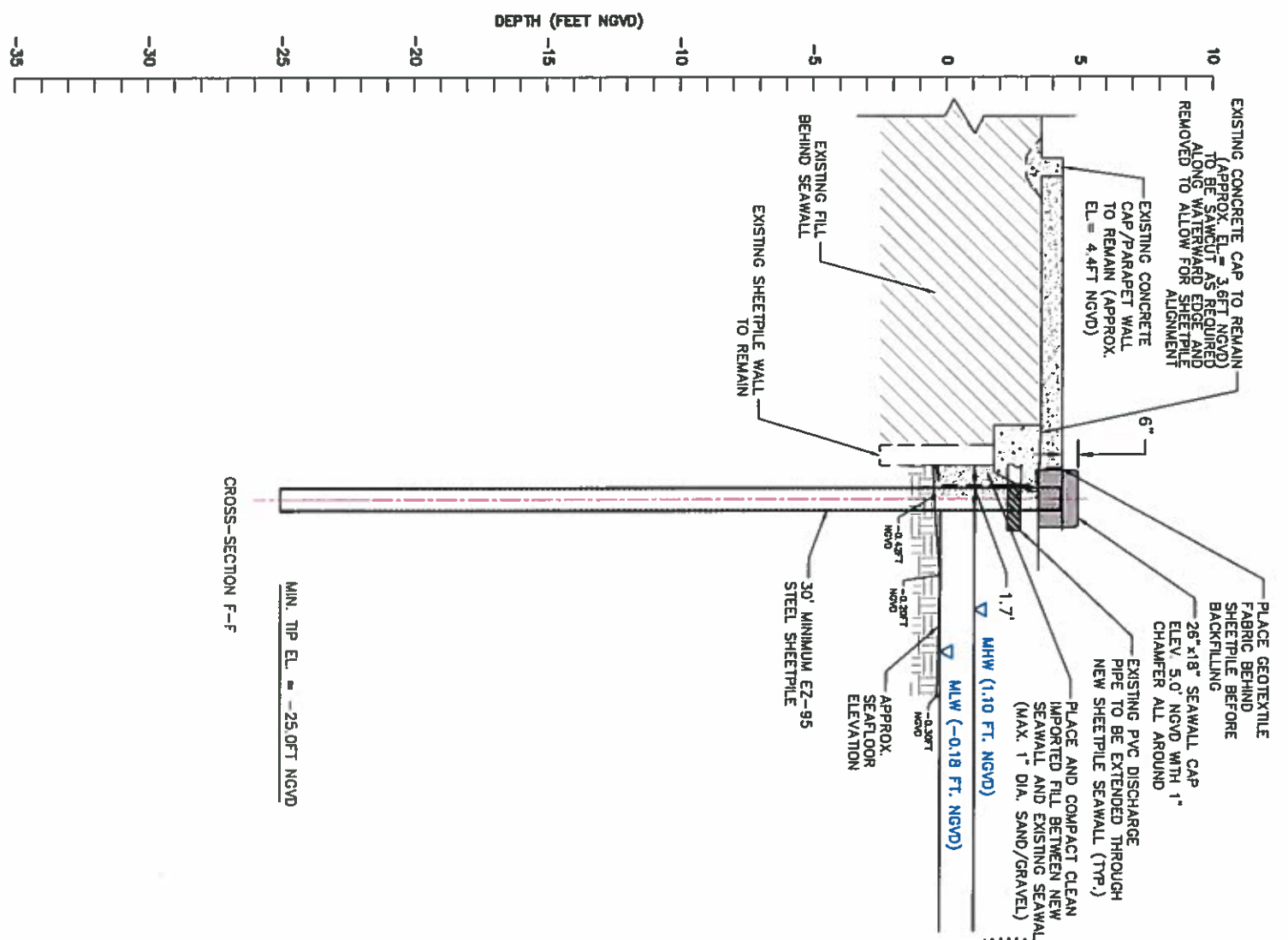
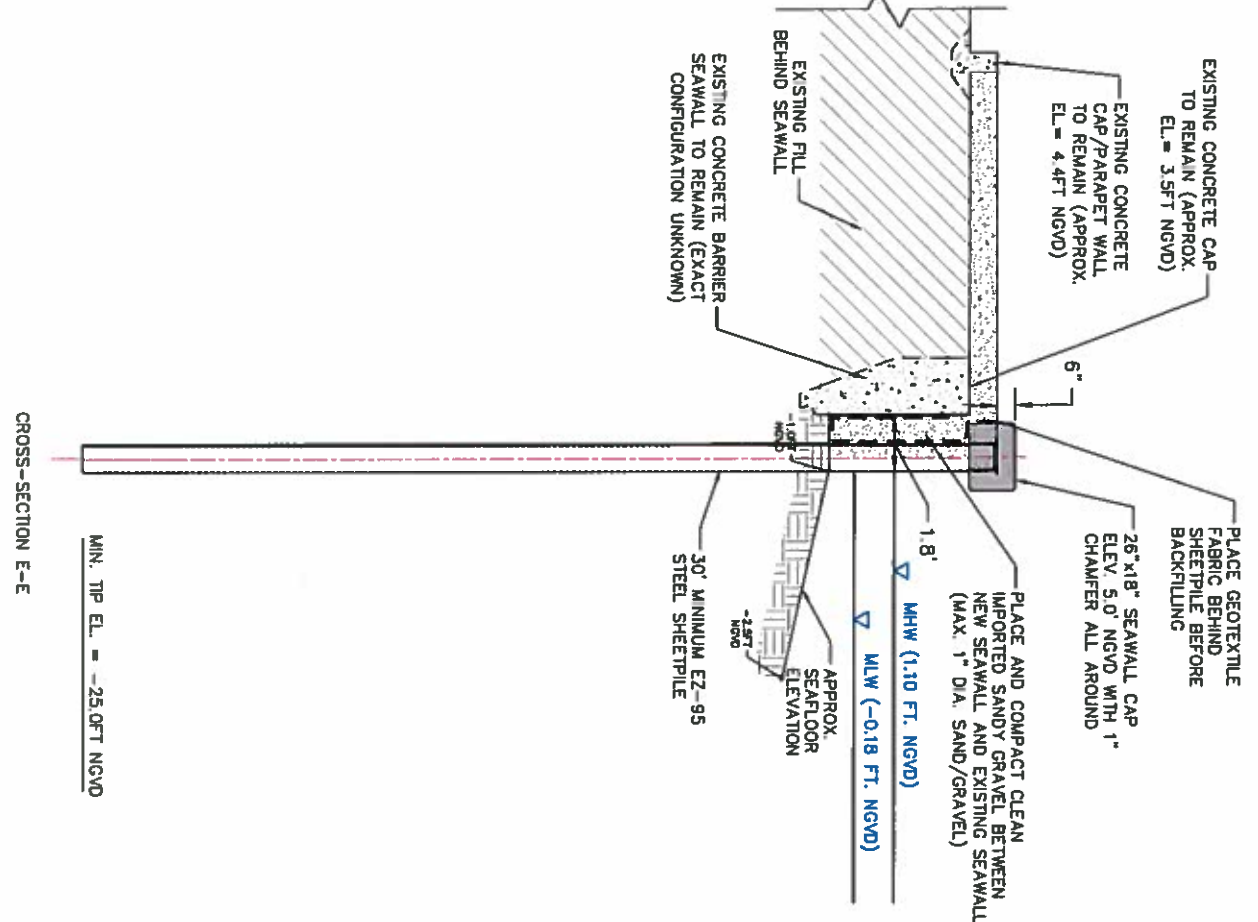
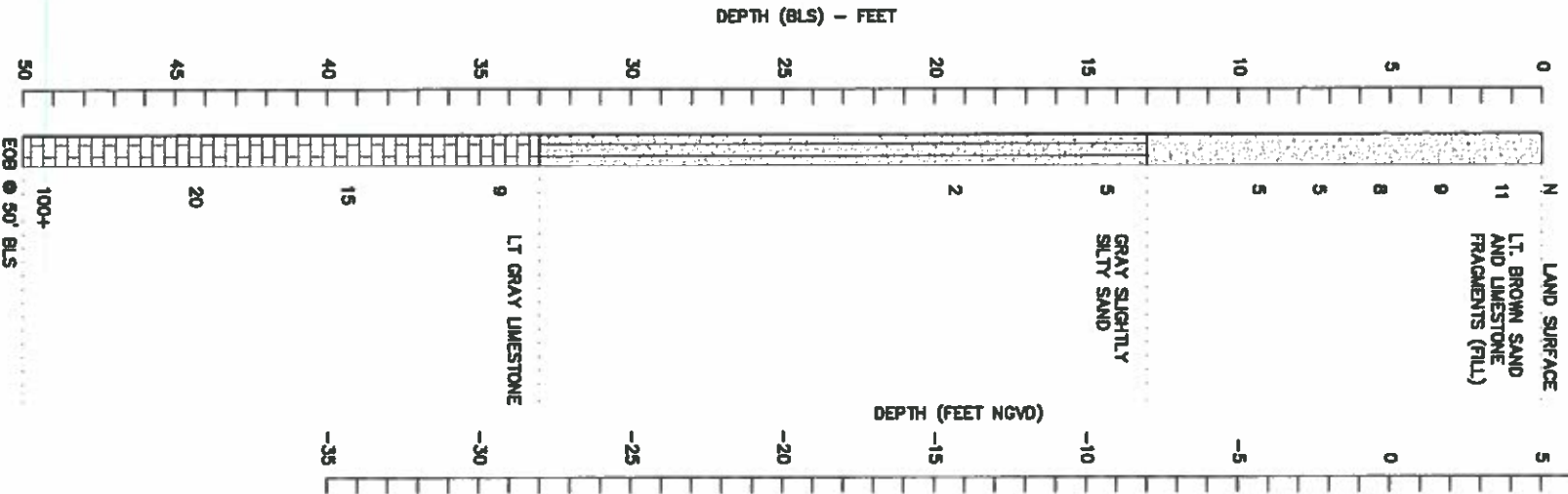
TETRA TECH INC.
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Sheet Reference:
C-104
 Sheet 8 of 11

DATE: 03/08/18
B-2



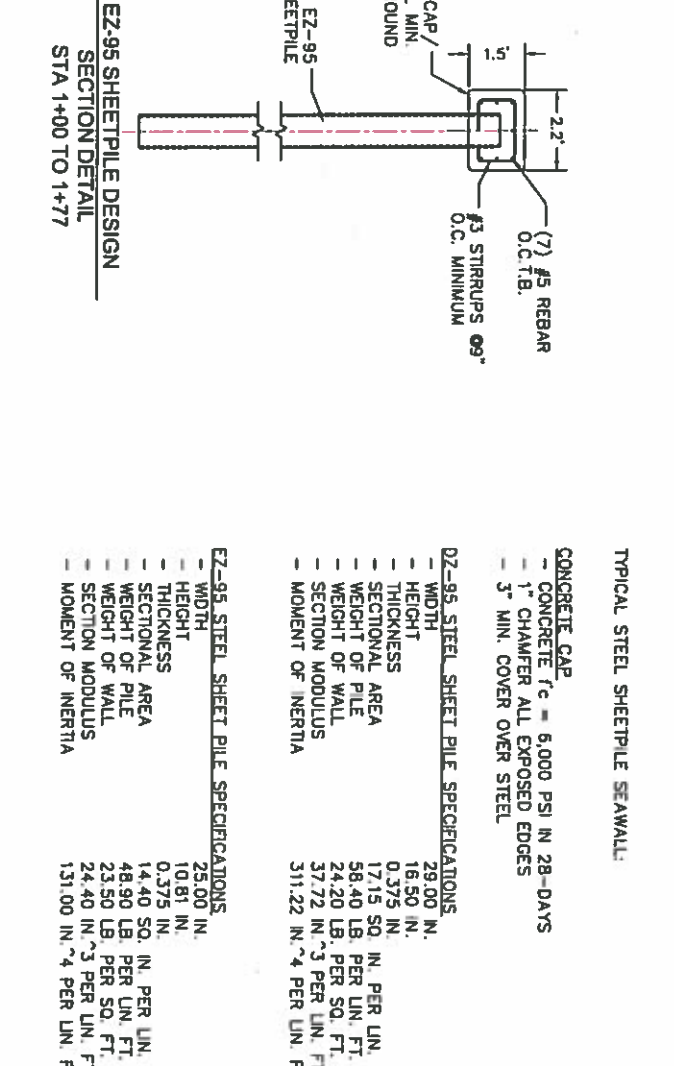
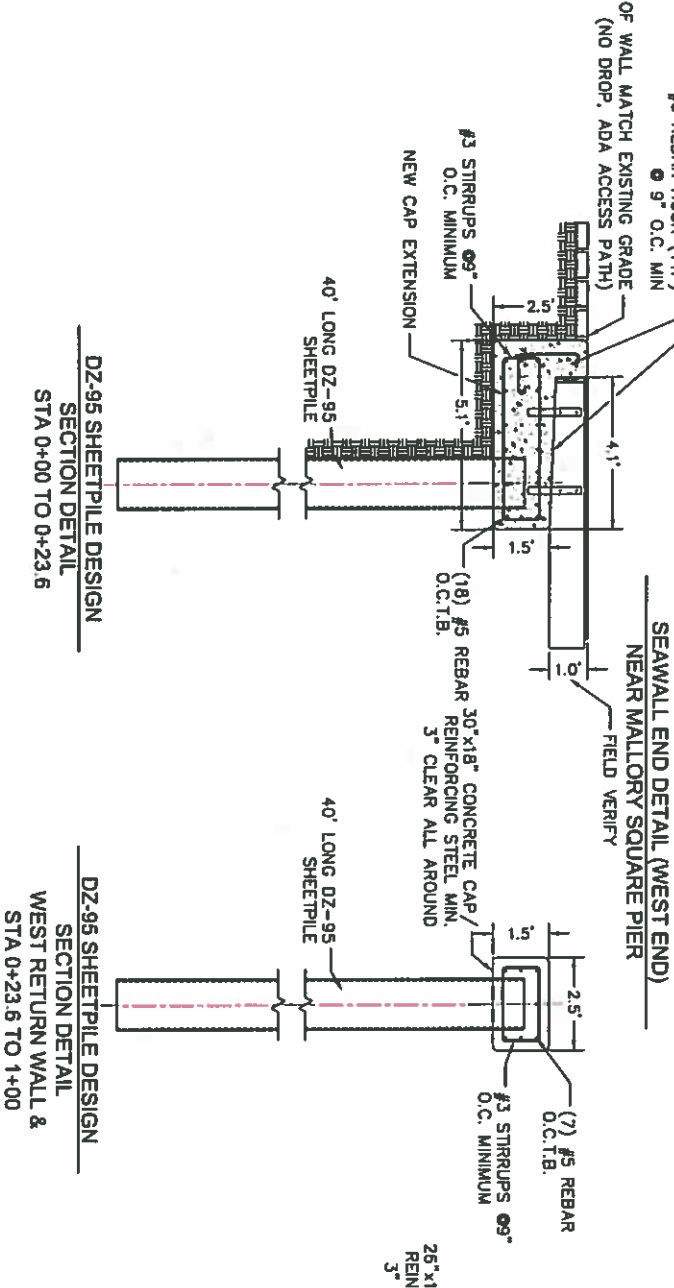
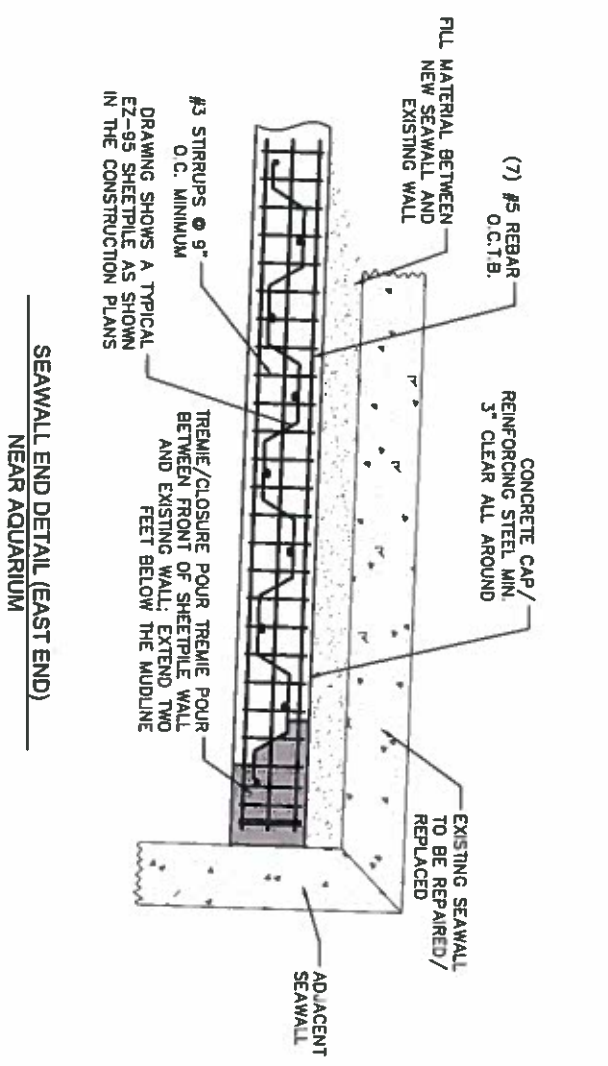
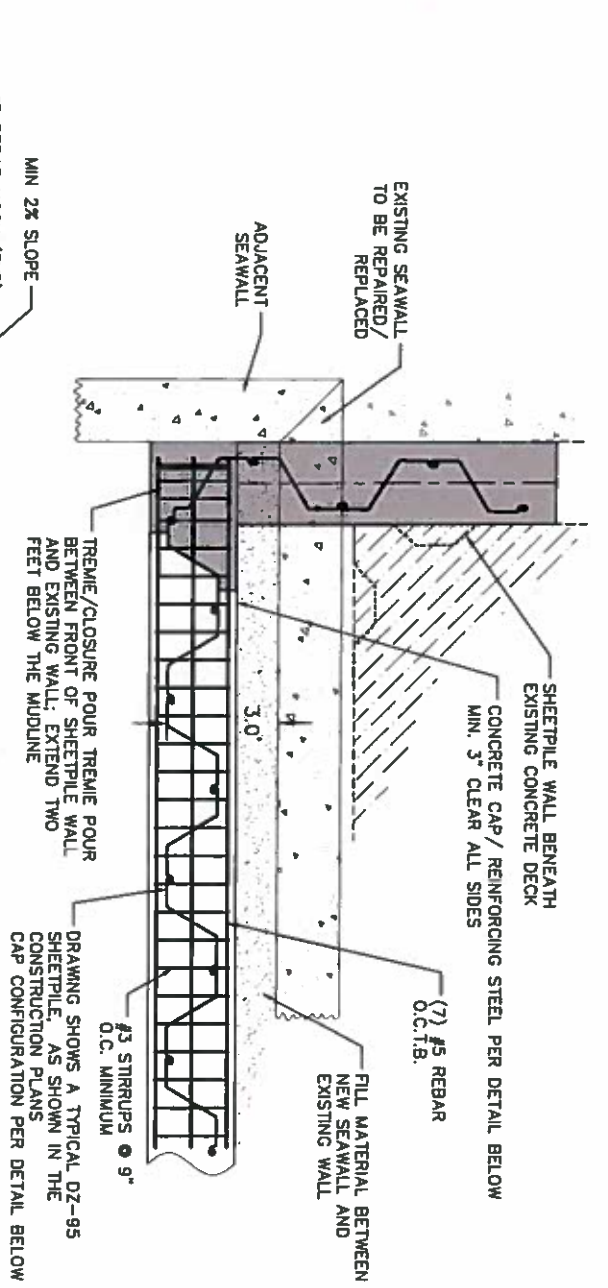
CITY OF KEY WEST
KEY WEST AQUARIUM SEAWALL REPAIR
SEAWALL CROSS-SECTIONS
KEY WEST, MONROE COUNTY, FLORIDA

Tt TETRA TECH INC.
759 SOUTH FEDERAL HWY
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Sheet Reference:
C-105
Sheet 9 of 11



CONCRETE CAP

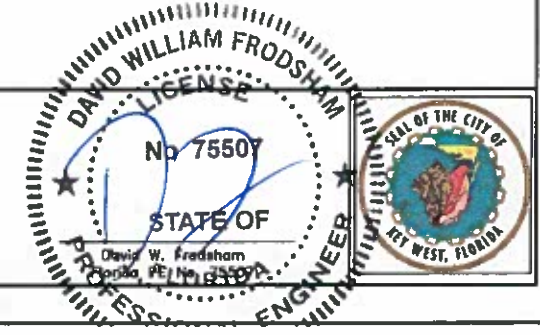
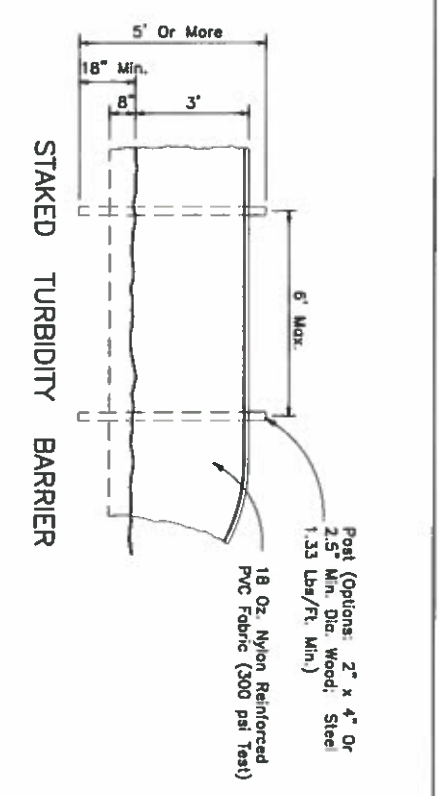
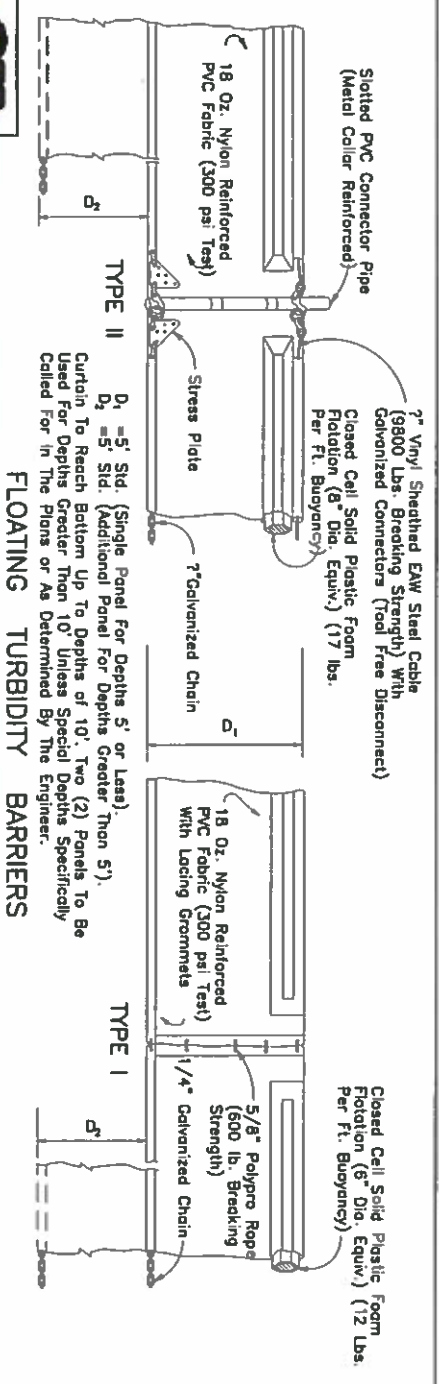
- CONCRETE $f_c = 6,000$ PSI IN 28-DAYS
- 1" CHAMFER ALL EXPOSED EDGES
- 3" MIN. COVER OVER STEEL

DZ-95 STEEL SHEETPILE SPECIFICATIONS

- WIDTH: 29.00 IN.
- HEIGHT: 16.50 IN.
- THICKNESS: 0.375 IN.
- SECTIONAL AREA: 17.15 SQ. IN. PER LIN. FT.
- WEIGHT OF PILE: 58.40 LB. PER LIN. FT.
- WEIGHT OF WALL: 24.20 LB. PER SQ. FT.
- SECTION MODULUS: 37.72 IN.³ PER LIN. FT.
- MOMENT OF INERTIA: 311.22 IN.⁴ PER LIN. FT.

EZ-95 STEEL SHEETPILE SPECIFICATIONS

- WIDTH: 25.00 IN.
- HEIGHT: 10.81 IN.
- THICKNESS: 0.375 IN.
- SECTIONAL AREA: 14.40 SQ. IN. PER LIN. FT.
- WEIGHT OF PILE: 48.90 LB. PER LIN. FT.
- WEIGHT OF WALL: 23.50 LB. PER SQ. FT.
- SECTION MODULUS: 24.40 IN.³ PER LIN. FT.
- MOMENT OF INERTIA: 131.00 IN.⁴ PER LIN. FT.

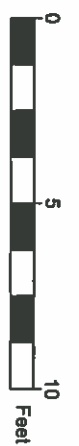


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Drawn by:	F. MARTINEZ
Checked by:	S. MCCAGHEE
Date:	7/10/2018
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Scale:	AS SHOWN

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CITY OF KEY WEST
KEY WEST AQUARIUM SEAWALL REPAIR
 GENERAL DETAILS
KEY WEST, MONROE COUNTY, FLORIDA

Sheet Reference:
C-106
 Sheet 10 of 11



CONSTRUCTION PLANS FOR MALLORY SQUARE PEDESTRIAN BRIDGE REMOVAL AND REINSTALLATION DETAILS

SITE LOCATION



LOCATION MAP:

CITY OF KEY WEST
PURCHASE ORDER: 086696
(DATED 05/01/2018)
ARTIBUS DESIGN TASK ORDER #1801

PROJECT LOCATION:
MALLORY SQUARE,
KEY WEST, FL 33040

REV: DESCRIPTION:	BY:	DATE:
STATUS: FINAL		



ARTIBUS DESIGN
3706 N. ROOSEVELT BLVD
SUITE 1-208
KEY WEST, FL 33040
(305) 304-3512
WWW.ARTIBUSDESIGN.COM
CA # 30835

CLIENT: CITY OF KEY WEST
ENGINEERING DEPARTMENT
1300 WHITE ST,
KEY WEST, FL 33040

PROJECT: MALLORY SQUARE
PEDESTRIAN BRIDGE
REMOVAL AND REINSTALLATION

SITE: MALLORY SQUARE,
KEY WEST, FL 33040

TITLE: COVER

SCALE AT 1/4"=1'-0"	DATE: 05/21/18	DRAWN: MNS	CHECKED: SAM
PROJECT NO: 1805-05	DRAWING NO: G-100	REVISION: 1	

THIS DRAWING IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL SEAL

SIGNATURE: *[Signature]*

DATE: AUG 01 2018

SERGE MASHTAKOV
PROFESSIONAL ENGINEER
STATE OF FLORIDA
LICENSE NO 71480

GENERAL REQUIREMENTS:

1. PRIOR TO STARTING ANY WORK THE CONTRACTOR SHALL REVIEW THESE PLANS AND SITE CONDITIONS AND NOTIFY THE ENGINEER IF ANY DISCREPANCIES ARE DISCOVERED.
2. THE ENGINEER IS NOT RESPONSIBLE FOR THE SUPERVISION OF THE CONTRACTOR NOR HIS EMPLOYEES DURING THE CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE MEANS AND ESTABLISH METHODS OF THE CONSTRUCTION TO MEET REQUIREMENTS OF ALL APPLICABLE CODES, INDUSTRY STANDARDS AND REQUIREMENTS OF THESE PLANS.
3. QUALITY OF THE WORK SHALL MEET OR EXCEED INDUSTRY STANDARD PRACTICES.
4. ANY DEVIATIONS FROM THESE PLANS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER.

DESIGN DATA:

1. APPLICABLE BUILDING CODE: FBC EXISTING 6TH EDITION (2017)
2. APPLICABLE DESIGN LOADS: PER ASCI/SEI 7-10
FLOOR LIVE LOAD 100 PSF
ROOF LIVE LOAD: 20 PSF (300 LB CONC.)
BASIC WIND SPEED: 180 MPH
EXPOSURE: D
STRUCTURAL CATEGORY: II

ALL PRESSURES SHOWN ARE BASED ON ASD DESIGN WITH A LOAD FACTOR OF 0.6

3. FLOOD ZONE: VE11 & VE13
FLOOD RESISTANT DESIGN AND CONSTRUCTION PER ASCI 24-14
FLOOD DESIGN CLASS 2

SOILS AND FOUNDATIONS:

FOUNDATIONS SHALL BE PLACED ON A "SEDIMENTARY AND FOLIATED ROCK" WITH A ALLOWABLE LOAD BEARING PRESSURE OF 3,000 PSF. NOTIFY THE ENGINEER OF SOIL CONDITIONS ARE DIFFERENT.

1. ALL FOUNDATIONS, SLABS AND FOOTERS SHALL BE PLACED ON STABILIZED UNDISTURBED SUBGRADE SOIL.
2. MINIMUM FOUNDATION DEPTH SHALL BE 24" UNLESS OTHERWISE IS SPECIFIED ON THE PLANS. IF OVER-EXCAVATED - FILL SHALL NOT BE PLACED BACK INTO THE TRENCH UNLESS APPROVED BY THE ENGINEER.
3. FILL UNDER THE FOUNDATIONS SHALL BE USED ONLY IF APPROVED BY THE ENGINEER. CLEAN FILL MATERIAL SHALL BE PLACED IN 6"-8" LAYERS AND COMPACTED TO 98% DENSITY USING THE MODIFIED PROCTOR TEST.
4. FILL MATERIAL SHALL BE CLEAN GRANULAR SAND OR LIMEROCK MIX WITHOUT ANY ORGANIC MATERIALS, CLAY, MUCK AND ROCKS LARGER THAN 4". BACKFILL SHALL NOT CONTAIN ANY WOOD OR CELLULOSE DEBRIS.

AUGERCAST PILES

1. AUGERCAST PILES SHALL BE 16" DIAMETER WITH MINIMUM EMBEDMENT OF 3FT INTO THE CAP ROCK UNLESS OTHERWISE SHOWN ON THE PLANS.
2. CONCRETE FOR PILES SHALL HAVE A MIN. COMPRESSIVE STRENGTH OF 5000 PSI. WATER CEMENT RATIO SHALL NOT EXCEED W/C=0.40.
3. REINFORCEMENT SHALL BE FOUR (4) #5 REBAR VERTICALLY WITH #3 STIRRUPS AT 10" O.C. CONTRACTOR SHALL USE PLASTIC CHAIRS OR CENTRALIZERS TO PROVIDE A 3" COVER ON ALL SIDES OF THE REINFORCEMENT.

CONCRETE

1. APPLICABLE CODE ACI 318 LATEST EDITION AND ACI 301.
 2. ALL CONCRETE ELEMENTS SHALL HAVE A MIN. COMPRESSIVE STRENGTH OF 4000 PSI UNLESS OTHERWISE IS SHOWN ON THE PLANS. WATER CEMENT RATIO SHALL NOT EXCEED W/C=0.40.
 3. ALL CAST-IN-PLACE CONCRETE SHALL BE CURED AND PROTECTED FROM OVERDRYING PER ACI 305R-10 "HOT WEATHER CONCRETING".
 4. ALL EXPOSED EDGES SHALL HAVE 1/2" CHAMFERS.
 5. NO COLD JOINTS ARE ALLOWED UNLESS OTHERWISE APPROVED BY THE ENGINEER.
 6. TESTING: ALL FIELD AND LABORATORY TESTING SHALL BE PERFORMED BY THE INDEPENDENT SPECIALIZED COMPANY.
- THE CONTRACTOR IS RESPONSIBLE FOR ALL SCHEDULING, COORDINATION AND COST OF TESTING COMPANY.
- THREE (3) SAMPLES SHALL BE TAKEN AND TESTED EACH TIME.
- MINIMUM SAMPLING FREQUENCY:
- A) EACH DAY OF CONCRETING FOR EVERY CONCRETE MIX;
 - B) EVERY 50 CUBIC YARDS;
 - C) EVERY 2000 SQ.FT. OF SLAB AREA.

ALL TESTING SHALL BE PER LATEST ACI AND ASTM REQUIREMENTS. LABORATORY SHALL SUPPLY THREE (3) ORIGINAL SIGNED&SEALED REPORT RESULTS TO THE ENGINEER.

7. CAST-IN-PLACE AND PRECAST MEMBERS ERECTION TOLERANCES SHALL BE AS SPECIFIED IN TABLE 8.2.2 OR IN SECTION 8.3 OF "PCI DESIGN HANDBOOK/SIXTH EDITION".

REINFORCEMENT

1. ALL REBAR SHALL BE ASTM A1035 GRADE 100 (CHROMX 9100) AS CORROSION RESISTANT REINFORCEMENT.
2. ALL REQUIREMENTS FOR PLACEMENT, COVER, TOLERANCES, ETC. SHALL BE PER ACI 318-11.
3. ALL HOOKS AND BENDS SHALL BE FACTORY MADE UNLESS FIELD BENDS ARE APPROVED BY THE ENGINEER.
4. ONLY PLASTIC CHAIRS AND CENTRALIZERS SHALL BE USED FOR REBAR SUPPORT.

STRUCTURAL LUMBER

1. ALL WOOD MEMBERS SHALL MEET OR EXCEED REQUIREMENTS SPECIFIED IN "ANSI/AF&PA NATIONAL DESIGN SPECIFICATION (NDS) FOR WOOD CONSTRUCTION" AND ALL REFERENCED STANDARDS.
2. ALL WOOD MEMBERS SHALL BE SOUTHER PINE NO2 OR GREATER KILN DRIED AS SPECIFIED IN THE STANDARDS, UNLESS OTHERWISE SPECIFIED.
3. ALL WOOD MEMBERS EXPOSED TO EXTERIOR, IN DIRECT CONTACT WITH CONCRETE OR STEEL SHALL BE PRESSURE-TREATED (PT) UC5C MARINE USE, SOUTHERN WATERS (SALT OR BRACKISH WATER) PER AWPA STANDARDS.
4. ALL FIELD CUTS IN PT LUMBER SHALL TREATED ON SITE.
5. NAILING SHALL BE IN ACCORDANCE WITH FBC 2017. NAILS AND OTHER FASTENERS FOR PT WOOD SHALL BE STAINLESS STEEL.
6. SHEATHING SHALL BE 5/8" CDX PLYWOOD SHEATHING GRADE, UNLESS OTHERWISE IS SPECIFIED ON THE PLANS. USE 10D RING-SHANK NAILS WITH SPACING OF 4" O.C. ON ALL EDGES AND 6" O.C. IN THE FIELD.

HARDWARE

1. HARDWARE SHALL BE 316 STAINLESS STEEL OR BETTER, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. ALL CONNECTORS SHALL HAVE STAINLESS STEEL SCREWS AND FASTENERS UNLESS OTHERWISE SPECIFIED ON THE PLANS.

REINFORCED MASONRY (CMU)

1. ALL MASONRY SHALL BE REINFORCED CONCRETE MASONRY UNIT IN ACCORDANCE WITH THE LATEST EDITION OF ACI 530/ASCE 5/TMS 402.
2. INSTALL ALL BLOCKS IN RUNNING BOND.
3. MINIMUM MASONRY BLOCK (ASTM C90) STRENGTH SHALL (F_m) BE 2000 PSI.
4. TYPE "S" MORTAR (ASTM C270) SHALL BE USED USING 3/8" FULL BEDDING REINFORCED W/ 9 GAGE GALVANIZED LADDER WIRE EVERY 2ND ROW.
5. FILLED CELLS SHALL BE REINFORCED WITH #5 REBAR @ 24" O.C. (UNLESS OTHERWISE IS SPECIFIED ON THE PLANS).
6. GROUT SHALL BE PEA ROCK PUMP MIX (ASTM C476) WITH A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI (28 DAY) (ASTM C1019). TARGETED SLUMP SHALL BE 8"-11".
6. EACH GROUTED CELL SHALL HAVE CLEANOUT OPENINGS AT THE BOTTOM. THERE SHALL BE NO LOOSE MORTAR OR OTHER DEBRIS IN THE BOTTOM OF THE CELL. USE BLAST PRESSURE WASHING FOR SURFACE PREPARATION.

STRUCTURAL STEEL

1. STRUCTURAL STEEL COMPONENTS SHALL BE AS DESCRIBED IN "SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS" AISC 2005 OR LATER EDITION.
2. HSS SHAPES (STRUCTURAL TUBING) SHALL BE ASTM A500 (FY=46 KSI).
3. STEEL PLATES, FLANGES AND MISCELLANEOUS ELEMENTS SHALL BE ASTM A36 (FY=36 KSI) UNLESS NOTED OTHERWISE ON THE PLANS.
4. W-SHAPES, C-SHAPES AND OTHER FORMED STEEL SHALL BE ASTM A36 (FY=36 KSI).
5. ALL WELDING SHALL BE IN CONFORMANCE WITH THE LATEST SPECIFICATIONS AWS D1.1/D1.1M:2014, STRUCTURAL WELDING CODE - STEEL.
6. BOLTS: HOT DIP GALVANIZED. A325N, A563DH HEX NUTS, F436 WASHERS.
7. ANCHOR BOLTS: HOT DIP GALVANIZED. A307 GRADE A, A563DH HEX NUTS, F844 WASHERS.

STRUCTURAL STEEL COATING

1. ALL SURFACES SHALL BE ABRASIVE BLAST CLEANED TO NEAR-WHITE METAL (PER SSPD-SP10) EXPOSED STEEL:
2. ALL SURFACES SHALL BE PRIMED WITH POLYAMIDE EPOXY - ONE COAT (8.0 MILS DFT).
3. APPLY SEALANT AT ALL LOCATIONS WHERE STEEL IS WELDED, LAPPED ETC. SEALANT MATERIAL SHALL BE COMPATIBLE WITH THE PAINTING SYSTEM.
4. TOP LAYER SHALL BE TWO (2) COAT POLYURETHANE (3.0 MILS DFT EACH).
5. TOP PAINT SHALL BE UV RESISTANT OR HAVE A UV RESISTANT COATING.
6. COLORS SHALL MATCH EXISTING OR TO BE SELECTED BY THE OWNER.
- NON-EXPOSED STEEL (INTERIOR):
7. 2 COATS OF "SUMTER COATINGS" UNIVERSAL PRIMER (6.0 MILS DFT) OR APPROVED EQUAL.

ALUMINUM COMPONENTS

1. TYPE 6061-T6 ALUMINUM.
2. MIG WELDED ALL JOINTS W/ CONTINUOUS 1/8" WELD. USE 5356 FILLER WIRE ALLOY.
3. ALL ALUMINUM IN CONTACT WITH CONCRETE, PT WOOD, DISSIMILAR METALS AND OTHER CORROSIVE MATERIALS SHALL COATED WITH COAL-TAR EPOXY OR PROTECTED BY OTHER ENGINEER APPROVED METHOD.

OPENINGS:

1. ALL EXTERIOR WINDOWS & DOORS SHALL BE LARGE AND SMALL MISSILE IMPACT RATED OR HAVE CODE COMPLIANT SHUTTERS.
2. ALL EXTERIOR WINDOWS AND DOORS SHALL HAVE FLORIDA PRODUCT APPROVAL AND NOA. PRODUCT APPROVAL LABELS SHALL BE PERMANENTLY ATTACHED TO THE FRAME.
3. WIND PRESSURE ON COMPONENTS AND CLADDING (CH 30 PART 1)

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DATE: _____

SERGE MASHTAKOV
PROFESSIONAL ENGINEER
STATE OF FLORIDA
LICENSE NO 71480

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STATUS:	FINAL	



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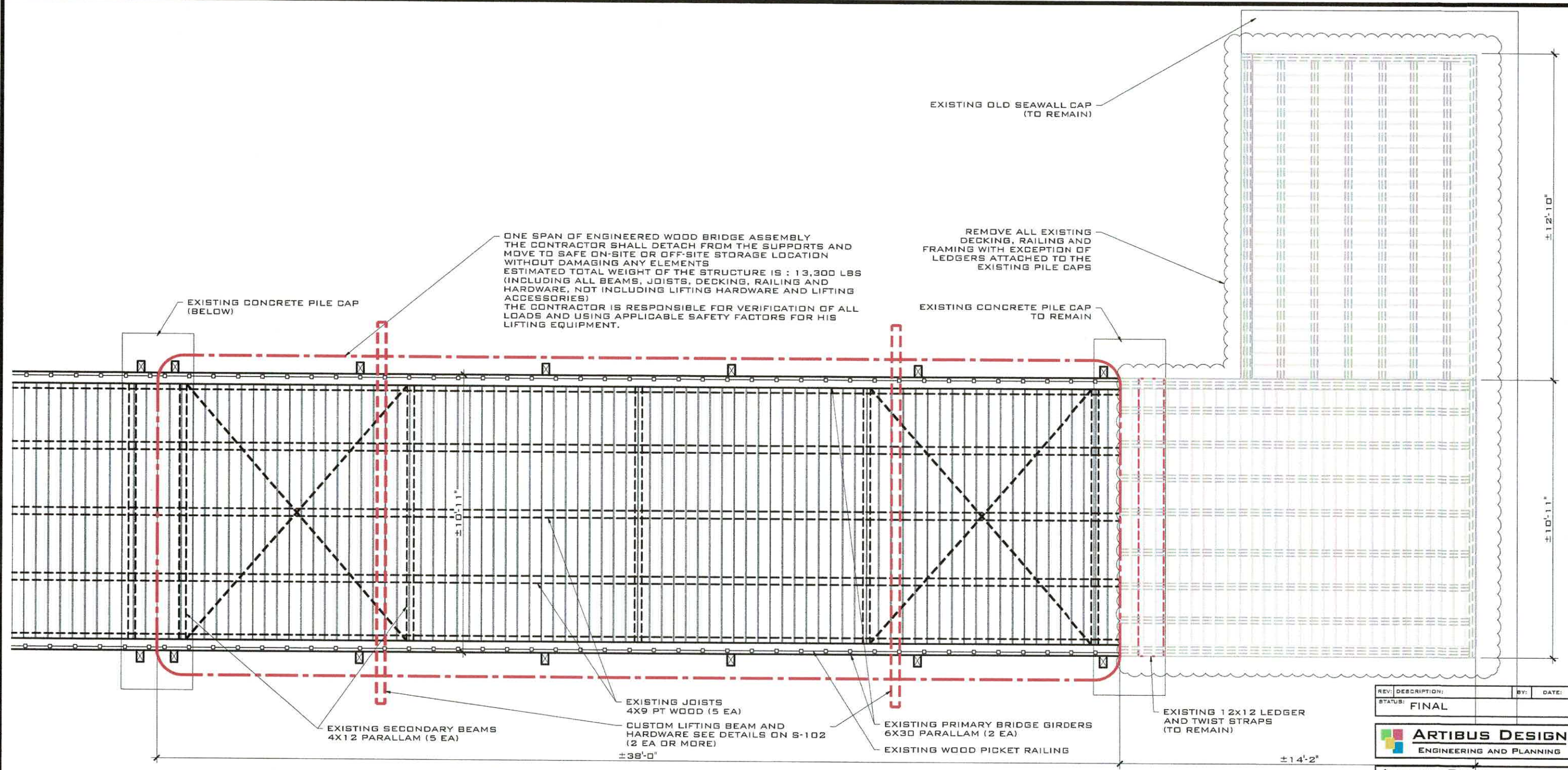
CLIENT: CITY OF KEY WEST
ENGINEERING DEPARTMENT
1300 WHITE ST.
KEY WEST, FL 33040

PROJECT: MALLORY SQUARE
PEDESTRIAN BRIDGE
REMOVAL AND REINSTALLATION

SITE: MALLORY SQUARE,
KEY WEST, FL 33040

TITLE: NOTES

SCALE AT 1:1=17:	DATE:	DRAWN:	CHECKED:
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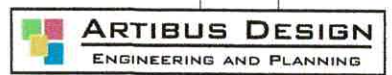


ONE SPAN OF ENGINEERED WOOD BRIDGE ASSEMBLY THE CONTRACTOR SHALL DETACH FROM THE SUPPORTS AND MOVE TO SAFE ON-SITE OR OFF-SITE STORAGE LOCATION WITHOUT DAMAGING ANY ELEMENTS ESTIMATED TOTAL WEIGHT OF THE STRUCTURE IS : 13,300 LBS (INCLUDING ALL BEAMS, JOISTS, DECKING, RAILING AND HARDWARE, NOT INCLUDING LIFTING HARDWARE AND LIFTING ACCESSORIES) THE CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF ALL LOADS AND USING APPLICABLE SAFETY FACTORS FOR HIS LIFTING EQUIPMENT.

**EXISTING CONDITIONS
RELOCATION AND DEMOLITION PLAN**
SCALE: 1/4" = 1'-0"

- NOTES: 1. ELECTRICAL CONDUITS ARE PRESENT UNDER THE FRAMING. THE CONTRACTOR IS RESPONSIBLE FOR DISCONNECTING ALL ELECTRICAL LINES AND CONDUITS AND RESTORATION OF THE SERVICE AFTER BRIDGE RE-INSTALLATION.
2. THE CONTRACTOR IS TO MANUFACTURE AND PROVIDE CUSTOM LIFTING BEAM AND HARDWARE AS PROVIDED IN DETAILS OR OTHER ENGINEER APPROVED METHOD OF LIFTING, MOVING AND STORING THE SPAN FOR THE DURATION OF CONSTRUCTION. SUPPORTING BEAMS SHALL BE LOCATED APPROXIMATELY WITHIN 1/4 OF THE SPAN ON EACH SIDE AND PROVIDE ADEQUATE EQUAL SUPPORT FOR THE SPAN WITHOUT SIGNIFICANT DAMAGE TO THE GIRDERS OR SECONDARY COMPONENTS.
3. THE CONTRACTOR SHALL COORDINATE ON-SITE SPAN STORING LOCATION WITH THE CITY OF KEY WEST OFFICIALS AND BE RESPONSIBLE FOR SAFE AND SECURE STORAGE (FENCING, SAFETY BARRICADES ETC.)
4. AFTER BRIDGE RE-INSTALLATION HOLES IN THE GIRDER SHALL BE FILLED WITH 3/4" DIA. HDG CARRIAGE BOLTS TO MATCH EXISTING HARDWARE STYLE (AS DECORATIVE MEASURE)

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1300 WHITE ST,
KEY WEST, FL 33040

PROJECT: MALLORY SQUARE
PEDESTRIAN BRIDGE
REMOVAL AND REINSTALLATION

SITE: MALLORY SQUARE,
KEY WEST, FL 33040

TITLE: EXISTING CONDITIONS

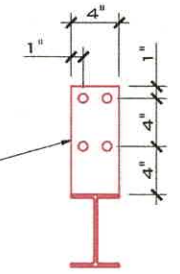
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SCALE AT 1/4" = 1'-0"	DATE:	DRAWN:	CHECKED:
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ESTIMATED TOTAL WEIGHT OF THE STRUCTURE IS : 13,300 LBS
 (INCLUDING ALL BEAMS, JOISTS, DECKING, RAILING AND HARDWARE,
 NOT INCLUDING LIFTING HARDWARE AND LIFTING ACCESSORIES)



4x9 1/2 STEEL PLATE
 FILLET WELDED 1/4" AROUND PERIMETER
 TO TOP FLANGE OF THE BEAM
 (4) 3/4" DIA. HOLES FOR (4) 5/8" DIA.
 BOLTS

CRANE LINES AND LIFTING EQUIPMENT
 SIZED AND PROVIDED BY THE CONTRACTOR

EXISTING BRIDGE ASSEMBLY
 TO BE REMOVED AND SECURELY STORED
 FOR RE-INSTALLATION

SOLID WOOD BLOCKING BETWEEN
 PLATE AND BRIDGE GIRDER

CUSTOM LIFTING BEAM

6x6 1/2 STEEL PLATE
 FILLET WELDED 1/4" AROUND PERIMETER
 TO TOP FLANGE OF THE BEAM
 2" DIA. OPENING FOR LIFTING LINES
 (COORDINATE WITH AVAILABLE
 EQUIPMENT)

STEEL BEAM W6x12 ASTM A992 OR LARGER

± 11'-2" CLEAR WIDTH + 1" ON EACH SIDE

± 15'-0"

EXISTING PILE CAP TO REMAIN

CUSTOM BRIDGE SPAN LIFTING HARDWARE
 SCALE: 3/4" = 1'-0"

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PROJECT: MALLORY SQUARE
 PEDESTRIAN BRIDGE
 REMOVAL AND REINSTALLATION

SITE: MALLORY SQUARE,
 KEY WEST, FL 33040

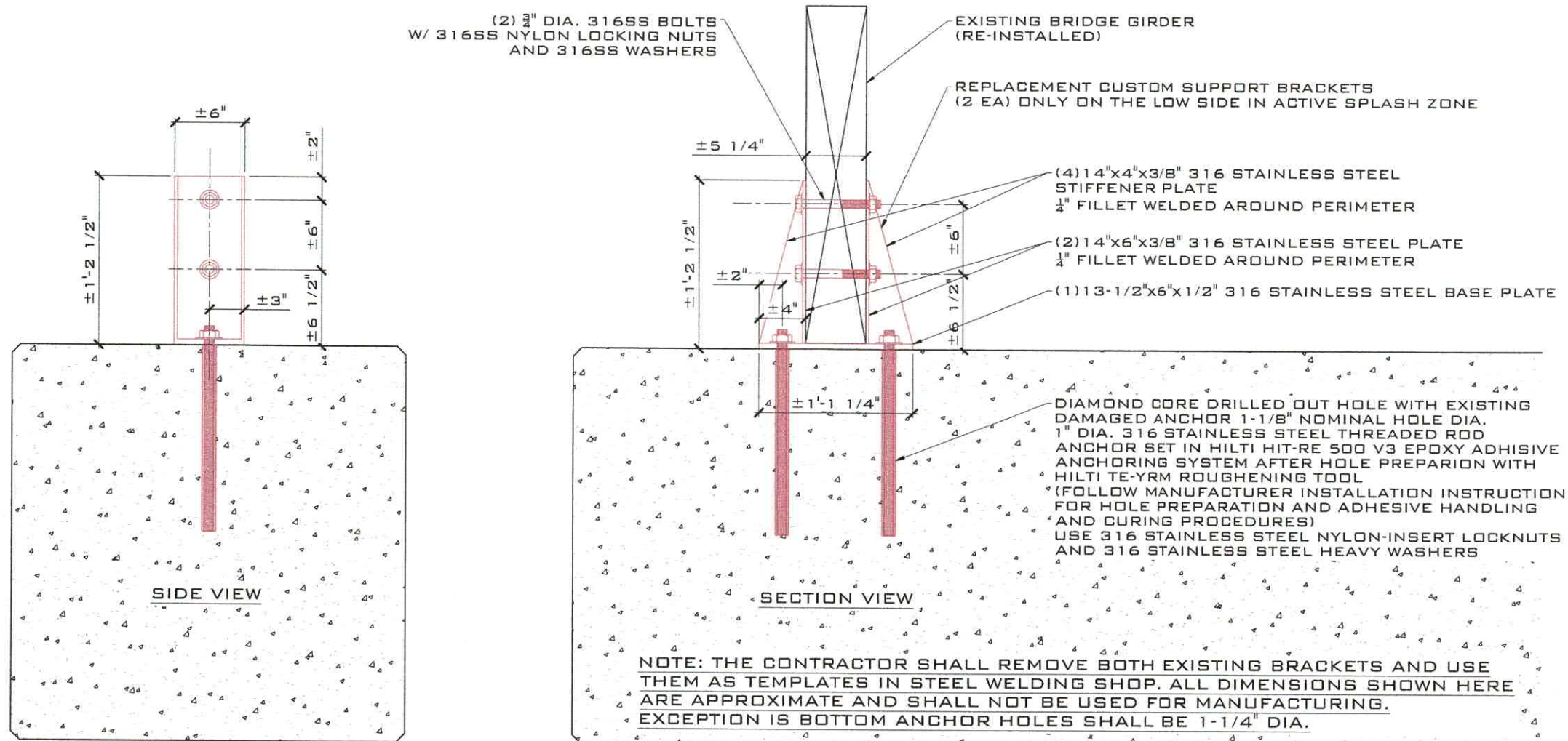
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SCALE AT 1/4" = 1'-0"	DATE:	DRAWN:	CHECKED:
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**CUSTOM BRIDGE GIRDER SUPPORT BRACKETS (2 EA)
REPLACEMENT**
SCALE: 1" = 1'-0"

NOTE: THE CONTRACTOR SHALL REMOVE BOTH EXISTING BRACKETS AND USE THEM AS TEMPLATES IN STEEL WELDING SHOP. ALL DIMENSIONS SHOWN HERE ARE APPROXIMATE AND SHALL NOT BE USED FOR MANUFACTURING. EXCEPTION IS BOTTOM ANCHOR HOLES SHALL BE 1-1/4" DIA.

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DATE: 07/31/18

PROFESSIONAL ENGINEER
STATE OF FLORIDA
LICENSE NO 71480

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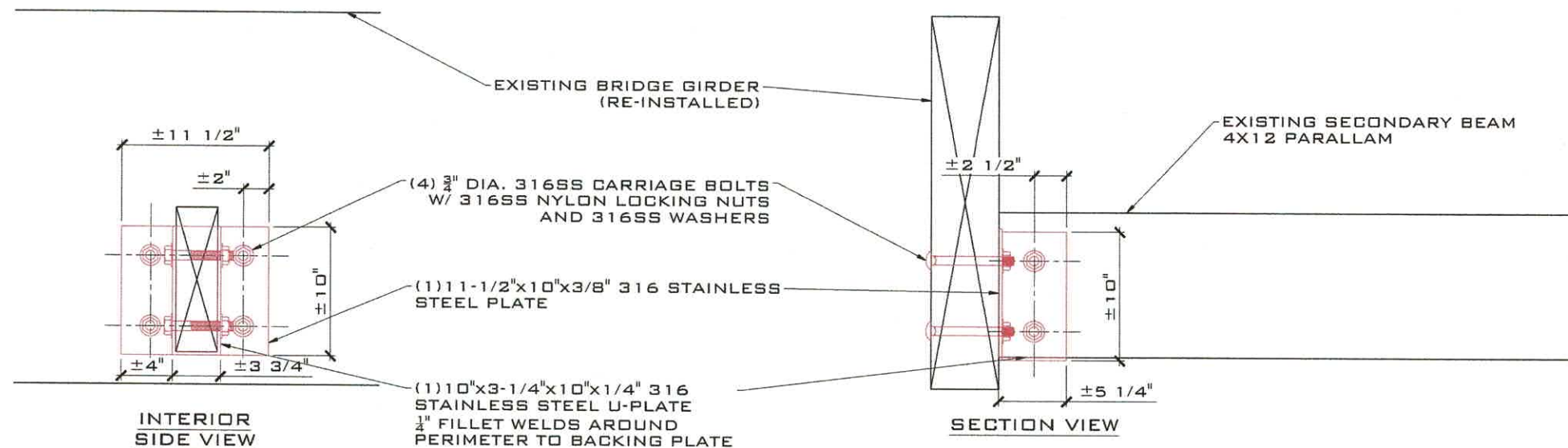
CLIENT: CITY OF KEY WEST
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KEY WEST, FL 33040

PROJECT: MALLORY SQUARE
PEDESTRIAN BRIDGE
REMOVAL AND REINSTALLATION

SITE: MALLORY SQUARE,
KEY WEST, FL 33040

TITLE: SUPPORT BRACKETS

SCALE AT 11x17:	DATE:	DRAWN:	CHECKED:
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1805-05	S-103	1	



**CUSTOM SECONDARY BEAM TO GIRDER BRACKETS (4 EA)
REPLACEMENT**

SCALE: 1" = 1'-0"

NOTE: THE CONTRACTOR SHALL REMOVE ONE EXISTING BRACKET AND USE IT AS A TEMPLATE IN STEEL WELDING SHOP. ALL DIMENSIONS SHOWN HERE ARE APPROXIMATE AND SHALL NOT BE USED FOR MANUFACTURING.

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PROJECT: MALLORY SQUARE
PEDESTRIAN BRIDGE
REMOVAL AND REINSTALLATION

SITE: MALLORY SQUARE,
KEY WEST, FL 33040

TITLE: SECONDARY BEAMS
BRACKETS

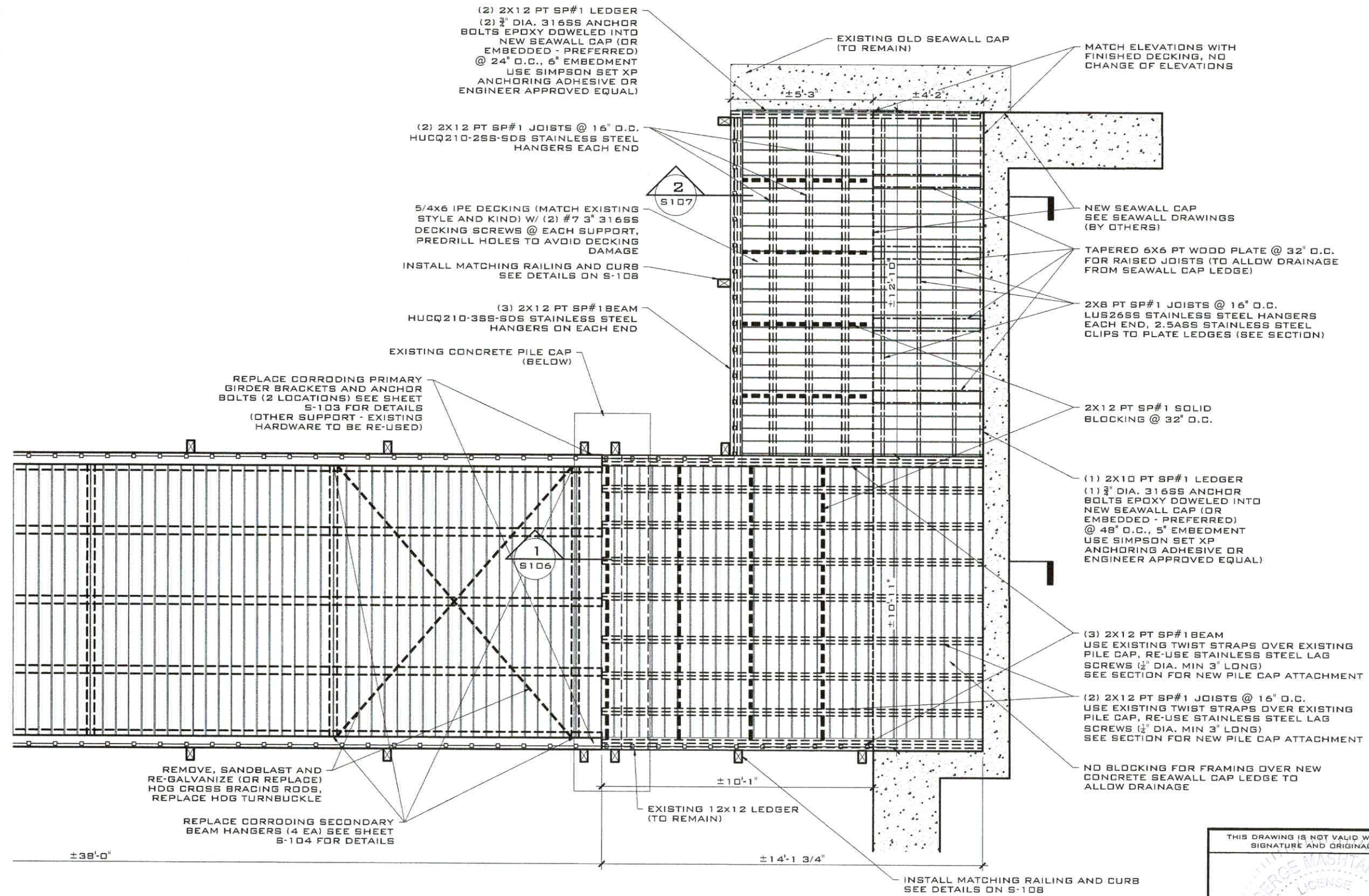
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DATE: 07/31/2018

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 STATE OF FLORIDA
 LICENSE NO 71480



**PROPOSED FRAMING PLAN AND
 BRIDGE RE-INSTALLATION PLAN**
 SCALE: 1/4" = 1'-0"

NOTES: 1. ELECTRICAL CONDUITS ARE PRESENT UNDER THE FRAMING. THE CONTRACTOR IS RESPONSIBLE FOR DISCONNECTING ALL ELECTRICAL LINES AND CONDUITS AND RESTORATION OF THE SERVICE AFTER BRIDGE RE-INSTALLATION.
 2. THE CONTRACTOR IS TO MANUFACTURE AND PROVIDE CUSTOM LIFTING BEAM AND HARDWARE AS PROVIDED IN DETAILS OR OTHER ENGINEER APPROVED METHOD OF LIFTING, MOVING AND STORING THE SPAN FOR THE DURATION OF CONSTRUCTION. SUPPORTING BEAMS SHALL BE LOCATED APPROXIMATELY WITHIN 1/4 OF THE SPAN ON EACH SIDE AND PROVIDE ADEQUATE EQUAL SUPPORT FOR THE SPAN WITHOUT SIGNIFICANT DAMAGE TO THE GIRDERS OR SECONDARY COMPONENTS.
 3. AFTER BRIDGE RE-INSTALLATION HOLES IN THE GIRDER SHALL BE FILLED WITH 5/8" DIA. HDG CARRIAGE BOLTS TO MATCH EXISTING HARDWARE STYLE (AS DECORATIVE MEASURE)

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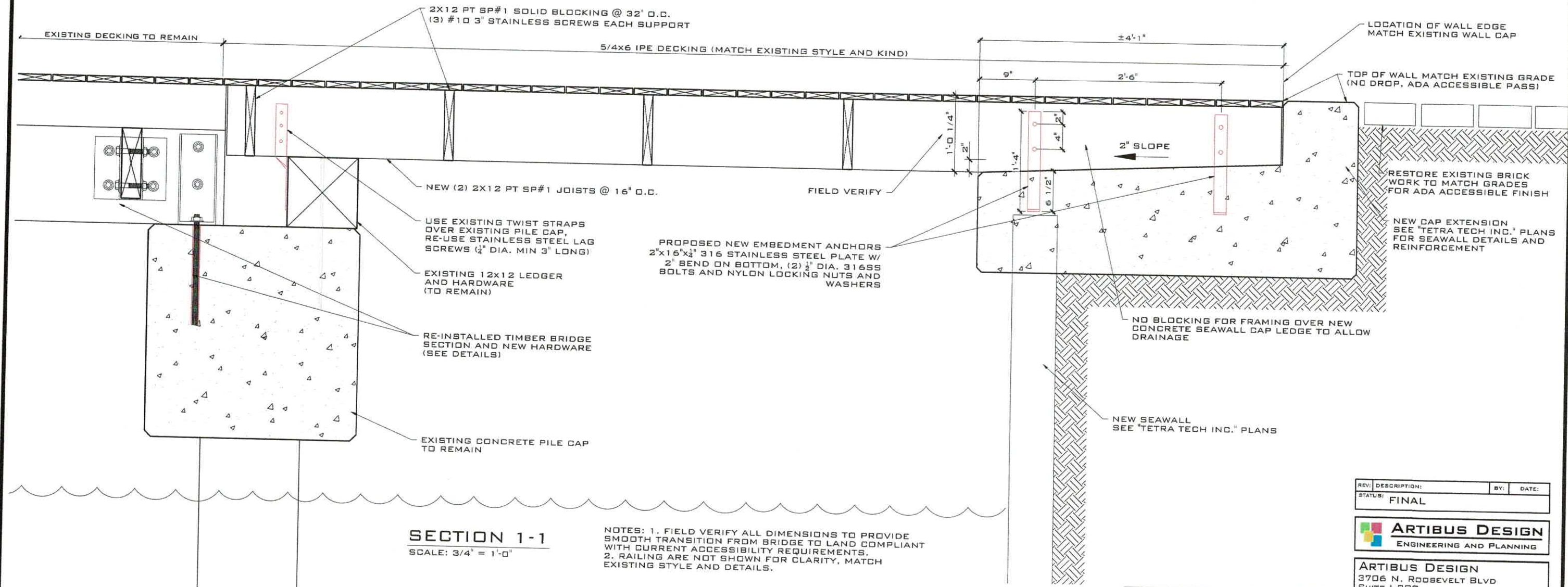
CLIENT: CITY OF KEY WEST
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 KEY WEST, FL 33040

PROJECT: MALLORY SQUARE
 PEDESTRIAN BRIDGE
 REMOVAL AND REINSTALLATION

SITE: MALLORY SQUARE,
 KEY WEST, FL 33040

TITLE: FRAMING PLAN

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PROJECT NO:	DRAWING NO:	REVISION:	
1805-05	S-105	1	



SECTION 1-1
SCALE: 3/4" = 1'-0"

NOTES: 1. FIELD VERIFY ALL DIMENSIONS TO PROVIDE SMOOTH TRANSITION FROM BRIDGE TO LAND COMPLIANT WITH CURRENT ACCESSIBILITY REQUIREMENTS.
2. RAILING ARE NOT SHOWN FOR CLARITY, MATCH EXISTING STYLE AND DETAILS.

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KEY WEST, FL 33040

PROJECT: MALLORY SQUARE
PEDESTRIAN BRIDGE
REMOVAL AND REINSTALLATION

SITE: MALLORY SQUARE,
KEY WEST, FL 33040

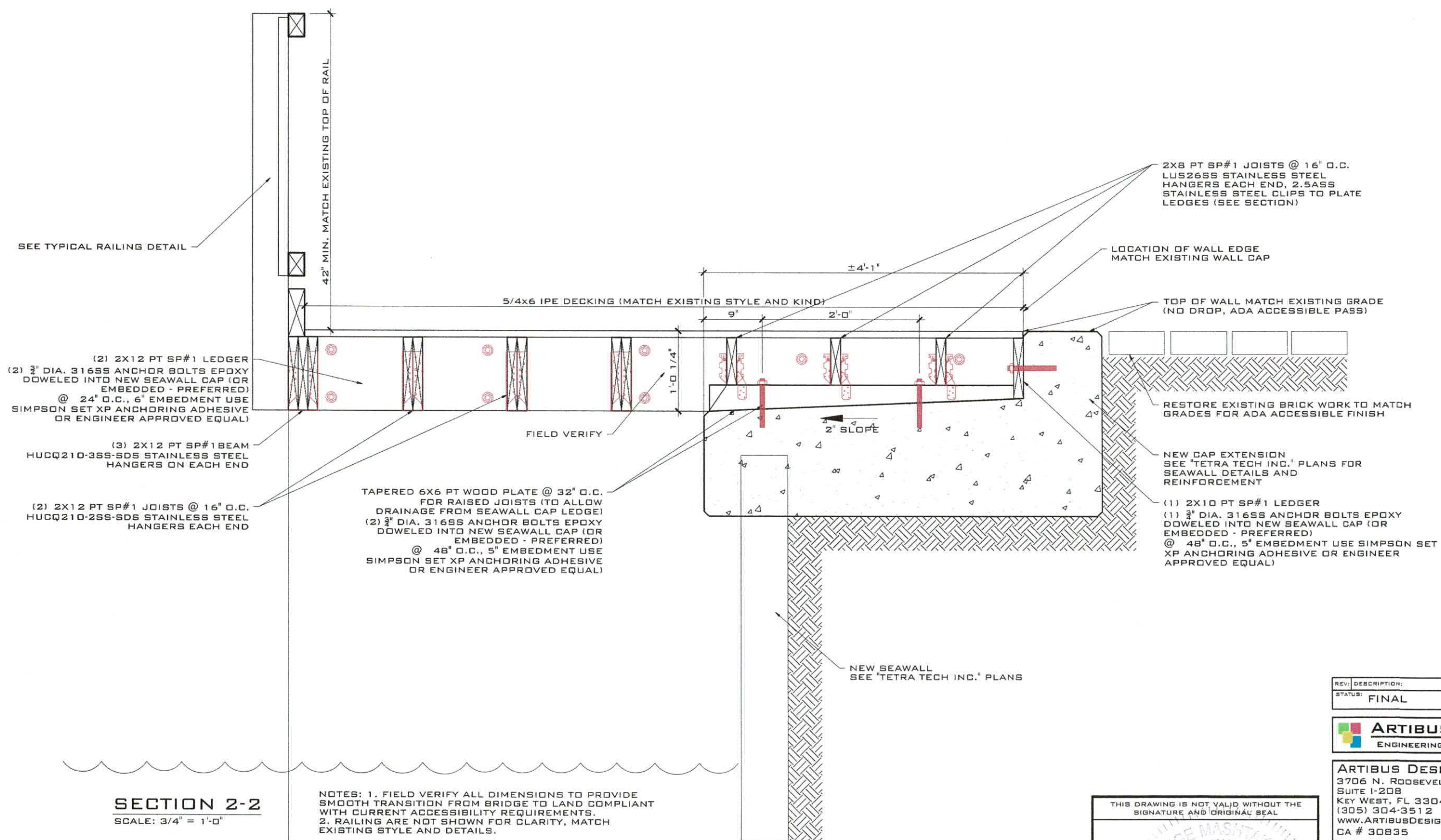
TITLE: SECTION 1-1

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SECTION 2-2
SCALE: 3/4" = 1'-0"

NOTES: 1. FIELD VERIFY ALL DIMENSIONS TO PROVIDE SMOOTH TRANSITION FROM BRIDGE TO LAND COMPLIANT WITH CURRENT ACCESSIBILITY REQUIREMENTS.
2. RAILING ARE NOT SHOWN FOR CLARITY, MATCH EXISTING STYLE AND DETAILS.

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PROFESSIONAL ENGINEER
No. 71480

SIGNATURE: *[Signature]*
DATE: 07/31/18

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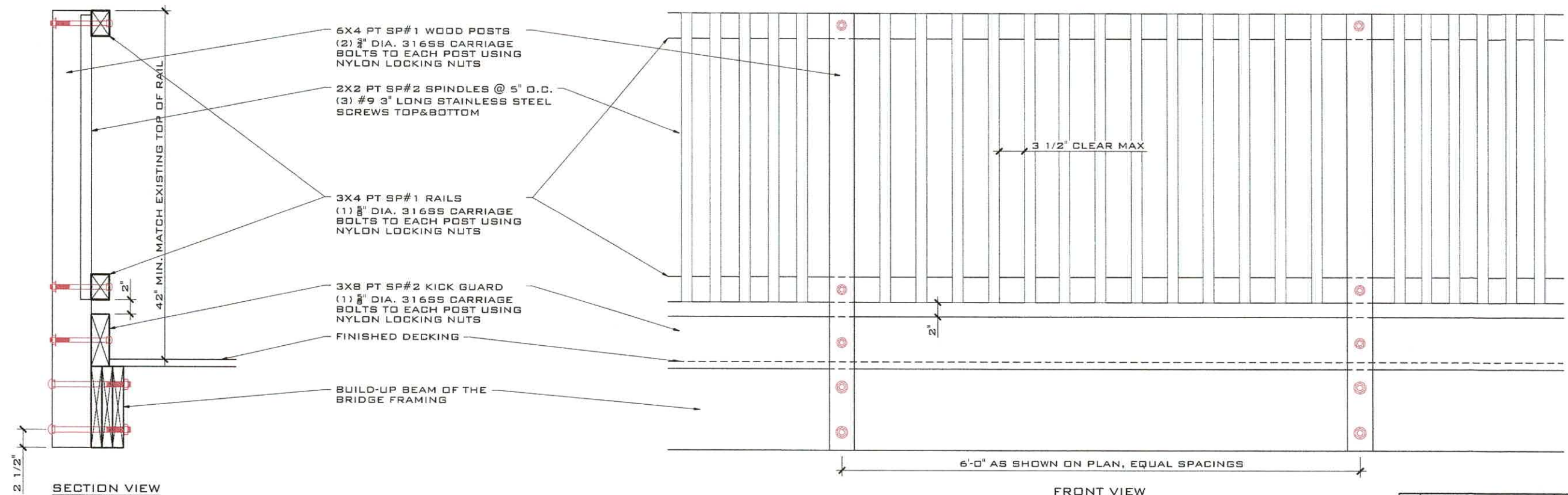
CLIENT: CITY OF KEY WEST
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KEY WEST, FL 33040

PROJECT: MALLORY SQUARE
PEDESTRIAN BRIDGE
REMOVAL AND REINSTALLATION

SITE: MALLORY SQUARE,
KEY WEST, FL 33040

TITLE: SECTION 2-2

SCALE AT 1/4" = 1'-0"	DATE: 07/31/18	DRAWN: SAM	CHECKED: SAM
PROJECT NO: 1805-05	DRAWING NO: S-107	REVISION: 1	



- 6X4 PT SP#1 WOOD POSTS
(2) 3/4" DIA. 316SS CARRIAGE BOLTS TO EACH POST USING NYLON LOCKING NUTS
- 2X2 PT SP#2 SPINDLES @ 5" O.C.
(3) #9 3" LONG STAINLESS STEEL SCREWS TOP&BOTTOM
- 3X4 PT SP#1 RAILS
(1) 3/8" DIA. 316SS CARRIAGE BOLTS TO EACH POST USING NYLON LOCKING NUTS
- 3X8 PT SP#2 KICK GUARD
(1) 3/8" DIA. 316SS CARRIAGE BOLTS TO EACH POST USING NYLON LOCKING NUTS
- FINISHED DECKING
- BUILD-UP BEAM OF THE BRIDGE FRAMING

RAILING DETAIL
SCALE: 3/4" = 1'-0"

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KEY WEST, FL 33040

PROJECT: MALLORY SQUARE
PEDESTRIAN BRIDGE
REMOVAL AND REINSTALLATION

SITE: MALLORY SQUARE,
KEY WEST, FL 33040

TITLE: RAILING DETAIL

SCALE AT 11x17:	DATE:	DRAWN:	CHECKED:
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PROJECT NO:	DRAWING NO:	REVISION:	
1805-05	S-108	1	

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SIGNATURE: *Serge Mashtakov*

DATE: 07/31/18

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PROFESSIONAL ENGINEER
STATE OF FLORIDA
LICENSE NO 71480

PART 8

SCHEDULE OF VALUES

City of Key West /Aquarium Seawall - 185 LF Seawall w/ Concrete Cap				
Description	Quantity*	Units	Unit Price	Amount
Direct Cost				
General				
Bonds, Permits & Insurance	1	LS		
Staging Area (provided by City of Key West)	1	LS		
General Site Preparation & MOT	1	LS		
NPDES Compliance	1	LS		
Mobilization/Demobilization	1	LS		
Preconstruction Video Survey	1	EA		
Vibration Monitoring during Driving Activities	1	LS		
Temporary Construcion Fencing (6' High with Wind Screen & Sandbags)	1	LS		
Site Work				
Relocate Rip-Rap, Seawall Sawcut, Demolition & Excavation as Required	1	LS		
Clean Imported Fill	140	CY		
Site Restoration	1	LS		
Testing - Allowance for Concrete	1	LS		
Bridge Work				
Deconstruct Timber Bridge Span per Artibus Plans	1	LS		
Reconstruct Timber Bridge Span per Artibus Plans	1	LS		
Seawall				
DZ-95 ASTM A690 Gr 50, 40' Lengths, (F&I, Barge Driven, includes freight)	105	LF		
EZ-95 ASTM A690 Gr 50, 30' Lengths, (F&I, Barge Driven, includes freight)	80	LF		
Concrete - Cap 1 (6,000 PSI, Ext. Aggressive Env., with forms, installed with FDOT Class 5 Finish Coating)	10	CY		
Concrete - Cap 2 (6,000 PSI, Ext. Aggressive Env., with forms, installed with FDOT Class 5 Finish Coating)	15	CY		
Concrete - Cap 3 (6,000 PSI, Ext. Aggressive Env., with forms, installed with FDOT Class 5 Finish Coating)	15	CY		
Rebar - #5 1.043# per FT, 90 pieces at 20' each = 1,400 LF = 1,460 LB, A615, Grade 60	1,800	LF		
Rebar - #3, Stirrups, 0.668# per FT, 280 pieces each 6ft = 1,680 LF @ 9-in OC, Grade 60	280	EA		
Rebar - #5, 1.043# per FT, 20 corner bar pieces at 10' each = 200 LF = 209 LB, A615, Grade 60	20	EA		
Concrete - West End Return Wall Closure Pour	5	CY		
Concrete - East End Closure Pour	3	CY		
Stormwater/Utility Extensions through/over Seawall	1	LS		
Filter Fabric	1,800	SF		
Timber Pilings				
Remove Decking as Required	1	LS		
Remove Timber Pilings	34	EA		
Replace Timber Pilings (40' Lengths, driven to -33 NGVD)	30	EA		
BASE BID SUBTOTAL				

* Quantities provided for information only, Bidder responsible for verifying all values.