The Enclosed Document Is Provided For Your Convenience.

Please Email ALL Questions:

MailTo:ContractAdministration@TampaGov.net

Please Let Us Know If You Plan To Bid

City of Tampa
Contract Administration Department
306 E. Jackson St. #280A4N
Tampa, FL 33602
(813)274-8456

CITY OF
TAMPA, FLORIDA

NOTICE TO BIDDERS, INSTRUCTIONS TO BIDDERS
PROPOSAL, BID BOND, FORM OF NOTICE OF AWARD,
AGREEMENT, PERFORMANCE BOND AND
SPECIFICATIONS

FOR

Contract 13-C-00018

DITCH STABILIZATION: BAYWAY CANAL, JONES AVENUE AND METWEST

City of Tampa
CONTRACT ADMINISTRATION DEPARTMENT
TAMPA MUNICIPAL OFFICE BUILDING
306 E. JACKSON STREET - 4TH FLOOR NORTH
TAMPA, FLORIDA 33602

JUNE 2013

CITY OF TAMPA
CONTRACT ADMINISTRATION DEPARTMENT
306 E. Jackson Street 280A4N
Tampa, FL 33602

****

BID NOTICE MEMO

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Bids will be received no later than 1:30 p.m. on the indicated Date(s) for the following Project(s):

****

CONTRACT NO.: 13-C-00018; Ditch Stabilization: Bay Way, Jones, and MetWest
BID DATE: July 16, 2013 **ESTIMATE:** $935,000 **SCOPE:** The project comprises grading of ditch banks, installation of stack block retaining wall and fabric formed concrete, extension of existing drainage pipes, sodding of disturbed areas in the ditch east of Lois Ave and south of the Met West Campus; establish side slopes, install GeoWeb stabilization system, rip-rap, sod, and landscaping where required in canal along north side of Bay Way Dr; and placement of fill material and grading of ditch bank, installation of fabric formed concrete, installation of guardrails and curbing, repaving of disturbed roadway at the Jones Avenue location.
PRE-BID CONFERENCE: Tuesday, July 2, 2013, 2:00 p.m. Attendance is not mandatory, but recommended.

****

Bids will be opened in the 4th Floor Conference Room, Tampa Municipal Office Building, 306 E. Jackson Street, Tampa, Florida 33602. Pre-Bid Conference is held at the same location unless otherwise indicated. Plans and Specifications and Addenda for this work may be examined at, and downloaded from, www.demandstar.com. Backup files are available at http://www.tampagov.net/dept_contract_administration/programs_and_services/construction_project_bidding/index.asp. Subcontracting opportunities may exist for City certified Small Local Business Enterprises (SLBEs). A copy of the current SLBE directory may be obtained at www.Tampagov.net. Phone (813) 274-8456 for assistance. **Email Technical Questions to: contractadministration@tampagov.net .**

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PVC DRAIN PIPES

CURBING

RIP RAP

SOD AND HYDROSEED

PLANS 38 Sheets of Drawings

NOTICE TO BIDDERS
CITY OF TAMPA, FLORIDA
Contract 13-C-00018; Ditch Stabilization: Bayway Canal, Jones Avenue and MetWest

Sealed Proposals will be received by the City of Tampa no later than 1:30 P.M., July 16, 2013, in the 4th Floor Conference Room, Tampa Municipal Office Building, 306 E. Jackson Street, Tampa, Florida, there to be publicly opened and read aloud.

The proposed work is to include, but not be limited to, grading of ditch banks, installation of stacked block retaining wall and fabric formed concrete, extension of existing drainage pipes, and installation of sod to disturb areas in the ditch east of Lois Ave and south of the Met West Campus; establish side slopes, install GeoWeb stabilization system, rip-rap, sod, and landscaping where required in canal along north side of Bay Way Dr; and placement of fill material and grading of ditch bank, installation fabric formed concrete, installation of guardrails and curbing, and repaving of disturbed roadway at the Jones Avenue location and all associated work required for a complete project in accordance with the Contract Documents.

The Instructions to Bidders, Proposal, Form of Bid Bond, Agreement, Form of Public Construction Bond, Specifications, Plans and other Contract Documents are posted at DemandStar.com. Backup files may be downloaded from http://www.tampagov.net/dept_contract_administration/programs_and_services/construction_project_bidding/index.asp. One set may be available for reference at the office of the Contract Administration Department, Municipal Office Building, Fourth Floor North, City Hall Plaza, Tampa, Florida 33602.

Each Proposal must be submitted on the Proposal form included in the Specifications and must be accompanied by a certified check or cashier's check on a solvent bank or trust company in compliance with Section 255.051, Florida Statutes, made payable to the City of Tampa, in an amount of not less than five per cent of the total bid, or a Bid Bond, of like amount, on the form set forth in the Contract Documents, as a guarantee that, if the Proposal is accepted, the Bidder will execute the Proposed Contract and furnish Performance and Payment Bonds within twenty (20) days after receipt of Notice of Award of Contract.

The City of Tampa reserves the right to reject any or all Bids and to waive any informalities in the Bid and/or Bid Bond. Acceptance or rejection of Proposals will be made as soon as practicable after the Proposals are received, but the City reserves the right to hold Proposals for ninety (90) days from the date of Opening.

Bid Protest Procedures: Unless subsequently indicated otherwise, in a revised posting on the Department's web page for Construction Project Bidding, the City of Tampa intends to award the referenced project to the lowest bidder listed in the tabulation posted on or about the date of Bid Opening. A bidder aggrieved by this decision may file a protest not later than 4:30 P.M., five (5) business days from the first posting thereof, pursuant to City of Tampa Code Chapter 2, Article V, Division 3, Section 2-282, Procurement Protest Procedures. Protests not conforming therewith shall not be reviewed.

Communication with City Staff

Pursuant to City of Tampa Ordinance 2010-92, during the solicitation period, including any protest and/or appeal, NO CONTACT initiated by bidders or responders with City officers or employees, other than the individuals specified below is permitted:
Director of Contract Administration, David Vaughn
Contracts Management Supervisor, Jim Greiner
Contract Officer, Jody Gray
The City's Legal Department staff
The City's Contract Administration Department staff.
Technical Questions and Requests For Information should be directed to the Department via
ContractAdministration@tampagov.net

"A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit bids on leases of real property to a public entity, may not be awarded or perform work as a contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list." Refer to Section 287.133 Florida Statues.

In accordance with the City of Tampa's Equal Business Opportunity Ordinance, a Goal may have been established for subcontracting with Small Local Business Enterprises, SLBEs, certified by the City. Links to further information and a list of SLBEs are on the Department's Construction Project Bidding Web page. A link to the current complete directory of SLBEs is on the Minority Business Development Office Website.

INSTRUCTIONS TO BIDDERS
SECTION 1 - SPECIAL INSTRUCTIONS

I-1.01 GENERAL:

The proposed work is the Ditch Stabilization: Bayway Canal, Jones Avenue and MetWest in the City of Tampa, as required for a complete project, as shown on the plans and detailed in the specifications. The work is located on land owned or controlled by the City of Tampa.

I-1.02 FORM PREPARATION AND PRESENTATION OF PROPOSALS: Replace the second sentence with the following: Submission of the entire specification book is not required.

I-1.03 ADDENDA – Section I-2.03 is replaced with the following: No interpretation of the meaning of the Plans, Specifications, or other Contract Documents will be made to any Bidder orally.

Every request for such interpretation must be in writing, addressed to the City of Tampa, Contract Administration Department, 306 E. Jackson St., 4th Floor, Tampa, Florida 33602 and then emailed to ContractAdministration@tampagov.net. To be given consideration, such request must be received at least seven (7) days prior to the date fixed for the opening of the Proposals. Any and all such interpretations and any supplemental instructions will be in the form of written addenda which, if issued, will be posted on DemandStar.Com and on the Department's web page, with notice given to all prospective bidders at the respective fax numbers or e-mail addresses furnished, for such purposes. Failure of any Bidder to receive any such addenda shall not relieve said Bidder from any obligation under his Proposal as submitted. All addenda so issued shall become part of the Contract Documents.

I-1.04 SIGNATURE OF BIDDERS: Section I-2.07 is replaced with the following:

Proposals must be signed in ink by the Bidder with signature in full. When firm is a Bidder, the Proposal shall be signed in the name of the firm by one or more partners. When a corporation is a bidder the officer signing shall set out the corporate name in full beneath which he shall sign his name and give the title of his office. The Proposal shall also bear the seal of the corporation attested by its secretary.

If the bidder referred to in Section I-2.07 is a corporation, it must submit; upon request, a copy of its filed Articles of Incorporation. In addition, if the bidder was incorporated in another state, it must establish that it is authorized to do business in the State of Florida. If the bidder is using a fictitious name, it must submit upon request, proof of registration of such name with the Clerk of the Circuit Court of the Country where its principal place of business is. Failure to submit what is required is grounds to reject the bid of that bidder.

I-1.05 TIME FOR COMPLETION:

The work shall be arranged to be completed in accordance with a progress schedule approved by the Construction Engineer.

The time for completion of this project, referred in Article 4.01 of the Agreement, shall be 180 consecutive calendar days. The period for performance shall start from the date indicated in the Notice To Proceed.

The construction schedule may be adjusted from time to time to accommodate Republican National Convention activities.

I-1.06 LIQUIDATED DAMAGES:

The amount of liquidated damages, referred to in Article 4.06 of the Agreement, for completion of this project shall be $500.00 per calendar day.

I-1.07 BASIS OF AWARD OF CONTRACT:

The basis of award referred to in Item I-2.11 of Instructions to Bidders shall be the greatest amount of work, which can be accomplished within the funds available as budgeted. The award may be made on the basis of the total bid, base bid, alternates(s) if any, unit bids if any, or any combination thereof deemed to be in the best interest of the City.

INSTRUCTIONS TO BIDDERS
SECTION 1 - SPECIAL INSTRUCTIONS

Unless all bids are rejected, the award will be made within 90 days after opening proposals.

I-1.08 GROUND BREAKING CEREMONY:

Arrangement may be made by the City in coordination with the Contractor, for construction to commence with a Ground Breaking Ceremony. Details will be discussed at the pre-construction conference.

I-1.09 INSURANCE:

The insurance required for this project shall be as indicated on Pages beginning with INS-1. Before commencing work, the Contractor shall provide the evidence of the insurance required on a Certificate of Insurance accompanied by evidence of authority to bind the insurance company or companies such as agents license, power of attorney, or letter of authority.

I-1.10 EQUAL BUSINESS OPPORTUNITY PROGRAM / SLBE / REQUIREMENTS

In accordance with the City of Tampa's Equal Business Opportunity Ordinance, a goal of 7.5% has been established for subcontracting with Small Local Business Enterprises, (SLBEs), certified by the City. The goal is based upon the availability of the firms listed on the Goal Worksheet and as posted in the "SLBEs" link under this Contract's notice on the Department's Construction Project Bidding web page.

BIDDERS MUST SOLICIT ALL SLBEs ON THAT LIST and provide documentation of emails, faxes, phone calls, letters, or other communication with the firms as a first step to demonstrate Good Faith Efforts to achieve the goal. The list is formatted to facilitate e-mail solicitations to the listed firms by copying and pasting e-mail addresses.

Bidders may explore other opportunities for subcontracting with SLBEs by consulting the current directory of all certified SLBEs posted on the Minority Business Development Office web page.

GOOD FAITH EFFORT COMPLIANCE PLAN REQUIRED - When a Goal has been established, the Bidder must submit, with its bid, completed to the fullest extent possible, a Good Faith Effort Compliance Plan using the form GFECP contained herein. Additional documentation is required whenever an SLBE subcontractor's low quote is not utilized. Supplemental information or documentation concerning the Bidder's Compliance Plan may be required prior to award as requested by the City.

DIVERSITY MANAGEMENT INITIATIVE, DMI, DATA REPORTING FORMS REQUIRED - Bidders must submit, with its bid, "DMI-Solicited" forms listing all subcontractors solicited and "DMI-Utilized" forms listing all subcontractors to be utilized. Supplemental forms, documentation, or information may be submitted at bid time or as requested by the City.

After an award, "DMI-Payments" forms are to be submitted with payment requests to report payments to subcontractors.

Bidders may visit the Minority Business Development Office's web page at TampaGov.net for other information about the SLBE program, FAQ's, and the latest SLBE directory of certified firms.

I-1.11 BID SECURITY:

Surety companies shall have a rating of not less than B+ Class VI as evaluated in the most recently circulated Best Key rating Guide Property-Liability.

I-1.12 PUBLIC CONSTRUCTION BOND:

The Bidder who is awarded the Contract will be required to furnish a Public Construction Bond upon the forms provided herein, each equal to 100 percent of the Contract price, such Bonds to be issued and executed by (a) surety company(ies) acceptable to the City of Tampa and licensed to underwrite contracts in the State of Florida.

INSTRUCTIONS TO BIDDERS
SECTION 1 - SPECIAL INSTRUCTIONS

I-1.13 AGREEMENT
Section 2 – Powers of the City's Representatives
Add the following:
Article 2.05 CITY'S TERMINATION FOR CONVENIENCE:

The City may, at any time, terminate the Contract in whole or in part for the City's convenience and without cause. Termination by the City under this Paragraph shall be by a notice of termination delivered to the Contractor, specify the extent of termination and the effective date.

Upon receipt of a notice of termination, the Contractor shall immediately, in accordance with instructions from the City, proceed with performance of the following duties regardless of delay in determining or adjusting amounts due under this Paragraph:

(a) cease operations as specified in the notice;
(b) place no further orders and enter into no further subcontracts for materials, labor, services or facilities except as necessary to complete continued portions of the Contract;
(c) terminate all subcontracts and orders to the extent they relate to the Work terminated;
(d) proceed to complete the performance of Work not terminated; and
(e) take actions that may be necessary, or that the City may direct, for the protection and preservation of the terminated Work.

The amount to be paid to the Contract by the City because of the termination shall consist of:

(a) for costs related to work performed on the terminated portion of the Work prior to the effective date including termination costs relative to subcontracts that are properly chargeable to the terminated portion of the Work.
(b) the reasonable costs of settlement of the Work terminated, including accounting, legal, clerical and other expenses reasonable necessary for the preparation of termination settlement proposals and supporting data; additional costs of termination and settlement of subcontracts excluding amounts of such settlements; and storage, transportation, and other costs incurred which are reasonably necessary for the preservation, protection or disposition of the terminated Work; and
(c) a fair and reasonable profit on the completed Work unless the Contractor would have sustained a loss on the entire Contract had it been completed.

Allowance shall be made for payments previously made to the Contractor for the terminated portion of the Work, and claims which the City has against the Contractor under the Contract, and for the value of materials supplies, equipment or other items that are part of the costs of the Work to be disposed of by the Contractor.

I-1.14 Section 5 – subcontracts and Assignments, Article 5.01, Page A-7, Last Paragraph:
Change "…twenty-five (25) percent… "to fifty-one (51) percent…"

Section 10-Payments, Article .05 Partial Payments, 1st Paragraph, 1st Sentence:
Change "…fair value of the work done, and may apply for…" to "…fair value of the work done, and shall apply for…"

I-1.15 Contractors must utilize the U.S. Department of Homeland Security's E-Verify Systems to verify the employment eligibility of all persons employed during the term of the contract to perform employment duties within the State of Florida and all persons, including subcontractors, assigned by the contractor to perform work pursuant to the contract.

I-1.16 GENERAL PROVISIONS; G-2.02 Copies Furnished to Contractor: Replace the first paragraph with the following:

The Contractor shall acquire for its use copies of the plans and specifications as needed. The documents may be downloaded from the City's web site, at
http://www.tampagov.net/dept_contract_administration/programs_and_services/construction_project_bidding/index.asp

I-1.17 PAYMENT DISPUTE RESOLUTION

Any dispute pertaining to pay requests must be presented to the City pursuant to Executive Order 2003-1.

INSTRUCTIONS TO BIDDERS
SECTION 1 - SPECIAL INSTRUCTIONS

I-1.18 SCRUTINIZED COMPANIES.

For Contracts $1,000,000 and greater, if the City determines the Contractor submitted a false certification under Section 287.135(5) of the Florida Statutes, or if the Contractor has been placed on the Scrutinized Companies with Activities in the Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, the City shall either terminate the Contract after it has given the Contractor notice and an opportunity to demonstrate the City's determination of false certification was in error pursuant to Section 287.135(5)(a) of the Florida Statutes, or maintain the Contract if the conditions of Section 287.135(4) of the Florida Statutes are met.

SECTION 2
GENERAL INSTRUCTIONS

I-2.01 BIDDER'S RESPONSIBILITY
Before submitting Proposals, Bidders shall carefully examine the entire site of the proposed work and adjacent premises and the various means of approach and access to the site, and make all necessary investigations to inform themselves thoroughly as to the facilities necessary for delivering, placing and operating the necessary construction equipment, and for delivering and handling materials at the site, and inform themselves thoroughly as to all difficulties involved in the completion of all the work in accordance with the Contract Documents.

Bidders must examine the Plans, Specifications, and other Contract Documents and shall exercise their own judgment as to the nature and amount of the whole of the work to be done, and for the bid prices must assume all risk of variance, by whomsoever made, in any computation or statement of amounts or quantities necessary to complete the work in strict compliance with the Contract Documents.

Elevations of the ground are shown on the Plans and are believed to be reasonably correct, but are not guaranteed to be absolutely so and are presented only as an approximation. Bidders shall satisfy themselves as to the correctness of all elevations.

The City may have acquired, for its own use, certain information relating to the character of materials, earth formations, probable profiles of the ground, conditions below ground, and water surfaces to be encountered at the site of the proposed work. This information, if it exists, is on file at the offices of the Department of Public Works and Bidders will be permitted to see and examine this information for whatever value they consider it worth. However, this information is not guaranteed, and Bidders should satisfy themselves by making borings or test pits, or by such other methods as they may prefer, as to the character, location, and amounts of water, peat, clay, sand, quicksand, gravel, boulders, conglomerate, rock, gas or other material to be encountered or work to be performed.

Various underground and overhead structures and utilities are shown on the plans. The location and dimensions of such structures and utilities, where given, are believed to be reasonably correct, but do not purport to be absolutely so. These structures and utilities are plotted on the Plans for the information of the Bidders, but information so given is not to be construed as a representation or assurance that such structures will be found or encountered as plotted, or that such information is complete or accurate.

I-2.02 FORM, PREPARATION AND PRESENTATION OF PROPOSALS
Each Proposal shall be submitted upon the Proposal Form and in accordance with the instructions included herein. The Proposal Form must not be detached herefrom. All blank spaces for bid prices must be filled in, in both words and figures, with the unit or lump sum prices, or both, for which the Proposal is made. The computed total price for each unit price Contract Item shall be determined by multiplying the estimated quantity of the item, as set forth in the Proposal Form, by the corresponding unit price bid for such item. The resulting product shall be entered in the appropriate blank space under the column headed "Computed Total Price for Item". The lump sum price bid for each lump sum price Contract Item shall also be entered in the column headed "Computed Total Price for Item". If a Proposal contains any omissions, erasures, alterations, additions, or items not called for in the itemized Proposal, or contains irregularities of any kind, such may constitute sufficient cause for rejection of the Proposal. In case of any discrepancy in the unit price or amount bid for any item in the Proposal, the price as expressed in written words will govern. In no case is the Agreement Form to be filled out or signed by the Bidder.

In the case of certain jobs bid Lump Sum a "Schedule of Unit Prices" must be filled out as an attachment to the Lump Sum proposal. These prices may be used as a guide for the negotiation of change orders, at the City's option.

The proposal must be signed and certified and be presented on the prescribed form in a sealed envelope on/or before the time and at the place stated in the Notice of Bidders, endorsed with the name of the person, firm or corporation presenting it, the date of presentation, and the title of the work for which the Proposal is made.

Unless the apparent low bidder is now engaged in or has recently completed contract work for the City of Tampa, he, if requested, shall furnish to the City, after the opening of bids and prior to award, a summary statement of record of construction experience over the past three (3) years with proper supporting evidence, and, if required by the City, shall also furnish a list of equipment and other facilities pertinent to and available for the proper execution of the proposed work, and a statement of financial resources to the extent necessary to establish ability to carry on the proposed work. The City may make further investigations as considered necessary with respect to responsibility of the Bidder to whom it appears may be awarded the Contract.

If forwarded by mail, the sealed envelope containing the Proposal, endorsed as directed above, must be enclosed in another envelope addressed as specified in the Notice to Bidders and sent by registered mail.

I-2.03 ADDENDA AND INTERPRETATIONS
No interpretation of the meaning of the Plans, Specifications, or other Contract Documents will be made to any Bidder orally.

Every request for such interpretation must be in writing, addressed to the Contract Administration Department, Tampa Municipal Office Building, 4th Floor North, City Hall Plaza, Tampa, Florida 33602. To be given consideration, such request must be received at least seven (7) days prior to the date fixed for the opening of the Proposals. Any and all such interpretations and any supplemental instructions will be in the form of written addenda which, if issued, will be sent by certified mail, with return receipt requested, to all prospective bidders at the respective addresses furnished, for such purposes, not later than three (3) working days prior to the date fixed for the opening of the Proposals, and if requested, a copy will be delivered to the prospective bidder's representative. Failure of any Bidder to receive any such addenda shall not relieve said Bidder from any obligation under his Proposal as submitted. All addenda so issued shall become part of the Contract Documents.

I-2.04 BID SECURITY
Each Proposal must be accompanied by a certified or cashier's check issued by a solvent bank or trust company and payable at sight to the City of Tampa, in compliance with Section 255.051 Florida Statutes, or a Bid Bond upon the form provided herein, in an amount of not less than five percent of the sum of the computed total amount of the Bidder's Proposal as a guarantee that if the Proposal is accepted, the Bidder will execute and fill in the proposed Contract and Public Construction Bond within twenty (20) days after notice of award of the Contract. Certified checks shall have all necessary documentary revenue stamps attached if required by law. Surety on Bid Bonds shall be a duly authorized surety company authorized to do business in the State of Florida, and all such Bonds shall be issued or countersigned by a local resident producing agent, and satisfactory evidence of the authority of the person or persons executing such Bond to Execute the same shall be submitted with the Bond. Bid Bonds shall be issued by a surety company acceptable to the City.

Within ten (10) days after the opening of Proposals, the bid security of all but the three lowest Bidders will be returned. The bid security of the remaining two Bidders whose Proposals are not accepted will be

returned within ten (10) days after the execution of the Contract, or, if no such Contract has been executed, within ninety (90) days after the date of opening Proposals. The bid security of the Bidder whose Proposal is accepted will be returned only after he has duly executed the Contract and furnished the required Public Construction Bond and insurance.

Should it be necessary for the City to retain the bid security and said bid security is in the form of checks, the checks of these Bidders will be returned if replaced by Bid Bonds in an amount equal to the amount of the checks of such Bidders in such form and issued by a surety company acceptable to the City.

A Bidder may withdraw his Proposal before the time fixed for the opening of Proposals, without prejudice to himself, by communicating his purpose, in writing, to the Mayor and City Council, and when his communication is received, the Proposal will be handed to him or his authorized agent unopened. No Bidder may withdraw his Proposal within ninety (90) days after the day of opening Proposals.

The Bidder whose Proposal is accepted shall enter into a written contract, upon the Agreement form included herein, for the performance of the work and furnish the required Public Construction Bond within twenty (20) days after written notice by the City of Award of Contract has been served on such Bidder personally or after receipt of the written notice by registered mail to such Bidder at the address given in his Proposal.

If the Bidder to whom a Contract is awarded refuses or neglects to execute it or fails to furnish the required Public Construction Bond within twenty (20) days after receipt by him of the Notice of Award of Contract, the amount of his bid security shall be forfeited and shall be retained by the City as liquidated damages, and not as a penalty, it being now agreed that said sum is a fair estimate of the amount of damages that the City will sustain in case said Bidder fails to enter into a Contract and furnish the required Public Construction Bond. If a Bid Bond was furnished, the full amount of the Bond shall become due and payable as liquidated damages caused by such failure. The full amount of the bid security shall be forfeited as liquidated damages without consideration of the fact that an award may be less than the full amount of the Bidder's Proposal, excepting that the award shall be within the conditions of said Proposal relating to the basis of consideration for an award. No plea of mistake in the bid or misunderstanding of the conditions of forfeiture shall be available to the Bidder for the recovery of his deposit or as a defense to any action based upon the neglect or refusal to execute a contract.

I-2.05 LAWS AND REGULATIONS
The Bidder who is awarded the Contract must comply with all laws of the State of Florida, and all applicable Ordinances of the City of Tampa respecting labor and compensation and with all other statutes, ordinances, rules and regulations applicable and having the force of law.

I-2.06 PUBLIC CONSTRUCTION BOND
The Bidder who is awarded the Contract will be required to furnish a Public Construction Bond upon the form provided herein, equal to 100 percent of the Contract price, such Bond to be executed by a surety company acceptable to the City of Tampa and licensed to underwrite contracts in the State of Florida. Surety companies shall have a rating of not less than: B+ Class VI as evaluated in the most recently circulated BEST'S KEY RATING GUIDE PROPERTY-LIABILITY.

I-2.07 SIGNATURE AND QUALIFICATIONS OF BIDDERS
Proposals must be signed in ink by the Bidder with signature in full. When a firm is a Bidder, the Proposal shall be signed in the name of the firm by one or more of the partners. When a corporation is a Bidder the officer signing shall set out the corporate name in full beneath which he shall sign his name and give the title of his office. The Proposal shall also bear the seal of the corporation attested by its secretary. Anyone signing the Proposal as agent must file with it legal evidence of his authority to do so.

Bidders who are nonresident corporations shall furnish to the City a duly certified copy of their permit to transact business in the State of Florida, signed by the Secretary of State, within ten days of the notice to do so. Such notice will be given to Bidders who are nonresident corporations, to whom it appears an award will be made, and the copy of the permit must be filed with the City before the award will be made. Failure to promptly submit this evidence of qualification to do business in the State of Florida may be basis for rejection of the Proposal.

I-2.08 REJECTION OF PROPOSALS
The City reserves the right to reject any Proposal if investigation of the Bidder fails to satisfy the City that such Bidder is properly qualified to carry out the obligations and to complete the work contemplated therein. Any or all Proposals will be rejected if there is reason to believe that collusion exists among Bidders. Proposals will be considered irregular and may be rejected if they show serious omissions, alterations in form, additions not called for, conditions or unauthorized alternates, or irregularities of any kind. The City reserves the right to reject any or all Proposals and to waive such technical errors as may be deemed best for the interests of the City.

I-2.09 QUANTITIES ESTIMATED ONLY
The estimate of quantities of the various items of work and materials, if set forth in the Proposal Form, is approximate only and is given solely to be used as a uniform basis for the comparison of Proposals. The quantities actually required to complete the Contract work may be less or more than so estimated, and if awarded a Contract for the work specified, the Contractor agrees that he will not make any claim for damages or for loss of profits because of a difference between the quantities of the various classes of work assumed for comparison of Proposals and quantities of work actually performed. The City further reserves the right to vary the quantities in any amount.

I-2.10 COMPARISON OF PROPOSALS
Except jobs bid on a "One Lump Sum" basis, proposals will be compared on the basis of a total computed price arrived at by taking the sum of the estimated quantity of each time and the corresponding unit price of each item, and including any lump sum prices on individual items.

The computed total prices for individual Contract Items and the total computed price for the entire Contract, as entered by the Bidder in the Proposal Form, are for convenience only and are subject to correction in the tabulation and computation of the Proposals.

I-2.11 BASIS OF AWARD
The Contract will be awarded, if at all, to the lowest responsible Bidder or Bidders, as determined by the City and by the terms and conditions of the Contract Documents. Unless all bids are rejected, the award will be made within ninety (90) days after the opening of Proposals. The successful Bidder will be required to possess, or obtain, a valid City Occupational License.

I-2.12 INSURANCE REQUIRED
The successful Bidder and his subcontractors will be required to procure and pay for insurance covering the work in accordance with the provisions of Article 6.02 of the Agreement as indicated on special instructions pages beginning with INS-1.

I-2.13 NO ASSIGNMENT OF BID
No Bidder shall assign his bid or any rights thereunder.

I-2.14 NONDISCRIMINATION IN EMPLOYMENT
Contracts for work under this Proposal will obligate the contractors and subcontractors not to discriminate in employment practices.

Bidders must, if requested, submit with their initial bid a signed statement as to whether they have previously performed work subject to the President's Executive Order Nos. 11246 and 11375.
Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the Contract.

Successful Bidders must, if requested, submit a list of all subcontractors who will perform work on the project and written,

signed statement from authorized agents of the labor pools with which they will or may deal for employees on the work together with supporting information to the effect that said labor pools practices and policies are in conformity with Executive Order No. 11246 and that said labor pools will affirmatively cooperate in or offer no hindrance to the recruitment, employment and equal treatment of employees seeking employment and performing work under the Contract, or a certification as to what efforts have been made to secure such statements when such agents or labor pools have failed or refused to furnish them prior to the award of the Contract.

I-2.15 LABOR STANDARDS
The Bidder's attention is directed to the Contract Provisions of the Labor Standards for federally assisted projects which may be attached to and made a part of the Agreement.

I-2.16 NOTICE TO LABOR UNIONS
If applicable, the successful Bidder will be required to provide Labor Unions and other organizations of workers a completed copy of the form entitled "Notice to Labor Unions or Other Organizations of Workers", and such form may be made a part of the Agreement.

I-2.17 NOTICE TO PROSPECTIVE FEDERALLY-ASSISTED CONSTRUCTION CONTRACTORS
A Certification of Nonsegregated Facilities, as required by the May 9, 1967, Order (32 F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted to said Secretary prior to the award of a federally-assisted construction and Contract exceeding $10,000 which is not exempt from the provisions of the Equal Opportunity Clause. The form of certification may be bound herein following the form of Bid Bond.

Contractors receiving federally-assisted construction Contract awards exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause will be required to provide for the forwarding of the following notice to prospective subcontractor for supplies and construction contracts where the subcontracts exceed $10,000 and are not exempt from the provisions of the Equal Opportunity Clause:

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT
FOR CERTIFICATIONS OF NONSEGREGATED FACILITIES

"A Certification of Nonsegregated Facilities, as required by the May 9, 1967, Order (32 F.R. 7439, May 19, 1967) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a subcontract exceeding $10,000 which is not exempt from the provisions of the Equal Opportunity Clause."

"Contractors receiving subcontract awards exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity Clause will be required to provide from the forwarding of this notice to prospective subcontractors for supplies and construction contracts where the subcontracts exceed $10,000 and are not exempt from the provisions of the Equal Opportunity Clause."

The United States requires a pre-award conference if a proposed construction contract exceeds one million dollars to determine if the the prospective contractor is in compliance with the Equal Employment Opportunity requirements of Executive Order 11246 of September 24, 1965. In such instances, a meeting may be scheduled at which the prospective contractor must specify what affirmative action he has taken or proposed to take to assure equal employment opportunity which must be approved by the United States before award of the contract will be authorized.

Bidders must be prepared to submit an Equal Employment Opportunity (EEO) plan at a pre-award conference. The plan must include bidding opportunities offered by the Bidder to minority subcontractors.

On October 13, 1971, President Nixon issued Executive Order 11246 emphasizing the government's commitment to the promotion of minority business enterprise. Accordingly, the United States is firmly committed to the utilization of available resources to support this important program. U.S. agencies are most interested in realizing minority participation on the subject. Achieving equal employment opportunity compliance is required through Executive Order 11246. WE cannot emphasize too strongly that minority subcontractors be extended subcontractors bidding opportunities as but one step in your affirmative action policy.

Due to the importance of this contract, U.S. Agencies may conduct an EEO Conference prior to the award of the Contract. It is suggested that the responsive Bidder confirm the minority subcontractors he contacted for bids or quotations in his EEO plan submitted at the conference.

I-2.18 EEO AFFIRMATIVE ACTION REQUIREMENTS
By the submission of a Proposal, each Bidder acknowledges that he understands and will agree to be bound by the equal opportunity requirements of Federal regulations which shall be applicable throughout the performance of work under any contract awarded pursuant to solicitation. Each Bidder agrees that if awarded a contract, he will similarly bind contractually each subcontractor. In policies, each Bidder further understands and agrees that if awarded a contract, he must engage in Affirmative Action directed to promoting and ensuring equal employment opportunity in the work force used under the contract (and he must require contractually the same effort of all subcontractors whose subcontracts exceed $100,000). The Bidder understands and agrees that "Affirmative Action" as used herein shall constitute a good faith effort to achieve and maintain minority employment in each trade in the on-site work force used on the project. * * * * * * * END of SECTION * * * * * * *

CITY OF TAMPA INSURANCE REQUIREMENTS

During the life of the award/contract the Awardee/Contractor shall provide, pay for, and maintain insurance with companies authorized to do business in Florida, with an A.M. Best rating of B+ (or better) Class VII (or higher), or otherwise be acceptable to the City if not rated by A.M. Best. All insurance shall be from responsible companies duly authorized to do business in the State of Florida.

All commercial general liability insurance policies (and Excess or Umbrella Liability Insurance policies, if applicable) shall provide that the City is an additional insured as to the operations of the Awardee/Contractor under the award/contract including the additional insured endorsement, the subrogation wavier endorsement, and the Severability of Interest Provision. In lieu of the additional named insured requirement, if the Awardee/Contractor's company has a declared existing policy which precludes it from including additional insureds, the City may permit the Contractor to purchase an Owners and Contractors Protective Liability policy. Such policy shall be written in the name of the City at the same limit as is required for General Liability coverage. The policy shall be evidenced on an insurance binder which must be effective from the date of issue until such time as a policy is in existence and shall be submitted to the City in the manner described below as applicable to certificates of insurance.

The insurance coverages and limits required must be evidenced by a properly executed Acord 25 Certificate of Insurance form or its equivalent. Each Certificate must be personally manually signed by the Authorized Representative of the insurance company shown in the Certificate with proof that he/she is an authorized representative thereof. Thirty days' written notice must be given to the City of any cancellation, intent not to renew, or reduction in the policy coverages, except in the application of the aggregate liability limits provisions. Should any aggregate limit of liability coverage be reduced, it shall be immediately increased back to the limit required by the contract. The insurance coverages required herein are to be primary to any insurance carried by the City or any self-insurance program thereof.

The following coverages are required:

A. Commercial General Liability Insurance shall be provided on the most current Insurance Services Office (ISO) form or its equivalent. This coverage must be provided to cover liability arising from premises and operations, independent contractors, products and completed operations, personal and advertising injury, contractual liability, and XCU exposures (if applicable). Completed operations liability coverage shall be maintained for a minimum of one-year following completion of work. The amount of Commercial General Liability insurance shall not be less than the amount specified.

(a) $1,000,000 per occurrence and a $2,000,000 general aggregate for projects valued at $2,000,000 or less. General aggregate limit for projects over that price shall equal or exceed the price of the project. An Excess or Umbrella Liability insurance policy can be provided to meet the required limit. Risk Management may be contacted for additional information regarding projects of this nature.

B. Automobile Liability Insurance shall be maintained in accordance with the laws of the State of Florida, as to the ownership, maintenance, and use of all owned, non-owned, leased, or hired vehicles. The amount of Automobile Liability Insurance shall not be less than the amount specified.

(a) $500,000 combined single limit each occurrence bodily injury & property damage- for projects valued at $100,000 and under

(b) $1,000,000 combined single limit each occurrence bodily injury & property damage – for projects valued over $100,000

C. Worker's Compensation and Employer's Liability Insurance shall be provided for all employees engaged in the work under the contract, in accordance with the Florida Statutory Requirements. The amount of the Employer's Liability Insurance shall not be less than:

(a) $500,000 bodily injury by accident and each accident, bodily injury by disease policy limit, and bodily injury by disease each employee – for projects valued at $100,00 and under
(b) $1,000,000 bodily injury by accident and each accident, bodily injury by disease policy limit, and bodily injury by disease each –for projects valued over $100,000

D. Excess Liability Insurance or Umbrella Liability Insurance may compensate for a deficiency in general liability, automobile, or worker's compensation insurance coverage limits. If the Excess or Umbrella policy is being provided as proof of coverage, it must name the City of Tampa as an additional insured **(IF APPLICABLE).**

E. Builder's Risk Insurance, specialized policy designed to cover the property loss exposures that are associated with construction of buildings. The amount of coverage should not be less than the amount of the project. **(IF APPLICABLE).**

F. Installation Floater- a builder's risk type policy that covers specific type of property during its installation, is coverage required for highly valued equipment or materials such as compressors, generators, or other machinery that are not covered by the builder's risk policy **(IF APPLICABLE).**

G. Longshoreman's & Harbor Worker's Compensation Act/Jones Act coverage shall be maintained for work being conducted upon navigable water of the United States. The limit required shall be the same limit as the worker's compensation/employer's liability insurance limit **(IF APPLICABLE).**

H. Professional Liability shall be maintained against claims of negligence, errors, mistakes, or omissions in the performance of the services to be performed and furnished by the Awardee/Contractor or any of its subcontractors when it acts as a DESIGN PROFESSIONAL. The amount of coverage shall be no less than amount specified **(IF APPLICABLE).**

(a) $1,000,000 per incident and general aggregate. Note all claims made policies must provide the date of retroactive coverage.

The City may waive any or all of the above referenced insurance requirements based on the specific nature of goods or services to be provided under the award/contract.

ADDITIONAL INSURED - The City must be included as an additional insured by on the general and (Excess or Umbrella liability policies) if applicable. Alternatively, the Contractor may purchase a separate owners protective liability policy in the name of the City in the specified amount as indicated in the insurance requirements.

CLAIMS MADE POLICIES - If any liability insurance is issued on a claims made form, Contractor agrees to maintain uninterrupted coverage for a minimum of one year following completion and acceptance of the work either through purchase of an extended reporting provision, or through purchase of successive renewals with a retroactive date not later than the beginning of performance of work for the City. The retroactive date must be provided for all claims made policies.

CANCELLATION/NON-RENEWAL - Thirty (30) days written notice must be given to the City of any cancellation, intent to non-renew or material reduction in coverages (except aggregate liability limits). However, ten (10) days notice may be given for non-payment of premium. Notice shall be sent to the City of Tampa Department of Public Works, 306 E. Jackson Street, Tampa, FL 33602.

NUMBER OF POLICIES - General and other liability insurance may be arranged under single policies for the full amounts required or by a combination of underlying policies with the balance provided by an excess or umbrella liability insurance policy.

WAIVER OF SUBROGATION - Contractor waives all rights against City, its agents, officers, directors and employees for recovery of damages to the extent such damage is covered under the automobile or excess liability policies.

SUBCONTRACTORS - It is the Contractor's responsibility to require all subcontractors to maintain adequate insurance coverage.

PRIMARY POLICIES - The Contractor's insurance is primary to the City's insurance or any self insurance program thereof.

RATING - All insurers shall be authorized to do business in Florida, and shall have an A.M. Best rating of B+ (or better), Class VII (or higher), or otherwise be acceptable to the City if not rated by A.M. Best.

DEDUCTIBLES - The Contractor is responsible for all deductibles. In the event of loss which would have been covered but for the presence of a deductible, the City may withhold from payment to Contractor an amount equal to the deductible to cover such loss should full recovery not be obtained under the insurance policy.

INSURANCE ADJUSTMENTS - These insurance requirements may be increased, reduced, or waived at the City's sole option with an appropriate adjustment to the Contract price.

Document updated on 12/22/2009 by RLD (Risk Management)

City of Tampa MBD Office

SLBE Goal Setting Firms Report

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ASPHALT PAVING SERVICES

Castco Construction, Inc. **Federal Number** 59-2548614

9001 126th Ave. North
Largo, FL 33773

Phone (727) 585-4714
Fax (727) 585-5091
E-mail cconstr@tampabay.rr.com

Minority Small Business
Contact Israel Castro

Johnson's Excavation & Services, Inc. **Federal Number** 59-3031174

1706 East Trapnell Road
Plant City, FL 33566

Phone (813) 752-7097
Fax (813) 719-9052
E-mail sales@jescontracting.com

Minority Small Business
Contact Donathan Johnson

Parking Lot Striping Service **Federal Number** 59-1522393

P.O. Box 11005
Tampa, FL 33680

Phone (813) 623-1454
Fax (813) 664-0140
E-mail lindaplss@aol.com

Minority Small Business
Contact Fernando Llop

Mend It Asphalt & Concrete Services, Inc. **Federal Number** 59-3274522

4915 15th Avenue South
Gulfport, FL 33707

Phone (727) 327-7784
Fax (727) 327-4504
E-mail menditasphaltconcrete@yahoo.com

Minority Small Business
Contact Robert Mendez

Howard Sealcoating & Land Clearing **Federal Number** 65-0802138

1911N. 57th St
Tampa, FL 33619

Phone (305) 693-8972
Fax (305) 693-8985
E-mail lhoward@asphaltfl.com

Minority Small Business
Contact Leroy Howard

City Wide Paving, LLC **Federal Number** 27-0559624

2508 N. 32nd St.
Tampa, FL 33605

Phone (813) 325-4250
Fax (813) 849-1723
E-mail citywidepavingcwp@yahoo.com

Minority Small Business
Contact Reginald Young

City of Tampa MBD Office

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BARRICADES, TRAFFIC CONES, LANE MARKERS, ETC

Sentry Barricades, Inc. **Federal Number** 59-3590342

P.O. Box 3647
820 Creative Drive
Lakeland, FL 33802

Phone (863) 682-7098 **Minority** Small Business
Fax (863) 680-9901 **Contact** Darryl Talley
E-mail admin@sentryb.com

CONCRETE (CURBS & GUTTERS)

E.S. Concrete Services, Inc. **Federal Number** 59-3119582

726 East Harbor Dr. South
St. Petersburg, FL 33705

Phone (727) 560-0957 **Minority** Small Business
Fax (727) 821-5029 **Contact** Enoris Sly
E-mail enorisslysr@yahoo.com

Parking Lot Striping Service **Federal Number** 59-1522393

P.O. Box 11005
Tampa, FL 33680

Phone (813) 623-1454 **Minority** Small Business
Fax (813) 664-0140 **Contact** Fernando Llop
E-mail lindaplss@aol.com

Chet Netherly, LLC d/b/a Anything in Concrete **Federal Number** 20-3926235

246 W Canal Drive
Palm Harbor, FL 34684

Phone (727) 945-7035 **Minority** Small Business
Fax (727) 934-0568 **Contact** Chet Netherly
E-mail netherlyWCAN@aol.com

Velez Concrete Construction, Inc. **Federal Number** 83-0373603

3926 E. Eden Roc Circle
Tampa, FL 33634

Phone (813) 493-4762 **Minority** Small Business
Fax (813) 882-3455 **Contact** John Velez
E-mail velezconcrete@verizon.net

Andras Construction Service, LLC **Federal Number** 20-4468935

18449 Lake Iola Rd
Dade City, FL 33523

Phone (813) 482-2581 **Minority** Small Business
Fax (352) 588-2073 **Contact** Jeffrey Andras
E-mail jeffandras@gmail.com

City of Tampa MBD Office

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CONCRETE (CURBS & GUTTERS)

Velocity Construction, Inc. **Federal Number** 74-3082984

1320 E. 137th Ave
Tampa, FL 33613

Phone (813) 624-2117
Fax (800) 807-0314
E-mail bconnor@tampabay.rr.com

Minority Small Business
Contact William Connor

Kilgore Construction, LLC **Federal Number** 26-3771464

11697 Walsingham Rd.
Largo, FL 33778

Phone (727) 755-2294
Fax (727) 581-5724
E-mail jo@kilgorellc.com

Minority Small Business
Contact Harold Kilgore

JMJ Site Development, Inc **Federal Number** 27-3413832

P.O. Box 1095
Lithia, FL 33547

Phone (813) 927-2484
Fax
E-mail jmjsitedevelopment@gmail.com

Minority Small Business
Contact Jeff Joaquin

ELECTRICAL SERVICES

Apollo Construction & Engineering Services, Inc. **Federal Number** 59-2811166

P.O. Box 5848
Sun City Center, FL 33571-5848

Phone (813) 645-4926
Fax (813) 645-3351
E-mail tkamprath@apollo-construction.com

Minority Small Business
Contact Thomas Kamprath

Gaylord / Miller Electric Corp **Federal Number** 59-1631953

602 North Oregon Avenue
Tampa, FL 33606

Phone (813) 254-4681
Fax (813) 254-9473
E-mail james.gmelectric@verizon.net

Minority Small Business
Contact James A. Tepper

All-In-One Electric, Inc. **Federal Number** 04-3689273

1201 W Waters Ave.
Tampa, FL 33604

Phone (813) 849-6331
Fax (813) 514-0473
E-mail allinoneelectric@msn.com

Minority Small Business
Contact Rodney Jones

City of Tampa MBD Office

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ELECTRICAL SERVICES

Romero & Gray Electric, Inc. **Federal Number** 57-1164017

6001 Johns Rd.
Tampa, FL 33634

Phone (813) 881-1876
Fax (813) 249-4840
E-mail mgray@rg-electric.com

Minority Small Business
Contact Alfredo Romero

Cousins Electrical Contracting, Inc. **Federal Number** 20-1736062

P. O. Box 320534
Tampa, FL 33679

Phone (813) 907-5323
Fax (813) 994-1047
E-mail couselec@aol.com

Minority Small Business
Contact Marilee Cousins

Mandy Electric, Inc. **Federal Number** 59-2914874

9353 E. Fowler Ave.
Thonotosassa, FL 33592

Phone (813) 264-9234
Fax (813) 333-9701
E-mail lhernandez@mandyselectric.com

Minority Small Business
Contact Armando Hernandez

Ralph A. Philbrook, III LLC **Federal Number** 61-1460231

3316 Bainbridge Dr.
Holiday, FL 34691

Phone (727) 847-3766
Fax (727) 845-3567
E-mail philbrook3llc@aol.com

Minority Small Business
Contact Ralph Philbrook III

Crevello Electric, Inc. **Federal Number** 59-3559003

3305 N. Stanley Rd.
Plant City, FL 33565

Phone (813) 986-6106
Fax (813) 986-9633
E-mail crevelloelectric@gmail.com

Minority Small Business
Contact Bill Crevello

SJM Electric Corporation **Federal Number** 20-4183090

333 North Falkenburg Rd, Suite B201
Tampa, FL 33619

Phone (813) 684-7459
Fax (813) 654-0420
E-mail tami@sjmelectric.com

Minority Small Business
Contact Scott Mroczkowski

YES Electric, LLC **Federal Number** 27-1341928

2412 E. 7th Avenue
Tampa, FL 33605

Phone (813) 447-2531
Fax
E-mail yeselectric@tampabay.rr.com

Minority Small Business
Contact George Pages

City of Tampa MBD Office

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ELECTRICAL SERVICES

JBC Builders & Electric, Inc. **Federal Number** 08-0054484

5001 N. Nebraska Avenue, Suite A
Tampa, FL 33603

Phone (813) 232-5000
Fax (813) 232-3555
E-mail jbc@tampabay.rr.com

Minority Small Business
Contact Gerald Martinez

Best Price Electric Service, LLC **Federal Number** 27-1211988

P.O. Box 6516
Seffner, FL 33583

Phone
Fax (813) 409-3154
E-mail BestPriceElectricServ@hotmail.com

Minority Small Business
Contact Frank Fleites

Manatee Electric, Inc. **Federal Number** 59-3454485

845 Thompson Road
Lithia, FL Fl

Phone (813) 645-7000
Fax (813) 654-7568
E-mail john@reliableelectricusa.com

Minority Small Business
Contact John Babuka

Slentz Electric, Inc. **Federal Number** 59-1996013

1202 Gary Ave
Ellenton, FL 34222

Phone (941) 722-9227
Fax (941) 722-3318
E-mail georgeperry2@gmail.com

Minority Small Business
Contact George Perry

Aguila Electrical Services, Inc. **Federal Number** 20-0818128

8928 N. Newport Avenue
Tampa, FL 33604

Phone (813) 368-9323
Fax (813) 884-4092
E-mail sales@aguilaelectrical.com

Minority Small Business
Contact Jael Aguila

A American Electrical Contractor, Inc. **Federal Number** 59-2603773

9170 126th Avenue N
Largo, FL 33773

Phone (727) 588-0126
Fax (727) 588-9170
E-mail mark.aaec@yahoo.com

Minority Small Business
Contact Mark Comerford

City of Tampa MBD Office

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FENCE INSTALLATION SERVICE

Best Made Enterprises, Inc. **Federal Number** 59-3498525

4133 Causeway Blvd.
Tampa, FL 33619

Phone (813) 248-5266
Fax (813) 248-1299
E-mail BestMadeEntInc@aol.com

Minority Small Business
Contact Karen Flores

Fresh Start Development, Inc. **Federal Number** 20-3857845

P.O. Box 310592
Tampa, FL 33680

Phone (813) 758-5345
Fax (813) 333-5949
E-mail freshstartdevelop@yahoo.com

Minority Small Business
Contact Katina McClinton

West Coast Fence of Tampa, Inc. **Federal Number** 59-3656003

6801 Benjamin Rd.
Tampa, FL 33634

Phone (813) 886-5097
Fax (813) 886-5849
E-mail John@wcftampa.com

Minority Small Business
Contact John Gavaghan

Communication Support Network, Inc. **Federal Number** 03-0379746

1984 Iowa Ave. NE
St. Petersburg, FL 33703

Phone (813) 966-5200
Fax (813) 932-5421
E-mail csn2@tampabay.rr.com

Minority Small Business
Contact Sara Armstrong

JEB Management Inc. dba Good Neighbor Fence Co. **Federal Number** 03-0416868

5011 20th Avenue South
Tampa, FL 33619

Phone (813) 968-1921
Fax (813) 241-6070
E-mail info@fence4u.biz

Minority Small Business
Contact Jeffrey Bognolo

Ortzak Technology, LLC **Federal Number** 45-4837502

13014 N. Dale Mabry Hwy, Suite 623
Tampa, FL 33618

Phone (813) 961-6023
Fax (813) 961-6023
E-mail dcastro@ortzak.com

Minority Small Business
Contact Daniel Castro

City of Tampa MBD Office

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IRRIGATION SYSTEMS, LABOR AND MATERIALS TO INSTALL

Ed's Lawn & Landscaping, Inc. **Federal Number** 59-3239828

P.O. Box 130744
Tampa, FL 33681

Phone (813) 254-8499
Fax (813) 250-3779
E-mail edslawn@verizon.net

Minority Small Business
Contact Susan Breit

Aqua Pro Irrigation Services **Federal Number** 59-3387591

13529 Prestige Place Suite 112
Tampa, FL 33635

Phone (813) 814-4437
Fax (813) 814-9710
E-mail ken@aquaproirrigation.com

Minority Small Business
Contact Martha Wagenbrenner

LANDSCAPING (TREES, LAWN, NEW CONSTRUCTION)

Morelli Landscaping, Inc **Federal Number** 59-1877993

4855 162nd Ave North
Clearwater, FL 33762

Phone (727) 535-6263
Fax (727) 536-6855
E-mail vjmorelli@tampabay.rr.com

Minority Small Business
Contact Joe Morelli

Infante's Services, Inc. **Federal Number** 59-3648843

18620 Gunn Hwy.
Odessa, FL 33556

Phone (813) 926-2271
Fax (813) 926-1431
E-mail charlotte@infanteservices.com

Minority Small Business
Contact Renee Infante

Ed's Lawn & Landscaping, Inc. **Federal Number** 59-3239828

P.O. Box 130744
Tampa, FL 33681

Phone (813) 254-8499
Fax (813) 250-3779
E-mail edslawn@verizon.net

Minority Small Business
Contact Susan Breit

Professional Property Services **Federal Number** 59-1341451

10105 11th Street North
Tampa, FL 33612

Phone (813) 972-4057
Fax (813) 971-0882
E-mail paulrobinson22@msn.com

Minority Small Business
Contact Hyacinth Robinson

City of Tampa MBD Office

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LANDSCAPING (TREES, LAWN, NEW CONSTRUCTION)

Baron's Landscaping Service — **Federal Number** 65-0837654

P.O. Box 4047
Tampa, FL 33677

Phone (813) 404-1509
Fax (813) 476-6255
E-mail baronslawncare@aol.com

Minority Small Business
Contact Randy Conte

Sunbelt Sod & Grading Company — **Federal Number** 13-4250933

819 - 9th St. N.E.
Ruskin, FL 33570

Phone (813) 641-9855
Fax (813) 645-7263
E-mail sunbeltsod@verizon.net

Minority Small Business
Contact Lesley Silva

NPC Mowing & Landscaping — **Federal Number** 03-0555858

P.O. Box 292873 6441 Eureka Springs Road
Tampa, FL 33687-2873

Phone (813) 967-4386
Fax (352) 668-3295
E-mail Jwoodho793@aol.com

Minority Small Business
Contact John Woodhouse

Fresh Start Development, Inc. — **Federal Number** 20-3857845

P.O. Box 310592
Tampa, FL 33680

Phone (813) 758-5345
Fax (813) 333-5949
E-mail freshstartdevelop@yahoo.com

Minority Small Business
Contact Katina McClinton

Nelson's Tree Farm and Nursery, Inc. — **Federal Number** 59-3404710

19139 Geraci Rd.
Lutz, FL 33549

Phone (813) 917-6608
Fax (813) 350-9139
E-mail kimberly.martinez33@gmail.com

Minority Small Business
Contact Kimberly Martinez

Gibbs Properties, LLC — **Federal Number** 43-2117741

17633 Gunn Hwy #236
Odessa, FL 33556

Phone (727) 376-4465
Fax (813) 425-0455
E-mail gmjservices@msn.com

Minority Small Business
Contact Bill Gibbs

City of Tampa MBD Office

SLBE Goal Setting Firms Report

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LANDSCAPING (TREES, LAWN, NEW CONSTRUCTION)

On-Point Group, Inc. **Federal Number** 38-3788119

5608 Puritan Rd
Tampa, FL 33617

Phone (813) 927-2808
Fax (813) 374-0993
E-mail d.jones@on-pointgroupinc.com

Minority Small Business
Contact Daphne Jones

Jungle Scapes **Federal Number** 26-2517542

1717 E. Busch Blvd., Suite 1101
Tampa, FL 33626

Phone (813) 516-9950
Fax (813) 902-7221
E-mail info@jungle-scapes.com

Minority Small Business
Contact Hulsey Ebanks, Jr.

Logan Moore Corporation **Federal Number** 20-8793036

501 Oakbriar Place
Brandon, FL 33510

Phone (813) 810-8614
Fax (267) 368-1716
E-mail jhaines@mygreenserve.com

Minority Small Business
Contact David Curtis

Pine Lake Services, Inc. **Federal Number** 27-3360158

2122 Henley Rd.
Lutz, FL 33548

Phone (813) 948-4736
Fax (813) 909-0386
E-mail Ivan@pinelakeservices.com

Minority Small Business
Contact Maria Martinez

Roque Landscaping, LLC **Federal Number** 27-2430577

9024 Duke Drive
Tampa, FL 33615

Phone (813) 385-6282
Fax (813) 443-3207
E-mail yndi12@univision.com

Minority Small Business
Contact Juan Roque

AAJ Lawn Care Services, Inc. **Federal Number** 26-0254393

3716 E. Idlewild Avenue
Tampa, FL 33610

Phone (813) 220-8533
Fax (888) 277-1860
E-mail aajlawncare@gmail.com

Minority Small Business
Contact Archie Jerry

The Leaf Man, LLC **Federal Number** 27-4668275

P.O. Box 4386
Tampa, FL 33677

Phone (813) 381-5133
Fax (888) 527-4874
E-mail tampaleafman@gmail.com

Minority Small Business
Contact Dan Mathis

City of Tampa MBD Office

SLBE Goal Setting Firms Report

as of 6/10/2013

LANDSCAPING (TREES, LAWN, NEW CONSTRUCTION)

Gustavo Negrete d/b/a Lawns & More **Federal Number** 76-6102049

2707 Demont Mollin Rd
Plant City, FL 33565

Phone (813) 650-1834
Fax (813) 754-0282
E-mail

Minority Small Business
Contact Gustavo Negrete

Breit Turf Management, LLC **Federal Number** 27-3737949

P.O. Box 13551
Tampa, FL 33681

Phone (813) 732-3221
Fax
E-mail breitturf1@gmail.com

Minority Small Business
Contact Edward Breit

Sunscape Ground Maintenance, Inc. **Federal Number** 56-2306877

3624 N. 18th St.
Tampa, FL 33605-1145

Phone (813) 247-3100
Fax (813) 247-4013
E-mail sunscapegmi@verizon.net

Minority Small Business
Contact Demond Bryant

Evolve Professional Landscape Management, LLC **Federal Number** 27-2323571

P.O. Box 2362
Bartow, FL 33831

Phone (863) 205-3769
Fax (863) 223-0275
E-mail office@evolveyourlawn.com

Minority Small Business
Contact Joseph Bustos

SOD, SEED SOIL, AND INOCULANTS

Morelli Landscaping, Inc **Federal Number** 59-1877993

4855 162nd Ave North
Clearwater, FL 33762

Phone (727) 535-6263
Fax (727) 536-6855
E-mail vjmorelli@tampabay.rr.com

Minority Small Business
Contact Joe Morelli

Ed's Lawn & Landscaping, Inc. **Federal Number** 59-3239828

P.O. Box 130744
Tampa, FL 33681

Phone (813) 254-8499
Fax (813) 250-3779
E-mail edslawn@verizon.net

Minority Small Business
Contact Susan Breit

City of Tampa MBD Office

SLBE Goal Setting Firms Report

as of 6/10/2013

SOD, SEED SOIL, AND INOCULANTS

Professional Property Services **Federal Number** 59-1341451

10105 11th Street North
Tampa, FL 33612

Phone (813) 972-4057 **Minority** Small Business
Fax (813) 971-0882 **Contact** Hyacinth Robinson
E-mail paulrobinson22@msn.com

Baron's Landscaping Service **Federal Number** 65-0837654

P.O. Box 4047
Tampa, FL 33677

Phone (813) 404-1509 **Minority** Small Business
Fax (813) 476-6255 **Contact** Randy Conte
E-mail baronslawncare@aol.com

Sunbelt Sod & Grading Company **Federal Number** 13-4250933

819 - 9th St. N.E.
Ruskin, FL 33570

Phone (813) 641-9855 **Minority** Small Business
Fax (813) 645-7263 **Contact** Lesley Silva
E-mail sunbeltsod@verizon.net

NPC Mowing & Landscaping **Federal Number** 03-0555858

P.O. Box 292873 6441 Eureka Springs Road
Tampa, FL 33687-2873

Phone (813) 967-4386 **Minority** Small Business
Fax (352) 668-3295 **Contact** John Woodhouse
E-mail Jwoodho793@aol.com

Fresh Start Development, Inc. **Federal Number** 20-3857845

P.O. Box 310592
Tampa, FL 33680

Phone (813) 758-5345 **Minority** Small Business
Fax (813) 333-5949 **Contact** Katina McClinton
E-mail freshstartdevelop@yahoo.com

Gibbs Properties, LLC **Federal Number** 43-2117741

17633 Gunn Hwy #236
Odessa, FL 33556

Phone (727) 376-4465 **Minority** Small Business
Fax (813) 425-0455 **Contact** Bill Gibbs
E-mail gmjservices@msn.com

City of Tampa MBD Office

SLBE Goal Setting Firms Report

as of 6/10/2013

SOD, SEED SOIL, AND INOCULANTS

On-Point Group, Inc. **Federal Number** 38-3788119

5608 Puritan Rd
Tampa, FL 33617

Phone (813) 927-2808
Fax (813) 374-0993
E-mail d.jones@on-pointgroupinc.com

Minority Small Business
Contact Daphne Jones

Jungle Scapes **Federal Number** 26-2517542

1717 E. Busch Blvd., Suite 1101
Tampa, FL 33626

Phone (813) 516-9950
Fax (813) 902-7221
E-mail info@jungle-scapes.com

Minority Small Business
Contact Hulsey Ebanks, Jr.

Logan Moore Corporation **Federal Number** 20-8793036

501 Oakbriar Place
Brandon, FL 33510

Phone (813) 810-8614
Fax (267) 368-1716
E-mail jhaines@mygreenserve.com

Minority Small Business
Contact David Curtis

SURVEYORS' SERVICES

Metzger & Willard, Inc. **Federal Number** 59-1907168

8600 Hidden River Parkway Ste. 550
Tampa, FL 33637-1033

Phone (813) 977-6055
Fax (813) 977-0593
E-mail nmetzger@metzgerwilard.com

Minority Small Business
Contact Nancy Metzger

Mills & Associates, Inc. **Federal Number** 59-2354541

3242 Henderson Blvd. #300
Tampa, FL 33609

Phone (813) 876-5869
Fax (813) 870-0317
E-mail larry.m@millsandassoc.com

Minority Small Business
Contact Lawrence Mills

Northwest Engineering Inc. **Federal Number** 59-2899240

8409 Sunstate St.
Tampa, FL 33634-1309

Phone (813) 889-9236
Fax (813) 886-3315
E-mail jsilva@neitampa.com

Minority Small Business
Contact Gerald Silva

City of Tampa MBD Office

SLBE Goal Setting Firms Report

as of 6/10/2013

SURVEYORS' SERVICES

Suncoast Land Surveying, Inc. **Federal Number** 59-2733609

111 Forest Lakes Blvd. S.
Oldsmar, FL 34677

Phone (813) 854-1342
Fax (813) 354-3435
E-mail kmcclung@knology.net

Minority Small Business
Contact Marie McClung

Land Precision Corporation **Federal Number** 59-3088679

2683 Sunset Point Road
Clearwater, FL 33759

Phone (727) 496-2737
Fax (727) 796-3326
E-mail vcorbitt@landprecision.com

Minority Small Business
Contact Vincent E. Corbitt

Compass Point Surveyors, PL **Federal Number** 20-5388139

806 Franklin Street
Clearwater, FL 33756

Phone (727) 230-9606
Fax (727) 230-9234
E-mail tdf@cp-surveyors.com

Minority Small Business
Contact Terry Ferguson

Parra & Karimi Engineering, LLC (P & K Engineering) **Federal Number** 22-3943908

2035 Camp Indianhead Rd
Land O Lakes, FL 34639

Phone (813) 988-8100
Fax (813) 988-8108
E-mail pkmail@pk-eng.com

Minority Small Business
Contact Mario Parra

AFN Consulting, Inc. **Federal Number** 43-2002761

9926 Preakness Stakes Way
Dade City, FL 33525

Phone (813) 503-3228
Fax (813) 437-4078
E-mail afn2@tampabay.rr.com

Minority Small Business
Contact David P. Graves

Hyatt Survey Services, Inc. **Federal Number** 03-0476653

11007 8th Avenue E.
Bradenton, FL 34212

Phone (941) 746-3903
Fax (941) 749-0166
E-mail pam@hyatt-survey.com

Minority Small Business
Contact Pamela Hyatt

SurvTech Solutions, Inc. **Federal Number** 52-2444588

10220 U.S. Highway 92 E
Tampa, FL 33610

Phone (813) 621-4929
Fax (813) 621-7194
E-mail sales@survtechsolutions.com

Minority Small Business
Contact David O'Brien

City of Tampa MBD Office

SLBE Goal Setting Firms Report

as of 6/10/2013

SURVEYORS' SERVICES

Digital Aerial Solutions, LLC — **Federal Number** 47-0907854

8409 Laurel Fair Cir, Suite 100
Tampa, FL 33610

Phone (813) 628-0788
Fax (813) 628-0777
E-mail mwaz@digitalaerial.com

Minority Small Business
Contact Michael Wasielewski

D.C. Johnson & Associates, Inc. — **Federal Number** 59-2214086

11911 S Curley St.
San Antonio, FL 33576

Phone (352) 588-2768
Fax (352) 588-2713
E-mail chrisxynides@dcjohnson.com

Minority Small Business
Contact Daniel Johnson

Leftcoast Surveyors, Inc. — **Federal Number** 59-3655470

2363 1st Avenue North
St. Petersburg, FL 33713

Phone (727) 576-2877
Fax (727) 576-6602
E-mail leftcoast@tampabay.rr.com

Minority Small Business
Contact Mike Guiler

AJN Surveying, LLC — **Federal Number** 90-0444646

5210 Cindy Kay Drive
Plant City, FL 33566

Phone (813) 352-9483
Fax (813) 704-4836
E-mail alan@ajnsurveying.com

Minority Small Business
Contact Alan Naumowicz

AREFCO International, Inc. — **Federal Number** 20-3286888

13250 N. 56th St.Suite 204
Tampa, FL 33617

Phone (813) 988-7722
Fax (813) 988-7733
E-mail saref@arefco-intl.com

Minority Small Business
Contact Sam Aref

REVOLUTION PROFESSIONAL SERVICES, INC — **Federal Number** 27-4498767

25400 US Hwy 19 N, Ste 137
Clearwater, FL 33763

Phone (727) 796-8740
Fax (727) 796-8601
E-mail klanzner@rpspls.com

Minority Small Business
Contact Kathleen Lanzner

Robert B. Curtis, PSM, Inc. — **Federal Number** 27-1713096

14502 N. Dale Mabry Hwy, Ste 200
Tampa, FL 33615

Phone (813) 500-1635
Fax
E-mail curtis.robertb@gmail.com

Minority Small Business
Contact Robert Curtis, PSM, Inc.

City of Tampa MBD Office

SLBE Goal Setting Firms Report

as of 6/10/2013

SURVEYORS' SERVICES

King Engineering, Inc. **Federal Number** 36-2925408

4213 Fishermans Lake Drive
Lutz, FL 33558

Phone (813) 886-7111
Fax (813) 886-6111
E-mail jackie.king@kesouth.net

Minority Small Business
Contact Jacqueline King

CCMG, Inc. **Federal Number** 90-0494998

11403 McMullen Loop
Riverview, FL 33569

Phone (813) 381-7878
Fax (813) 315-7879
E-mail gerrytraverso@caribconsult.com

Minority Small Business
Contact Gerardo Traverso

EMK Consulltants of Florida, Inc. **Federal Number** 84-1056258

7815 N. Dale Mabry Hwy, Suite 200
Tampa, FL 33614

Phone (813) 931-8900
Fax (813) 931-5848
E-mail duane@emkfla.com

Minority Small Business
Contact Earl Michaels

Sycamore Engineering, Inc. **Federal Number** 20-1479603

11435 Cypress Reserve Drive
Tampa, FL 33626

Phone (813) 889-0700
Fax (813) 889-0788
E-mail akhaled@sycamoreeng.com

Minority Small Business
Contact Abir Khaled

TRUCKING & HAULING

Sabrina's Trucking, LLC **Federal Number** 59-3284380

P.O. Box 992
Mango, FL 33550

Phone (813) 629-7210
Fax (813) 627-9094
E-mail jtrucker151@aol.com

Minority Small Business
Contact Nathaniel Johnson

T. Carreno Fill Haulers, Inc. **Federal Number** 59-2707257

602 Duque Rd.
Lutz, FL 33549

Phone (813) 948-0312
Fax (813) 948-3313
E-mail ctcarreno@verizon.net

Minority Small Business
Contact Anthony Carreno

City of Tampa MBD Office

SLBE Goal Setting Firms Report

as of 6/10/2013

TRUCKING & HAULING

Professional Property Services **Federal Number** 59-1341451

10105 11th Street North
Tampa, FL 33612

Phone (813) 972-4057
Fax (813) 971-0882
E-mail paulrobinson22@msn.com

Minority Small Business
Contact Hyacinth Robinson

Par Development Partners, Inc. **Federal Number** 20-5657414

10002 Forest Hills Dr
Tampa, FL 33612

Phone (813) 374-2856
Fax (866) 594-2505
E-mail ydwilson@aol.com

Minority Small Business
Contact Yancy Wilson

Howard Sealcoating & Land Clearing **Federal Number** 65-0802138

1911N. 57th St
Tampa, FL 33619

Phone (305) 693-8972
Fax (305) 693-8985
E-mail lhoward@asphaltfl.com

Minority Small Business
Contact Leroy Howard

Charlie Brown's Hauling & Demolition, Inc. **Federal Number** 20-1874672

P.O. Box 1178
Dade City, FL 33526

Phone (352) 521-0482
Fax (352) 521-5915
E-mail Charliewbrown@aol.com

Minority Small Business
Contact Charlie Brown

Suarez Grading Enterprises, Inc. **Federal Number** 84-1681751

P.O. Box 89579
Tampa, FL 33689

Phone (813) 663-9037
Fax (813) 620-4158
E-mail l.martinez@suarezgrading.com

Minority Small Business
Contact Pedro Suarez

On-Point Group, Inc. **Federal Number** 38-3788119

5608 Puritan Rd
Tampa, FL 33617

Phone (813) 927-2808
Fax (813) 374-0993
E-mail d.jones@on-pointgroupinc.com

Minority Small Business
Contact Daphne Jones

Accelerated Waste Solutions of North America, LLC **Federal Number** 27-1394911

10226 Oslin St
Tampa, FL 33615

Phone (866) 698-2874
Fax (813) 871-0377
E-mail cityoftampa@acceleratedwaste.com

Minority Small Business
Contact Fred Tomlin

City of Tampa MBD Office

SLBE Goal Setting Firms Report

as of 6/10/2013

TRUCKING & HAULING

TNT Environmental, LLC **Federal Number** 26-3864129

17852 Pine Knoll Drive
Dade City, FL 33523

Phone (352) 567-1822
Fax (352) 567-5817
E-mail tntenvironmental@gmail.com

Minority Small Business
Contact Christopher Leibereid

J M J Hauling, Inc. **Federal Number** 32-0270935

8209 69th St E
Palmetto, FL 34221

Phone (917) 544-9741
Fax (941) 721-6932
E-mail mvachu@tampabay.rr.com

Minority Small Business
Contact Bachu Maniram

Manes Trucking, Inc. **Federal Number** 59-3594014

5812 Imperial Key
Tampa, FL 33615

Phone (813) 475-4466
Fax (813) 475-4466
E-mail manestrucking22@tampabay.rr.com

Minority Small Business
Contact Amelia Manes

SLBE Contract Goal

Goal
7.5%

Instructions Regarding Use of the SLBE Goal Setting List

Bidders must solicit a subcontracting bid from ALL of the firms listed on the SLBEs list provided on the City's web site, and provide documentation of emails, faxes, phone calls, letters, or other communication with the firms a first step in demonstrating Good-Faith Efforts to achieve the goal set for SLBE participation on this contract.

The list is formatted to facilitate e-mailing of a solicitation to the listed firms by copying and pasting the email addresses.

The SLBE participation Goal is based upon the availability of the certified firms indicated on the attached list. The Goal and Requirements of the City's Equal Business Opportunity Program are stated in the Bid/Contract Document, Specifications.

SOLICITATION FOR SUBCONTRACTOR QUOTES

From:
OUR COMPANY NAME:
TELEPHONE NUMBER:
ADDRESS:
FAX NUMBER:
E-MAIL ADDRESS:

To Subcontractor:

Our firm is in the process of preparing a bid for a **City of Tampa Contract**. Please accept this notice as our request for quotes for the scope of work identified below. Please respond to this request by filling in the information below and returning via e-mail or fax to the address or number provided. Please contact us if you need any assistance in obtaining bonding, lines of credit, insurance, assistance in obtaining necessary equipment, supplies, materials, participation in a City-sponsored mentor-protégé program, or if you have any questions.

Plans and Specs for this project are posted at:
http://www.tampagov.net/dept_contract_administration/programs_and_services/construction_project_bidding/

CONTRACT NO.:
CONTRACT NAME:
CITY'S BID OPENING DATE:
DEADLINE FOR YOUR SUBCONTRACTOR BID OR RESPONSE:
SPECIFIC SCOPE OF WORK:

Please complete and submit with your subcontract bid or response:
YOUR FIRM'S NAME:
MAILING ADDRESS:
CITY:
STATE:
ZIP:
FAX NUMBER:
E-MAIL ADDRESS:
__Yes, my company is interested in quoting this project for the following items of work:

__No, my company will not quote this project for the following reason(s):

(Sample Suggested Sub Solicitation 3-9-9 Tampa MBDO)

City of Tampa
Official Letter of Intent
(Form MBD-40)

A Letter of Intent is required for each WMBE/SLBE listed on the Schedule of Subcontractors to be Utilized (MBD 20 Form). Letter of Intent must be signed by both the Bidder/Service Provider and WMBE/SLBE firm.

Bid/Proposal/Contract Number: _____

Bid/Proposal/Contract Name: _____

A. To be completed by the Bidder/Service Provider

Name of Bidder: _____
Address: _____
_____

Contact Person: _____
Telephone: _____ Fax: _____
Email: _____

B. To be completed by WMBE/SLBE

Name of WMBE/SLBE: _____
Address: _____
_____

Contract Person: _____
Telephone: _____Fax: _____
Email: _____

C. Identify the scope of work to be performed or item(s) to be supplied by the WMBE/SLBE. On unit price bids, identify to which bid line item the WMBE/SLBE's work scope or supply corresponds:
_____
_____
_____

D. Cost of work to be performed by WMBE/SLBE: _____

E. Cost of work to be performed by WMBE/SLBE as a percent of total City contract amount:_____

Bidder/Proposer certifies that it intends to utilize the WMBE/SLBE listed above, and that the work described above is accurate. Bidder/Proposer will provide City with copy of the related subcontract agreement and/or purchase order prior to commencement of the WMBE/SLBE's work. The WMBE/SLBE firm certifies that it has agreed to provide such work/supplies for the amount stated above.

Bidder/Proposer: _____ Date: _____
Signature and Title

WMBE/SLBE Firm: _____ Date: _____
Signature and Title

Official Letter of Intent Instructions
City of Tampa
Equal Business Opportunity Program

The Official Letter of Intent must be submitted to the soliciting department within ten (10) work days of the bid opening, prior to award. Not providing all letters of intent within the prescribed time frame may be cause to delay award or declare the bid to be non-responsive.

Bid/Proposal/Contract Number- Please provide bid/proposal/contract number provided by City of Tampa procuring department.

Bid/Proposal/Contract Name – Please provide bid/proposal/contract name provided by City of Tampa procuring department.

To be Completed by the Bidder/Service Provide – Please provide prime contractor or main bidders detailed company information as indicated.

To be completed by the WMBE/SLBE – Please provide WMBE/SLBE subcontractor detailed company information as indicated.

Bidder is to Identify the scope of work to be performed or item(s) to be supplied by the WMBE/SLBE. On unit price bids indentify, which bid line item the WMBE/SLBE's scope of work or supply corresponds – Please provide details of the services or supplies the WMBE/SLBE will provide.

Cost of work to be performed by WMBE/SLBE – Provide agreed upon estimate of work or supplies total price (Unit prices are accepted if specific quantities have yet to be determined).

Bidder/Proposer – Signature of authorized agent for the prime contractor or main bidder with date signed.

WMBE/SLBE firm – Signature of authorized agent for the WMBE/SLBE subcontractor or supplier with date signed.

Contract Confirmation – A copy of the executed subcontract agreement and/or purchase order with the WMBE/SLBE must be filed with the City of Tampa immediately upon execution and/or prior to commencement of work by WMBE/SLBE.

Contract 13-C-00018; Ditch Stabilization: Bayway Canal, Jones Avenue and MetWest

PROPOSAL

To the Mayor and City Council of the City of Tampa, Florida:

Name of Bidder _____

_____
Business Phone Number and Email Address

_____
Business Name and Mailing Address

_____
Phone Number and Name of Contact Regarding Permits

_____
Contractor/Qualifiers Name and Federal Identification Number

Date of Proposal _____

(If Bidder is a firm, fill in the following blanks):

Names and Residential Addresses of Partners

_____

_____

(If Bidder is a corporation, fill in the following blanks):

Organized under the laws of the State of _____

Names and Address of President

_____

_____

Name and Address of Vice President

_____

_____

Name and Address of Secretary

_____

_____

Names and Address of Treasurer

_____

_____

The above-named Bidder affirms and declares:

(1) That the Bidder is of lawful age and that no other person, firm or corporation has any interest in this Proposal or in the Contract proposed to be entered into.

(2) That this Proposal is made without any understanding, agreement or connection with any other person, firm, or corporation making Proposal for the same purposes, and is in all respects fair and without collusion or fraud.

(3) That the Bidder is not in arrears to the City of Tampa, upon debt or contract, and is not a defaulter, as surety or otherwise, upon any obligation to the City of Tampa.

(4) That no officer or employee or person whose salary is payable in whole or in part from the City Treasury is, shall be or become interested, directly or indirectly, as a contracting party, partner, stockholder, surety or otherwise, in this Proposal, or in the performance of the Contract, or in the supplies, materials, or equipment and work or labor to which it relates, or in any portion of the profits thereof.

(5) That the Bidder has carefully examined the site of the work and that, from his own investigations, he has satisfied himself as to the nature and location of the work, the character, quality, and quantity of materials and the kinds and extent of equipment and other facilities needed for the performance of the work, the general and local conditions and all difficulties to be encountered, and all other items which may, in any way, affect the work or its performance.

(6) That the Bidder

_____ Has; Treasury Number _____

_____ Has not
(Check applicable box)

previously performed work under the President's Executive Order Nos. 11246 and 11375.

(7) That the undersigned, as Bidder, also declares that he has carefully examined and fully understands all the component parts of the Contract Documents and agrees that he will execute the Contract and finish the required Performance Bond and will completely perform the work in strict accordance with the terms of the Contract and the Contract Documents therein referred to for the following prices, to wit:

Item No.	Description	Unit	Approx. Quantity	Unit Price in Words		Unit Price		Total Computed Price
0100-1	Contingency	LS	1		$		$	
0101-1	Mobilization	LS	1		$		$	
				TOTAL CONTINGENCY AND MOBILIZATION	$		$	
Schedule A	Bay Way Drive Segment							
0102-1	Maintenance of Traffic	LS	1		$		$	
0104-1	Erosion and Tree Protection	LS	1		$		$	
0105-1	Tree and Root Pruning	LS	1		$		$	
0112-1	Landscape Replacement	LS	1		$		$	
0113-1	Irrigation and Electric Repairs	LS	1		$		$	
0142-7	Imported Soil Fill Material	CY	400		$		$	
0150-1	Cellular Confinement Erosion Control System	SY	700		$		$	
0530-3	Rip Rap Rubble	TN	21		$		$	
0570-1	Sod	SY	900		$		$	
				TOTAL CONSTRUCTION COST SEGMENT A	$		$	

Item No.	Description	Unit	Approx. Quantity	Unit Price in Words		Unit Price		Total Computed Price
Schedule B	Jones Avenue Segment							
0102-1	Maintenance of Traffic	LS	1		$		$	
0104-1	Erosion Control and Tree Protection	LS	1		$		$	
0105-1	Tree and Root Pruning	LS	1		$		$	
0108-1	Dewatering and By-Pass Pumping	LS	1		$		$	
0110-1	Clearing and Grubbing	LS	1		$		$	
0120-3	Grading Slope	SY	590		$		$	
0142-7	Imported Soil Fill Material	CY	300		$		$	
0160-5	Stabilized Subbase - 8"	SY	37		$		$	
0285-7	Permanent Pavement Base - 6"	SY	28		$		$	
0327-1	Milling 1 Inch Asphalt	SY	700		$		$	
0334-1	Permanent Pavement Surface Replacement - 1" S-3	TN	35		$		$	
0334-4	Permanent Pavement Replacement - 1" S-1	TN	7		$		$	
0350-1	Reinforced Concrete Flumes	EA	2		$		$	
0410-1	Wood Post W-Beam Guardrail w/ Impact Heads	LF	580		$		$	
0440-2	Wastewater Service Plug and Removal	EA	7		$		$	

Item No.	Description	Unit	Approx. Quantity	Unit Price in Words		Unit Price		Total Computed Price
0520-1	Concrete Curb Type "F"	LF	575		$		$	
0520-2	Concrete Curb Transitions	EA	6		$		$	
0522-1	Concrete Paving Under Guardrail - 4"	SY	193		$		$	
0524-1	Filter-Point Fabric Formed Concrete System	SY	900		$		$	
0530-3	Rip Rap Rubble	TN	9		$		$	
				TOTAL CONSTRUCTION COST SEGMENT B	$		$	
Schedule C	Met West Segment							
0102-1	Maintenance of Traffic	LS	1		$		$	
0104-1	Erosion Control and Tree Protection	LS	1		$		$	
0108-1	Dewatering and By-Pass Pumping	LS	1		$		$	
0110-1	Clearing and Grubbing	LS	1		$		$	
0120-1	Regular Excavation	CY	3,280		$		$	
0120-4	Subsoil Excavation (Unsuitables)*	CY	100		$		$	
0120-6	Embankment	CY	2,256		$		$	
0142-7	Imported Soil Fill Material*	CY	100		$		$	
0350-2	Concrete Class 1, Retaining wall Penetrations	CY	12		$		$	
0430-175-124	Pipe Culvert, Opt Material, Round, 24" CD	LF	8		$		$	

Item No.	Description	Unit	Approx. Quantity	Unit Price in Words		Unit Price		Total Computed Price
0430-175-148	Pipe Culvert, Opt Material, Round, 48" CD	LF	10		$		$	
0440-73-6	Outlet Pipe, 6" PVC (Includes Bends)	LF	12		$		$	
0440-73-10	Outlet Pipe, 10" PVC (Includes Bends)	LF	16		$		$	
0515-22-11	Ped/Bicycle Railing, Gal. Stl, 42" Type 1	LF	30		$		$	
0524-1	Filter-Point Fabric Formed Concrete System	SY	320		$		$	
0530-1	Rip Rap Sand Cement (Above Wall)	CY	11		$		$	
0530-3	Rip Rap Rubble, F & I, Ditch Lining	TN	129		$		$	
0548-12	Retaining Wall System	SF	22,868		$		$	
0550-21	Fencing, Type B, 6.0' Ht., w/ Black Vinyl Coating	LF	240		$		$	
0570-1	Performance Turf, Sod	SY	6,250		$		$	
0570-2	Hydroseed w/ Mulch	SY	2,900		$		$	
	* Contingent Item - See SP-60				$		$	
				TOTAL CONSTRUCTION COST SEGMENT C	$		$	
				TOTAL CONTRACT 13-C-00018 COST INCLUDING GENERAL PROJECT, SCHEDULE A, SCHEDULE B, AND SCHEDULE C	$		$	

Computed Total Price In Words:

_____

_____ dollars and _____ cents.

Computed Total Price in Figures: $_____

The bidder acknowledges that the following addenda have been received and that the changes covered by the addendum(s) have been taken into account in this proposal: #1 ___ #2 ___ #3 ___ #4___ #5___.

The bidder acknowledges the requirements of the City of Tampa's Equal Business Opportunity Program.

Bidder acknowledges that included in the various items of the proposal and the Total Bid Price are costs for complying with the Florida Trench Safety Act (90096), (Laws of Fla.) effective October 1, 1990. The bidder further identifies the costs to be summarized below:

	Trench Safety Measure (Description)	Unit of Measure (LF, SY)	Unit Quantity	Unit Cost	Extended Cost
A.	_____	_____	_____	_____	_____
B.	_____	_____	_____	_____	_____
C.	_____	_____	_____	_____	_____
D.	_____	_____	_____	_____	_____

Total Cost $_____

Signed _____

Failure to complete the above may result in the bid being declared non-responsive.

Accompanying this Proposal is a certified check, cashier's check or Bid Bond (form included herein must be used) on the form at least five (5) percent of the total amount of the Proposal which check shall become the property of the

_____ of _____
(Name of Bank or Surety) (City & State)

City of Tampa, or which bond shall become forthwith due and payable to the City of Tampa, if this Proposal shall be accepted by the City of Tampa and the undersigned shall fail to execute a contract with and to furnish the required Performance Bond and Payment Bond to the City of Tampa within twenty (20) days after the date of receipt of written Notice of Award by the City of Tampa to the undersigned so to do.

Dated _____, 2013

_____
(Name of Bidder)

_____
(Address of Bidder)

_____
(Signature)

_____
(Title)

Where Bidder is a Corporation:

Attest:

_____
Secretary

AFFIX
CORPORATE
SEAL

(ACKNOWLEDGMENT OF PRINCIPAL)

STATE OF)
) SS:
COUNTY OF)

For a Corporation:

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me this ___ of _____, 2013 by _____ of _____, a _____ corporation, on behalf of the corporation. He/she is ___ personally known or has ___ produced _____ as identification.

_____
Notary

My Commission Expires:

_____

For an Individual:

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me this ___ of _____, 2013 by _____ who is ___ personally known to me or has ___ produced _____ as identification.

_____
Notary

My Commission Expires:

_____

For a Firm:

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me this ___ of _____, 2013 by _____ who signed on behalf of the said firm. He/she is ___ personally known or has ___ produced _____ as identification.

_____
Notary

My Commission Expires:

_____

_____

Good Faith Effort Compliance Plan

for Women/Minority Business Enterprise\Small Local Business Subcontracting
City of Tampa - Equal Business Opportunity Program
(MBD Form 50)

Contract _____ **Bid Date** _____

Bidder _____

Signature _____ **Date** _____

Name _____ **Title** _____

The following Compliance Plan is a true report of Good Faith Efforts made to accomplish subcontracting goals for Women/Minority Business Enterprise/Small Local Business Enterprises, WMBE/SLBEs, on the referenced contract:

□ **The goal for WMBE/SLBE participation has been met or exceeded. See the DMI form reporting subcontractors to be utilized.**

(Check Box, if appropriate; the remainder of the Compliance Plan need not be reported.)

□ **The goal for WMBE/SLBE participation has not been met. The following is a recap of Good Faith Efforts made:**

(Check applicable boxes below. Enclose additional documents, and/or add remarks below as needed.)

(1) Soliciting through reasonable and available means the interest of WMBE/SLBEs that have the capability to perform the work of the contract. The Bidder or Contractor must solicit this interest within sufficient time to allow the WMBE/SLBEs to respond. The Bidder or Contractor must take appropriate steps to follow up initial solicitations with interested WMBE/SLBEs. □ See DMI report forms for subcontractors solicited. □ See enclosed supplemental data on solicitation efforts. □ Remarks:

(2) Providing interested WMBE/SLBEs with adequate information about the plans, specifications, and requirements of the contract, including addenda, in a timely manner to assist them in responding to the solicitation. □ See enclosed sample solicitation. □ Remarks:

(3) Negotiating in good faith with interested WMBE/SLBEs that have submitted bids. Documentation of negotiation must include the names, addresses, and telephone numbers of WMBE/SLBEs that were solicited; the date of each such solicitation; a description of the information provided regarding the plans and specifications for the work selected for subcontracting; and evidence as to why agreements could not be reached with WMBE/SLBEs to perform the work. That there may be some additional costs involved in soliciting and using WMBE/SLBEs is not a sufficient reason for a contractor's failure to meet the goals, as long as such costs are reasonable. Bidders are not required to accept higher quotes in order to meet the goal. □ DMI subcontractor-utilized forms reflect successful negotiations □ This project is of a low-bid nature and negotiations are limited to clarifications of scope and specifications. □ See enclosed document. □ Remarks:

(4) Not rejecting WMBE/SLBEs as being unqualified without sound reasons based on a thorough investigation of their capabilities. The WMBE/SLBEs standing within its industry, membership in specific groups, organizations, or associations and political or social affiliations are not legitimate causes for rejecting or not soliciting bids to meet the goals. □ Not applicable. □ See attached explanation for rejection of a low-bidding subcontractor's bid. □ Remarks:

(5) Making a portion of the work available to WMBE/SLBE subcontractors and suppliers and to select those portions of the work or material consistent with the available WMBE/SLBE subcontractors and suppliers, so as to facilitate meeting the goal. □ Sub-Contractors were allowed to bid on their own choice of work or trade without restriction to a pre-determined portion. □ See enclosed comments. □ Remarks:

(6) Making good faith efforts, despite the ability or desire of a Bidder or Contractor to perform the work of a contract with its own organization. A Bidder or Contractor who desires to self-perform the work of a contract must demonstrate good faith efforts unless the goal has been met. □ Sub-Contractors were not prohibited from submitting bids on work not usually sub-contracted. □ Remarks:

(7) Selecting portions of the work to be performed by WMBE/SLBEs in order to increase the likelihood that the goals will be met. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate WMBE/SLBE participation, even when the Bidder or Contractor might otherwise prefer to perform these work items with its own forces. □ Sub-Contractors were allowed to bid on their own choice of work or trade without restriction to a pre-determined portion. □ Sub-Contractors were not prohibited from submitting bids on work not usually sub-contracted. □ See enclosed comments. □ Remarks:

(8) Making efforts to assist interested WMBE/SLBEs in obtaining bonding, lines of credit, or insurance as required by the city or contractor. □ See enclosed sample solicitation □ see enclosed document. □ Remarks:

(9) Making efforts to assist interested WMBE/SLBEs in obtaining necessary equipment, supplies, materials, or related assistance or services, including participation in a City-sponsored mentor-protégé program. □ See enclosed sample solicitation. □ See enclosed document. □ Remarks:

(10) Effectively using the services of the City and other organizations that provide assistance in the recruitment and placement of WMBE/SLBEs. □ See enclosed document. □ The following services were used:

Other Supporting Good Faith Efforts: □ See enclosed document. □ Remarks:

Compliance Plan: Guidance For Meeting Good Faith Efforts

1. All firms on the WMBE/SLBE Goal Setting List must be solicited and documentation provided for email, fax, letters, phone calls, and other communication with the listed firms. The DMI Solicited and DMI-Utilized forms must be completed for all firms solicited or utilized. Other opportunities for subcontracting may be explored by consulting the City of Tampa and/or Hillsborough County certification listings of WMBEs/SLBEs.

2. Solicitation of WMBE/SLBEs, via written or electronic notification, should provide specific information on the services needed, where plans can be reviewed and assistance offered in obtaining these, if required. Solicitations should be typically be sent a week or more before the bid date. Sample copies of the bidder's solicitations should be provided.

3. With any quotes received, a follow-up should be made whenever needed to confirm scope of work. For any WMBE/SLBE low quotes rejected, an explanation should be provided detailing negotiation efforts.

4. If a low bid WMBE/SLBE is rejected or deemed unqualified the contractor must provide an explanation and supporting documentation for this decision.

5. Prime should break down portions of work into economical feasible opportunities for subcontracting. The WMBE/SLBE directory can be useful in identifying additional subcontracting opportunities and firms not listed in the "WMBE/SLBE Goal Setting Firms List."

6. Contractor should not preclude WMBE/SLBEs from bidding on any part of work, even if the Contractor can self-perform the work.

7. Contractor should avoid relying solely on subcontracting out work where availability is not sufficient to attain pre-determined goal.

8. In its solicitations, the Bidder should offer assistance to WMBE/SLBEs in obtaining bonding, insurance, etc, if required of subcontractors by the City or Prime Contractor.

9. In its solicitation, the Bidder should offer assistance in obtaining equipment for a specific job to WMBE/SLBEs, if needed.

10. Contractor should use the services offered by such agencies as the Minority Business Development Office of the City of Tampa, Hillsborough County and the NAACP Empowerment Center for the recruitment and placement of WMBE/SLBEs.

City of Tampa –DMI -Schedule of All Sub-(Contractors/Consultants/Suppliers) Solicited

(FORM MBD-10)

Contract No.:_____ Contract Name:_____

Contractor Name:_____ Address:_____

Federal ID:_____Phone:_____ Fax:_____ Email:_____

[] No Firms were contacted/solicited for this contract.

[] No Firms were contacted because:_____

[] See attached documents with supplemental information.

NIGP Code General Categories: Buildings = 909, General = 912, Heavy = 913, Trades = 914, Architects = 906, Engineers & Surveyors = 925, Supplier = 912-77

This DMI Schedule Must Be Submitted with the Bid or Proposal (Do Not Modify This Form)

S = SLBE W=WMBE Federal ID	Company Name Address Phone & Fax	Type of Ownership (F=Female M=Male) BF BM = African Am. HF HM = Hispanic Am. AF AM = Asian Am. NF NM = Native Am. CF CM = Caucasian	Trade or Services NIGP Code (listed above)	Contact Method L=Letter F=Fax E=Email P=Phone	Quote or Resp. Rec'd Y/N

It is hereby certified that the information provided is an accurate and true account of contacts and solicitations for sub – contracting opportunitieson this contract. ***This form must be completed and submitted with the bid or proposal***.Modifying or failing to sign DMI forms may result in Non-Compliance and/or deemed non-responsive.

Signed:_____ Name/Title:_____ Date:_____

Note: Detailed Instructions for completing this form are on the next page

Instructions for completing The Sub-(Contractors/Consultants/ Suppliers) Solicited Form (Form MBD-10)

This form must be submitted with all bids or proposals. All subcontractors (regardless of ownership or size) solicited and subcontractors from whom unsolicited quotations were received must be included on this form. The instructions that follow correspond to the headings on the form required to be completed.Note: Ability or desire to self-perform all work shall not exempt the prime from Good Faith Efforts when Goal has been established.

- **Contract No.** This is the number assigned by the City of Tampa for the bid or proposal.
- **Contract Name.** This is the name of the contract assigned by the City of Tampa for the bid or proposal.
- **Contractor Name.** The name of your business.
- **Address.** The physical address of your business.
- **Federal ID.**FIN. A number assigned to your business for tax reporting purposes.
- **Phone.** Telephone number to contact business.
- **Fax.** Fax number for business.
- **Email.** Provide email address for electronic correspondence.
- **No Firms were contacted/solicited for this contract.** Checking the box indicates that a pre-determined Subcontract Goal was not set by the City resulting in your business not using subcontractors and will self-perform all work. If during the performance of the contract you employ subcontractors, the City must pre-approve subcontractors. Use of the "Sub-(Contractors/Consultants/Suppliers) Payments" form must be submitted with your invoices. Note: Certified SLBE or WMBE firms bidding as Primes are not exempt from outreach and solicitation of subcontractors.
- **No Firms were contacted because.** Provide brief explanation why no firms were contacted/solicited.
- **See attached documents.**Check box, if after you have completed the DMI Form in its entirety, you are providing any additional documentation relating to the form.All DMI data not submitted on the MBD Form-10 must be in the same format and have all requested data from MBD Form-10 included.

The following instructions are for information of any and all subcontractors solicited.

- **"S" = SLBE, "W" = WMBE.** Enter "**S**" for firms Certified by the City as Small Local Business Enterprises and/or "**W**" for firms Certified by the City as Women/Minority Business Enterprise.
- **Federal ID.**FIN. A number assigned to a business for tax reporting purposes. This information is critical in proper identification of the subcontractor.
- **Company Name, Address, Phone & Fax**. Provide company information for verification of payments.
- **Type of Ownership.** Indicate the Ethnicity and Gender of the owner of the subcontracting business.
- **Trade, Services, or Materials** Indicate the trade, service, or material provided by the subcontractor. NIGP codes are listed at top section of document.
- **Contact Method L=letter, F=fax, E=Email, P=Phone.** Indicate with letter the method of soliciting for bid.
- **Quote or Resp. (response) Rec'd (received) Y/N**. Indicate "Y" Yes if you received a quotation or if you received a response to your solicitation. Indicate "N" No if you received no response to your solicitation from the subcontractor.

If any additional information is required or you have any questions, you may call the Minority Business Development Office at (813) 274-5522.

City of Tampa –DMI Schedule of Sub-(Contractors/Consultants/Suppliers) to be Utilized

(FORM MBD-20)

Contract No.:_____ Contract Name:_____

Contractor Name:_____ Address:_____

Federal ID:_____Phone:_____ Fax:_____ Email:_____

[ ] See attached documents.

[ ] No Subcontracting (of any kind) will be performed on this contract.

NIGP Code General Categories: Buildings = 909, General = 912, Heavy = 913, Trades = 914, Architects = 906, Engineers & Surveyors = 925, Supplier = 912-77

This DMI Schedule Must Be Submitted with the Bid or Proposal (Do Not Modify This Form)

Enter "S" for firms Certified as Small Local Business Enterprises, "W" for firms Certified as Women/Minority Business Enterprise

S = SLBE W=WMBE Federal ID	Company Name Address Phone & Fax	Type of Ownership (F=Female M=Male) BF BM = African Am. HF HM = Hispanic Am. AF AM = Asian Am. NF NM = Native Am. CF CM = Caucasian	Trade, Services, or Materials NIGP Code Listed above	Amount of Quote. Letter of Intent if available.	Percent of Scope/Contract %

Total Subcontract/Supplier Utilization $_____

Total SLBE Utilization $ _____

Total WMBE Utilization $ _____

Percent SLBE Utilization of Total Bid/Proposal Amt. _____% Percent WMBE Utilization of Total Bid/Proposal Amt. _____%

It is hereby certified that the following information is a true and accurate account of utilization for sub-contracting opportunities on this contract. ***This form must be completed and submitted with the bid or proposal.*** Modifying or failing to sign DMI forms may result in Non-Complianceand/or deemed non-responsive.

Signed:_____ Name/Title:_____ Date:_____

Note: Detailed Instructions for completing this form are on the next page.

Instructions for completing The Sub-(Contractors/Consultants/ Suppliers) to be Utilized Form

(Form MBD-20)

This form must be submitted with all bids or proposals. All subcontractors projected to be utilized must be included on this form.

- **Contract No.** This is the number assigned by the City of Tampa for the bid or proposal.
- **Contract Name.** This is the name of the contract assigned by the City of Tampa for the bid or proposal.
- **Contractor Name.** The name of your business.
- **Address.** The physical address of your business.
- **Federal ID.**FIN. A number assigned to your business for tax reporting purposes.
- **Phone.** Telephone number to contact business.
- **Fax.** Fax number for business.
- **Email.** Provide email address for electronic correspondence.
- **No Subcontracting (of any kind) will be performed on this contract.** Checking box indicates your business will not use subcontractors when no Subcontract Goal has been set by the City, but will self-perform all work. When subcontractors are utilized during the performance of the contract, the "Sub-(Contractors/Consultants/Suppliers) Payments" form must be submitted with your invoices. Note: Certified SLBE or WMBE firms bidding as Primes are not exempt from outreach and solicitation of subcontractors.
- **See attached documents.** Check if you have provided any additional documentation relating to the utilization of subcontractors.
-

The following instructions are for information of Any and All subcontractors to be utilized.

- **Federal ID.**FIN. A number assigned to a business for tax reporting purposes. This information is critical in proper identification of the subcontractor.
- **"S" = SLBE, "W" = WMBE.** Enter "**S**" for firms Certified by the City as Small Local Business Enterprises and/or "**W**" for firms Certified by the City as Women/Minority Business Enterprise.
- **Company Name, Address, Phone & Fax**. Provide company information for verification of payments.
- **Type of Ownership.** Indicate the Ethnicity and Gender of the owner of the subcontracting business.
- **Trade, Services, or Materials (NIGP code if Known)** Indicate the trade, service, or material provided by the subcontractor. NIGP codes are available at http:/www.tampagov.net/mbd.
- **Amount of Quote, Letters of Intent** (required for both SLBEs and WMBEs)
- **Percent of Work/Contract.** Indicate the percent of the total contract price the subcontract(s) represent.
- **Total Subcontract/Supplier Utilization.** – Provide total dollar amount of all subcontractors/suppliers projected to be used for the contract. (Dollar amounts may not apply to CCNA proposals.)
- **Total SLBE Utilization.** Provide total dollar amount for all projected SLBE subcontractors/Suppliers used for this contract. (Dollar amounts may not apply to CCNA proposals.)
- **Total WMBE Utilization.** Provide total dollar amount for all projected WMBE subcontractors/Suppliers used for this contract. (Dollar amounts may not apply to CCNA proposals.)
- **Percent SLBE Utilization.** Total amount allocated to SLBEs divided by the total bid amount. (Dollar amounts may not apply to CCNA proposals.)
- **Percent WMBE Utilization.** Total amount allocated to WMBEs divided by the total bid/proposal amount. (Dollar amounts may not apply to CCNA proposals.)

If any additional information is required or you have any questions, you may call the Minority Business Development Office at (813) 274-5522.

TAMPA BID BOND
Contract 13-C-00018; Ditch Stabilization: Bayway Canal, Jones Avenue and MetWest

KNOW ALL MEN BY THESE PRESENTS, that we, _____

_____

(hereinafter called the Principal) and _____

(hereinafter called the Surety) a Corporation chartered and existing under the laws of the State of _____, with its principal offices in the City of _____, and authorized to do business in the State of Florida, are held and firmly bound unto the City of Tampa, a Municipal Corporation of Hillsborough County, Florida, in the full and just sum of 5% of the amount of the (Bid) (Proposal) good and lawful money of the United States of America, to be paid upon demand of the City of Tampa, Florida, to which payment will and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally and firmly these presents.

WHEREAS, the Principal is about to submit, or has submitted to the City of Tampa, Florida, a Proposal for the construction of certain facilities for the City designated Contract 13-C-00018, Ditch Stabilization: Bayway Canal, Jones Avenue and MetWest.

WHEREAS, the Principal desires to file this Bond in accordance with law, in lieu of a certified Bidder's check otherwise required to accompany this Proposal.

NOW, THEREFORE: The conditions of this obligation are such that if the Proposal be accepted, the Principal shall, within twenty (20) days after the date of receipt of written Notice of Award, execute a contract in accordance with the Proposal and upon the terms, conditions and price set forth therein, in the form and manner required by the City of Tampa, Florida and execute a sufficient and satisfactory Performance Bond and Payment Bond payable to the City of Tampa, Florida in an amount of one hundred percent (100%) of the total contract price, in form and with security satisfactory to said City, then this Bid Bond obligation is to be void; otherwise to be and remain in full force and virtue in law, and the Surety shall, upon failure of the Principal to comply with any or all of the foregoing requirements within the time specified above, immediately pay to the aforesaid City, upon demand, the amount thereof, in good and lawful money of the United States of America, not as a penalty, but as liquidated damages.

IN TESTIMONY THEREOF, the Principal and Surety have caused these presents to be duly signed and sealed this _____ day of _____,2013.

Principal _____

BY _____

TITLE _____

BY _____

TITLE _____

Countersigned:
(SEAL)

_____
Local Resident Producing Agent

_____
Local Resident Producing Agent's Address

_____
Name of Local Agency

_____
The addition of such phrases as "not to exceed" or like import shall render the (Bid) (Proposal)non-responsive.

AGREEMENT

For furnishing all labor, materials and equipment, together with all work incidental thereto, necessary and required for the performance of the work for the construction of Contract 13-C-00018 in accordance with your Proposal dated _____, amounting to a total of $_____ as completed in accordance with subsections I-2.09 and I-2.10 of the Instruction to Bidders.

THIS AGREEMENT, made and entered into in triplicate, this ____ day of _____, 2013, between the City of Tampa, Florida, hereinafter called the City, and hereinafter called the Contractor.

WITNESSETH that, in consideration of the mutual stipulations, agreements, and covenants herein contained, the parties hereto have agreed and hereby agree with each other, the Party of the First Part for itself, its successors and assigns, and the Party of the Second Part for itself, or himself, or themselves, and its successors and assigns, or his or their executors, administrators and assigns, as follows:

Contract 13-C-00018; Ditch Stabilization: Bayway Canal, Jones Avenue and MetWest, shall include, but not be limited to, grading of ditch banks, installation of stack block retaining wall and fabric formed concrete, extension of existing drainage pipes, and installation of sod to disturb areas in the ditch east of Lois Ave and south of the Met West Campus; establish side slopes, install GeoWeb stabilization system, rip-rap, sod, and landscaping where required in canal along north side of Bay Way Dr; and placement of fill material and grading of ditch bank, installation fabric formed concrete, installation of guardrails and curbing, and repaving of disturbed roadway at the Jones Avenue location with all associated work required for a complete project in accordance with the Contract Documents.

Contract Documents referred to in Article 1.01 of this Agreement also includes this volume, applicable standard drawings, the plans and any provisions referred to whether actually attached or not.

TAMPA AGREEMENT

SECTION 1
GENERAL

ARTICLE 1.01 THE CONTRACT

Except for titles, subtitles, headings, running headlines, and tables of contents (all of which are printed herein merely for convenience), the following, except for such portions thereof as may be specifically excluded, constitute the Contract:

The Notice to Bidders;
The Instructions to Bidders, including Special Instructions and General Instructions;
The Proposal;
The Bid Bond;
The Certification of Nonsegregated Facilities;
The Notice of Award;
The Agreement;
The Performance Bond;
The Notice To Proceed;
The Specifications, including the General Provisions, the Workmanship and Materials, the Specific Provisions or the Contract Items
The Plans;
All Supplementary Drawings Issued after award of the Contract;
All Addenda issued by the City prior to the receipt of proposals;
All provisions required by law to be inserted in this Contract, whether actually inserted or not.

ARTICLE 1.02 DEFINITIONS

The following words and terms, or pronouns used in their stead, shall, wherever they appear in this Contract, be construed as follows, unless different meaning is clear from the context:

(a)"City" shall mean the City of Tampa, Florida, represented by its Mayor and City Council, Party of the First Part, or such other City official as shall be duly empowered to act for the City on matters relating to this Contract.

(b)"Contractor" shall mean the Party of the Second Part hereto, whether corporation, firm or individual, or any combination thereof, and its, their, or his successors, personal representatives, executors, administrators, and assigns, and any person, firm or corporation who or which shall at any time be substituted in the place of the Party of the Second Part under this Contract.

(c)"Engineer" shall mean the Director of the Department or his duly authorized representative.

(d)"Consultant" shall mean the engineering or architectural firm or individual employed by the City to consult with and advise the City in the construction of the project.

(e)"Surety" shall mean any person, firm or corporation that has executed as Surety the Contractor's Performance Bond securing the performance of this Contact.

(f)"The Work" shall mean everything expressly or implied required to be furnished and done by the Contractor under the Contract, and shall include both Contract Work and Extra Work.

(g)"Contract Work" shall mean everything expressly or implied required to be furnished and done by the Contractor by any one or more of the Contract parts referred to in Article 1.01 hereof, except Extra Work, as hereinafter defined; it being understood that, in case of any inconsistency in or between any part or parts of this Contract, the Engineer shall determine which shall prevail.

(h)"Contract" or "Contract Documents" shall mean each of the various part of the Contract referred to in Article 1.01 hereof, both as a whole and severally.

(i)"Extra Work" shall mean work other than that required either expressly or implied by the contract in its present form.

(j)"Plans" shall mean only those drawings specifically referred to as such in these documents, or in any Addendum. Drawings issued after the execution of the Contract to explain further, or to illustrate, or to show changes in the work, will be known as "Supplementary Drawings" and shall be binding upon the Contractor with the same force as the Plans.

(k)"Specifications" shall mean all of the directions, requirements, and standards of performance applying to the work, as hereinafter detailed and designated as such, or which may be issued in an addendum.

(l)"Addendum or Addenda" shall mean the additional contract provisions issued in writing prior to the receipt of bids.

(m)"Notice" shall mean written notice. Notice shall be served upon the Contractor, either personally or by leaving the said notice at his residence or with any employee found on the work, or addressed to the Contractor at the residence or place of business given in his proposal and deposited in a postpaid wrapper in any post office box regularly maintained by the United States Post Office.

(n)"Project" shall mean the entire improvement package or related work. The "project" may consist of several different, but related, contracts.

(o)"Site" shall mean, and be limited to, the area upon or in which the Contractor's operations are carried on and such other appropriate areas as may be designed as such by the Engineer.

(p)"Subcontractor" shall mean any person, firm, or corporation, other than employees of the Contractor, who or which contracts with the Contractor to furnish, or actually furnishes labor, or labor and materials, or labor and equipment or labor, materials, and equipment at the site.

(q)Whenever in the Contract the words "directed", "required", "permitted", "ordered", "designated", "prescribed", and words of like import are used, they shall imply the direction, requirement, permission, order, designation, or prescription of the Engineer; and "approved", "acceptable", "satisfactory", "in the judgement of", and words of like import shall mean approved by, or acceptable to, or satisfactory to, or in the judgment of the Engineer.

(r)Whenever in the Contract the word "day" is used, it shall mean calendar day.

(s)"Final Acceptance" shall mean acceptance of the

work as evidenced by an official resolution of the City. Such acceptance shall be deemed to have taken place only if and when an approving resolution has been adopted by the City Council. The final acceptance shall be signed only after the City has assured itself by tests, inspection, or otherwise, that all of the provisions of the Contract have been carried out to its satisfaction.

(t)"Eastern Standard Time" shall be construed as the time being observed in the City on the day proposals are received or other documents issued or signed.

SECTION 2
POWERS OF THE CITY'S REPRESENTATIVES

ARTICLE 2.01 THE ENGINEER

It is covenanted and agreed that the Engineer, in addition to those matters elsewhere herein expressly made subject to his determination, direction, or approval, shall have the power, subject to such express provisions and limitations herein contained as are not in conflict herewith, and subject to review by the Mayor and City Council:

(a)To monitor the performance of the work.

(b)To determine the amount, kind, quality, sequence, and location of the work to be paid for hereunder and, when completed, to measure such work for payment.

(c)To determine all questions of an engineering character in relation to the work, to interpret the Plans, Specifications and Addenda.

(d)To determine how the work of this Contract shall be coordinated with the work of other contractors engaged simultaneously on this project.

(e)To make minor changes in the work as he deems necessary, provided such changes do not result in a net increase in the cost to the City or to the Contractor of the work to be done under the Contract.

(f)To amplify the Plans, add explanatory information and furnish additional Specifications and Drawings consistent with the intent of the Contract Documents.

The power of the Engineer shall not be limited to the foregoing enumeration, for it is the intent of this Contract that all of the work shall be subject to his determinations and approval, except where the determination or approval of someone other than the Engineer is expressly called for herein and except as subject to review by the Mayor and City Council. All orders of the Engineer requiring the Contractor to perform work as Contract work shall be promptly obeyed by the Contractor.

The Engineer shall not, however, have the power to issue an extra work order, and the performance of such work on the order of the Engineer without previously obtaining written confirmation thereof from the Mayor in accordance with Article 7.02 hereof may constitute a waiver of any right to extra compensation therefor. The Contractor is warned that the Engineer has no power to change the terms and provisions of this Contract, except minor changes where such change results in no net increase in the Contract Price.

ARTICLE 2.02 DIRECTOR

The Director of the Department in addition to those matters expressly made subject to his determination, direction or approval in his capacity as "Engineer", shall also have the power:

(a)To review any and all questions in relation to this Contract and its performance, except as herein otherwise specifically provided, and his determination upon such review shall be final and conclusive upon the Contractor.

(b)With the approval of the Mayor and City Council to authorize modifications or changes in the Contract so as to require: (1) the performance of extra work, or (2) the omission of Contract work whenever he deems it in the interest of the City to do so, or both.

(c)To suspend the whole or any part of the work whenever, in his judgment, such suspension is required: (1) in the interest of the City generally, or (2) to coordinate the work of the various Contractors engaged on this project, or (3) to expedite the completion of the entire project, even though the completion of this particular Contract may be thereby delayed, without compensation to the Contractor for such suspension other than extending the time for the completion of the work, as much as it may have been, in the opinion of the City, delayed by such a suspension.

(d)If, before the final acceptance of all the work contemplated herein, it shall be deemed necessary to take over, use, occupy, or operate any part of the completed or partly completed work, the Engineer shall have the right to do so and the Contractor will not, in any way, interfere with or object to the use, occupation, or operation of such work by the City after receipt of notice in writing from the Engineer that such work or part thereof will be used by the City on and after the date specified in such notice. Such taking over, use, occupancy or operation of any part of the completed or partially completed work shall not constitute final acceptance or approval of any such part of the work.

ARTICLE 2.03 NO ESTOPPEL

The City shall not, nor shall any department, officer, agent, or employee thereof, be bound, precluded, or estopped by any determination, decision, acceptance, return, certificate, or payment made or given under or in connection with this Contract by any officer, agent or employee of the City at any time either before or after final completion and acceptance of the work and payment therefor: (a) from showing the true and correct classification, amount, quality, or character of the work done, or that any determination, decision, acceptance, return certificate or payment is untrue, incorrect or improperly made in any particular, or that the work or any part thereof does not in fact conform to the requirements of the Contract Documents, and (b) from demanding and recovering from the Contractor any overpayments made to him or such damages as it may sustain by reason his failure to comply with the requirements of the Contract of Documents, or both.

ARTICLE 2.04 NO WAIVER OF RIGHTS

Neither the inspection, nor any order, measurements or certificate of the City or its employees, officers, or agents, nor by any order of the City for payment of money, nor any money, nor payments for or acceptance of the whole or any part of the work by the City, nor any extension of time, nor any changes in the Contract, Specifications or Plans, nor any possession by the City or its employees shall operate as a

waiver of any provisions of this Contract, nor any power herein provided nor shall any waiver of any breach of this Contract be held as a waiver of any other subsequent breach.

Any remedy provided in this Contract shall be taken and construed as cumulative, namely, in addition to each and every other suit, action, or legal proceeding. The City shall be entitled as of right to an injunction against any breach of the provisions of this Contract.

SECTION 3
PERFORMANCE OF WORK

ARTICLE 3.01 CONTRACTOR'S RESPONSIBILITY
The Contractor shall do all the work and furnish, at his own cost and expense, all labor, materials, equipment, and other facilities, except as herein otherwise provided, as may be necessary and proper for performing and completing the work under this Contract. The Contractor shall be responsible for the entire work until completed and finally accepted by the City.

The work shall be performed in accordance with the true intent and meaning of the Contract Documents. Unless otherwise expressly provided, the work must be performed in accordance with the best modern practice, with materials as specified and workmanship of the highest quality, all as determined by and entirely to the satisfaction of the Engineer.

Unless otherwise expressly provided, the means and methods of construction shall be such as the Contractor may choose, subject, however, to the approval of the Engineer. Only adequate and safe procedure, methods, structures and equipment shall be used. The Engineer's approval or the Engineer's failure to exercise his right thereon shall not relieve the Contractor of obligations to accomplish the result intended by the Contract, nor shall such create a cause of action for damages.

ARTICLE 3.02 COMPLIANCE WITH LAWS
The Contractor must comply with all local, State and Federal laws, rules, ordinances and regulations applicable to this Contract and to the work done hereunder, and must obtain, at his own expense, all permits, licenses or other authorization necessary for the prosecution of the work.

No work shall be performed under this Contract on Sundays, legal holidays or after regular working hours without the express permission of the Engineer. Where such permission is granted, the Engineer may require that such work be performed without additional expense to the City.

ARTICLE 3.03 INSPECTION
During the progress of the work and up to the date of final acceptance, the Contractor shall, at all times, afford the representatives of the City, the Florida Department of Environmental Regulation, and if applicable, the Federal Environmental Protection Agency and the Federal Department of Labor every reasonable, safe and proper facility for inspecting the work done or being done at the site. The inspection of any work shall not relieve the Contractor of any of his obligations to perform proper and satisfactory work as herein specified. Finished or unfinished work found not to be in strict accordance with the Contract shall be replaced as directed by the Engineer, even though such work may have been previously approved and payment made therefor.

The City shall have the right to reject materials and workmanship which are defective or require their correction. Rejected work and materials must be promptly removed from the site, which must at all times be kept in a reasonably clean and neat condition.

Failure or neglect on the part of the City to condemn or reject bad or inferior work or materials shall not be construed to imply an acceptance of such work or materials, if it becomes evident at any time prior to the final acceptance of the work by the City. Neither shall it be construed as barring the City at any subsequent time from the recovery of damages of such a sum of money as may be needed to build anew all portions of the work in which inferior work or improper materials were used, wherever found.

Should it be considered necessary or advisable by the City at any time before final acceptance of the entire work to make examinations of work already completed, by removing or tearing out all or portions of such work, the Contractor shall, on request, promptly furnish all necessary facilities, labor, and material for that purpose. If such work is found to be defective in any material respect, due to the fault of the Contractor or his subcontractors, he shall defray all expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, the cost of examination and restoration of the work shall be considered an item of extra work to be paid for in accordance with the provisions of Article 7.02 hereof.

ARTICLE 3.04 PROTECTION
During performance and until final acceptance, the Contractor shall be under an absolute obligation to protect the finished and unfinished work against any damage, loss, or injury. The Contractor shall take proper precaution to protect the finished work from loss or damage, pending completion and the final acceptance of all the work included in the entire Contract, provided that such precaution shall not relieve the Contractor from any and all liability and responsibility for loss or damage to the work occurring before final acceptance by the City. Such loss or damage shall be at the risk of and borne by the Contractor, whether arising from acts or omissions of the Contractor or others. In the event of any such loss or damage, the Contractor shall forthwith repair, replace, and make good the work without extension of time therefor, except as may be otherwise provided herein.

The provisions of this Article shall not be deemed to create any new right of action in favor of third parties against the Contractor or the City.

ARTICLE 3.05 PRESERVATION OF PROPERTY

The Contractor shall preserve from damage all property along the line of the work, or which is in the vicinity of or is in anywise affected by the work, the removal or destruction of which is not called for by the Plans. This applies, but is not limited, to the public utilities, trees, lawn areas, building monuments, fences, pipe and underground structures, public streets (except natural wear and tear of streets resulting from legitimate use thereof by the Contractor), and wherever such property is damaged due to the activities of the Contractor, it shall be immediately restored to its original condition by the Contractor and at his own expense.

In case of failure on the part of the Contractor to restore such property, or make good such damage or injury, the City may, upon forty-eight (48) hour written notice, proceed to repair, rebuild, or otherwise restore such property as may be deemed necessary, and the cost thereof will be deducted from any monies due or which may become due the Contractor under this Contract. Nothing in this clause shall prevent the Contractor from receiving proper compensation for the removal, damage, or replacement of any public or private property not shown on the Plans, when this is made necessary by alteration of grade or alignment authorized by the Engineer, provided that such property has not been damaged through fault of the Contractor, his employees or agents.

ARTICLE 3.06 BOUNDARIES
The Contractor shall confine his equipment, apparatus, the storage of materials, supplies and apparatus of his workmen to the limits indicated on the plans, by law, ordinances, permits or direction of the Engineer.

ARTICLE 3.07 SAFETY AND HEALTH REGULATIONS
The Contractor shall comply with the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91- 596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL91-54).

ARTICLE 3.08 TAXES
All taxes of any kind and character payable on account of the work done and materials furnished under this Contract shall be paid by the Contractor and shall be deemed to have been included in his bid. The laws of the State of Florida provide that sales and use taxes are payable by the Contractor upon the tangible personal property incorporated in the work and such taxes shall be paid by the Contractor and shall be deemed to have been included in his bid.

ARTICLE 3.09 ENVIRONMENTAL CONSIDERATIONS
The Contractor, in the performance of the work under this Contract, shall comply with all Local, State and Federal laws, statutes, ordinances, rules and regulations applicable to protection of the environment; and, in the event he violates any of the provisions of same, he shall be answerable to the Local, State and Federal agencies designated by law to protect the environment. In the event the City receives, from any of the environmental agencies, a citation which is occasioned by an act or omission of the Contractor or his subcontractor or any officers, employees or agents of either, it is understood and agreed that the Contractor shall automatically become a party-respondent under said citation; and the City immediately shall notify the Contractor and provide him with a copy of said citation.

The Contractor shall comply with the requirements of the citation and correct the offending conditions(s) within the time stated in said citation and further shall be held fully responsible for all fines and/or penalties.

SECTION 4
TIME PROVISIONS

ARTICLE 4.01 TIME OF START AND COMPLETION
The Contractor must commence work within thirty (30) days subsequent to the date of the receipt of the "Notice to Proceed" by the City unless otherwise provided in the Specific Provisions and Special Instructions. Time being of the essence of this Contract, the Contractor shall thereafter prosecute the work diligently, using such means and methods of construction as well as secure its full completion in accordance with the requirements of the Contract Documents no later than the date specified therefor, or on the date to which the time for completion may be extended.

The Contractor must complete the work covered by this Contract in the number of consecutive calendar days set forth in the Instructions to Bidders, unless the date of completion is extended pursuant to the provisions of Article 4.05 hereof. The period for performance shall start from the date of signing of this Agreement by the City.

The actual date of completion will be established after a final inspection as provided in Article 4.07 hereof.

ARTICLE 4.02 PROGRESS SCHEDULE
To enable the work to be laid out and prosecuted in an orderly and expeditious manner, the Contractor shall submit to the Engineer a proposed progress schedule within fifteen (15) days after the award of this Contract.

The schedule shall state the Contract starting date, time for completion and date of completion and shall show the anticipated time of starting and completion of each of the various operations to be performed under this Contract, together with all necessary and appropriate information regarding sequence and correlation of work and an estimated time required for the delivery of all materials and equipment required for the work. The proposed schedule shall be revised as directed by the Engineer until finally approved by him, and, after such approval, shall be strictly adhered to by the Contractor. The approved progress schedule may be changed only with the written permission of the Engineer.

If the Contractor shall fail to adhere to the approved progress schedule or the schedule as revised, he shall promptly adopt such other or additional means and methods of construction as will make up for the time lost, and will assure completion in accordance with the contract time.

ARTICLE 4.03 APPROVAL REQUESTS
From time to time, as the work progresses and in the sequence indicated by the approved schedule, the Contractor must submit to the Engineer a specific request, in writing, for each item of information or approval required of him by the Contract. These requests must be submitted sufficiently in advance of the date upon which the information or approval is actually required by the Contractor to allow for the time the Engineer may take to act upon such submissions or resubmissions. The Contractor shall not have any right to an extension of time on account of delays due to his failure to submit his requests for the required information or the required approval in accordance with these requirements.

ARTICLE 4.04 COORDINATION WITH OTHER CONTRACTORS
During progress of the work, other Contractors may be engaged in performing other work on this project or on other projects on the site. In that event, the Contractor shall coordinate the work to be done hereunder with the work of such other Contractors in such manner as the Engineer may direct.

ARTICLE 4.05 EXTENSION OF TIME
If such an application is made, the Contractor shall be entitled to an extension of time for delay in completion of the work should the Contractor be obstructed or delayed in the commencement, prosecution or completion of any part of said work by any act or delay of the City, or by acts or omissions of other Contractors on this project, or by a riot, insurrection, war, pestilence, acts of public authorities, fire, lightning, hurricanes, earthquakes, tornadoes, floods, extremely abnormal and excessive inclement weather as indicated by the records of the local weather bureau for a five-year period preceding the date of the Contract, or by strikes, or other causes, which causes of delay mentioned in this Article, in the opinion of the City, are entirely beyond the expectation and control of the Contractor.

The Contractor shall, however, be entitled to an extension of time for such causes only for the number of days of delay which the City may determine to be due solely to such causes and only to the extent that such occurrences actually delay the completion of the project and then only if the Contractor shall have strictly complied with all of the requirements of Articles 4.01, 4.02, 4.03 and 4.04 hereof. It is hereby understood that the determination by the Engineer as to the order and sequence of the work shall not in itself constitute a basis for extension of time.

The determination made by the City on an application for an extension of time shall be binding and conclusive on the Contractor.

Delays caused by failure of the Contractor's materialmen, manufacturers, and dealers to furnish approved working drawings, materials, fixtures, equipment, appliances, or other fittings on time or failure of subcontractors to perform their work shall not constitute a basis of extension of time.

The Contractor agrees to make no claim for damages for delay in the performance of this Contract occasioned by any act or omission to act of the City or any of its representatives or because of any injunction which may be brought against the City or its representatives and agrees that any such claim shall be fully compensated for by an extension of time to complete performance of the work as provided herein.

ARTICLE 4.06 LIQUIDATED DAMAGES
It is mutually agreed between the parties that time is the essence of this Contract and that there will be on the part of the City considerable monetary damage in the event the Contractor should fail to complete the work within the time fixed for completion in the Contract or within the time to which such completion may have been extended.

The amount per day set forth in the Instructions to Bidders is hereby agreed upon as the liquidated damages for each and every calendar day that the time consumed in completing the work under this Contract exceeds the time allowed.

This amount shall, in no event, be considered as a penalty or otherwise than as the liquidated and adjusted damages to the City because of the delay and the Contractor and his Surety agree that the stated sum per day for each such day of delay shall be deducted and retained out of the monies which may become due hereunder and if not so deductible, the Contractor and his Surety shall be liable therefor.

ARTICLE 4.07 FINAL INSPECTION
When the work has been completed in accordance with the requirements of the Contract and final cleaning up performed, a date for final inspection of the work by the Engineer shall be set by the Contractor in a written request therefor, which date shall be not less than ten (10) days after the date of such request. The work will be deemed complete as of the date so set by the Contractor if, upon such inspection, the Engineer determines that no further work remains to be done at the site.

If such inspection reveals interms of work still to be performed, however, the Contractor shall promptly perform them and then request a reinspection. If, upon such inspection, the Engineer determines that the work is complete, the date of final completion shall be deemed to be the last day of such reinspection.

SECTION 5
SUBCONTRACTS AND ASSIGNMENTS

ARTICLE 5.01 LIMITATIONS AND CONSENT
The Contractor shall not assign, transfer, convey, sublet or otherwise dispose of this Contract or of his right, title, or interest therein, or his power to execute such Contract, or to assign any monies due or to become due thereunder to any other person, firm or corporation unless the previous written consent of the City shall first be obtained thereto and the giving of any such consent to a particular subcontract or assignment shall not dispense with the necessity of such consent to any further or other assignment.

Before making any subcontract, the Contractor must submit a

written statement to the Engineer, giving the name and address of the proposed contractor, the portion of the work and materials which he is to perform and furnish and any other information tending to prove that the proposed subcontractor has the necessary facilities, skill, integrity, past experience and financial resources to perform the work in accordance with the terms and conditions of this Contract.

If the City finds that the proposed subcontractor is qualified, the Contractor will be notified in writing. The City may revoke approval of any subcontractor when such subcontractor evidences an unwillingness or inability to perform his work in strict accordance with these Contract Documents. Notice of such revocation of approval will be given in writing to the Contractor.

The Contractor will promptly, upon request, file with the City a conformed copy of the subcontract. The Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the work to bind subcontractors to the Contractor by the terms of these Contract Documents, insofar as applicable to the work of subcontractors, and to give the Contractor the same power as regards terminating any subcontracts that the City may exercise over the Contractor under provisions of these Contract Documents.

The Contractor shall be required to perform with his own forces at least twenty-five (25) percent of the work, unless written consent to subcontract a greater percentage of the work is first obtained from the City.

ARTICLE 5.02 RESPONSIBILITY
The approval by the City of a subcontractor shall not relieve the Contractor of any of his responsibilities, duties, and liabilities hereunder. The Contractor shall be solely responsible to the City for the acts or defaults or omissions of his subcontractor and of such subcontractor's officers, agents, and employees, each of whom shall for all purposes be deemed to be the agent or employee of the Contractor. Nothing contained in the Contract Documents shall create any contractual relationship between any subcontractor and the City.

SECTION 6
SECURITY AND GUARANTY

ARTICLE 6.01 CONTRACT SECURITY
The Contractor shall execute and deliver to the City a Performance Bond on the form as provided herein, in an amount at least equal to one hundred (100) percent of the full Contract price, such Bond to be executed by a surety company acceptable to the City. The surety on such Performance Bond shall be a surety company duly authorized to do business in the State of Florida, and the Bond shall be issued or countersigned by a local resident producing agent of such surety company who is a resident of the State of Florida, regularly commissioned and licensed in said State, and satisfactory evidence of the authority of the person or persons executing such Bond shall be submitted with the Bond. The Performance Bond shall serve as security for the faithful performance of this Contract, including maintenance and guaranty provisions, and for the payment of all persons performing labor and furnishing materials in connection with the Contract. The premiums on the Performance Bond shall be paid by the Contractor.

If, at any time, the City shall become dissatisfied with any surety or sureties then upon the Performance Bond, or if for any other reason such bond shall cease to be adequate security for the City, the Contractor shall, within five days after notice so to do, substitute an acceptable Bond in such form and sum and signed by such other sureties as may be satisfactory to the City. The premiums on such Bond shall be paid by the Contractor. No further partial payments shall be deemed due or shall be made until the new sureties have qualified.

ARTICLE 6.02 CONTRACTORS INSURANCE
Insurance required shall be as indicated on Special Instructions pages beginning with "INS-1"

ARTICLE 6.03 AGAINST CLAIMS AND LIENS
The City may withhold from the Contractor as much as any approved payments to him as may, in the opinion of the City, be necessary to secure (a) just claims of any persons supplying labor or materials to the Contractor or any of his subcontractors for the work then due and unpaid; (b) loss due to defective work not remedied, or (c) liability, damage, or loss due to injury to persons or damages to the work or property of other contractors, subcontractors, or others, caused by the act or neglect of the Contractor or of any of his subcontractors. The City shall have the right, as agent for the Contractor, to apply any such amounts so withheld in such manner as the City may deem proper to satisfy such claims or to secure such protection. Such application of such money shall be deemed payments for the account of the Contractor.

ARTICLE 6.04 MAINTENANCE AND GUARANTY
The Contractor hereby guarantees all the work furnished under this Contract against any defects in workmanship and materials for a period of one year following the date of final acceptance of the work by the City. Under this guarantee, the Contractor hereby agrees to make good, without delay, at his own expense, any failure of any part of the work due to faulty materials or manufacture, construction, or installation, or the failure of any equipment to perform satisfactorily all the work put upon it within the limits of the Contract Documents, and further, shall make good any damage to any part of the work caused by such failure. It is hereby agreed that the Performance Bond shall fully cover all guarantees contained in this Article.
It is also agreed that all warranties, expressed or implied, inure to the benefit of the City and are enforceable by the City.

SECTION 7
CHANGES

ARTICLE 7.01 MINOR CHANGES
The City reserves the right to make such additions, deductions, or changes to this Contract from time to time as

it deems necessary and in a manner not materially affecting the substance thereof or materially changing the price to be paid in order to carry out and complete more fully and perfectly the work herein agreed to be done and performed. This Contract shall in no way be invalidated by any such additions, deductions, or changes, and no claim by the Contractor shall be made for any loss of anticipated profits thereby.

Construction conditions may require that minor changes be made in the location and installation of the work and equipment to be furnished and other work to be performed hereunder, and the Contractor when ordered by the Engineer, shall make such adjustments and changes in said locations and work as may be necessary, without additional cost to the City, provided such adjustments and changes do not alter the character, quantity of cost of the work as a whole, and provided further that Plans and Specifications showing such adjustments and changes are furnished to the Contractor by the City within a reasonable time before any work involving such adjustment and changes is begun. The Engineer shall be the sole judge of what constitutes a minor change for which no additional compensation shall be allowed.

ARTICLE 7.02 EXTRA WORK

The City may at any time by a written order and without notice to the sureties require the performance of such extra work as it may find necessary or desirable. An order for extra work shall be valid only if issued in writing and signed by the Mayor and the work so ordered must be performed by the Contractor.

The amount of compensation to be paid to the Contractor for any extra work as so ordered shall be determined as follows:

(a)By such applicable unit prices, if any, as are set forth in the Proposal; or

(b)If no such unit prices are set forth then by a lump sum or other unit prices mutually agreed upon by the City and the Contractor; or

(c)If no such unit prices are set forth in the Proposal and if the parties cannot agree upon a lump sum or other unit prices then by the actual net cost in money to the Contractor of the extra work performed, which cost shall be determined as follows:

(1) For all labor and foreman in direct charge of the authorized operations, the Contractor shall receive the current local rate of wages to be agreed upon, in writing, before starting such work for each hour that said labor and foremen are actually engaged thereon, to which shall be added an amount equal to 25 percent of the sum thereof which shall be considered and accepted as full compensation for general supervision, FICA taxes, contributions under the Florida Unemployment Compensation Act, insurance, bond, subcontractor's profit and overhead, the furnishing of small tools and miscellaneous equipment used, such as picks, shovels, hand pumps, and similar items.

(2) For all materials used, the Contractor shall receive the actual cost of such materials delivered at the site or previously approved delivery point as established by original receipted bills. No percentage shall be added to this cost.

(3) For special equipment and machinery such as power-driven pumps, concrete mixers, trucks, and tractors, or other equipment, required for the economical performance of the authorized work, the Contractor shall receive payment based on the average local area rental price for each item of equipment and the actual time of its use on the work. No percentage shall be added to this sum.

(4) Records of extra work done under this procedure shall be reviewed at the end of each day by the Contractor or his representative and the Engineer. Duplicate copies of accepted records shall be made and signed by both Contractor or his representative and the Engineer, and one copy retained by each.

Request for payment for approved and duly authorized extra work shall be submitted in the same form as Contract work or in the case of work performed under paragraph (c) (1) above upon a certified statement supported by receipted bills. Such statement shall be submitted for the current Contract payment for the month in which the work was done.

ARTICLE 7.03 DISPUTED WORK

If the Contractor is of the opinion that any work required, necessitated, or ordered violates the terms and provisions of this Contract, he must promptly notify the Engineer, in writing, of his contentions with respect thereto and request a final determination thereof. If the Engineer determines that the work in question is Contract work and not extra work or that the order complained of is proper, he will direct the Contractor to proceed and the Contractor shall promptly comply. In order, however, to reserve his right to claim compensation for such work or damages resulting from such compliance, the Contractor must, within five (5) days after receiving notice of the Engineer's determination and direction, notify the City in writing that the work is being performed or that the determination and direction is being complied with under protest. Failure of the Contractor to notify shall be deemed as a waiver of claim for extra compensation or damages therefor.

Before final acceptance by the City, all matters of dispute must be adjusted to the mutual satisfaction of the parties thereto. Final determinations and decisions, in case any questions shall arise, shall constitute a condition precedent to the right of the Contractor to receive the money therefor until the matter in question has been adjusted.

ARTICLE 7.04 OMITTED WORK

The City may at any time by a written order and without notice to the sureties require the omission of such Contract work as it may find necessary or desirable.

An order for omission of work shall be valid only if signed by the Mayor and the work so ordered must be omitted by the Contractor. The amount by which the Contract price shall be reduced shall be determined as follows:

(a) By such applicable unit prices, if any, as are set forth in the Contract; or

(b) By the appropriate lump sum price set forth in the Contract; or

(c) By the fair and reasonable estimated cost to the City

of such omitted work as determined by the Engineer and approved by the City.

SECTION 8
CONTRACTOR'S EMPLOYEES

ARTICLE 8.01 CHARACTER AND COMPETENCY
The Contractor and his subcontractors shall employ upon all parts of the work herein contracted for only competent, skillful, and trustworthy workers. Should the Engineer at any time give notice, in writing, to the Contractor or his duly authorized representative on the work that any employee in his opinion is incompetent, unfaithful, disorderly, careless, unobservant of instructions, or in any way a detriment to the satisfactory progress of the work, such employee shall immediately be dismissed and not again allowed upon the site.

ARTICLE 8.02 SUPERINTENDENCE
The Contractor shall give his personal supervision to the faithful prosecution of the work and in case of his absence shall have a competent, experienced, and reliable supervisor or superintendent, acceptable to the Engineer on the site who shall follow without delay all instructions of the Engineer in the prosecution and completion of the work and every part thereof, in full authority to supply workers, material, and equipment immediately. He shall keep on hand at all times copies of the Contract Documents.

ARTICLE 8.03 EMPLOYMENT OPPORTUNITIES
The Contractor shall, in the performance of the work required to be done under this Contract, employ all workers without discrimination regarding race, creed, color, sex or national origin and must not maintain or provide facilities that are segregated on the basis of race, color, creed or national origin.

ARTICLE 8.04 RATES OF WAGES
On federally assisted projects, the rates of wages to be paid under this Contract shall not be less than the rates of wages set forth in Section 12 of this Agreement.

On other projects, no wage rate determination is included. Florida's Prevailing Wage Law (Section 215.19, Florida Statutes) was repealed effective April 25, 1979.

ARTICLE 8.05 PAYROLL REPORTS
The Contractor and each subcontractor shall, if requested to do so, furnish to the Engineer a duly certified copy of his payroll and also any other information required by the Engineer to satisfy him that the provisions of the law as to the hours of employment and rate of wages are being observed.

Payrolls shall be prepared in accordance with instructions furnished by the City and on approved forms. The Contractor shall not carry on his payroll any persons not employed by him. Subcontractor's employees shall be carried only on the payrolls of the employing subcontractor.

SECTION 9
CONTRACTOR'S DEFAULT

ARTICLE 9.01 CITY'S RIGHT AND NOTICE
It is mutually agreed that: (a) if the Contractor fails to begin work when required to do so, or (b) if at any time during the progress of the work it shall appear to the Engineer that the Contractor is not prosecuting the work with reasonable speed, or is delaying the work unreasonably and unnecessarily, or (c) if the force of workmen or quality or quantity of material furnished are not sufficient to insure completion of the work within the specified time and in accordance with the Specifications hereto attached, or (d) if the Contractor shall fail to make prompt payments for materials or labor or to subcontractors for work performed under the Contract, or (e) if legal proceedings have been instituted by others than the City in such manner as to interfere with the progress of the work and may subject the City to peril of litigation or outside claims of (f) if the Contractor shall be adjudged a bankrupt or make an assignment for the benefit of creditors, or (g) if in any proceeding instituted by or against the Contractor an order shall be made or entered granting an extension of time of payment, composition, adjustment, modification, settlement or satisfaction of his debts or liabilities, or (h) if a receiver or trustee shall be appointed for the Contractor or the Contractor's property, or (i) if the Contract or any part thereof shall be sublet without the consent of the City being first obtained in writing, or (j) if this Contract or any right, monies, or claim thereunder shall be assigned by the Contractor, otherwise than as herein specified, or (k) if the Contractor shall fail in any manner of substance to observe the provisions of this Contract, or (l) if any of the work, machinery, or equipment shall be defective, and shall not be replaced as herein provided, or (m) if the work to be done under this Contract shall be abandoned, then such fact or conditions shall be certified by the Engineer and thereupon the City without prejudice to any other rights or remedies of the City, shall have the right to declare the Contractor in default and so notify the Contractor by a written notice, setting forth the ground or grounds upon which such default is declared and the Contractor must discontinue the work, either as a portion of the work or the whole thereof, as directed.

ARTICLE 9.02 CONTRACTOR'S DUTY UPON DEFAULT
Upon receipt of notice that his Contract is in default, the Contractor shall immediately discontinue all further operations on the work or such part thereof, and shall immediately quit the site or such part thereof, leaving untouched all plant, materials, equipment, tools, and supplies.

ARTICLE 9.03 COMPLETION OF DEFAULTED WORK
The City, after declaring the Contractor in default, may then have the work completed or the defective equipment or machinery replaced or anything else done to complete the work in strict accordance with the Contract Documents by such means and in such manner, by Contract with or without public letting, or otherwise, as it may deem advisable,

utilizing for such purpose without additional cost to the City such of the Contractor's plant, materials, equipment, tools, and supplies remaining on the site, and also such subcontractors as it may deem advisable.

The City shall reimburse all parties, including itself, for the expense of such completion, including liquidated damages, if any, and the cost of reletting. The City shall deduct this expense from monies due or to become due to the Contractor under this Contract, or any part thereof, and in case such expense is more than the sum remaining unpaid of the original contract price, the Contractor and his sureties shall pay the amount of such deficiency to the City.

ARTICLE 9.04 PARTIAL DEFAULT
In case the City shall declare the Contractor in default as to a part of the work only, the Contractor shall discontinue such part, shall continue performing the remainder of the work in strict conformity with the terms of the Contract, and shall in no way hinder or interfere with any other contractor or person whom the City may engage to complete the work as to which the Contractor was declared in default.

SECTION 10
PAYMENTS

ARTICLE 10.01 PRICES
For the Contractor's complete performance of the work, the City will pay and the Contractor agrees to accept, subject to the terms and conditions hereof, the lump sum prices or unit prices in the Contractor's Proposal and the award made therein, plus the amount required to be paid for any extra work ordered under Article 7.02 hereof, less credit for any work omitted pursuant to Article 7.04 hereof. Under unit price items, the number of units actually required to complete the work under the Contract may be more than stated in the Proposal. The Contractor agrees that no claim will be made for any damages or for loss of profits because of a difference between the quantities of the various classes of work assumed and stated in the Proposal Form as a basis for comparing Proposals and the quantities of work actually performed.

The sum as awarded for any lump sum Contract or lump sum Contract Item shall represent payment in full for all of the various classes of work, including materials, equipment, and labor necessary or required to complete, in conformity with the Contract Document, the entire work shown, indicated or specified under the lump sum Contract or lump sum Contract Item.

The amount as awarded as a unit price for any unit price Contact Item shall represent payment in full for all the materials, equipment, and labor necessary to complete, in conformity with the Contract Documents, each unit of work shown, specified, or required under the said unit price Contract Item.

No payment other than the amount as awarded will be made for any class of work included in a lump sum Contract Item or a unit price Contract Item, unless specific provision is made therefor in the Contract Documents.

ARTICLE 10.02 SUBMISSION OF BID BREAKDOWN
Within fifteen (15) days after the execution of this Contract, the Contractor must submit to the Engineer in duplicate an acceptable breakdown of the lump sums and unit prices bid for items of the Contract, showing the various operations to be performed under the Contract, as described in the progress schedule required under Article 4.02 hereof, and the value of each of such operations, the total of such items to equal the total price bid. The Contractor shall also submit such other information relating to the bid prices as may be required and shall revise the bid breakdown as directed. Thereafter, the breakdown may be used for checking the Contractor's applications for partial payments hereunder but shall not be binding upon the City or the Engineer for any purpose whatsoever.

ARTICLE 10.03 REPORTS, RECORDS AND DATA
The Contractor shall furnish to the Engineer such schedules of quantities and costs, progress schedules, reports, invoices, delivery tickets, estimates, records, and other data as the Engineer may request concerning work performed or to be performed and the materials furnished under the Contract.

ARTICLE 10.04 PAYMENTS BY CONTRACTOR
The Contractor shall pay (a) for all transportation and utility services not later than the 20th day of the calendar month following that in which such services are rendered, (b) for all materials, tools, and equipment delivered at the site of the project, and the balance of the cost thereof not later than the 30th day following the completion of that part of the work in or on which such materials, tools, and equipment are incorporated or used, and (c) to each of his subcontractors, not later than the 5th day following each payment to the Contractor, the respective amounts allowed the Contractor on account of the work performed by his subcontractors, to the extent of each subcontractor's interest therein; and proof of such payments or releases therefor shall be submitted to the Engineer upon request.

ARTICLE 10.05 PARTIAL PAYMENTS
On or about the first of each month, the Contractor shall make and certify an estimate, on forms prescribed by the City, of the amount and fair value of the work done, and may apply for partial payment therefor. The Contractor shall revise the estimate as the Engineer may direct. When satisfactory progress has been made, and shows that the value of the work completed since the last payment exceeds one percent (1%) of the total Contract price in amount, the Engineer will issue a certificate that such work has been completed and the value thereof. The City will then issue a voucher to the Contractor in accordance with the following schedule:

FOR CONTRACT AMOUNTS UNDER $250,000

(A)In the amount of ninety percent (90%) of the value of the work completed as certified until construction is one hundred percent (100%) complete (operational or beneficial occupancy), the withheld amount may be reduced below ten percent (10%), at the Engineer's option, to only that amount necessary to assure completion.

FOR CONTRACT AMOUNTS OVER $250,000

(A)In the amount of ninety percent (90%) of the value of the work completed as certified until construction is fifty percent (50%) complete.

(B)When the dollar value, as determined by the Engineer, of satisfactorily completed work in place is greater than fifty percent (50%) of the original contract price, vouchers for partial payment will be issued by the City to the Contractor in the amount of one hundred percent (100%) of the value of the work, above 50%, completed as certified for that payment period.

(C)If the Contractor has performed satisfactorily and the work is substantially complete (operational or beneficial occupancy) the withheld amount may be reduced, at the Engineer's option, to only that amount necessary to assure completion.

In addition to the Conditions set forth in (A), (B), and (C) above, payments will always be less any sums that may be retained or deducted by the City under the terms of any of the contract documents and less any sums that may be retained to cover monetary guarantees for equipment, materials or progress performance.

Payment on estimates made on or about the first of the month may be expected on or about the 20th of the month.

Unless specified otherwise in the Contract Items, the delivered cost of equipment and nonperishable materials suitably stored at the site of the work and tested for adequacy may be included in the Contractor's application for partial payment provided, however, that the Contractor shall furnish evidence satisfactory to the City that the Contractor is the unconditional owner and in possession of such materials or equipment. The amount to be paid will be 90 percent of the invoice cost to the Contractor which cost shall be supported by receipted bills within 30 days of the date of payment by the City to the Contractor. Such payment shall not relieve the Contractor from full responsibility for completion of the work and for protection of such materials and equipment until incorporated in the work in a permanent manner as required by the Contract Documents.

Before any payment will be made under this Contract, the Contractor and every subcontractor, if required, shall deliver to the Engineer a written, verified statement, in satisfactory form, showing in detail all amounts then due and unpaid by such Contractor or subcontractor to all laborers, workmen, and mechanics, employed by him under the Contract for the performance of the work at the site thereof, for daily or weekly wages, or to other persons for materials, equipment, or supplies delivered at the site of the work during the period covered by the payment under consideration.

ARTICLE 10.06 FINAL PAYMENT

Under determination of satisfactory completion of the work under this Contract as provided in Article 4.07 hereof, the Engineer will prepare the final estimate showing the value of the completed work. This estimate will be prepared within 30 days after the date of completion or as soon thereafter as the necessary measurements and computations can be made. All prior certificates and estimates, being approximate only, are subject to correction in the final estimate and payment.

When the final estimate has been prepared and certified by Engineer, he will submit to the Mayor and City Council the final certificate stating that the work has been completed and the amount based on the final estimate remaining due to the Contractor. The City will then accept the work as fully completed and will, not later than 30 days after the final acceptance, as defined in Article 1.02, of the work done under this Contract, pay the Contractor the entire amount so found due thereunder after deduction of all previous payments and all percentages and amounts to be kept and retained under provisions of this Contract; provided, however, and it is understood and agreed that, as a precedent to receiving final payment, the Contractor shall submit to the City a sworn affidavit that all bills for labor, service, materials, and subcontractors have been paid and that there are no suits pending in connection with this work. The City, at its option, may permit the Contractor to execute a separate surety bond in a form satisfactory to the City. The surety bond shall be in the full amount of the suit or suits.

Neither the final payment nor any part of the retained percentage shall be paid until the Contractor, if required, shall furnish the City with a complete release from any should remain unsatisfied after all payments are made, the Contractor shall refund to the City all monies which the City may be compelled to pay in discharging such claim, including incidental costs and attorney's fees.

ARTICLE 10.07 ACCEPTANCE OF FINAL PAYMENT

The acceptance by the Contractor, or by anyone claiming by or through him, of the final payment shall operate as and shall be a release to the City and every officer and agent thereof from any and all claims and liability to the Contractor for anything done or furnished in connection with the work or project and for any act or neglect of the Contractor or of any others relating to or affecting the work. No payment, however, final or otherwise, shall operate to release the Contractor or his sureties from any obligations under this Contract or the Performance Bond.

SECTION 11
MISCELLANEOUS PROVISIONS

ARTICLE 11.01 CONTRACTOR'S WARRANTIES

In consideration of, and to induce the award of this contract to him, the Contractor represents and warrants:

(a)That he is not in arrears to the City upon debt or contract, and he is not a defaulter, as surety, contractor, or otherwise.

(b)That he is financially solvent and sufficiently experienced and competent to perform the work.

(c)That the work can be performed as called for by the Contract Documents.

(d)That the facts stated in his proposal and the information given by him are true and correct in all respects.

(e)That he is fully informed regarding all the conditions affecting the work to be done and labor and materials to be

furnished for the completion of this Contract, and that his information was secured by personal investigation and research.

ARTICLE 11.02 PATENTED DEVICES, MATERIAL AND PROCESSES

It is mutually understood and agreed that Contract prices include all royalties and costs arising from patents, trademarks, and copyrights in any way involved in the work. Whenever the Contractor is required or desires to use any design, device, material, or process covered by letters of patent or copyright, the Contractor shall indemnify and save harmless the City, its officers, agents and employees from any and all claims for infringement by reason of the use of any such patented design, device, tool, material, equipment, or process, to be performed under the Contract, and shall indemnify the said City, its officers, agents, and employees for any costs, expenses, and damages which may be incurred by reason of such infringement at any time during the prosecution or after completion of the work.

ARTICLE 11.03 SUITS AT LAW

In case any action at law or suit in equity may or shall be brought against the City or any of its officers, agents, or employees for or on account of the failure, omission, or neglect of the Contractor or his subcontractors, employees, or agents, to do or perform any of the covenants, acts, matters, or things by this Contract undertaken to be done or performed by the Contractor of his subcontractors, employees, or agents, or from any injuries done to property or persons and caused by the negligence or alleged negligence of the Contractor of his subcontractors, employees, or agents, or in any other manner arising out of the performance of this Contract, then the Contractor shall immediately assume and take charge of the defense of such actions or suits in like manner and to all intents and purposes as if said actions or suits have been brought directly against the Contractor, and the Contractor shall also indemnity and save harmless the City, its officers, agents, and employees from any and all loss, cost or damage whatever arising out of such actions or suits, in like manner and to all intents and purposes as if said actions or suits have been brought directly against the Contractor.

The Contractor shall and does hereby assume all liability for and agrees to indemnify the City or its Engineer against any or all loss, costs, damages, and liability for any or by reason of any lien, claims or demands, either for materials purchased or for work performed by laborers, mechanics, and others and from any damages, costs, actions, or causes of action and judgement arising from injuries sustained by mechanics, laborers, or other persons by reason of accidents or otherwise, whether caused by the carelessness or inefficiency or neglect of said Contractor, his subcontractors, agents, employees, workmen or otherwise.

ARTICLE 11.04 CLAIMS FOR DAMAGES

If the Contractor shall claim compensation for any damage sustained, other than for extra or disputed work covered by Article 7.02 and 7.03 hereof, by reason of any act or omission of the City, its agents, or any persons, he shall, within five days after sustaining such damage, make and deliver to the Engineer a written statement of the nature of the damage sustained and of the basis of the claim against the City. On or before the 15th of the month succeeding that in which any damage shall have been sustained, the Contractor shall make and deliver to the Engineer an itemized statement of the details and amounts of such damage, duly verified by the Contractor. Unless such statements shall be made delivered within the times aforesaid, it is stipulated that and all claims for such compensation shall be forfeited and invalidated, and the Contractor shall not be entitled to payment on account of such claims.

ARTICLE 11.05 NO CLAIMS AGAINST INDIVIDUALS

No claim whatsoever shall be made by the Contractor against any officer, agent, employee of the City for, or on account of, anything done or omitted to be done in connection with this Contract.

ARTICLE 11.06 LIABILITY UNAFFECTED

Nothing herein contained shall in any manner create any liability against the City on behalf of any claim for labor, services, or materials, or of subcontractors, and nothing herein contained shall affect the liability of the Contractor or his sureties to the City or to any workmen or materialsmen upon bond given in connection with this Contract.

ARTICLE 11.07 INDEMNIFICATION PROVISIONS

Whenever there appears in this Agreement, or in the other Contact Documents made a part hereof, an indemnification provision within the purview of Chapter 725.06, Laws of Florida, the monetary limitation on the extent of the indemnification under each such provision shall be One Million Dollars or a sum equal to the total Contract price, whichever shall be the greater.

ARTICLE 11.08 UNLAWFUL PROVISIONS DEEMED STRICKEN

If this contract contains any unlawful provisions not an essential part of the Contract and which shall not appear to have a controlling or material inducement to the making thereof, such provisions shall be deemed of no effect and shall, upon notice by either party, be deemed stricken from the Contract without affecting the binding force of the remainder.

ARTICLE 11.09 LEGAL PROVISIONS DEEMED INCLUDED

Each and every provision of any law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though it were included herein and if, through mistake or otherwise, any such provision is not inserted or is not correctly inserted, then upon application of either party the Contract shall forthwith be physically amended to make such insertion.

ARTICLE 11.10 DEATH OR INCOMPETENCY OF CONTRACTOR

In the event of death or legal incompetency of a Contractor who shall be an individual or surviving member of a contracting firm, such death or adjudication of incompetency

shall not terminate the Contract, but shall act as default hereunder to the effect provided in Article 9.01 hereof and the estate of the Contractor and his surety shall remain liable hereunder to the same extent as though the Contractor had lived. Notice of default, as provided in Article 9.01 hereof, shall not be required to be given in the event of such death or adjudication of incompetency.

ARTICLE 11.11 NUMBER AND GENDER OF WORDS

Whenever the context so admits or requires, all references herein in one number shall be deemed extended to and including the other number, whether singular or plural, and the use of any gender shall be applicable to all genders.

ARTICLE 11.12 ACCESS TO RECORDS

Representatives of Federal Agencies, if applicable, and the State of Florida shall have access to the work whenever it is in preparation of progress. On federally assisted projects the Federal Agency, the Comptroller General of the United States, or any authorized representative shall have access to any books, documents, papers, and records of the Contractor which are pertinent to the project for the purpose of making audit, examination, excerpts, and transcription thereof.

SECTION 12
LABOR STANDARDS

ARTICLE 12.01 LABOR STANDARDS

The Contractor shall comply with all of the regulations set forth in "Labor Standards Provisions for Federally Assisted Construction Contracts", which may be attached, and any applicable Florida Statutes.

ARTICLE 12.02 NOTICE TO LABOR UNIONS

If required, the Contractor shall provide Labor Unions and other organizations of workers, and shall post, in a conspicuous place available to employees or applicants for employment, a completed copy of the form entitled "Notice to Labor Unions or Other Organizations of Workers" attached to and made a part of this Agreement.

ARTICLE 12.03 SAFETY AND HEALTH REGULATIONS

The Contractor shall comply with the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91- 596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54). Nothing in these Acts shall be construed to supersede or in any manner affect any worker's compensation law or statutory rights, duties, or liabilities of employers and employees under any law with respect to injuries, diseases, or death of employees arising out of, or in the course of, employment.

ARTICLE 12.04 EEO AFFIRMATIVE ACTION REQUIREMENTS

The Contractor understands and agrees to be bound by the equal opportunity requirements of Federal regulations which shall be applicable throughout the performance of work under this Contract. The Contractor also agrees to similarly bind contractually each subcontractor. In policies, the Contractor agrees to engage in Affirmative Action directed at promoting and ensuring equal employment opportunity in the work force used under the Contract (and the Contractor agrees to require contractually the same effort of all subcontractors whose subcontractors exceed $100,000). The Contractor understands and agrees that "Affirmative Action" as used herein shall constitute a good faith effort to achieve and maintain minority employment in each trade in the on-site work force used on the Contract.

ARTICLE 12.05 PREVAILING RATES OF WAGES

Florida's prevailing wage law was repealed effective April 25, 1979.

For Federally assisted projects, appropriate prevailing wage rate determinations are indicated on pages beginning with WR-1.

* * * * * * *

IN WITNESS THEREOF, the parties have hereunto set their hands and seals, and such of them as are corporation have caused these present to be signed by their duly authorized officers.

CITY OF TAMPA, FLORIDA

_____
Bob Buckhorn, Mayor
(SEAL)

ATTEST:

_____
City Clerk

Approved as to Form:

The execution of this document was authorized by Resolution No. _____

_____
Justin R. Vaske, Assistant City Attorney

Contractor

By:_____
(SEAL)

Title:

ATTEST:

_____
Secretary

STATE OF)
) SS:
COUNTY OF)

For a Corporation:

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me this ___ of _____, 2013 by _____ of _____, a _____ corporation, on behalf of the corporation. He/she is ___ personally known or has ___ produced _____ as identification.

_____
Notary

My Commission Expires:

_____

For an Individual:

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me this ___ of _____, 2013 by _____ who is ___ personally known to me or has ___ produced _____ as identification.

_____
Notary

My Commission Expires:

_____

For a Firm:

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me this ___ of _____, 2013 by _____ who signed on behalf of the said firm. He/she is ___ personally known or has ___ produced _____ as identification.

_____
Notary

My Commission Expires:

_____

_____

PUBLIC CONSTRUCTION BOND

Bond No. (enter bond number)_____

Name of Contractor:_____

Principal Business Address of Contractor:_____

_____

Telephone Number of Contractor:_____

Name of Surety (if more than one list each):_____

_____

Principal Business Address of Surety:_____

_____

Telephone Number of Surety:_____

Owner is The City of Tampa, Florida

Principal Business Address of Owner: 306 E Jackson St, Tampa, FL 33602

Contract Administration Department (280A4N)

Telephone Number of Owner: 813/274-8456

Contract Number Assigned by City to contract which is the subject of this bond:_____

Legal Description or Address of Property Improved or Contract Number is:_____

_____

_____

_____

General Description of Work and Services:_____

_____

_____

_____

KNOW ALL MEN BY THESE PRESENTS That we, _____

_____
(Name of Contractor)

as Principal, hereinafter called CONTRACTOR, of the State of _____, and

_____(Name of Surety)
a corporation organized and existing under and by virtue of the laws of the State of _____, and regularly authorized to do business in the State of Florida, as SURETY, are held and firmly bound unto the City of Tampa, a municipal corporation organized and existing under the laws of the State of Florida, hereinafter called Owner, in the penal sum of _____Dollars and _____Cents ($_____), lawful money of the United States of America, for the payment whereof well and truly to be made, we bind ourselves, our heirs, executors, and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS BOND is that if Principal:

1. Performs the contract dated _____, _____, 20___, between Principal and Owner for construction of _____, the contract being made a part of this bond by reference, in the time and in the manner prescribed in the contract; and

2. Promptly makes payments to all claimants, as defined in Section 255.05(1) (Section 713.01), 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 Owner all losses, damages, expenses, costs, and attorney's fees, including appellate proceedings, that Owner sustains because of a default by Principal under the contract; and

4. Performs the guarantee of all work and materials furnished under the contract for the time specified in the contract, then this bond is void; otherwise it remains in full force.

5. Contractor and Surety acknowledge that the Work for which this bond has been issued may be one of several such contract documents for a group of projects. This bond does not secure covenants to pay for or to perform design services survey or program management services. The Owner/Obligee is expected to reasonably account for damages that are caused to Owner with respect to Principal's (Contractor's) default in performance of the scope of the Work incorporated by reference into the bond, and notwithstanding any contractual or common law remedy permitted to Owner as against Contractor, the obligation of Surety for any damages under this bond shall be determined by the cost of completion of the Work less the contract balance unpaid upon default of Contractor for the Work plus liquidated damages at the rate of $500.00 per day for delays by the Contractor and/or Surety in reaching substantial completion.

6. The notice requirements for claimants and conditions for entitlement to payment set forth in Section 255.05, Fla. Stat. and the limitations period to actions upon Section 255.05, Fla. Stat. bonds apply to claimants seeking payment from surety under this bond. 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, Florida Statutes.

7. The Surety, for value received, hereby stipulates and agrees that no changes, extensions of time, alterations or additions to the terms of the contract documents or other Work to be performed hereunder, or the specifications referred to therein shall in any way affect its obligations under this bond, and it does hereby waive notice of any such changes, extensions of time, alterations or additions to the terms of the Contract or to Work or to the specifications.

8. The above SURETY states that it has read all of the Contract Documents made by the CONTRACTOR with the CITY, hereto attached, and the terms and conditions of the contract and work, and is familiar therewith and in particular those portions of the Agreement concerning the guaranty of such CONTRACTOR for a period of one year following the date of the final acceptance of the completed work under the Contract by the CITY, all of which this BOND includes.

DATED ON _____, 20___

_____
(Name of Principal)

_____
(Principal Business Address)

By _____

Title _____

_____
Telephone Number of Principal

Countersignature:

_____
(Name of Local Agency)

_____
(Address of Resident Agent)

By _____

Title _____

_____
Telephone Number of Local Agency

_____
(Name of Surety)

_____
(Surety Address)

By _____
(As Attorney in Fact)*

_____
Telephone Number of Surety

Accepted by City of Tampa:

By _____
Bob Buckhorn, Mayor

Date: _____ 20____

Approved as to legal sufficiency:

By _____
Assistant City Attorney

Date: _____, 20____

*(As Attorney in Fact) attach Power of Attorney and Current Certificate with Original Signature

SPECIFICATIONS
GENERAL PROVISIONS

SECTION 1
SCOPE AND INTENT

G-1.01 DESCRIPTION
The work to be done consists of the furnishing of all labor, materials and equipment, and the performance of all work included in this Contract.

G-1.02 WORK INCLUDED
The Contractor shall furnish all labor, superintendence, materials, plant, power, light, heat, fuel, water, tools, appliances, equipment, supplies, and other means of construction necessary or proper for performing and completing the work. He shall obtain and pay for all required permits. He shall perform and complete the work in the manner best calculated to promote rapid construction consistent with safety of life and property and to the satisfaction of the Engineer, and in strict accordance with the Contract Documents. The Contractor shall clean up the work and maintain it during and after construction, until accepted, and shall do all work and pay all costs incidental thereto. He shall repair or restore all structures and property that may be damaged or disturbed during performance of the work.

The cost of incidental work described in these General Provisions, for which there are no specific Contract Items, shall be considered as part of the overhead cost of doing the work and shall be included in the prices for the various Contract Items. No additional payment will be made therefor.

The Contractor shall provide and maintain such modern plant, tools, and equipment as may be necessary, in the opinion of the Engineer, to perform in a satisfactory and acceptable manner all the work required by this Contract. Only equipment of established reputation and proven efficiency shall be used. The Contractor shall be solely responsible for the adequacy of his plant and equipment, prior approval of the Engineer notwithstanding.

G-1.03 PUBLIC UTILITY INSTALLATIONS AND STRUCTURES
Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, house service connections, vaults, manholes, and all other appurtenances and facilities pertaining thereto whether owned or controlled by the City, other governmental bodies or privately owned by individuals, firms, or corporations, and used to serve the public with transportation, traffic control, gas, electricity, telephone, sewerage, drainage, water or other public or private property which may be affected by the work.

The Contract Documents contain data relative to existing public utility installations and structures above and below the ground surface. These data are not guaranteed as to their completeness or accuracy and it is the responsibility of the Contractor to make his own investigations to inform himself fully of the character, condition and extent of all such installations and structures as may be encountered and as may affect the construction operations.

The Contractor shall protect all public utility installations and structures from damage during the work. Access across any buried public utility installation or structure shall be made only in such locations and by means approved by the Engineer. The Contractor shall so arrange his operations as to avoid any damage to these facilities. All required protective devices and construction shall be provided by the Contractor at his expense. All existing public utilities damaged by the Contractor which are shown on the Plans or have been located in the field by the utility shall be repaired by the Contractor, at his expense, as directed by the Engineer. No separate payment shall be made for such protection or repairs to public utility installations or structures.

Public utility installations or structures owned or controlled by the City or other governmental body which are shown on the Plans to be removed, relocated, replaced or rebuilt by the Contractor shall be considered as a part of the general cost of doing the work and shall be included in the prices bid for the various Contract Items. No separate payment shall be made therefor.

Where public utility installations or structures owned or controlled by the City or other governmental body are encountered during the course of the work, and are not indicated on the Plans or in the Specifications, and when, in the opinion of the Engineer, removal, relocation, replacement or rebuilding is necessary to complete the work under this Contract, such work shall be accomplished by the utility having jurisdiction or such work may be ordered, in writing by the Engineer, for the Contractor to accomplish. If such work is accomplished by the utility having jurisdiction it will be carried out expeditiously and the Contractor shall give full cooperation to permit the utility to complete the removal, relocation, replacement or rebuilding as required. If such work is accomplished by the Contractor, it will be paid for as extra work as provided for in Article 7.02 of the Agreement.

The Contractor shall, at all times in performance of the work, employ approved methods and exercise reasonable care and skill so as to avoid unnecessary delay, injury, damage or destruction of public utility installations and structures; and shall, at all times in the performance of the work, avoid unnecessary interference with, or interruption of, public utility services, and shall cooperate fully with the owners thereof to that end.

All City and other governmental utility departments and other owners of public utilities, which may be affected by the work, will be informed in writing by the Engineer within two weeks after the execution of the Contract or Contracts covering the work. Such notice will set out, in general, and direct attention to, the responsibilities of the City and other governmental

utility departments and other owners of public utilities for such installations and structures as may be affected by the work and will be accompanied by one set of Plans and Specifications covering the work under such Contract or Contracts.

In addition to the general notice given by the Engineer, the Contractor shall give written notice to all City and other governmental utility departments and other owners of public utilities of the location of his proposed construction operations, at least forty-eight (48) hours in advance of breaking ground in any area or on any unit of the work. This can be accomplished by making the appropriate contact with the "Underground Utility Notification Center for Excavators (Call Candy)".

The maintenance, repair, removal, relocation, or rebuilding of public utility installations and structures, when accomplished by the Contractor as herein provided, shall be done by methods approved by the Engineer.

SECTION 2
PLANS AND SPECIFICATIONS

G-2.01 PLANS
The Plans referred to in the Contract Documents bear the general project name and number as shown in the Notice To Bidders.

When obtaining data and information from the Plans, figures shall be used in preference to scaled dimensions, and large scale drawings in preference to small scale drawings.

G-2.02 COPIES FURNISHED TO CONTRACTOR
After the Contract has been executed, the Contractor will be furnished with five sets of paper prints, the same size as the original drawings, of each sheet of the Plans and five copies of the Specifications. Additional copies of the Plans and Specifications, when requested, may be furnished to the Contractor at cost of reproduction.

The Contractor shall furnish each of the subcontractors, manufacturers, and material suppliers such copies of the Contract Documents as may be required for his work.

G-2.03 SUPPLEMENTARY DRAWINGS
When, in the opinion of the Engineer, it becomes necessary to explain more fully the work to be done or to illustrate the work further or to show any changes which may be required, drawings known as Supplementary Drawings, with specifications pertaining thereto, will be prepared by the Engineer and five paper prints thereof will be given to the Contractor.

The Supplementary Drawings shall be binding upon the Contractor with the same force as the Plans. Where such Supplementary Drawings require either less or more than the estimated quantities of work, credit to the City or compensation therefor to the Contractor shall be subject to the terms of the Agreement.

G-2.04 CONTRACTOR TO CHECK PLANS AND DATA
The Contractor shall verify all dimensions, quantities, and details shown on the Plans, Supplementary Drawings, Schedules, Specifications, or other data received from the Engineer, and shall notify him of all errors, omissions, conflicts, and discrepancies found therein. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction or improper operation resulting therefrom nor from rectifying such conditions at his own expense. He will not be allowed to take advantage of any errors or omissions as full instructions will be furnished by the Engineer, should such errors or omissions be discovered. All schedules are given for the convenience of the Engineer and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility for the making of estimates of the size, kind, and quality of materials and equipment included in work to be done under the Contract.

G-2.05 SPECIFICATIONS
The specifications consist of four parts, the General Provisions, the Technical Specifications, the Special Provisions and the Contract Items. The General Provisions and Technical Specifications contain general requirements which govern the work. The Special Provisions and the Contract Items modify and supplement these by detailed requirements for the work and shall always govern, whenever there appears to be conflict.

G-2.06 INTENT
All work called for in the Specifications applicable to this Contract, but not shown on the Plans in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified in either the Plans or in the Specifications, but involved in carrying out their intent or in the complete and proper execution of the work, is required and shall be performed by the Contractor as though it were specifically delineated or described.

The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, and interpretation of these Specifications shall be made upon that basis.

SECTION 3
WORKING DRAWINGS

G-3.01 SCOPE
The Contractor shall promptly prepare and submit layout, detail and shop drawings to insure proper construction, assembly, and installation of the work using those materials and methods as hereafter specified under the Technical Specifications, Special Provisions and Contract Items.

These drawings shall accurately and distinctly present the following:

a. All working and erection dimensions.
b. Arrangements and sectional views.
c. Necessary details, including complete information for making connections between work under this Contract and work under other Contracts.
d. Kinds of materials and finishes.
e. Parts listed and description thereof.

Drawings for mechanical equipment shall present, where applicable, such data as dimensions, weight and performance characteristics. These data shall show conformance with the performance characteristics and other criteria incorporated in the Plans and Specifications.

Each drawing shall be dated and shall contain the name of the project, Division number and description, the technical specifications section number, names of equipment or materials and the location at which the equipment or materials are to be installed. Location shall mean both physical location and location relative to other connected or attached material. The Engineer will return unchecked any submittal which does not contain complete data on the work and full information on related matters.

Stock or standard drawings will not be accepted for review unless full identification and supplementary information is shown thereon in ink or typewritten form.

The Contractor shall review all working drawing submittals before transmitting them to the Engineer to determine that they comply with requirements of the Specifications. Drawings which are incomplete or are not in compliance with the Contract Documents shall not be submitted for processing by the Engineer. The Contractor shall place his stamp of approval on all working drawings submitted to the Engineer to indicate compliance with the above.

G-3.02 APPROVAL
If the working drawings show departures from the Contract requirements, the Contractor shall make specific mention thereof in his letter of submittal; otherwise approval of such submittals shall not constitute approval of the departure. Approval of the drawings shall constitute approval of the subject matter thereof only and not of any structure, material, equipment, or apparatus shown or indicated.

The approval of drawings will be general and shall not relieve the Contractor of responsibility for the accuracy of such drawings, nor for the proper fitting and construction of the work, nor for the furnishing of materials or work required by the Contract and not indicated on the drawings. No work called for by working drawings shall be done until such drawings have been approved by the Engineer.

The procedure in seeking approval of the working drawings shall be as follows:

1.The Contractor shall submit four complete sets of drawings and other descriptive data together with one copy of a letter of transmittal to the Engineer for approval. The letter of transmittal shall contain the name of the project, contract number, technical specifications section number, the name of the Contractor, a list of drawings with numbers and titles, and any other pertinent information.

2.Drawings or descriptive data will be stamped "Approved", "Approved Subject to Corrections Marked", or "Examined and Returned for Correction" and one copy with a letter of transmittal will be returned to the Contractor.

3.If a drawing or other data is stamped "Approved", the Contractor shall insert the date of approval on five additional copies of the document and transmit the five copies to the Engineer together with one copy of a letter of transmittal containing substantially the same information as described in Instruction 1. above.

4.If a drawing or other data is stamped "Approved Subject to Corrections Marked", the Contractor shall make the corrections indicated and proceed as in Instruction 3., above.

5.If a drawing or data is stamped "Examined and Returned for Correction", the Contractor shall make the necessary corrections and resubmit the documents as set forth in Instruction 1., above. The letter of transmittal shall indicate that this is a resubmittal.

The Contractor shall revise and resubmit the working drawings as required by the Engineer, until approval thereof is obtained.

SECTION 4
MATERIALS AND EQUIPMENT

G-4.01 GENERAL REQUIREMENTS
All materials, appliances, and types or methods of construction shall be in accordance with the Specifications and shall, in no event, be less than that necessary to conform to the requirements of any applicable laws, ordinances, and codes.

All materials and equipment shall be new, unused, and correctly designed. They shall be of standard first grade quality, produced by expert personnel, and intended for the use for which they are offered. Materials or equipment which, in the opinion of the Engineer, are inferior or of a lower grade than indicated, specified, or required will not be accepted.

The quality of Workmanship and Materials entering into the work under this Contract shall conform to the requirements of the pertinent sections, clauses, paragraphs, and sentences, both directly and indirectly applicable thereto, of that part of the Technical Specifications, whether or not direct reference to such occurs in the Contract Items.

Equipment and appurtenances shall be designed in conformity with ANSI, ASME, IEEE, NEMA and other

generally accepted standards and shall be of rugged construction and of sufficient strength to withstand all stresses which may occur during fabrication, testing, transportation, installation, and all conditions of operation. All bearings and moving parts shall be adequately protected against wear by bushings or other approved means and shall be fully lubricated by readily accessible devices. Details shall be designed for appearance as well as utility. Protruding members, joints, corners, gear covers, and the like, shall be finished in appearance. All exposed welds shall be ground smooth and the corners of structural shapes shall be mitered.

Equipment shall be of the approximate dimensions as indicated on the Plans or as specified, shall fit the spaces shown on the Plans with adequate clearances, and shall be capable of being handled through openings provided in the structure for this purpose. The equipment shall be of such design that piping and electrical connections, ductwork, and auxiliary equipment can be assembled and installed without causing major revisions to the location or arrangement of any of the facilities.

Machinery parts shall conform exactly to the dimensions shown on the working drawings. There shall be no more fitting or adjusting in setting up a machine than is necessary in assembling high grade apparatus of standard design. The equivalent parts of identical machines shall be made interchangeable. All grease lubricating fittings on equipment shall be of a uniform type. All machinery and equipment shall be safeguarded in accordance with the safety codes of the ANSI and applicable state and local codes.

G-4.02 MANUFACTURER

The names of proposed manufacturers, suppliers, material, and dealers who are to furnish materials, fixtures, equipment, appliances or other fittings shall be submitted to the Engineer for approval, as early as possible, to afford proper investigation and checking. Such approval must be obtained before shop drawings will be checked. No manufacturer will be approved for any materials to be furnished under this Contract unless he shall be of good reputation and have a plant of ample capacity. He shall, upon the request of the Engineer, be required to submit evidence that he has manufactured a similar product to the one specified and that it has been previously used for a like purpose for a sufficient length of time to demonstrate its satisfactory performance.

All transactions with the manufacturers or subcontractors shall be through the Contractor, unless the Contractor shall request, in writing to the Engineer, that the manufacturer or subcontractor deal directly with the Engineer. Any such transactions shall not in any way release the Contractor from his full responsibility under this Contract.

Any two or more pieces of material or equipment of the same kind, type or classification, and being used for identical types of service, shall be made by the same manufacturer.

G-4.03 REFERENCE TO STANDARDS

Whenever reference is made to the furnishing of materials or testing thereof to conform to the standards of any technical society, organization or body, it shall be construed to mean the latest standard, code, specification or tentative specification adopted and published at the date of advertisement for proposals, even though reference has been made to an earlier standard, and such standards are made a part hereof to the extent which is indicated or intended.

Reference to a technical society, organization or body may be made in the Specifications by abbreviations, in accordance with the following list:

AASHTO for American Association of State Highway and Transportation Officials (formerly AASHO)
ACI for American Concrete Institute
AGMA for American Gear Manufacturer's Association
AFBMA for Anti-Friction Bearing Manufacturer's Association
AISC for American Institute of Steel Construction
AISI for American Iron and Steel Institute
ANSI for American National Standards Institute
ASCE for American Society of Civil Engineers
ASTM for American Society for Testing and Materials
ASME for American Society of Mechanical Engineers
AWS for American Welding Society
AWWA for American Water Works Association
AWPA for American Wood Preservers Association
CEMA for Conveyor Equipment Manufacturers Association
CIPRA for Cast Iron Pipe Research Association
IEEE for Institute of Electrical and Electronic Engineers
IPCEA for Insulated Power Cable Engineers Association
NEC for National Electrical Code
NEMA for National Electrical Manufacturers Association
SAE for Society of Automotive Engineers
SHBI for Steel Heating Boiler Institute
Fed.Spec. for Federal Specifications
Navy Spec. for Navy Department Specifications
U.L.,Inc. for Underwriters' Laboratories, Inc.

When no reference is made to a code, standard or specification, the Standard Specifications of the ANSI, the ASME, the ASTM, the IEEE, or the NEMA shall govern.

G-4.04 SAMPLES

The Contractor shall, when required, submit to the Engineer for approval typical samples of materials and equipment. The samples shall be properly identified by tags and shall be submitted sufficiently in advance of the time when they are to be incorporated into the work, so that rejections thereof will not cause delay. A letter of transmittal, in duplicate, from the Contractor requesting approval must accompany all such samples.

G-4.05 EQUIVALENT QUALITY

Whenever, in the Contract Documents, an article, material, apparatus, equipment, or process is called for by trade name or by the name of a patentee, manufacturer, or dealer or by reference to catalogs of a manufacturer or dealer, it shall be understood as intending to mean and specify the article, material, apparatus, equipment or process designated, or any

equal thereto in quality, finish, design, efficiency, and durability and equally serviceable for the purposes for which it is intended.

Whenever material or equipment is submitted for approval as being equal to that specified, the decision as to whether or not such material or equipment is equal to that specified shall be made by the Engineer.

Upon rejection of any material or equipment submitted as the equivalent of that specifically named in the Contract, the Contractor shall immediately proceed to furnish the designated material or equipment.

Neither the approval by the Engineer of alternate material or equipment as being equivalent to that specified nor the furnishing of the material or equipment specified, shall in any way relieve the Contractor of responsibility for failure of the material or equipment, due to faulty design, material, or workmanship, to perform the functions required of them by the Specifications.

G-4.06 DELIVERY
The Contractor shall deliver materials in ample quantities to insure the most speedy and uninterrupted progress of the work so as to complete thw work within the allotted time. The Contractor shall also coordinate deliveries in order to avoid a delay in, or impediment of, the progress of the work of any related Contractor.

G-4.07 CARE AND PROTECTION
The Contractor shall be solely responsible for properly storing and protecting all materials, equipment, and work furnished under the Contract from the time such materials and equipment are delivered at the site of the work until final acceptance thereof. He shall, at all times, take necessary precautions to prevent injury or damage by water, freezing, or by inclemencies of the weather to such materials, equipment and work. All injury or damage to materials, equipment, or work resulting from any cause whatsoever shall be made good by the Contractor.

The Engineer shall, in all cases, determine the portion of the site to be used by the Contractor for storage, plant or for other purposes. If, however, it becomes necessary to remove and restack materials to avoid impeding the progress of any part of the work or interference with the work to be done by any other Contractor, the Contractor shall remove and restack such materials at his own expense.

G-4.08 TOOLS AND ACCESSORIES
The Contractor shall, unless otherwise stated in the Contract Documents, furnish with each type, kind or size of equipment, one complete set of suitably marked high grade special tools and appliances which may be needed to adjust, operate, maintain, or repair the equipment. Such tools and appliances shall be furnished in approved painted steel cases, properly labeled and equipped with good grade cylinder locks and duplicate keys.

Spare parts shall be furnished as specified.

Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, serial number, weight and principal rating data.

G-4.09 INSTALLATION OF EQUIPMENT
The Contractor shall have on hand sufficient proper equipment and machinery of ample capacity to facilitate the work and to handle all emergencies normally encountered in work of this character.

Equipment shall be erected in a neat and workmanlike manner on the foundations at the locations and elevations shown on the Plans, unless directed otherwise by the Engineer during installation. All equipment shall be correctly aligned, leveled and adjusted for satisfactory operation and shall be installed so that proper and necessary connections can be made readily between the various units.

The Contractor shall furnish, install and protect all necessary anchor and attachment bolts and all other appurtenances needed for the installation of the devices included in the equipment specified. Anchor bolts shall be as approved by the Engineer and made of ample size and strength for the purpose intended. Substantial templates and working drawings for installation shall be furnished.

The Contractor shall, at his own expense, furnish all materials and labor for, and shall properly bed in non-shrink grout, each piece of equipment on its supporting base that rests on masonry foundations. Grout shall completely fill the space between the equipment base and the foundation.

G-4.10 OPERATING INSTRUCTIONS
The Contractor, through qualified individuals, shall adequately instruct designated employees of the City in the operation and care of all equipment installed hereunder, except for equipment that may be furnished by the City.

The Contractor shall also furnish and deliver to the Engineer three complete sets for permanent files, identified in accordance with Subsection G-3.01 hereof, of instructions, technical bulletins and any other printed matter, such as diagrams, prints or drawings, containing full information required for the proper operation, maintenance, and repair, of the equipment installed and the ordering of spare parts, except for equipment that may be furnished by the City.

In addition to the above three copies, the Contractor shall furnish any additional copies that may be required for use during construction and start-up operations.

G-4.11 SERVICE OF MANUFACTURER'S ENGINEER
The Contract prices for equipment shall include the cost of furnishing a competent and experienced engineer or superintendent who shall represent the manufacturer and shall assist the Contractor, when required, to install, adjust, test and place in operation the equipment in conformity with the Contract Documents. After the equipment is placed in

permanent operation by the City, such engineer or superintendent shall make all adjustments and tests required by the Engineer to provide that such equipment is in proper and satisfactory operating condition, and shall instruct such personnel as may be designated by the City in the proper operation and maintenance of such equipment.

SECTION 5
INSPECTION AND TESTING

G-5.01 GENERAL
The Contractor's attention is hereby directed to Article 3.03 of the Agreement.

Inspection and testing of materials will be performed by the City unless otherwise specified.

For tests specified to be made by the Contractor, the testing personnel shall make the necessary inspections and tests and the reports thereof shall be in such form as will facilitate checking to determine compliance with the Contract Documents. Five copies of the reports shall be submitted and authoritative certification thereof must be furnished to the Engineer as a prerequisite for the acceptance of any material or equipment.

If, in the making of any test of any material or equipment, it is ascertained by the Engineer that the material or equipment does not comply with the Contract, the Contractor will be notified thereof and he will be directed to refrain from delivering said material and equipment, or to remove it promptly from the site or from the work and replace it with acceptable material, without cost to the City.

Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with recognized test codes of the ANSI, ASME, or the IEEE, except as may otherwise be stated herein.

The Contractor shall be fully responsible for the proper operation of equipment during tests and instruction periods and shall neither have nor make any claim for damage which may occur to equipment prior to the time when the City formally takes over the operation thereof.

G-5.02 COSTS
All inspection and testing of materials furnished under this Contract will be performed by the City or duly authorized inspection engineers or inspection bureaus without cost to the Contractor, unless otherwise expressly specified.

The cost of shop and field tests of equipment and of certain other tests specifically called for in the Contract Documents shall be borne by the Contractor and such costs shall be deemed to be included in the contract price.

Materials and equipment submitted by the Contractor as the equivalent to those specifically named in the Contract may be tested by the City for compliance. The Contractor shall reimburse the City for the expenditures incurred in making such tests on materials and equipment which are rejected for noncompliance.

G-5.03 INSPECTIONS OF MATERIALS
The Contractor shall give notice, in writing to the Engineer, sufficiently in advance of his intention to commence the manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction. Such notice shall contain a request for inspection, the date of commencement and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice the Engineer will arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials or he will notify the Contractor that inspection will be made at a point other than the point of manufacture, or he will notify the Contractor that inspection will be waived. The Contractor must comply with these provisions before shipping any material. Such inspection shall not release the Contractor from the responsibility for furnishing materials meeting the requirements of the Contract Documents.

G-5.04 CERTIFICATE OF MANUFACTURE
When inspection is waived or when the Engineer so requires, the Contractor shall furnish to him authoritative evidence in the form of Certificates of Manufacture that the materials to be used in the work have been manufactured and tested in conformity with the Contract Documents. These certificates shall be notarized and shall include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer.

G-5.05 SHOP TESTS OF OPERATING EQUIPMENT
Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function, or special requirements are specified shall be tested in the shop of the maker in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents. No such equipment shall be shipped to the work until the Engineer notifies the Contractor, in writing, that the results of such tests are acceptable.

Five copies of the manufacturer's actual test data and interpreted results thereof, accompanied by a certificate of authenticity sworn to by a responsible official of the manufacturing company, shall be forwarded to the Engineer for approval.

The cost of the shop tests and of furnishing manufacturer's preliminary and shop test data of operating equipment shall be borne by the Contractor.

G-5.06 PRELIMINARY FIELD TESTS
As soon as conditions permit, the Contractor shall furnish all labor, materials, and instruments and shall make preliminary field tests of equipment. If the preliminary field tests disclose any equipment furnished under this Contract which does not comply with the requirements of the Contract Documents, the Contractor shall, prior to the acceptance tests, make all changes, adjustments, and replacements required.

G-5.07 FINAL FIELD TESTS
Upon completion of the work and prior to final payment, all equipment and appliances installed under this Contract shall be subjected to acceptance tests as specified or required to prove compliance with the Contract Documents.

The Contractor shall furnish labor, fuel, energy, water and all other materials, equipment, and instruments necessary for all acceptance tests, at no additional cost to the City.

G-5.08 FAILURE OF TESTS
Any defects in the materials and equipment or their failure to meet the tests, guarantees or requirements of the Contract Documents shall be promptly corrected by the Contractor by replacements or otherwise. The decision of the Engineer as to whether or not the Contractor has fulfilled his obligations under the Contract shall be final and conclusive. If the Contractor fails to make those corrections or if the improved materials and equipment, when tested, shall again fail to meet the guarantees or specified requirements, the City, notwithstanding its partial payment for work, and materials and equipment, may reject the materials and equipment and may order the Contractor to remove them from the site at his own expense.

In case the City rejects any materials and equipment, then the Contractor shall replace the rejected materials and equipment within a reasonable time. If he fails to do so, the City may, after the expiration of a period of thirty calendar days after giving him notice in writing, proceed to replace such rejected materials and equipment, and the cost thereof shall be deducted from any compensation due or which may become due the Contractor under this Contract.

The City agrees to obtain other equipment within a reasonable time and the Contractor agrees that the City may use the equipment furnished by him without rental or other charges until the new equipment is obtained.

Materials or work in place that fails to pass acceptability tests shall be retested at the direction of the construction engineer all such retests shall be at the Contractor's expense. The rates charged shall be in accordance with the Department of Public Works current annual inspection contract which is available for inspection at the offices of the Department of Public Works.

G-5.09 FINAL INSPECTION
The procedures for final inspection shall be in accordance with the provisions of Article 4.07 of the Agreement. During such final inspections, the work shall be clean and free from water. In no case will the final estimate be prepared until the Contractor has complied with all the requirements set forth and the Engineer has made his final inspection of the entire work and is satisfied that the entire work is properly and satisfactorily cosntructed in accordance with the requirements of the Contract Documents.

SECTION 6

TEMPORARY STRUCTURES

G-6.01 GENERAL
All false work, scaffolding, ladders, hoistways, braces, pumping plants, shields, trestles, roadways, sheeting, centering forms, barricades, drains, flumes, and the like, any of which may be needed in the construction of any part of the work and which are not herein described or specified in detail, must be furnished, maintained and removed by the Contractor, and he shall be responsible for the safety and efficiency of such works and for any damages that may result from their failure or from their improper construction, maintenance, or operation.

G-6.02 PUBLIC ACCESS
At all points in the work where public access to any building, house, place of business, public road, or sidewalk would be obstructed by any action of the Contractor in executing the work required by this Contract, the Contractor shall provide such temporary structure, bridges or roadway as may be necessary to maintain public access at all times. At least one lane for vehicular traffic shall be maintained in streets in which the Contractor is working. Street closure permits are required from the Department of Public Works.

The Contractor shall provide suitable temporary bridges, as directed by the Engineer, at street intersections when necessary for the maintenance of vehicular and pedestrian traffic.

Prior to temporarily cutting of access to driveways and garages, the Contractor shall give twelve (12) hours notice to affected property owners. Interruptions to use of private driveways shall be kept to a minimum.

G-6.03 CONTRACTOR'S FIELD OFFICE
The Contractor shall erect, furnish and maintain a field office with a telephone at the site during the entire period of construction. He or an authorized agent shall be present at this office at all times while his work is in progress. Readily accessible copies of both the Contract Documents and the latest approved working drawings shall be kept at this field office.

G-6.04 TEMPORARY FENCE
If, during the course of the work, it is necessary to remove or disturb any fence or part thereof, the Contractor shall, at his own expense, if so ordered by the Engineer, provide a suitable temporary fence which shall be maintained until the permanent fence is replaced. The Engineer shall be solely responsible for the determination of the necessity for providing a temporary fence and the type of temporary fence to be used.

G-6.05 RESPONSIBILITY FOR TEMPORARY STRUCTURES
In accepting the Contract, the Contractor assumes full responsibility for the sufficiency and safety of all temporary structures or work and for any damage which may result from their failure or their improper construction, maintenance, or operation and will indemnify and save harmless the City from

all claims, suits or actions and damages or costs of every description arising by reason of failure to comply with the above provisions.

SECTION 7
TEMPORARY SERVICES

G-7.01 WATER
The Contractor shall provide the necessary water supply at his own expense. He shall, if necessary, provide and lay necessary waterlines from existing mains to the place of using, shall secure all necessary permits and pay for all taps to water mains or hydrants and for all water used at the established rates.

G-7.02 LIGHT AND POWER
The Contractor shall provide, at his own expense, temporary lighting and power facilities required for the proper prosecution and inspection of the work. If, in the opinion of the Engineer, these facilities are inadequate, the Contractor will not be permitted to proceed with any portion of the work affected thereby.

G-7.03 SANITARY REGULATIONS
The Contractor shall prohibit and prevent the committing of nuisances on the site of the work or on adjoining property and shall discharge any employee who violates this rule.

Ample washrooms and toilet facilities and a drinking water supply shall be furnished and maintained in strict conformity with the law by the Contractor for use by his employees.

G-7.04 ACCIDENT PREVENTION
Precautions shall be exercised at all times for the protection of persons and property. The safety provisions of applicable laws, building and construction codes shall be observed. The Contractor shall comply with the U. S. Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596), and under Section 107 of the Contract Work. Hours and Safety Standards Act (PL 91-54), except where state and local safety standards exceed the federal requirements and except where state safety standards have been approved by the Secretary of Labor in accordance with provisions of the Occupational Safety and Health Act.

G-7.05 FIRST AID
The Contractor shall keep upon the site, at each location where work is in progress, a completely equipped first aid kit and shall provide ready access thereto at all times when men are employed on the work.

G-7.06 HEATING
The Contractor shall provide temporary heat, at his own expense, whenever required on account of work being carried on during cold weather and to prevent freezing of water pipes and other damage to the work.

SECTION 8
LINES AND GRADES

G-8.01 GENERAL
All work done under this Contract shall be constructed in accordance with the lines and grades shown on the Plans, or as given by the Engineer. The full responsibility for keeping alignment and grade shall rest upon the Contractor.

The Engineer will establish bench marks and base line controlling points. Reference remarks for lines and grades as the work progresses will be located to cause as little inconvenience to the prosecution of the work as possible. The Contractor shall so place excavation and other materials as to cause no inconvenience in the use of the use of the reference marks provided. He shall remove any obstructions placed by him contrary to this provision.

G-8.02 SURVEYS
The Contractor shall furnish and maintain, at his own expense, stakes and other such materials, and give such assistance, including qualified helpers, as may be required by the Engineer for setting reference marks. The Contractor shall check such reference marks by such means as he may deem necessary and, before using them, shall call the Engineer's attention to any inaccuracies. The Contractor shall, at his own expense, establish all working or construction lines and grades as required from the reference marks set by the Engineer, and shall be solely responsible for the accuracy thereof. He shall, however, be subject to the check and review of the Engineer.

The Contractor shall keep the Engineer informed a reasonable time in advance as to his need for line and grade reference marks, in order that they may be furnished and all necessary measurements made for record and payment with the minimum of inconvenience to the Engineer or of delay to the Contractor.

It is the intention not to delay the work for the establishment of reference marks but, when necessary, working operations shall be suspended for such reasonable time as the Engineer may require for this purpose.

G-8.03 SAFEGUARDING MARKS
The Contractor shall safeguard all points, stakes, grade marks, monuments and bench marks made or established on the work, bear the cost of reestablishing them if disturbed, and bear the entire expense of rectifying work improperly installed due to not maintaining or protecting or to removing without authorization such established points, stakes and marks.

The Contractor shall safeguard all existing and known property corners, monuments and marks adjacent to but not related to the work and, if required, shall bear the cost of reestablishing them if disturbed or destroyed.

G-8.04 DATUM PLANE
All elevations indicated or specified refer to the Mean Sea Level Datum of the U.S.C. & G.S. (N.O.S.) which is 0.80 feet above the Mean Low Water Datum of the U. S. Army

Corps of Engineers.

SECTION 9
ADJACENT STRUCTURES AND LANDSCAPING

G-9.01 RESPONSIBILITY
The responsibility for removal, replacement, relocation, repair, rebuilding or protection of all public utility installations, including poles, tracks, pipes, wires, conduits, house service connections, vaults, manholes, sewers, traffic control and fire alarm signal circuit installations and other appurtenances and facilities shall be in accordance with G-1.02 and G-1.03.

The Contractor shall also be entirely responsible and liable for all damage or injury as a result of his operations to all other adjacent public and private property, structures of any kind and appurtenances thereto met with during the progress of the work. The cost of protection, replacement in their original locations and conditions or payment of damages for injuries to such adjacent public and private property and structures affected by the work, whether or not shown on the Plans, and the removal, relocation, and reconstruction of such items called for on the Plans or specified shall be included in the various Contract Items and no separate payment will be made therefor. Where such public and private property, structures of any kind and appurtenances thereto are not shown on the Plans and when, in the opinion of the Engineer, removal or relocation and reconstruction is necessary to avoid interference with the work, payment therefor will be made as provided for extra work in Article 7.02 of the Agreement.

G-9.02 PROTECTION OF TREES
All trees and shrubs shall be adequately protected by the Contractor with boxes or otherwise and, within the City of Tampa, in accordance with ordinances governing the protection of trees. No excavated materials shall be placed so as to injure such trees or shrubs. Trees or shrubs destroyed by negligence of the Contractor or his employees shall be replaced by him with new stock of similar size and age, at the proper season, and at the sole expense of the Contractor.

Beneath trees or other surface structures, where possible, pipelines may be built in short tunnels, backfilled with excavated materials, except as otherwise specified, or the trees or structures carefully supported and protected from damage.

The City may order the Contractor, for the convenience of the City, to remove trees along the line of trench excavation. If so ordered, the City will obtain any permits required for removal of trees. Such tree removal ordered shall be paid for under the appropriate Contract Items.

G-9.03 LAWN AREAS
Lawn areas shall be left in as good condition as before the starting of the work. Where sod is to be removed, it shall be carefully removed and later replaced, or the area where sod has been removed shall be restored with new sod in the manner described in the Technical Specifications section.

G-9.04 RESTORATION OF FENCES
Any fence, or part thereof, that is damaged or removed during the course of the work shall be replaced or repaired by the Contractor and shall be left in as good a condition as before the starting of the work. The manner in which the fence is repaired or replaced and the materials used in such work shall be subject to the approval of the Engineer. The cost of all labor, materials, equipment, and work for the replacement or repair of any fence shall be deemed included in the appropriate Contract Item or Items, or if no specific Item is provided therefor, as part of the overhead cost of the work, and no additional payment will be made therefor.

SECTION 10
PROTECTION OF WORK AND PUBLIC

G-10.01 TRAFFIC REGULATIONS
The Contractor shall arrange his work to comply with Article G-6.02. The work shall be done with the least possible inconvenience to the public and to that end the work may be confined by the Engineer to one block at a time.

G-10.02 BARRIERS AND LIGHTS
During the prosecution of the work, the Contractor shall put up and maintain at all times such barriers, and lights, as will effectually prevent accidents. The Contractor shall provide suitable barricades, red lights, "danger" or "caution" or "street closed" signs and watchmen at all places where the work causes obstructions to the normal traffic or constitutes in any way a hazard to the public. Such barriers and signs shall be constructed to State of Florida Department of Transportation standards and placed as recommended by the Traffic Division of the City's Department of Public Works.

No open fires will be permitted.

G-10.03 SMOKE PREVENTIONS
The Contractor shall use hard coal, coke, oil or gas as fuel for equipment generating steam. A strict compliance with ordinances regulating the production and emission of smoke will be required.

G-10.04 NOISE
The Contractor shall eliminate noise to as great an extent as practicable at all times. Air compressing plants shall be equipped with silencers and the exhaust of all gasoline motors or other power equipment shall be provided with mufflers. In the vicinity of hospitals and schools, special care shall be used to avoid noise or other nuisances. The Contractor shall strictly observe all local regulations and ordinances covering noise control.

Except in the event of an emergency, no work shall be done between the hours of 7:00 p.m. and 7:00 a.m., or on Sundays. If the proper and efficient prosecution of the work requires operations during the night, the written permission of the Engineer shall be obtained before starting such items of the work.

G-10.05 ACCESS TO PUBLIC SERVICES
Neither the materials excavated nor the materials or plant used in the construction of the work shall be so placed as to prevent free access to all fire hydrants, valves or manholes.

G-10.06 DUST PREVENTION
The Contractor shall prevent dust nuisance from his operations or from traffic by keeping the streets sprinkled with water at all times.

G-10.07 PRIVATE PROPERTY
The Contractor shall so conduct the work that no equipment, material, or debris will be placed or allowed to fall upon private property in the vicinity of the work unless he shall have obtained the owner's written consent thereto and shall have shown this consent to the Engineer.

SECTION 11
SLEEVES AND INSERTS

G-11.01 COORDINATION
When the Contract requires the placing of conduits, saddles, boxes, cabinets, sleeves, inserts, foundation bolts, anchors, and other like work in floors, roofs, or walls of buildings and structures, they shall be promptly installed in conformity with the construction program. The Contractor who erects the floors, roofs, and walls shall facilitate such work by fully cooperating with the Contractors responsible for installing such appurtenances. The Contractor responsible for installing such appurtenances shall arrange the work in strict conformity with the construction schedule and avoid interference with the work of other contractors.

G-11.02 OPENINGS TO BE PROVIDED
In the event timely delivery of sleeves and other materials cannot be made and to avoid delay, the affected Contractor may arrange to have boxes or other forms set at the locations where the appurtenances are to pass through or into the floors, roofs, walls, or other work. Upon the subsequent installation of these appurtenances, the Contractor erecting the structure shall fill around them with materials as required by the Contract. The necessary expenditures incurred for the boxing out and filling in shall be borne by the Contractor or Contractors required to furnish the sleeves and inserts. Formed openings and later installation of sleeves will not be permitted at locations subject to hydrostatic pressure.

SECTION 12
CUTTING AND PATCHING

G-12.01 GENERAL
The Contractor shall do all cutting, fitting, or patching of his portion of the work that may be required to make the several parts thereof join and coordinate in a manner satisfactory to the Engineer and in accordance with the Plans and Specifications. The work must be done by competent workmen skilled in the trade required by the restoration.

SECTION 13
CLEANING

G-13.01 DURING CONSTRUCTION
During construction of the work, the Contractor shall, at all times, keep the site of the work and adjacent premises as free from material, debris, and rubbish as is practicable and shall remove the same from any portion of the site if, in the opinion of the Engineer, such material, debris, or rubbish constitutes a nuisance or is objectionable.

The Contractor shall remove from the site all of his surplus materials and temporary structures when no further need therefor develops.

G-13.02 FINAL CLEANING
At the conclusion of the work, all erection plant, tools, temporary structures and materials belonging to the Contractor shall be promptly taken away, and he shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances.

The Contractor shall thoroughly clean all equipment and materials installed by him and shall deliver such materials and equipment undamaged in a bright, clean, polished, and new appearing condition.

SECTION 14
MISCELLANEOUS

G-14.01 PROTECTION AGAINST SILTATION AND BANK EROSION
The Contractor shall arrange his operations to minimize siltation and bank erosion on construction sites and on existing or proposed watercourses and drainage ditches.

G-14.02 EXISTING FACILITIES
The work shall be so conducted to maintain existing facilities in operation insofar as is possible. Work shall be scheduled to minimize bypassing during construction. Requirements and schedules of operations for maintaining existing facilities in service during construction shall be as described in the Special Provisions.

G-14.03 USE OF CHEMICALS
All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions.

* * * * * * *

SPECIFIC PROVISIONS

SP-1 Scope

The work included under these Contract Documents comprises the reconstruction of ditch banks, installation of stack ed block retaining wall and fabric formed concrete, extension of existing drainage pipes, and installation of sod to disturb areas in the ditch east of Lois Ave. and south of the Met West Campus; establish side slopes, install cellular confinement erosion control system, rip-rap, sod, and landscaping where required in canal along north side of Bay Way Dr.; and placement of fill material and grading of ditch bank, installation fabric formed concrete, installation of guardrails and curbing, and repaving of disturbed roadway at the Jones Avenue location, and all miscellaneous and appurtenant work.

The work consists of furnishing, constructing, installing, testing and maintaining the said sewers and structures complete and in place.

The Contractor shall furnish all labor, materials and equipment for the accomplishment of all work as described in the Specifications, as shown on the Plans and as directed by the Engineer in accordance with the obvious or expressed intent of the Contract.

SP-1 Scope

The work included under these Contract Documents is as described in the Proposal.

All work shall be constructed, installed and maintained complete in place as specifically described in these Specifications, as shown on the Plans and as described and directed by the Engineer in accordance with the obvious or expressed intent of the Contract.

This work also includes grading of ditch banks, installation of stacked block retaining wall and fabric formed concrete, installation of guardrails and curbing, repaving of disturbed roadway, extension of existing drainage pipes, and installation of sod to disturb areas, and all other work required by the Contract Documents necessary to complete the work.

SP-2 Permits

The Contractor will obtain permits required from any State or County agencies having jurisdiction over the roadways and for any railroad or highway crossings shown on the Plans. The Contractor shall be required to comply with all provisions of such permits regarding workmanship, schedules, maintenance of traffic, notification of starting construction, pavement removal and replacement and other conditions under which the permit is issued.

The Contractor shall obtain all permits required to comply with SP-24.C Maintenance of Traffic, contained herein.

The Contractor shall have in his possession the proper license to perform the work before submittal of his bid and shall obtain any required City/County building permits and shall obtain and pay for all other licenses and authorizations required for the prosecution of the work, including the cost of all work performed in compliance with the terms and conditions of such permits, licenses and authorizations, whether by himself or others.

City/County building permit fees will be paid by the City. Right-of-way and maintenance of traffic permit fees shall be paid by the Contractor.

The Contractor shall require all subcontractors to be currently licensed by the City to perform the proposed work in their respective fields and to obtain permits for the execution of said work. All work shall be performed in accordance with the licenses, permits and the requirements of the current Building and Construction Regulations Chapter of the City of Tampa Code.

The Contractor is responsible to schedule and coordinate with the Contract Administration of Public Works and Utility Services all required inspections and tests for all phases of work to obtain final approval thereof.

The Contractor is encouraged to contact the City's Contract Administration Division prior to commencement of work to ascertain their respective requirements.

SP-3 Intent

Stormwater facilities work not specified in either the Plans or in the Specifications, but involved in carrying out their intent or in the complete and proper execution of the work, is required and shall be performed by the Contractor in accordance with the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, as though it were specifically delineated or described. The cost of this work shall be included in the cost of the pay item to which it is incidental, and no additional payment will be made therefor.

SP-4 Standard Drawings

The City of Tampa, Stormwater Management and Transportation Divisions' Standard Drawings are available on the 6th Floor, North Wing of City Hall Annex, 306 East Jackson Street.

These standard drawings are available for bidding and construction purposes but are not part of the refundable deposit made for the Plans and Specifications.

SP-4.C Maintenance of Traffic

The Contractor shall arrange his work so that there will be as little disruption of traffic as possible.

At least seventy-two hours before starting any work in City streets, the Contractor shall obtain a City of Tampa Street Closure Permit for any traffic lane or street closure within the City. The permit will establish the requirements for closures related to the number of lanes and time of day lanes or streets may be closed. If the Contractor proposes a complete street closure, a detailed traffic maintenance plan shall be submitted to the City of Tampa Traffic Engineering Division together with the application for the Street Closure Permit. The traffic maintenance plan shall include proposed detour routes and locations and descriptions of direction signs for the construction area and detour routes. Two approved copies of all Street Closure Permits shall be submitted to the Engineer before starting any work in City streets. No changes to approved Street Closure Permits will be permitted without prior approval by the City.

The Contractor shall furnish and maintain all necessary signs, barricades, lights and flagmen necessary to control traffic and provide for safety to the public, all in compliance with the Florida Department of Transportation “Manual on Traffic Controls and Safe Practices for Street and Highway Construction, Maintenance and Utility Operations,” with subsequent revisions and additions, and to the satisfaction of the Engineer.

The cost of maintaining traffic and of any additional earth excavation, selected fill, temporary wearing surface, temporary

bridges, barricades, warning lights, flagmen, and like work required therefor shall be included under the various classified unit price Contract Items, or in the total Lump Sum Price, as applicable, and no additional payment with be made therefor.

SP-5 Working Drawings

Prior to performing any work requiring working drawings, as specified on the Plans and in the Workmanship and Materials Sections, the Contractor shall submit the working drawings in accordance with the General Provisions section headed "Working Drawings."

SP-6 Environmental Protection

The Contractor will be held liable for the violation of any and all environmental regulations. Violation citations carry civil penalties and in the event of willful violation, criminal penalties. The fact that the permits are issued to the City does not relieve the Contractor in any way of his environmental obligations and responsibilities.

SP-7 Use of Explosives

Explosives will not be used on the work except when authorized by the Engineer. The use of same, if authorized, shall conform to laws or ordinances which may pertain to the use of same and the utmost care will be exercised by the Contractor so as not to endanger life or property. The Contractor will assume full responsibility in connection with use of any explosives even though authorized. Explosives will not be stored within the City limits.

SP-8 Construction Start

Construction will not begin prior to receipt by the City of the required permits or until all necessary equipment and materials are on-site. If issuance of the Notice to Proceed is delayed due to permit acquisition, the contract time will be extended to suit, but no extra payment will be made to the Contractor.

SP-9 Coordination and Cooperation

In performing work under this Contract, the Contractor shall coordinate his work with that of any adjacent contractors for the City, and others, and cooperate with them in every reasonable way, to the end that there shall be the minimum practicable interference with their operations.

SP-10 Connections Between Construction

The Contractor shall provide an approved type masonry bulkhead, spigot plug, bell cap, or standard pipe plug in the sewer, manhole, junction chamber, pipe stub or other location to provide for terminating construction when the work is performed in phases and the connecting phase is not complete.

The Contractor shall remove any such bulkhead or plug encountered when connecting to previously completed work.

The cost of furnishing and removing bulkheads and plugs shall be included in the various classified unit price Contract Items for pipe lines, or in the total Lump Sum Price, as applicable, and no separate payment will be made

therefor.

SP-11 Construction Easements

In the event that, in the opinion of the Contractor, obtaining a temporary construction easement is necessary or desirable, it shall be the sole responsibility of the Contractor to obtain such easements from the Owner of the property. If such easements are obtained by the Contractor, they shall contain provisions to hold the City harmless from any operations of the Contractor within the easement limits. The Contractor shall not conduct construction operations on private property outside the limits of any easement obtained by the City or of any City-owned right-of-way unless a copy of the temporary construction easement agreement is filed with the Engineer.

SP-12 Releasing Facilities for Use

It is the intent of these Specifications that all newly constructed sewers and appurtenant facilities be placed in service as rapidly as an integrated portion of the facilities can be constructed, inspected and accepted by the Engineer. Acceptance or use by the City of any portion of the facilities prior to final acceptance shall not relieve the Contractor of any responsibilities, regarding such facilities, included in the Contract.

SP-13 Material and Equipment Approval

The Contractor shall not enter into any subcontracts, or place any order, for the furnishing of any material or equipment until he has received the Engineer's written approval of the manufacturers.

SP-14 Contractor Emergency Response Time

The Contractor must be available to service emergency calls seven (7) days a week, twenty-four (24) hours a day. The response time for emergency calls shall be within two (2) hours. A contact person and telephone number shall be provided to the Engineer for such purposes.

SP-15 Contractor's Field Office

Delete Article G-6.03 Contractor's Field Office on Page G-14 from GENERAL PROVISIONS. The Contractor or an authorized agent shall be present at all times while his work is in progress. Readily accessible copies of both the contract documents and the latest approved working drawings shall be kept at the job site.

SP-16 Salvage

All existing pipe and appurtenances removed by the Contractor and which are not designated to be salvaged shall become the property of the Contractor and shall be removed from the site of the work to the Contractor's own place of disposal.

Items which are shown on the Plans or specified to be salvaged shall be removed by the Contractor, delivered, and unloaded at a location within the Department’s service area, as directed by the Engineer. The cost of removing, disposing, delivering, and unloading as salvage items of pipe and appurtenances shall be included in the various classified unit price Contract Items or in the total Lump Sum Price, as applicable, and no separate payment will be made therefor.

SP-17 Sequence of Operations

The Contractor shall develop with the Engineer a complete schedule of operations which, in the opinion of the Engineer, will permit use of the facility at the earliest possible date.

Taking over of parts of the work for operation before completion of the entire project shall not relieve the Contractor of any responsibility for proper integrated operations of all parts of the work, nor shall it act to relieve him of any responsibilities under Article A-6.04 of the Agreement, for guaranty of all parts of the work, for one year after the date of acceptance of all the work on the project.

SP-18 Dewatering

Dewatering is the responsibility of the Contractor. All costs associated with dewatering shall be included in the appropriate contract price for items to which dewatering is incidental, or in the Dewatering contract item, as applicable, and no separate payment shall be made therefor.

Before commencing any excavation at the site of the work, the Contractor shall submit to the Engineer and obtain his approval of the methods and equipment and arrangement of facilities proposed for the removal and disposal of water at the site and of all water entering any excavation or other part of the work from any source whatsoever. Adequate standby facilities shall be provided to ensure that the excavation will be kept dry in the event of power failure or mechanical breakdown. Facilities for removal and disposal of water shall be of sufficient capacity to keep the excavation dry under all circumstances with one-half of the facilities out of service. If well points are used, provision shall be made for removing and resetting individual well points without taking the system of which they are a part out of service.

SP-19 Prevention, Control and Abatement of Erosion and Water Pollution

The Contractor shall be responsible for prevention, control and abatement of erosion, siltation and water pollution resulting from construction of the project until final acceptance of the project.

He shall provide, install, construct, and maintain any covering, mulching, sodding, sand bagging, berms, slope drains, sedimentation structures, or other devices necessary to meet City, County, State and Federal regulatory agency codes, rules and laws.

The Contractor shall take sufficient precautions to prevent pollution of streams, canals, lakes, reservoirs and other water impoundments with fuels, oils, bitumen, calcium chloride or other harmful materials. Also, he shall conduct and schedule his operations so as to avoid or otherwise minimize pollution or siltation of such streams, and the like, and to avoid interference with movement of migratory fish. No residue from dust collectors or washers shall be dumped into any live stream.

Storm drainage facilities, both open and closed conduit, serving the construction area shall be protected by the Contractor from pollutant and contaminants. If the Engineer determines that siltation of drainage facilities has resulted due to the project, the Engineer will advise the Contractor to remove and properly dispose of the deposited material. Should the Contractor fail to or elect not to remove the deposits, the City will provide maintenance cleaning as needed and will charge all costs of such service against the amount of money due or to become due the Contractor.

Construction operations in rivers, channels, streams, tidal waters, canals and other impoundments shall be restricted to those areas where it is necessary to perform filling or excavation to accomplish the work shown in the Plans and to those areas which must be entered to construct temporary or permanent structures. As soon as conditions permit,

rivers, channels, streams and impoundments shall be promptly cleared of all obstructions placed therein or caused by construction operations.

Except as necessary for construction, excavated materials shall not be deposited in rivers, streams, canals or impoundments, or in a position close enough thereto to be washed away by high water or runoff.

The Contractor shall not disturb lands or waters outside the limits of construction except as may be found necessary and authorized by the Engineer.

The location of and methods of operation in all detention areas, borrow pits, material supply pits and disposal areas furnished by the Contractor shall meet the approval of the Engineer as being such that erosion during and after completion of the work will not likely result in detrimental siltation or water pollution.

The Contractor shall schedule his operations such that the area of unprotected erodible earth exposed at any one time is not larger than the minimum area necessary for efficient construction operations; and the duration of exposed, uncompleted construction to the elements shall be as short as practicable.

Clearing and grubbing shall be so scheduled and performed that grading operations can follow immediately thereafter and grading operations shall be so scheduled and performed that permanent erosion control features can follow immediately thereafter if conditions on the project permit.

The Engineer may limit the surface areas of unprotected erodible earth exposed by clearing and grubbing, excavation or filling operations and may direct the Contractor to provide immediate erosion or pollution control measures to prevent siltation or contamination of any river, stream, channel, tidal waters, reservoir, canal or other impoundment or to prevent damage to the project or property outside the project right of way.

SP-20 Project Sign

The Contractor shall furnish a project sign as shown on the detail included herein, and install it in the construction area as directed by the Engineer within five (5) days of the Notice to Proceed date. Since the contract is for work in three (3) different locations, a sign must be installed at each active work site.

The cost of fabrication, erection, maintenance, removal, and proper disposal of the project sign at the completion of the project, including all labor and materials shall be deemed included in the prices bid for the various Contract Items of this Contract, or in the total Lump Sum Price, as applicable, and no separate payment will be made therefor.

No extra payment will be made for obliterating of certain names and offices and replacement thereof with others because of administrative changes during the course of the Contract.

SP-22 Construction Operations

In City streets, excavated materials shall, where practicable, be deposited upon streets, sidewalks, driveways, or other paved surfaces within the street right-of-way, except that interruptions to the use of driveways shall be kept to a minimum. The Contractor shall clean up areas from which soil has been removed at the end of each day by sweeping,

washing, or other approved methods. When the work is halted by rain, the Contractor shall clean up the working areas before leaving the site.

Trenches shall be protected at the close of each day's operations by lighted barricades, fences, and other methods to the satisfaction of the Engineer. Fences shall meet ASHA standards and be structurally stable as approved by the Engineer. No excavations shall be left open over a weekend.

In general, pipes shall be laid in opencut, except when another method, such as jacking, augering or tunneling is shown on the Plans, specified or ordered.

In City, State and County highways, excavated materials shall not be stored or cast upon the pavement, unless an advance approval of the governing agency is first obtained by the Contractor.

SP-23 Project Cleanup

Cleanup is extremely important and the Contractor will be responsible for keeping the construction site neat and clean with debris to be removed regularly as the work progresses.

SP-24.C Maintenance of Traffic

The Contractor shall arrange his work so that there will be as little disruption of traffic as possible.

At least seventy-two hours before starting any work in City streets, the Contractor shall obtain a City of Tampa Street Closure Permit for any traffic lane or street closure within the City. The permit will establish the requirements for closures related to the number of lanes and time of day lanes or streets may be closed. If the Contractor proposes a complete street closure, a detailed traffic maintenance plan shall be submitted to the City of Tampa Traffic Engineering Division together with the application for the Street Closure Permit. The traffic maintenance plan shall include proposed detour routes and locations and descriptions of direction signs for the construction area and detour routes. Two approved copies of all Street Closure Permits shall be submitted to the Engineer before starting any work in City streets. No changes to approved Street Closure Permits will be permitted without prior approval by the City.

The Contractor shall furnish and maintain all necessary signs, barricades, lights and flagmen necessary to control traffic and provide for safety to he public, all in compliance with the Florida Department of Transportation "Manual on Traffic Controls and Safe Practices for Street and Highway Construction, Maintenance and Utility Operations," with subsequent revisions and additions, and to the satisfaction of the Engineer.

The cost of maintaining traffic and of any additional earth excavation, selected fill, temporary wearing surface, temporary bridges, barricades, warning lights, flagmen, and like work required therefor shall be included under the various classified unit price Contract Items, or in the total Lump Sum Price, as applicable, and no additional payment will be made therefor.

SP-25 Work in Streets and Highways

All work within streets and highways shall be subject to the regulations and requirements of the appropriate agencies. Within the City of Tampa, streets and highways are under the jurisdiction of the City of Tampa, Department of Public Works or State of Florida, Department of Transportation. Outside the City of Tampa, streets and highways are

under the jurisdiction of the County of Hillsborough or the State Department of Transportation.

Methods and materials of construction used in restoration within such streets and highways, including pavement, sidewalk, curb, curb and gutter removal and replacement, replacement of storm sewerage facilities, excavation and backfilling, and the storage of plant, materials and equipment shall conform to the requirements of the City of Tampa and, where applicable, the County of Hillsborough or State Department of Transportation, and will be subject to the inspection and approval of the duly authorized representatives of the City, County and the State.

SP-26 Surface Restoration

Where construction activities are conducted in existing grassed areas, the grassed areas shall be restored as specified or directed by sodding or grassing. Such restoration of grassed areas shall conform to the requirements of the Workmanship and Materials section headed "Lawn Replacement."

The Contractor shall replace or repair all ground surfaces damaged during construction. Any bushes, flowers, gardens, patios, lighting system, other landscaping, and irrigation systems disturbed by the construction project shall be repaired or replaced by the Contractor. The cost of such ground surface repair shall be included in the various classified unit price Contract Items, or in the specific contract item, as applicable, and no separate payment will be made therefor.

Existing corrugated metal and concrete pipe culverts removed during the construction work shall be stored and maintained in sound, useful condition and replaced upon completion of the work. Culverts damaged by the Contractor shall be replaced with new culverts meeting the applicable requirements of the Standard Specifications for Road and Bridge Construction published by the Florida Department of Transportation. No separate payment will be made for replacement of damaged culverts.

SP-27 Existing Public Facilities

Existing public facilities that are removed by construction operations under this contract shall be replaced by the Contractor to City of Tampa specifications. These items shall include all public benches, playground light poles, shelters, roadway signs, and replacement of these items shall be considered incidental to the cost of construction, and no separate payment will be made therefor.

SP-28 Work Adjacent to Utilities

Existing utilities including house services adjacent to or crossing the line of the work shall be protected as shown on the Plans, specified hereinbefore, and in accordance with the requirements of the General Provisions.

SP-29 Utility Protection Considerations

The Contractor shall protect all utilities and other facilities within and adjacent to the construction as covered in Section G-1.03, unless a utility firm has conclusively indicated, or such is shown on the Plans, that the certain adjustment, removal, reconstruction, or protection of the utility's facility will be performed by that respective utility.

The Contractor shall furnish, install, and remove sheeting and shoring and other protective measures as may be necessary to satisfactorily accomplish the construction of this project. The cost of such sheeting and shoring and other protective measures shall be included in the unit prices as bid for the storm or sanitary sewer pipe items, and no separate payment shall be made therefor.

SP-31 House Services

The various utilities, along the line of the work, which are shown on the Plans or located in the field during the course of the work may have house services connected to them. The Contractor is required to give all utility agencies 48 hours notice prior to start of work. The Contractor shall notify the various utility companies by calling the Sunshine State One Call of Florida, Inc. (1-800-432-4770) or, if necessary, by contacting the utilities individually. When such notice is properly given, the utility having jurisdiction will locate house services along the line of work. The Contractor shall protect all existing house services which are shown on the Plans or located in the field during the course of the work. The Contractor shall arrange his operations to avoid any damage or disruption of water, gas, sewer, electric, telephone, and other house services.

Methods and techniques used by the Contractor to protect and maintain house services shall be subject to the prior approval of the Engineer.

Water and sewer services damaged or removed due to the work methods of the Contractor shall be replaced by the Contractor to such limits as directed by the Engineer, unless otherwise noted on the plans. Materials used for such replacements shall be similar to those in the existing service or shall conform to the current standards of the utility as directed by the Engineer. All damaged water and sewer services shall be promptly repaired and shall be returned to service within 24 hours after the damage has occurred.

Other public utility house services which are damaged or removed due to the work methods of the Contractor will be repaired by the utility having jurisdiction and the cost of such repairs shall be borne by the Contractor.

Where the relocation or special maintenance of house services, as shown on the Plans, is required during construction of new pipelines the disruption of such services shall be kept to a minimum period of time as approved by the Engineer.

Unless otherwise specified in other Contract Items, or in the total Lump Sum Price, as applicable, the cost of protecting, replacing, repairing, relocating and maintaining house services shall be included in the various classified unit price Contract Items for pipelines, or in the total Lump Sum Price, as applicable, and no separate payment will be made therefor.

The maintenance and guaranty provisions of the Agreement shall also apply to all repairs and replacements of damaged or relocated services accomplished by the Contractor.

SP-33 Protection of Trees and Shrubs

All trees and shrubs, except where otherwise shown or ordered, shall be adequately protected by boxes, fences, or otherwise carefully supported, as necessary, by the Contractor. Protective barricades shall be placed around all protected trees and grand trees and shall remain in place until all potentially damaging construction activities are completed (see attached tree barricade detail). The Parks Department must inspect the site after tree protection devices have been installed and prior to construction. A 48-hour notice must be given to Parks Department to schedule the inspection. No excavated or backfill material shall be placed in a manner which, in the opinion of the Engineer, may result in damage to trees or shrubs. Prior to mobilization, all exposed roots shall be covered with a two (2)-inch layer of mulch. The Contractor shall replace all trees or shrubs which are destroyed or damaged to such extent, in the opinion of the Engineer, to be considered destroyed. Replacement of destroyed trees or shrubs shall be made with new stock conforming to the

requirements of the City's Tree Ordinance at the expense of the Contractor, and no separate payment will be made therefor.

Beneath trees within the limits of the excavation, and where possible, pipelines shall be built in short tunnels, except as otherwise shown or specified. When the tree is outside the limits of the excavation but, where the distance from the centerline of the new pipeline to the trunk of any tree is such that, in the opinion of the Engineer, the excavation would result in serious damage to the tree, the pipeline shall be constructed in short tunnel or the root system shall be pruned, as ordered in writing by the Engineer. The Contractor shall be responsible for all damage to trees and shrubs as a result of his operations, whether the pipeline is placed on trench, tunnel, or other excavation.

The Contractor shall provide the services of an approved licensed tree professional when it is necessary to trim or cut a branch from a tree, or for required root pruning.

The cost of protection of trees and shrubs, replacement or repair of trees or shrubs destroyed by the Contractor, short tunnels, cutting or trimming of tree branches, and root pruning shall be included in the various classified unit price Contract Items for pipelines, tree and root pruning, or in the total Lump Sum Price, as applicable, and no separate payment will be made therefor.

SP-34 Existing Storm Sewer Facilities

In the course of the work, it will be necessary to perform construction activities under or closely adjacent to existing culverts and other storm sewer facilities. The Contractor shall protect all existing storm sewer facilities which are shown on the Plans or located in the field during the course of the work. When approved by the Engineer, relocation or special maintenance of storm sewer facilities during construction will be permitted. Disruption of service shall be kept to a minimum.

Facilities which are damaged due to the work method of the Contractor shall be replaced by the Contractor to such limits as directed by the Engineer. Materials used for such replacements shall be similar to those used in the existing facility and shall conform to City Standards for the construction of storm sewers for work done in the City of Tampa. Work done outside the City shall conform to the Florida Department of Transportation "Standard Specifications for Road and Bridge Construction."

The cost of protecting, replacing, relocating and maintaining storm sewer facilities shall be included in the various classified unit price Contract Items for pipelines, or in the total Lump Sum Price, as applicable, and no separate payment will be made therefor, unless otherwise specified in other Contract Items.

The maintenance and guarantee provisions of the Agreement shall also apply to all replacements of damaged or relocated storm sewer facilities accomplished by the Contractor.

SP-35 Work in Private Property

Where portions of the work are constructed in easements through private properties, the limits of such City-owned easements are as shown on the Plans.

Upon completion of work in City-owned easements, the Contractor shall restore the property, including all fences or other structures disturbed by his operations, as nearly as possible to the condition in which he found it. No material shall be used or removed from private property without the approval of the Engineer.

The Contractor shall confine his operation in such private properties within the limits of the easements as shown or directed by the Engineer.

The Contractor shall further comply with all provisions of the grants of the City-owned easement and shall assume full responsibility as the agent of the City for all obligations of the City under such grants of easement in connection with the construction of pipelines.

The Contractor shall not enter upon or occupy any private land outside of the limits of the City-owned easement unless a copy of the written consent of the Owner is filed with the Engineer. The Contractor shall conduct his operations along easements through private property so as not to damage the property and to interfere with its ordinary use as little as possible.

SP-36 Fences

Temporary fences, where required, shall be "wood and wire fence" or other suitable fencing as approved by the Engineer.

Permanent fences shall be restored by the Contractor and shall be finished and installed so that the restoration is equal to the original. Only those portions of original fencing, or materials therefrom, that the Engineer approved for reuse shall be used by the Contractor in fence restoration. All other materials, including lumber, paint, creosote, concrete and metal products, shall be furnished by the Contractor.

The cost of temporary fences and permanent fence restoration shall be included under the various classified unit price Contract Items, or in the total Lump Sum Price, as applicable, and no separate payment will be made therefor.

SP-37 Data to be Submitted on Pipe

Within ten days after the date the Contractor is issued the Notice of Award and prior to his entering into any subcontract for the manufacture or purchase of any pipe, the Contractor shall submit to the Engineer, in an amount equal to four (4) sets to be retained by the City plus the number of sets desired by the Contractor, the following information:

1. The name and address of the pipe manufacturer and the location of the plant at which the pipe will be manufactured.

2. A general description of and specifications for the pipe and pipe joints proposed.

3. Notarized certificates of manufacture for VCP, PVC, HDPE, and DIP stating conformance to applicable standards and specifications.

4. Any additional information that the Engineer may deem necessary in order to evaluate the qualifications of the manufacturer and to determine the suitability of the proposed pipe to meet the requirements of the Contract Documents.

The Contractor shall not enter into any subcontract for the furnishing of pipe until he has received the Engineer's approval, in writing, of the proposed manufacturer and pipe.

All pipes of specified classes and materials shall be of one kind and shall be produced by a single manufacturer.

SP-38 Inspection of Reinforced Concrete Pipe

All reinforced concrete pipes, reinforced concrete arch culverts, storm drain, and sewer pipe, and all reinforced concrete elliptical pipes shall be inspected and accepted by a testing laboratory approved by the Engineer.

Each pipe shall bear the stamp of acceptance of the testing laboratory and the Engineer shall be supplied with a copy of each inspection report, including a certification of "D-load," absorption test, conformance to the dimensional requirements, and all other designations of ASTM specifications. The cost of such inspection services shall be included in the unit prices for the respective pipe items.

Unless specified otherwise on the Plans, or directed by the Engineer, all storm sewer pipes shall be ASTM Class III, B wall thickness.

Prior to the manufacture of any reinforced concrete sewer pipe, details of the steel reinforcing and concrete strength together with proof of the adequacy of the pipe design for each size and class of pipe shall be submitted to the Engineer for approval.

As proof that the design of the pipe meets the 0.01-inch crack and ultimate load strength requirements for this class of pipe, the manufacturer shall submit the results of properly certified three-edge-bearing tests already witnessed and verified by an approved independent testing laboratory on identical pipe of identical design or, if such three-edge-bearing test results are not already available or are not acceptable, shall have one pipe, at least four feet in length, tested in three-edge-bearing and witnessed and verified by an approved independent testing laboratory and shall submit certified test results. All costs associated with proof-of-design tests shall be borne by the Contractor.

Concrete sewer pipe shall be tested in accordance with the applicable provisions of ASTM Des: C 497 as required by the ASTM Specification for the pipe.

The basis of acceptance for reinforced concrete pipe shall be in accordance with Section 5.1.1 of ASTM Des: C 76 (round pipe) or ASTM Des: C 507 (elliptical pipe). During manufacture, at least one pipe section shall be shop tested to destruction in three-edge-bearing in the presence of an approved independent testing laboratory for each 1,000 feet of pipe or fraction thereof made. The test pipe sections shall be a minimum of four feet in length. The manufacturer shall have a pipe casting form, of the same inside diameter as the pipe being manufactured, together with the proper reinforcing steel cages, available at all times during manufacture for the purpose of casting test pipes at the times designated by the Engineer. Test pipe sections shall not be lined with plastic sheet. No pipe shall be tested at an age of less than 12 days, and no pipe shall be delivered to the job site until satisfactory completion of shop tests on representative pipe specimens for each 1,000-foot lot of pipe manufacturer. Proof-of-design tests performed on pipe manufactured for this Contract will be accepted by the City in lieu of shop tests for the first 1,000- foot lot of pipe of each size and class manufactured. This test must be within one (1) year of shipment for each size and class of pipe.

The basis for acceptance of nonreinforced concrete pipe shall be in accordance with Section 4.1 of ASTM Des: C 14.

The Contractor shall obtain, review and submit to the Engineer four (4) copies of certified test reports made by the City's inspection engineer. All costs associated with shop testing shall be borne by the Contractor.

SP-39 Elliptical Concrete Pipe and Round Concrete Pipe Joints

All joints in elliptical concrete pipe and round R.C.P. shall be provided with filter fabric or concrete jacket as per D.O.T Standard Index No. 280 and as directed by the Engineer. Filter fabric shall be provided at all joints, except the last two joints not supported by a structure; these joints shall be provided with a concrete collar.

The cost of the filter fabric jackets and concrete collars shall be included in the unit cost of pipe. No extra payment will be paid for such jackets or collars.

SP-40 Concrete Requirements

Workmanship and Materials Section 4 & 5 shall apply to all concrete work.

SP-43 Sand-Cement Riprap Bags

Bags made from synthetic fiber or material shall not be used on this project. The preferred bag material is jute.

SP-44 Standard for Filter Fabric

Unless specified otherwise on the Plans, filter fabric shall be nonwoven fabric per D.O.T. Specification Sections 514 and 985. Payment for furnishing and placing the filter fabric shall be included in the contract price for the item or items to which it is incidental.

SP-45 Measurement for Payment

The quantity, in linear feet, to be measured for payment under the various classified unit price Contract Items for pipelines in opencut, or in the total Lump Sum Price, as applicable, shall be the actual length of new pipelines placed in the work, as shown, specified and directed. Depth of cut for sanitary sewers shall be measured from the original ground surface to the pipe invert. Pipelines will be measured along the centerline of the pipe as follows:

1. The measured length of gravity sanitary sewers, regardless of pipe material, will include all fittings, short tunnels and manholes with no deductions for wyes, tees and the width of manholes. Deductions in the measured length of gravity sanitary sewers will be made for the width of structures, such as junction boxes, measured from the outside face to the outside face of the structure walls, plus one foot.

2. The measured length for sanitary or stormwater force mains will include all fittings and short tunnels with deductions for the laid length of valves.

3. Deductions in the measured length of storm sewers will be made for the width of all structures, including manholes and inlets, measured from the inside wall to the inside wall of the structure.

SP-46 Filling Abandoned Sewers

The Contractor shall pump a lean mixture of grout into sewers as shown on the Plans and as directed by the Engineer.

The grout shall be a mixture of flash and cement, the ratio of which shall be submitted to the Engineer for approval. The air-entraining admixture shall be permitted per Section 26. The grouting shall be carried out by pumps.

This work shall be carried out after the proposed sanitary sewer or storm sewer is functioning.

The Contractor shall take measures to ensure the pipe is completely filled with the grout. Such measures may consist of constructing temporary stand pipes, grout injection tubes, or other measures approved by the Engineer and as directed in the Workmanship and Materials section. The Contractor shall also construct approved plugs into the ends of the abandoned sewers. All costs to construct the plugs, stand pipes, grout injection tubes (or other approved measures), and any other necessary steps to provide for a complete item shall be included in the unit cost of the grout, and no additional payment shall be made therefor.

SP-48 Temporary Pavement Restoration

No portion of the work shall be left more than fourteen (14) days without temporary pavement surface; however, the Engineer may require that temporary pavement surface be installed sooner to ensure that no more than one-thousand (1,000) linear feet of road be open at one time. Payments on installed pipe of up to fifty percent (50%) of the unit price can be retained by the Engineer until a crushed concrete or limerock base material along with a sand seal temporary pavement surface is provided. The Engineer can restrict further pipe laying if satisfactory and on-going street restoration is not performed by the Contractor. Temporary work shall be maintained in a suitable and safe condition for traffic until the permanent pavement is laid, or until final acceptance of the work.

SP-51 City Testing

The cost of retesting materials and/or workmanship, which has been initially tested by the City and found to be unacceptable, is to be borne by the Contractor.

SP-52 Street Pavement Base and Asphalt Surface Replacement

Permanent base material shall be installed and compacted to the required densities (98% modified proctor) in layers not exceeding six (6) inches.

The quantity of Permanent Pavement Base, in square yards, to be measured for payment will be as detailed on the plans.

The total compacted thickness of replacement pavement base and the asphalt surface shall be a minimum of that shown on details, in the plans.

SP-59 Monthly Schedules

In addition to the Progress Schedule required in Article 4.02 of the Agreement, the Contractor shall submit a monthly schedule with each pay estimate. Pay estimates will not be processed unless accompanied by an updated

monthly schedule. The schedule shall be broken down into the following components:

1. Well pointing
2. Main line pipe installation
3. Lateral pipe
4. Cutting subgrade
5. Base work
6. Paving
7. Restoration

SP-60 Contingent Items

Contract Items in the Proposal marked with an asterisk (*) are contingent. These items may or may not be used.

Contingent Contract Items that have an established unit price by the City or a unit bid price established by the Contractor will be the unit price the City will pay the Contractor should it become necessary to use more or less of the stated quantities.

SP-61 Replacement of Traffic Markings and Signalization Loops

The Contractor shall furnish all labor, equipment and materials to replace, test and maintain all traffic markings (temporary and permanent) and signalization loops removed or damaged by pipeline construction and appurtenant work as shown on the Plans, specified and directed by the Engineer.

The replacement of traffic markings (temporary and permanent), signalization loops and all appurtenant work shall be replaced by the Contractor in kind.

It shall be the Contractor's responsibility to field verify before construction begins all markings and signalization loops to be replaced.

All traffic markings and signalization loops shall conform to the Workmanship and Materials standards set forth in the latest edition of the Florida Department of Transportation Standard and Supplemental Specifications.

Payment for the replacement of temporary and permanent traffic markings, signalization loops and all appurtenant work shall be included in the various classified unit price Contract Items, or in the total Lump Sum Price, as applicable, and no separate payment shall be made.

SP-69 New Electric Service

"The Contractor shall provide, at his own expense, temporary lighting and power facilities required for the proper prosecution and inspection of the work. If, in the opinion of the Engineer, these facilities are inadequate, the Contractor will not be permitted to proceed with any portion of the work affected thereby." (General Provisions G-7.02.)

Prior to construction, the City will pay TECO an installation fee for new service, which will be good for the duration

of the contract. Any additional fees required shall be the responsibility of the Contractor.

The installation of the new permanent electrical service as well as any coordination with the City or County electrical inspection and with Tampa Electric Company shall be solely the responsibility of the Contractor. TECO will not perform any work without the following: (1) All fees paid. (2) Inspection by the appropriate electrical department.

SP-72 Request for Information and Shop Drawings

Contractor shall prepare and submit up to four (4) hardcopies and one (1) bookmarked, unsecured electronic post document format (PDF) file for all Submittals, RFI, and Shop Drawings. The City will review the submittals and return one (1) hardcopy and PDF file of the marked up submittal to the contractor. The contractor shall have approved hard copies of all submittals at the job site. Each electronic submission must be in a high resolution color format and shall be original electronic documents from the manufacturer. Hardcopies shall be high quality printed in color. Scanned printouts or poor quality resolution PDF files will not be accepted.

SP-73 Work Directive Change

A Work Directive Change is a written directive to the Contractor, issued on or after the date of the execution of the Agreement, and signed by the Engineer on behalf of the City, ordering an addition, deletion or revision in the work, or responding to an emergency. A Work Directive Change will not change the contract price or the time for completion, but is evidence that the parties expect that the change directed or documented by an Authorization to Proceed with Extra Work letter will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the contract price or the time for completion.

Without invalidating the Agreement, additions, deletions or revisions in the work may, at any time or from time to time, be authorized by a Change Order or a Work Directive Change. Upon receipt of any such document, the Contractor shall promptly proceed with the work involved.

SP-85 Storage of Materials

Unless otherwise directed, the Contractor may not use that portion of the right-of-way located between the existing/proposed curb lines or existing/proposed edges of pavement to store pipe, structures, materials, surplus excavated fill, or equipment other than that used for excavating or dewatering. The Contractor may use that portion of the right-of-way behind the existing or proposed curb line or off the edge of pavement for storage provided that this use does not obstruct pedestrian or vehicular traffic and conforms to the City's Tree Ordinance. If the area behind the curb line/off the edge of pavement is insufficient in size to accommodate the Contractor's storage needs, the Contractor is required to secure the use of a vacant parcel of land for use as a storage site for the duration of this project. Upon completion of the project, all storage areas will be restored to a condition which meets or exceeds the pre-construction condition of the storage area. Payment for use and restoration of storage areas will be included in the appropriate lump sum pay items and unless the area is within the pipeline pay limits, no separate payment will be made therefor.

SP-86 Temporary Stockpiling

For temporary stockpiling of the excavated material within project limits (and anywhere within City limits), the Contractor shall follow the following procedure:

Public Right-of-Way

a. The Contractor will not be allowed to stockpile suitable, excavated material within right-of-way for a period in excess of 30 calendar days. Unsuitable excavated material shall not be stockpiled within public right-of-way for a period in excess of 7 calendar days.

Location other than Public Right-of-way

b. The Contractor shall:

1) Obtain the permission (in writing) from the owner of the property where stockpiling is desired.

2) At his own expense present the above letter and a contour plan of the site to the Engineer for approval of the stockpiling site.

The time periods of stockpiling shall be specified by the Contractor in writing.

Upon removal of stockpiled material, the Contractor shall clean up and grade the site to its original contours and conditions.

The City of Tampa shall not be a party to the agreement between the Contractor and the property owner.

Regardless of the location of stockpiling, it shall be the Contractor's responsibility to make sure that stockpiling in no way constitutes a public hazard or nuisance and does not interfere with the natural surface runoff in the area

SP-89 Temporary Work Stoppages

The Contractor shall temporarily discontinue all construction activities from, and including, Thanksgiving Day through the following Sunday, and December 24 through January 2.

Prior to temporary work stoppages, all streets shall be restored to permit access to all businesses and residences and to allow ingress and egress by local traffic only. The Contractor shall maintain all streets at this condition level for the duration of the shutdown period.

All equipment, except that used for excavation and well pointing, and all materials including, but not limited to, manhole structures, pipe, and stockpiled material shall be removed to either the Contractor's storage lot or to a location outside the project area as approved by the Engineer.

The Contractor will also be required to accommodate the annual Gasparilla Parade and Gasparilla Run by ceasing construction activities and providing ingress and egress to allow local traffic only. The time limits for these requirements shall be from one day before to one day after the Gasparilla Parade and the Gasparilla Run. Accommodation of these events will entail restoration of all streets to at least a sand seal coat of crushed concrete or limerock base. All equipment, except that used for excavation and well pointing, and all materials including, but not limited to, manhole structures, pipe, and stockpiled material shall be removed to either the Contractor's storage lot or to a location outside the project area as approved by the Engineer.

All costs associated with furnishing labor, equipment, temporary pavement restoration, demobilization, mobilization, signage, barricades, clean-up, security, and any other incidentals required to accommodate the Thanksgiving, Christmas and New Years' Holidays and Gasparilla Parade and Race shall be included in the various contract unit prices, and no additional payment shall be made therefor.

SP-91 Project Photographs

The Contractor will not be required to furnish photographs of the project; however, the Engineer may or may not take photographs of the area immediately prior to and after completion of the construction for record and information. To assure that there will not be any conflict with this photography, the Contractor shall not perform clearing operations or action which will disturb any street or area within the project until the Engineer has been advised thereof and has had adequate opportunity to perform the desired photography.

SP-92 Project Videotaping

Prior to commencing work, the Contractor shall submit to the Engineer for approval, a DVD containing a continuous color video recording including complete coverage of pre-construction conditions of all surface features within the construction's zone of influence, (including detour routes) simultaneously produced audio commentary and electronic display of time and date. The video recording shall be sufficient to fulfill the technical and forensic requirements of the project and provide continuous unedited coverage, establishing locations and viewer orientation with clear, bright, steady and sharp video images with accurate colors free of distortion or other imperfections. The DVD must be accompanied by a detailed log of its contents including date, locations, video counter numbers and features. No work shall be allowed until the completed DVD and log are approved by the Engineer.

SP-95 Reconstruction of Swales

This project consists of areas where existing ditches or swales shall be regraded according to the typical section and design as indicated on the Plans.

The Contractor may be required to fill existing ditches or swales as per designed elevations. The Contractor is to use excavated, suitable material from the work site first before importing suitable fill material.

The cost of ditch or swale reconstruction including all material, labor, equipment, etc., to complete the job, excluding the cost of sodding, shall be included under the various classified unit price items, or in the total Lump Sum Price, as applicable, and no additional payment shall be made therefor.

SP-105 Rubble Riprap

Rubble riprap shall be placed against the embankment or other work to be protected in conformity with the specifications, lines, grades, dimensions, and notes shown in the Plans.

Rubble riprap shall consist of broken concrete or of broken stone. The material shall be sound and durable, with specific gravity of at least 1.90. It shall be free of cracks, soft seams, and other structural defects. The pieces shall be

roughly angular and shall be reasonably free from thin, flat, or elongated pieces.

The cost of rubble riprap shall include all material, filter fabric underlayment, labor, equipment, etc., to complete the job, and shall be included under the various classified unit price items, or in the total Lump Sum Price, as applicable, and no additional payment shall be made therefor.

SP-112 Removal of Existing Pavement

The Contractor shall remove existing pavement and additional excavated material required for proposed pavement grade as indicated on the Plans and as directed by the Engineer.

The removal of existing pavement shall include the regrading of the shoulder, etc., as indicated on the Plans.

The cost of existing pavement removal and additional dirt removal including all labor, equipment, etc., to complete the job shall be included under the various classified unit price items, or in the total Lump Sum Price, as applicable, and no additional payment shall be made therefor.

SP-122 Foundation Rock (#57)

The Contractor shall also provide 2-foot thick foundation rock fully wrapped with filter fabric under all manholes and inlets of this project. The filter fabric shall be included in the price of rock, and no additional payment shall be made. Where found necessary, the Engineer has the right to increase foundation rock with filter fabric at the same unit bid price.

SP-129 As-Built Plans

During manufacture and construction, installation and testing, records shall be kept of any changes or adjustments made in the work. All such changes shall be incorporated in the "As-Built" plans, shown in red.

The Contractor shall provide the City of Tampa with one (1) hardcopy, one (1) electronic high resolution PDF copy, and one (1) AutoCAD file of "As-Built" plans along with the supporting survey data. The survey shall be in accordance with the City of Tampa Department of Public Works specifications and note keeping standards for surveys and signed by a Land Surveyor registered in the State of Florida. Plan sheets shall have all deviations from original design annotated in red pencil to clearly show as-built conditions. Relocation of existing facilities and utilities must be clearly noted and their location identified by station, offset and elevation, when performed by the Contractor.

All relocation of structures and pipelines must be clearly shown on Plans with as-built stations and offsets verified. All as-built inverts for the entire project must be clearly noted on plan sheets. No separate payment shall be made for this work.

All as-built plans shall be submitted within seven (7) calendar days of the final inspection. The final payment will not be issued until the as-built plans have been submitted to, and accepted by the City. Upon request the City will provide AutoCAD drawings.

SP-130 SAFETY:

A. Responsibility: Employees shall immediately report any unsafe work practice or unsafe condition to their supervisor(s). The Contractor is solely responsible for the safety of its workers, and shall comply with all applicable

requirements [i.e.: 29 CFR 1910 -Occupational Safety and Health Standards, 29 CFR 1926 - Safety and Health Regulations for Construction, etc] and industry safety standards while at the work site. The fact that City personnel may bring un-safe conditions to the attention of any member of the Contractor's work force does not relieve the Contractor of this responsibility.

All Contractors' employees and sub-contractors should be given a copy of SP-130.

The Contractor shall have a designated Safety Officer within its organization. At the Pre-Construction meeting, the Contractor shall provide the name and contact information of the Safety Officer to the Engineer.

At the Pre-Construction meeting, the Contractor will be given pertinent safety related information, necessary forms and instructions that pertain to any work that might be utilized during the contract. The Contractor shall be responsible to disseminate that information to its employees and sub-contractors. Special care shall be taken by the Contractor to ensure that any new employee or sub-contractor to the work site shall be briefed on these safety instructions.

If warranted by the project and directed by the Engineer, the Contractor shall develop and implement a comprehensive health and safety plan for its employees that will cover all aspects of onsite construction operations and activities associated with the Contract. This plan must comply with all applicable health and safety regulations and any project specific requirements specified in the Contract.

B. Incident Reporting: All accidents that result in personal injury, illness or property damage shall be immediately reported and investigated, regardless of the extent of injury, illness or property damage. Employees must report accidents within one hour (or as soon as practical) from the time of occurrence to their immediate supervisor, who in turn will report it to the City's inspector. The City inspector will record the incident in the daily report and report it to the Risk Management Division (274-5708).

C. Air-Borne Debris: All personnel in proximity to drilling, sawing, sanding, scraping, spraying, power-washing or other work being done, either in enclosed spaces or in the open, that creates dust or air-borne debris shall wear eye protection [29 CFR 1910.133] and a respirator [29 CFR 1910.134].

D. Confined Spaces: OSHA defines a confined space as having limited or restricted means for entry or exit, and is not designed for continuous employee occupancy. Confined spaces include, but are not limited, to vaults, tanks, manholes, wet-wells, pipelines, utility tunnels, etc.

The Contractor shall take measures [29 CFR 1910.146 (c)(5)] to ensure that atmospheric conditions in confined spaces are not hazardous to occupants. This can be accomplished by forcing a sufficient amount of clean air through the confined space and testing the atmosphere by using a portable certified, calibrated, atmosphere monitor that meets OSHA requirements [29 CFR 1910.146(c)(5)(ii)(C)]. The atmosphere monitor should record oxygen content, flammable gases and vapors and toxic air contaminants, such as the Industrial Scientific TMX-412.

E. Trench Safety: Any excavation deeper than four (4) feet shall adhere to the requirements contained in 29 CFR 1926.650 thru 652 and the Florida Trench Safety Act [Florida Statutes, ss 553.60 - 553.64].

F. Open Flames: No fires shall be allowed. No open flames necessary for any construction activity shall ever be left un-attended. A current, portable, fully charged fire extinguisher shall be located with each activity requiring an open flame.

G. Sparks: Any activity lasting more than 10 continuous minutes that creates sparks, such as grinding or chipping, shall have a dedicated fire watch in attendance. A current, portable, fully charged fire extinguisher shall be located with each activity creating sparks, regardless if a fire watch is required or not.

H. First Aid: The Contractor shall furnish appropriate First Aid Kits [29 CFR 1910.151] and shall be responsible to ensure its employees are properly trained to render first aid. If injurious corrosive materials are to be utilized, eyewash and body wash facilities must be provided in the immediate area.

I. Related Costs: All costs associated with these, or any safety measures shall be included in the total lump sum contract price or the various contract item unit prices, as applicable, and no separate payment shall be made therefor.

* * *

City of Tampa – DMI Sub-(Contractors/Consultants/Suppliers) Payments

(FORM MBD-30)

[ ] Partial [ ] Final

Contract No.: _____ WO#,(if any):_____ Contract Name:_____

Contractor Name:_____ Address:_____

Federal ID:_____ Phone:_____ Fax:_____ Email:_____

GC Pay Period:_____ Payment Request/Invoice Number:_____ City Department:_____

Total Amount Requested for pay period: $_____ Total Contract Amount(including change orders):$_____

-Type of Ownership - (F=Female M=Male), BF BM = African Am., HF HM = Hispanic Am., AF AM = Asian Am., NF NM = Native Am., CF CM = Caucasian S = SLBE

Type Trade/Work Activity []Sub []Supplier Federal ID	Company Name Address Phone & Fax	Total Sub Contract Or PO Amount	Amount Paid To Date Amount Pending Previously Reported	Amount To Be Paid For This Period Sub Pay Period Ending Date
			$	$
			$	$
			$	$
			$	$
			$	$
			$	$

(Modifying This Form or Failure to Complete and Sign May Result in Non-Compliance)

Certification: I hereby certify that the above information is a true and accurate account of payments to sub – contractors/consultants on this contract.

Signed:_____ Name/Title:_____ Date:_____

Note: Detailed Instructions for completing this form are on the next page

Page 2 of 2 – DMI Payment

Instructions for completing The DMI Sub-(Contractors/Consultants/ Suppliers) Payment Form (Form MBD-30)

This form must be submitted with all invoicing or payment requests where there has been subcontracting rendered for the pay period. If applicable, after payment has been made to the subcontractor, "Waiver and Release of Lien upon Progress Payment", "Affidavit of Contractor in Connection with Final Payment", or an affidavit of payment must be submitted with the amount paid for the pay period. The following will detail what data is required for this form. The instructions that follow correspond to the headings on the form required to be completed. **(Modifying or omitted information from this form my result in non-compliance).**

- **Contract No.** This is the number assigned by the City of Tampa for the bid or proposal.
- **W.O.#** If the report covers a work order number (W.O.#) for the contract, please indicate it in that space.
- **Contract Name.** This is the name of the contract assigned by the City of Tampa for the bid or proposal.
- **Contractor Name.** The name of your business.
- **Address.** The physical address of your business.
- **Federal ID.** A number assigned to a business for tax reporting purposes.
- **Phone.** Telephone number to contact business.
- **Fax.** Fax number for business.
- **Email.** Provide email address for electronic correspondence.
- **Pay Period.** Provide start and finish dates for pay period. (e.g. 05/01/13 – 05/31/13)
- **Payment Request/Invoice Number.** Provide sequence number for payment requests. (ex. Payment one, write 1 in space, payment three, write 3 in space provided.)
- **City Department**. The City of Tampa department to which the contract pertains.
- **Total Amount Requested for pay period.** Provide all dollars you are expecting to receive for the pay period.
- **Total Contract Amount (including change orders).** Provide expected total contract amount. This includes any change orders that may increase or decrease the original contract amount.
- **Signed/Name/Title/Date**. This is your certification that the information provided on the form is accurate.
- **See attached documents.** Check if you have provided any additional documentation relating to the payment data. Located at the bottom middle of the form.
- **Partial Payment.** Check if the payment period is a partial payment, not a final payment. Located at the top right of the form.
- **Final Payment.** Check of this period is the final payment period. Located at the top right of the form.

The following instructions are for information of any and all subcontractors used for the pay period.

- **(Type) of Ownership.** Indicate the Ethnicity and Gender of the owner of the subcontracting business or SLBE.
- **Trade/Work Activity.** Indicate the trade, service, or material provided by the subcontractor.
- **SubContractor/SubConsultant/Supplier.** Please indicate status of firm on this contract.
- **Federal ID.** A number assigned to a business for tax reporting purposes. This information is critical in proper identification of the subcontractor.
- **Company Name, Address, Phone & Fax**. Provide company information for verification of payments.
- **Total Subcontract Amount.** Provide total amount of subcontract for subcontractor including change orders.
- **Amount Paid To Date.** Indicate all dollars paid to date for the subcontractor.
- **Amount Pending, Previously Reported.** Indicate any amount previously reported that payments are pending.
- **Amount To Be Paid for this Period.** Provide dollar amount of dollars requested for the pay period.
- **Sub Pay Period Ending Date.** Provide date for which subcontractor invoiced performed work.

Forms must be signed and dated or will be considered incomplete. The company authorized representative must sign and certify the information is true and accurate. Failure to sign this document or return the document unsigned can be cause for determining a company is in non-compliance of Ordinance 2008-89.

If any additional information is required or you have any questions, you may call the Minority Business Development Office at (813) 274-5522.

SIGN EXAMPLE ONLY GRAPHIC TO BE DEVELOPED BY CONTRACTOR

scale: 3"

Sign Information

Building a Better Tampa

Downtown Riverwalk

Creates a waterfront pedestrian walkway connecting the south edge of the CapTrust building with MacDill Park.

$1.5 Million investment
Scheduled for completion in October 2012

Orion Marine Construction, Inc.

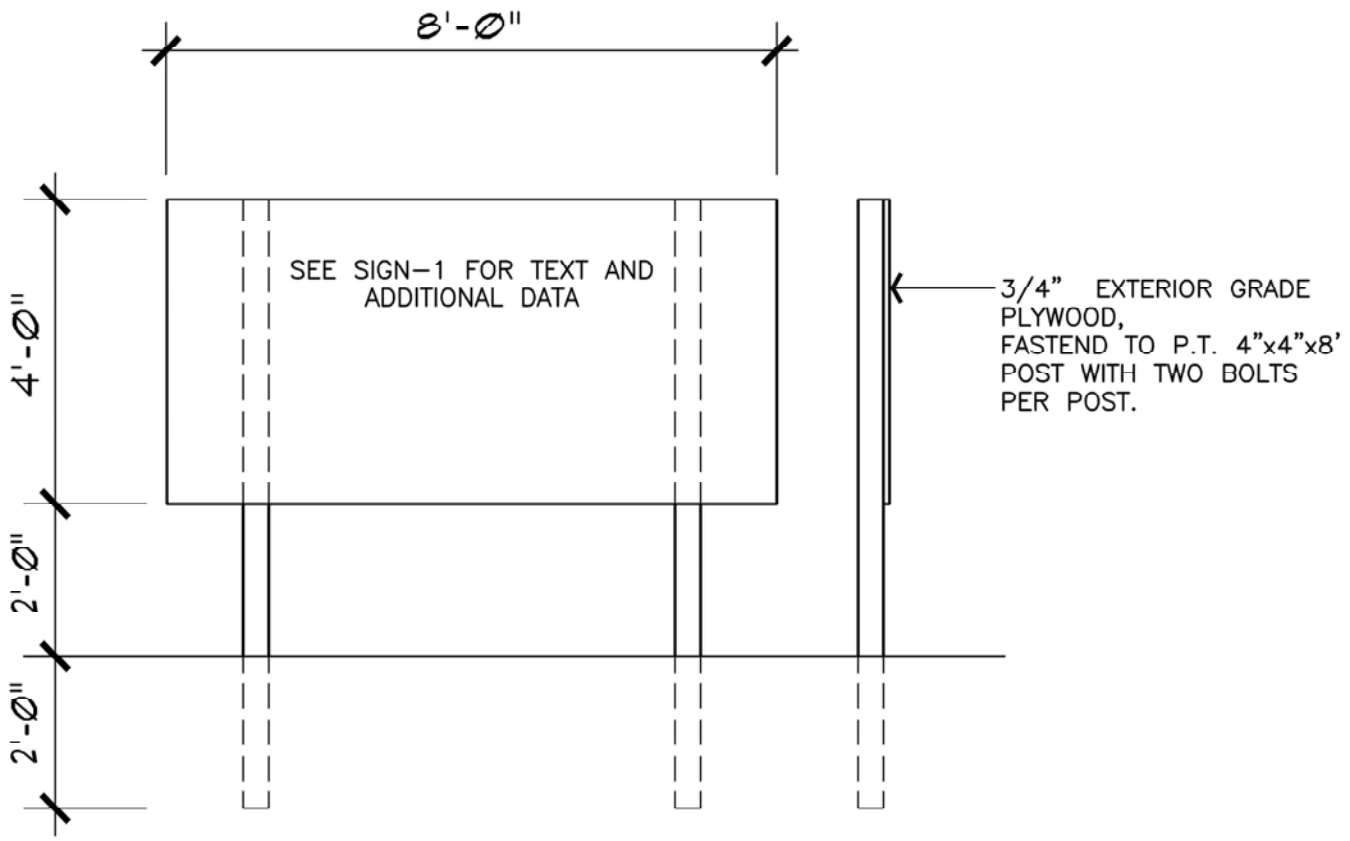
Colors

Blue: Sherwin Williams Naval SW6244
Green: Sherwin Williams Center Stage SW6920
White: Sherwin Williams Pure White SW7005

Font

Franklin Gothic

SIGN-1


8'-0"
4'-0"
2'-0"
2'-0"
SEE SIGN-1 FOR TEXT AND ADDITIONAL DATA
3/4" EXTERIOR GRADE PLYWOOD, FASTEND TO P.T. 4"x4"x8' POST WITH TWO BOLTS PER POST.

SECTION 1 - EXCAVATION - EARTH AND ROCK

W-1.01 General

Opencut excavations shall be made to the widths and depths necessary for constructing all structures, pipelines and other conduits included in the Contract, according to the Plans, and includes the excavation of any material which, in the opinion of the Engineer, is desirable to be excavated for any purpose pertinent to the construction of the work. Banks more than 5 feet high, where a danger of slides or cave-ins exist, shall be shored or sloped to the angle of repose.

Where excavations are to be made below groundwater, the Contractor shall submit to the Engineer for approval, in detail, his proposed method for control of groundwater, including a description of the equipment he plans to use and the arrangement of such equipment. No such excavation shall be started until approval of the Engineer has been obtained. Dewatering work shall be included in the Contract Items for pipelines, box culverts, inlets, manholes and other structures, and pumping stations, and no separate payment will be made therefor.

W-1.02 Clearing

The site of all opencut excavations shall first be cleared of obstructions preparatory to excavation. This includes the removal and disposal of vegetation, trees, stumps, roots and bushes, except as specified under the subsection headed "Trench Excavation."

W-1.03 Authorized Additional Excavation

In case the materials encountered at the elevations shown are not suitable, or in case it is found desirable or necessary to go to an additional depth, or to an additional depth and width, the excavation shall be carried to such additional depth and width as the Engineer may direct in writing. The Contractor shall refill such excavated space with either Class D concrete, or select sand or crushed stone fill material, as ordered. Where necessary, fill materials shall be compacted to avoid future settlement. Additional earth excavations so ordered and concrete, or selected sand or crushed stone fill material ordered for filling such additional excavation and compaction of select sand or crushed stone fill material will be paid for under the appropriate Contract Items or where no such items exist, as extra work as specified in Article 7 of the Agreement.

W-1.04 Unauthorized Excavation

Wherever the excavation is carried beyond or below the lines and grades shown or given by the Engineer, except as specified in the subsection headed "Authorized Additional Excavation," all such excavated space shall be refilled with such material and in such manner as may be directed in order to ensure the stability of the various structures. Spaces beneath all manholes, structures or pipelines excavated without authority shall be refilled by the Contractor at his own expense, with Class D concrete, or select sand or crushed stone fill material, and properly compacted, as ordered by the Engineer, and no separate payment will be made therefor.

W-1.05 Segregation and Disposal of Material

Topsoil suitable for final grading and landscaping and excavated material suitable for backfilling or embankments shall be stockpiled separately on the site in locations approved by the Engineer. Excavated and other material shall not be stored nearer than 4 feet from the edge of any excavation and shall be so stored and retained as to prevent its falling or sliding back into the excavation. Surplus excavated material and excavated material unsuitable for backfilling or embankments shall become the property of the Contractor and shall be transported, as approved by the Engineer, away

from the site of the work to the Contractor's own place of disposal.

W-1.06 Shoring and Sheeting

All excavations shall be properly shored, sheeted, and braced or cut back at the proper slope to furnish safe working conditions, to prevent shifting of material, to prevent damage to structures or other work, and to avoid delay to the work, all in compliance with the U. S. Department of Labor Safety and Health Regulations for Construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54). The minimum shoring, sheeting and bracing for trench excavations shall meet the general trenching requirements of the safety and health regulations. Before starting excavation for jacking pits and structures, the Contractor shall submit complete design calculations and working drawings of proposed sheeting and bracing arrangements which have been prepared, signed and sealed by a Professional Engineer registered in the State of Florida. Bracing shall be so arranged as not to place any strain on portions of completed work until the general construction has proceeded far enough, in the opinion of the Engineer, to provide ample strength. If the Engineer is of the opinion that at any point the sheeting or supports furnished are inadequate or unsuited for the purpose, he may order additional sheeting or supports to be installed. Whether or not such orders are issued, the sole responsibility for the design, methods of installation, and adequacy of the sheeting and supports shall be and shall remain that of the Contractor.

Tight sheeting shall be used in that portion of the excavation in City collector and arterial streets and in State and County highways below the intersection of a 1 on 1 slope line from the edge of the existing pavement to the nearest face of the excavation.

In general, sheeting for pipelines shall not be driven below the elevation of the top of the pipe. If it is necessary to drive the sheeting below that elevation in order to obtain a dry trench or satisfactory working conditions, the sheeting shall be cut off at the top of the pipe and left in place below the top of the pipe at no additional cost.

The sheeting and bracing shall be removed as the excavation is refilled in such a manner as to avoid the caving in of the bank or disturbance to adjacent areas or structures except as otherwise shown or directed. Voids left by the withdrawal of the sheeting shall be carefully filled by ramming or otherwise as directed.

Permission of the Engineer shall be obtained before the removal of any shoring, sheeting, or bracing. Such permission by the Engineer shall not relieve the Contractor from the responsibility for injury or to other property or persons from failure to leave such sheeting and bracing in place.

W-1.07 Sheeting Left in Place

The Engineer may order, in writing, any or all sheeting or bracing to be left in place for the purpose of preventing injury to the structures or to other property or to persons, whether such sheeting or bracing was shown on the Plans or placed at his direction or otherwise. If left in place, such sheeting shall be cut off at the elevation ordered, but, in general, such cutoffs shall be at least 18 inches below the final ground surface. Bracing remaining in place shall be driven up tight.

The right of the Engineer to order sheeting and bracing left in place shall not be construed as creating any obligation on his part to issue such orders.

Sheeting and bracing left in place, by written order of the Engineer, will be paid for under the appropriate Contract Item if included in the Proposal or otherwise by provisions of extra work as specified in Section 7 of the Agreement.

W-1.08 Removal of Water

At all times during the excavation period and until completion and acceptance of the work at final inspection, ample means and equipment shall be provided with which to remove promptly and dispose of properly all water entering any excavation or other parts of the work. The excavation shall be kept dry. No water shall be allowed to rise over or come in contact with masonry and concrete until the concrete and mortar have attained a set satisfactory to the Engineer and, in any event, not sooner than 12 hours after placing the masonry or concrete. Water pumped or drained from the work hereunder shall be disposed of in a safe and suitable manner without damage to adjacent property or streets or to other work under construction. Water shall not be discharged onto streets without adequate protection of the surface at the point of discharge. No water shall be discharged into sanitary sewers. No water containing settleable solids shall be discharged into storm sewers. Any and all damage caused by dewatering the work shall be promptly repaired by the Contractor.

W-1.09 Structure Excavation

Excavations shall be of sufficient size and only of sufficient size to permit the work to be economically and properly constructed in the manner and of the size specified. The bottom of the excavation in earth and rock shall have the shape and dimensions of the underside of the structure wherever the nature of the ground will permit.

W-1.10 Trench Excavation

Before starting trench excavation, all obstructions which are to be removed or relocated shall be cleared away. Trees, shrubs, poles, and other structures which are to be preserved shall be properly braced and protected. All trees and large shrubs shall be preserved with damage to the root structure held to a minimum, unless otherwise shown or specified. Small shrubs may be preserved or replaced with equivalent specimens.

The width of trenches shall be such as to provide adequate space for workmen to place, joint, and backfill the pipe properly, but shall be kept to a minimum. Unless otherwise approved by the Engineer, the clear width of the trench at the level of the top of the pipe shall not exceed the sum of the outside diameter of the pipe barrel plus 24 inches.

In sheeted trenches, the clear width of the trench at the level of the top of the pipe shall be measured to the inside of the sheeting.

Should the Contractor exceed the maximum trench widths specified above, without written approval of the Engineer, he may be required to provide, at his own expense, concrete cradle or encasement for the pipe as directed by the Engineer, and no separate payment will be made therefor.

The Contractor shall excavate trenches to the respective depths, below the bottom of the pipe, for the various classes of pipe bedding shown on the Plans so that pipe bedding material can be placed in the bottom of the trench and shaped to provide a continuous, firm bearing for the pipe barrel and bells.

If unstable material is exposed at the level of the bottom of the trench excavation, it shall be excavated in accordance with the subsection headed "Authorized Additional Excavation." When in the judgement of the Engineer the unstable material extends to an excessive depth, he may advise the Contractor in writing to stabilize the trench bottom with a crushed stone, sand mat or gravel mat to ensure firm support for the pipe by other suitable methods. Payment for such trench stabilization will be made under the appropriate Contract Items or where no such items exist, as extra work as specified in Section 7 of the Agreement.

The open excavated trench preceding the pipe laying operation and the unfilled trench with pipe in place shall be kept to a minimum length causing the least disturbance to traffic and use of adjacent property. Ladders shall be provided and so located as to provide means of exit from the trench without more than 25 feet of lateral travel.

W-1.11 Rock Excavation

The term "rock" as used herein shall include all materials which have compressive strengths in excess of 300 psi in their natural undisturbed state and which, in the opinion of the Engineer, require drilling and blasting, wedging, sledging, barring or breaking with power tools not otherwise required for normal excavating.

Rock shall be excavated, within the boundary lines and grades as shown on the Plans, specified, or given by the Engineer. Rock removed from the excavation shall become the property of the Contractor and shall be removed by him away from the site of the work to his own place of disposal, and no separate payment will be made therefor.

All shattered rock and loose pieces shall be removed.

For trench excavation in which pipelines or other conduits are to be placed, the rock shall be excavated to a minimum depth of 6 inches below the bottom of the pipe and the excavated space refilled with pipe bedding material. Placing, compacting, and shaping pipe bedding material shall be included in the various classified unit price Contract Items for pipelines, and no separate payment will be made therefor.

For manhole excavation, the rock shall be excavated to a minimum depth of 8 inches below the bottom of the manhole base for pipelines 24 inches in diameter and larger, and 6 inches below the bottom manhole base for pipelines less than 24 inches in diameter and the excavated space refilled with crushed stone. Placing, compacting, and shaping crushed stone for manhole bases shall be included in the appropriate Contract Items for manhole bases, and no separate payment will be made therefor.

For cast-in-place structures, the rock shall be excavated only to the bottom of the structure or foundation slab.

Excavated space in rock below structures, pipelines, and manholes which exceeds the depths specified above shall be refilled with Class D concrete, crushed stone, or other material as directed by the Engineer. Refilling of over-excavated rock in rock shall be included as part of the rock excavation, and no separate payment will be made therefor.

Where applicable, the requirements of the subsections on "Trench Excavation" and "Structure Excavation" shall be followed.

Blasting may be performed only when approved by the Engineer and authorized by the Agency having jurisdiction over the subject location and in accordance with all laws, ordinances, and regulations of the Agency.

W-1.12 Excavation for Jacking and Augering

Excavation for jacking or augering shall meet the requirements of the Workmanship and Materials section headed "Jacking and Augering."

* * *

SECTION 2 - BACKFILLING

W-2.01 General

All excavation shall be backfilled to the original surface of the ground or to such other grades as may be shown or directed. For areas to be covered by topsoil, backfill shall be left 4 inches below the finished grade or as shown on the Plans. The time elapsing before backfilling is begun shall be subject to the approval of the Engineer. In all backfilling, all compressible and destructible rubbish and refuse which might cause later settlement and all lumber and braces shall be removed from the excavated space before backfilling is started, except that sheeting and bracing shall be left in place or removed as the work progresses.

Construction equipment used to backfill against and over cast-in-place concrete structures shall not be permitted to travel over these structures until the designated concrete strength has been obtained as verified by concrete test cylinders. In special cases where conditions warrant, as determined by the Engineer, the above restriction may be modified if the concrete has gained sufficient strength, as determined from test cylinders, to satisfy design requirements for the removal of forms and the application of load.

W-2.02 Unsuitable Backfill Material

Before backfilling around structures, all rubbish shall be removed from behind the walls.

When the excavated material contains garbage, cinders, glass, tin cans, wood, or other trash or objectionable organic material, as determined by the Engineer, it shall not be used for backfill but shall be disposed of by the Contractor away from the site of the work to his own place of disposal. The unsuitable materials shall be replaced with backfill material which shall be sand, clay, gravel, sandy loam, or other excavated material free of objectionable organic matter, as approved by the Engineer.

W-2.03 Select Fill Material - General

Select fill material shall be used for pipe bedding, manhole bedding, trench and structure backfill, and other purposes as shown on the Plans, specified, and ordered in writing by the Engineer.

Select fill material shall be sand, conforming to the requirements of the subsections headed "Select Fill Material - Sand" or crushed stone or limestone screenings, conforming to the requirements of the subsection headed "Select Fill Material - Crushed Stone."

W-2.04 Select Fill Material - Sand

Sand used for pipe bedding or as select fill material for trench or structure backfill shall consist of job excavated sand or imported sand which can be readily and thoroughly compacted. Sand shall be reasonably well graded and shall fall within the following gradation limits:

Passing No. 4 sieve - 95 percent (minimum)
Passing No. 200 sieve - 10 percent (maximum)

Sand containing more than 10 percent of material passing the No. 200 sieve or sand which, in the opinion of the Engineer, would have a tendency to flow under pressure when wet will not be acceptable for use as pipe bedding or select fill material for trench or structure backfill

Sand shall not be used for bedding for manholes or other structures.

W-2.05 Select Fill Material - Crushed Stone

Crushed stone used for pipe bedding, manhole base bedding, or as select fill material for trench or structure backfill shall consist of clean, durable rock, angular in shape, which can be readily and thoroughly compacted. Crushed stone shall be reasonably well graded and shall be no greater than a No. 57 stone.

W-2.06 Pipe and Structure Bedding

All pipelines shall be bedded in well graded, compacted select fill material. Select fill material shall be sand, conforming to the subsection headed "Select Fill Material - Sand" and/or crushed stone, conforming to the subsection headed "Select Fill Material - Crushed Stone," as shown on the Plans, specified or ordered in writing by the Engineer. Pipe bedding shall be constructed in accordance with the details shown on the Plans.

When shown on the Plans or ordered in writing by the Engineer, pipelines (except PVC) shall be laid in Class D concrete cradle or encasement.

Precast concrete manhole bases shall be bedded on No. 57 stone, conforming to the subsection headed "Select Fill Material - Crushed Stone," as shown on the Plans.

Cast-in-place manhole bases and other foundations for structures shall be cast against undisturbed earth in clean and dry excavations.

Existing underground structures, tunnels, conduits and pipes crossing the excavation shall be bedded with compacted select fill material. Bedding material shall be placed under and around each existing underground structure, tunnel, conduit or pipe and shall extend underneath and on each side to a distance equal to the depth of the trench below the structure, tunnel, conduit or pipe.

W-2.07 Bedding Placement for Pipelines

Select fill material, used as pipe bedding, shall be placed by hand, in uniform layers not greater than 6 inches in loose thickness and thoroughly compacted in place. Select fill material pipe bedding shall extend to one foot over the top of the pipe.

Each layer of select fill shall be thoroughly tamped and compacted in place by hand or with suitable mechanical or pneumatic tools to a dry density not less than 95 percent of the maximum dry density as determined by AASHTO Des: T-180. No large stone fragments shall be placed in the pipe bedding nor closer than two feet to any point on any pipe.

W-2.08 Bedding Placement for Precast Concrete Manholes

No. 57 stone used for bedding beneath precast manhole bases shall be placed in uniform layers not greater than 6 inches in loose thickness and thoroughly compacted in place with suitable mechanical or pneumatic tools.

W-2.09 Structure Backfill

Backfill around manholes, risers, and structures shall be suitable job excavated material, selected fill material, or other material approved by the Engineer. Such backfill shall extend from the bottom of the excavation or top of structure bedding to the bottom of pavement base course, subgrade for lawn replacement, the top of the existing ground surface, or to such other grades as may be shown or given by the Engineer.

The backfill shall be placed in uniform layers not greater than 18 inches in loose thickness and thoroughly compacted in place with suitable mechanical or pneumatic tools to a dry density of not less than 98 percent of the maximum dry density as determined by AASHTO Des: T-180.

W-2.10 Trench Backfill

Trenches shall be backfilled from 1 foot over the top of the pipe to the bottom of pavement base course, subgrade for lawn replacement, to the top of the existing ground surface or to such other grades as may be shown or given by the Engineer. Trench backfill shall be select fill material, suitable job excavated material or other material, as approved by the Engineer.

Except under pavements and railroad tracks, trench backfill shall be placed in uniform layers not greater than 18 inches in loose thickness and thoroughly compacted in place using heavy-duty tampers such as pneumatic jackhammers with tamping foot attachment or vibrating rollers if required. Each layer shall be compacted to a dry density of not less than 95 percent of the maximum dry density as determined by AASHTO Des: T-180.

Where railroad tracks or pavements and appurtenances for streets or highways are to be placed over trenches, the trench backfill shall be placed in uniform layers not greater than 12 inches in loose thickness and thoroughly compacted in place with equipment as specified above. Each layer shall be compacted to a dry density of not less than 98 percent of the maximum dry density as determined by AASHTO Des: T-180. On City of Tampa streets, each layer shall be compacted as specified above to the bottom of the subbase which is defined as 10 inches below the bottom of the base course. The subbase shall be compacted to 98 percent of modified proctor.

Trench backfilling work shall be done in a manner to prevent dropping of material directly on top of any conduit or pipe through any great vertical distance. In no case shall backfilling material from a bucket be allowed to fall directly on a structure or pipe and in all cases, the bucket shall be lowered so that the shock of falling earth will not cause damage.

Lumps shall be broken up and if there are any stones, pieces of crushed rock or lumps which cannot be readily broken up, they shall be distributed throughout the mass so that all interstices are solidly filled with fine material.

W-2.11 Backfill for Short Tunnel

Where pipelines are placed in short tunnels, the annular space between the outside of the pipe wall and the tunnel wall shall be completely filled with select fill material or suitable excavated material. Pipelines in short tunnels shall be suitably supported, to permit placing backfill which shall be suitably tamped in place.

W-2.12 Finish Grading

Finish grading shall be performed to meet the existing contour elevations and grades shown on the Plans or given by the Engineer and shall be made to blend into adjacent natural ground surfaces. All finished surfaces shall be left smooth and free to drain.

Grading outside of pipelines or structure lines shall be performed in such a manner as to prevent accumulation of water within the area. Where necessary or where shown on the Drawings, finish grading shall be extended to ensure that water will be carried to drainage ditches, and the construction area left smooth and free from depressions holding water.

W-2.13 Responsibility for After Settlement

Any depression which may develop in backfilled areas from settlement within one year after the work is fully completed and accepted shall be the responsibility of the Contractor. The Contractor shall, at his own expense, provide as needed additional backfill material, pavement base replacement, permanent pavement sidewalk curb and driveway repair or replacement, and lawn replacement and shall perform the necessary reconditioning and restoration work to bring such depressed areas to proper grade as approved by the Engineer.

W-2.14 Inspection and Testing of Backfilling

All backfill shall be subject to test by the Engineer with the assistance of the Contractor.

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SECTION 4 - CONCRETE, MORTAR AND GROUT MATERIALS

W-4.01 General

The materials covered under this section are cement, sand, crushed stone, gravel, admixtures and water for use in concrete, mortar and grout.

W-4.02 Uniformity of Materials

Cement, fine and coarse aggregate and admixtures used in concrete for interior and exterior concrete surfaces shall be identical in type, color and size to provide a consistently uniform concrete finish.

W-4.03 Cement

Cement shall be that as manufactured by Florida Portland Cement or equal and shall be a domestic product from a source approved by the Engineer. Notarized Certificates of Manufacture as evidence that the cement conforms to the specified requirements shall be furnished. These certificates shall include mill-test reports on the cement. Cement shall be standard portland cement meeting the requirements of ASTM C 150 Type II.

Standard portland cement without an air-entraining agent shall be used in the manufacture of concrete pressure pipe and may be used in the manufacture of concrete sewer pipe by processes using a nonplastic (0 slump) mix.

W-4.04 Fly Ash

Fly ash shall be a local product from a source approved by the Engineer with cementitious properties conforming to the requirements of ASTM C 618, Class C or F, with the following exceptions:

Loss on ignition - 5% maximum
Sulfur trioxide - 4% maximum

Fly ash shall have a uniform light color. Notorized Certificates shall be furnished by the supplier to verify that the fly ash meets these requirements.

Fly ash shall be stored at the concrete mixing plant separate from the cement, in accordance with the requirements specified for storage of cement. Cement and fly ash shall not be intermixed prior to being added to the concrete mix.

W-4.05 Delivery and Storage of Cement

Cement delivered in bulk to the batching plant shall be stored in weathertight bins and batched by an appropriate weighing device, in accordance with ASTM C 94.

Cement shall be stored in weathertight buildings, bins or silos which will exclude moisture and contaminants. Cement that has deteriorated from storage shall not be used. Cement stored for a period longer than 6 months after testing shall be retested before use, and rejected if it fails to meet all of the specified requirements. Accepted cement that has been in storage for more than one year from the time of original acceptance shall not be used.

Cement delivered to the job site shall be in strong, well-made bags plainly marked with the brand, name of manufacturer and net weight. Packages received in a damaged condition will be rejected.

Ready-mixed concrete delivered shall be accompanied by delivery tickets showing the following:

1. Date and time leaving the plant
2. Type of cement and weight
3. Quantity of water and time added
4. Aggregate moisture correction factor
5. Admixtures and weight
6. Site arrival time
7. Site leaving time
8. Type of fly ash and weight

W-4.06 Samples of Aggregates

At least 15 days before the first concrete is to be used, a 50-pound representative sample of each aggregate shall be submitted to the Engineer for approval. As the work proceeds, additional samples shall be submitted if and when required by the Engineer.

W-4.07 Fine Aggregate

Fine aggregate shall be natural sharp sand meeting the requirements of ASTM C 33, except as modified herein.

Fine aggregate subjected to the test for organic impurities and producing a color darker than standard will be rejected without exceptions.

Fine aggregate shall meet the requirements of the soundness test set forth in Paragraph 7.1 of ASTM C 33. The exceptions stated in Paragraphs 7.2 and 7.3 shall not apply.

Fine aggregate for mortar and grout shall be well graded within the following limits by weight when tested in accordance with ASTM C 136.

	Percentage Passing	
Sieve	Mortar	Grout
3/8-inch 100	100	
No. 4	100	100
No. 8	96 to 100	96 to 100
No. 16	70 to 90	70 to 90
No. 30	40 to 70	50
No. 50	15 to 35	5 to 35
No. 100	5 to 15	5 to 15

W-4.08 Coarse Aggregate

Coarse aggregate shall consist of gravel or crushed stone meeting the requirements of ASTM C 33. The limits for deleterious substances and physical property requirements given in Table 3 shall apply for each concrete class designation without exception. Coarse aggregate shall be graded according to Size No. 467, No. 57, or No. 67 Table 2.

Size No. 57 or No. 67 shall be used for all thin or closely reinforced concrete work, such as floors and roofs less than 7 inches thick, walls less than 9 inches thick, all beams, girders, struts, columns, and all fireproofing. Size No. 57, 67 or No. 467 shall be used for all other concrete work; however, gradation sizes shall not be mixed.

W-4.09 Storage and Handling of Aggregates

Aggregates shall be kept clean and free from all other materials during transportation and handling. They shall be kept separated from each other until measured in batches and placed in the mixer.

Aggregates shall be stockpiled in a manner to prevent segregation unless finish screening is provided at the batch plant.

W-4.10 Admixtures

Admixtures shall be used as specified under the Workmanship and Materials section headed "Concrete".

The use of admixtures shall be limited to an air-entraining admixture conforming to ASTM C 260, water-reducing admixtures conforming to ASTM C 494, Type A, and water-reducing set retarders conforming to ASTM C 494, Type D. All concrete, except Class D, shall contain an air-entraining admixture.

Water-reducing and set-retarding admixtures shall be used only with the written permission of the Engineer. Test data shall be provided indicating that the concrete containing the admixtures has improved workability and does not show any abnormal behavior such as premature stiffening or slump loss for at least 30 minutes after mixing has been completed, or any other abnormal differences when compared with concrete made without the admixture. Such test data shall be based on fresh concrete from the proposed supplier, using batching equipment proposed for use on the project.

Admixtures containing calcium chloride, thiocyanates or more than 0.05 percent chloride ion are not permitted. Written conformance to the above requirements and the chloride ion content of each admixture will be required from the admixture manufacturer prior to mix design review by the Engineer.

When more than one admixture is used, each admixture shall be dispensed separately into the mix, and at different times during mixing, in accordance with the recommendation of ACI Committee 212. After system approval, no changes shall be made in batching equipment or concrete constituents without approval of the Engineer.

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SECTION 5 - CONCRETE

W-5.01 General

Concrete supplied and placed under this Contract shall be divided into various classes according to use and compressive strength.

Class A concrete shall be used for all precast concrete units.

Class B concrete shall be used for all reinforced concrete structures designed for high strength and water-tightness; and shall be used for columns, walls, beams, slabs and, in general, wherever formwork other than simple forms is required.

Class C concrete shall be used for all reinforced concrete structures designed for high strength and water-tightness; and shall be used for bottoms of structures, electrical duct encasement, and, in general, where concrete is deposited directly on the bottoms or slopes of excavations and where only simple forms are required.

Class D concrete shall be used for low-strength concrete, plain or reinforced, used for work mats beneath structures, soil stabilization, pipe cradles and encasement, filling, and other similar purposes. Clean boulders or fragments of rock excavated during construction may be embedded in large volumes of Class D concrete to provide added bulk. Care shall be taken in placing the boulders or rock fragments so that there will be no voids in the concrete.

W-5.02 Strength

The specified compressive strength of concrete in pounds per square inch for the classes previously described shall be as follows. The 28-day strength shall be designated as f'_c.

Class	7-Day Test	28-Day Test
A	3,400	5,000
B	2,700	4,000
C	2,700	4,000
D	1,300	2,000

Concrete shall be proportioned and produced to provide an average 28-day compressive strength in excess of the specified compressive strength, f'_c. The required proportions shall be based on tests of cylinders made, cured and tested as prescribed herein.

Mix designs shall be prepared for each type of concrete required and submitted for approval. Concrete of any class which will be placed by pumping methods will require a separate mix design and mix design approval, as described herein, in addition to the mix design approval required for other placement methods.

W-5.03 Selection of Concrete Proportions

Concrete proportions shall be selected to provide the required strength and durability and to provide workability and consistency so that the concrete can be worked into forms and around reinforcement without segregation or excessive bleeding.

Concrete for all water-containing structures and all structures constructed below grade shall be watertight. For this concrete, the maximum water-cement ratio shall not exceed 0.50 by weight of the total cementitious constituent. The quantity of water shall be the total quantity, including free surface moisture contained in the aggregates.

Class B and C concrete may contain fly ash in an amount not to exceed 150 pounds per cubic yard, and shall have a minimum cement content of 350 pounds per cubic yard.

Concrete proportions including the water-cement ratio shall be established on the basis of field experience or trial mixtures with the materials to be used in accordance with Section 4.3 of ACI 318. All test results shall be submitted for approval a minimum of 35 days before concrete is placed.

W-5.04 Entrained Air Content

All Class B and C concrete shall be air entrained with an average total air content of 5 percent. Tolerance on air content as delivered shall be plus or minus 1.5 percent. Air content tests in accordance with ASTM C 138 or C 173 shall be submitted with mix design data.

W-5.05 Consistency

When tested in accordance with ASTM C 143, concrete mix design slumps shall be within the following limits:

	Minimum and Maximum Slump in Inches	
Concrete Placement	Class A, B, and C	Class D
Normal	3 to 4	2 to 4
Pumped	4 to 6	4 to 6

Mix design slump shall be based on the concrete mix without water reducing admixture. For production concrete, slump may be increased up to 1 inch by use of specified water reducing admixtures. For pumped concrete, slump shall be measured at end of hose.

The combined aggregates shall be graded such that when a sample of the mix is separated on No. 4 standard sieve, the weight passing the sieve shall be not less than 30 percent nor greater than 45 percent of the total, unless otherwise specified.

W-5.06 Architectural Concrete

Architectural concrete shall be air entrained with a total air content of at least 4 percent but not to exceed 5 percent. Mix proportions for architectural concrete shall provide a workable mixture of proper strength. The maximum water cement ratio shall not exceed 0.50 by weight and the ratio provided shall be consistent from batch to batch. Slump for architectural concrete shall not exceed 5 inches, nor shall the temperature at the time of placement exceed 80 degrees F. Retarding admixtures may be used in architectural concrete subject to prior approval.

W-5.07 Water Reducing Admixtures

Where the proportions of aggregates, cement and mixing water conforming to the specification requirements produce a concrete with a slump less than the minimum required, a water-reducing admixture shall be used to obtain improved workability. Water-reducing admixtures shall comply with the requirements of the Workmanship and Materials section headed "Concrete, Mortar and Grout Materials."

W-5.08 Strength Tests - Laboratory Cured Cylinders

Concrete test cylinders will be tested at a laboratory designated by the Engineer. The costs for testing and preparation of reports will be the responsibility of the Engineer. The Contractor shall furnish all labor and materials required to assist the Engineer in making concrete test cylinders.

During the progress of the work, concrete compressive strength tests shall be made as directed and as required. Test cylinders shall be made, cured, and stored in accordance with ASTM C 31 and will be tested in accordance with ASTM C 39. Each test shall consist of three cylinders. One laboratory-cured cylinder will be tested at 7 days, and one field-cured cylinder will be tested at 28 days. If the 7-day cylinder is not satisfactory, the third cylinder, a laboratory-cured cylinder, will be tested at 7-days. Otherwise, the third cylinder will be tested at 28 days.

The strength level of the concrete mix for each individual class of concrete shall be considered satisfactory when:

a. The average of all sets of three consecutive 28-day strength tests equal or exceed the specified compressive strength (f'_c).

b. No individual 28-day strength test (average of two cylinders) falls below f'_c by more than 500 psi.

If the requirements of either (a) or (b) are not met, changes in the mix proportions shall be made immediately to achieve the required strength.

W-5.09 Low Concrete Strength Test Results

If the Engineer determines the serviceability of the concrete is significantly reduced by low concrete strength test results, test cores shall be taken by the Contractor from the area in question. Cores shall be drilled and tested in accordance with ASTM C 42 except as noted. Three cores shall be taken for each strength test more than 500 psi below the specified f'_c.

Concrete in the area represented by core tests shall be accepted if the average of three cores is equal or greater than $0.85f'_c$ and no single core is less than $0.75f'_c$.

Concrete which does not meet the core tests requirements shall be removed and replaced at the expense of the Contractor.

W-5.10 Measurement and Mixing

Measurement and mixing of concrete shall be performed in accordance with recommendations of ACI 304, as modified herein.

Cement, and fine and coarse aggregates shall be measured separately by weight by equipment providing an accuracy within one percent of the net load weighed. Cement and water shall be measured within 1 percent accuracy. Aggregates shall be measured within 2 percent accuracy. Admixtures shall be measured within 3 percent accuracy by

weight.

The accuracy of the weighing equipment shall meet the requirements of the United States Bureau of Standards. Standard testing weights and other necessary equipment shall be available at all times for testing the equipment.

Concrete shall be mixed in a rotary, batch-type mixer of adequate design to produce a thorough mix, homogeneous in composition and uniform in color. Each batch of one cubic yard or less shall be mixed not less than 1-1/2 minutes after the last of the ingredients have been added to the mixer. The mixing time shall be increased 15 seconds for each additional cubic yard or fraction thereof.

W-5.11 Ready-Mixed Concrete

Ready-mixed concrete shall meet the requirements of ASTM C 94, except as modified in the following paragraphs, and shall be subject to all provisions herein relative to materials, strength, proportioning, consistency, and testing. Article 18 of ASTM C94, however, shall not apply. In the event of low strengths, procedures outlined in the subsection headed "Low Concrete Strength Test Results" shall apply.

The rate of delivery of the mixed concrete shall be such that the interval between placing of fresh concrete in contact with concrete already placed from previous batches shall not exceed 45 minutes. The elapsed time between the introduction of mixing water to the cement and aggregates and depositing concrete in the work shall not exceed 60 minutes, including mixing and agitating time.

Delivery of concrete in nonagitating equipment will not be permitted.

No water shall be added to the concrete at the site, unless approved by the Engineer for a specific batch. Approval of such addition to one batch shall not be construed as approval of additions to subsequent deliveries.

The Contractor shall prepare a detailed concrete field record in which the following information is identified:

a. Number of concrete batches produced.
b. Proportions of materials used.
c. Approximate location of final deposit of each batch in the structure.
d. Time and date of mixing and placing.

W-5.12 Forms - General

Forms shall be designed in accordance with the recommendations of ACI 347. The presence of fly ash in the mix will delay the setting time, which shall be considered in the design of the forms. The Contractor shall be solely responsible for adequate design of all form elements for support of the wet concrete mixtures specified and as delivered.

Forms shall be designed to produce concrete members identical in shape, lines and dimensions to the members shown. They shall be substantial, properly braced, and tied together to maintain position and shape and to resist all pressures to which they may be subjected. Forms shall be sufficiently tight to prevent leakage of mortar. The thickness and character of form lumber and size and spacing of studs and wales shall be determined by the nature of the work and the height to which concrete is placed and shall be adequate to produce true, smooth surfaces with not more than 1/8-inch variation in either direction from a geometrical plane. Horizontal joints shall be level, and vertical joints shall be plumb.

Forms for the sides of columns and beam and girder soffits shall be constructed with 2-inch lumber, and all joints shall be tight and even. Beam and girder soffits shall be erected with a camber of ½-inch in 20 feet and sufficiently braced, shored, and wedged to prevent deflection. Column sides shall be clamped with metal column clamps, which shall be spaced according to the manufacturer's directions, in accordance with this specification.

Beam and girder soffits shall be erected with a camber of 1/2-inch in 20 feet and sufficiently braced, shored, and wedged to prevent deflection. Column sides shall be clamped with metal column clamps, which shall be spaced according to the manufacturer's directions, in accordance with this specification.

External angles of walls, beams, pilasters, columns, window openings and girders shall be provided with ¾-inch bevel strips.

Forms for repeated use shall be supplied in sufficient number to ensure the required rate of progress. All forms shall be thoroughly cleaned before reuse and shall be inspected immediately before concrete is placed. Deformed, broken, or defective forms shall be removed from the work. Temporary openings shall be provided in forms at convenient locations to facilitate cleaning and inspection.

The entire inside surfaces of forms shall be coated with a suitable form release agent immediately before, during or after erection just prior to placing concrete. No form release agent shall be permitted on the reinforcing steel.

The Contractor shall be responsible for the adequacy of all forms and for remedying any defects resulting from their use.

Butt joints at corners and bottoms of placements shall be sealed with closed cell impressible form gaskets with adhesive bucking.

W-5.13 Forms for Architectural Concrete

Forms for smooth finish architectural concrete shall be constructed with 3/4-inch thick, High Density Overlay (HDO) Plyform, Class 1, meeting the requirements of the American Plywood Association. The weight of the surfacing materials shall be not less than 60-60. Surfaces of architectural concrete panel forms shall be given one thinned coat of form film, as manufactured by A.C. Horn Corporation, Brooklyn, NY, W.R. Grace & Company, or equal. Thinner used shall be as recommended by the manufacturer of the form film. HDO plyform panels, once used, shall be thoroughly cleaned and lightly recoated before each additional use.

Where rustications are shown, form panels shall be in one piece, of the sizes shown. Rustications shall be formed with plastic, 2-piece, snap-on strips as manufactured by the Symons Corporation, Chicago, IL, Gateway Corporation, Chicago, IL, or equal.

Forms for smooth concrete shall be installed in a manner such that there will be no horizontal form joints and aligned so that vertical joints will occur only at "V-groove" rustications.

W-5.14 Form Ties

Form ties, hangers, and clamps shall be submitted for approval by the Engineer. They shall be of such type that, after removal of the forms, no metal will be closer than one inch from the surface. Wire ties will not be permitted. Lugs, cones, washers, or other devices that will leave holes or depressions at the surface of the concrete greater than 7/8-inch in diameter shall not be fitted within the forms. Ties which are to be left in place shall be provided with swaged washers or other suitable devices to prevent seepage of moisture along the ties. The spacing of form ties, hangers, and clamps shall be strictly in accordance with the manufacturer's directions, and the removable portions shall be coated with cup grease or other approved material.

Form ties in architectural concrete shall be she-bolts with water seals and shall be spaced in a uniform pattern vertically and horizontally. Form ties in smooth concrete bands shall be positioned to be within the "V-groove" rustications. The proposed form tie pattern for all architectural concrete shall be submitted for approval. The pattern shall be similar to that shown, or as approved.

Tie holes shall be plugged flush with the surface using portland cement mortar. Tie holes shall be pre-wet with clean water after which a neat cement slurry bond coat shall be applied. Mortar of a dry-tamp consistency shall then be densely tamped into the tie holes exercising care so as not to smear mortar onto the finished concrete surface. The mortar mix shall include sufficient white cement to cause the plugged holes to blend in with the adjacent surfaces. Sample patches with different mixes shall be made to assure that this requirements is met.

W-5.15 Removal of Forms

In general, forms shall not be removed until the concrete has hardened sufficiently to support its own load safely, plus any superimposed load that might be placed thereon. The forms shall be left in place for the minimum length of time indicated below or until the concrete has reached the minimum strength indicated as determined by testing, whichever time is reached first. The times indicated represent cumulative days or hours, not necessarily consecutive, during which the air surrounding the concrete is above 50 degrees F. These times may be decreased if reshores are installed.

	Minimum Time	Minimum Strength (psi)
Columns	7 days.	2700
Side forms for girders and beams	7 days	2700
Walls	7 days	2700
Bottom forms of slabs:		
Under 10 feet clear span	4 days	2300
10 to 20 feet clear span	7 days	2700
Over 20 feet clear span.	10 days	2900
Bottom forms of beams and girders:		
Under 10 feet clear span	7 days	2700
10 to 20 feet clear span	14 days	3000
Over 20 feet clear span.	21 days	3500

Forms for vertical architectural concrete surfaces shall not be removed sooner than 12 hours nor longer than 24 hours after placement of concrete.

These times shall be increased as required if the concrete temperature following placement is permitted to drop below 50 degrees F, or if fly ash is used in the concrete mix.

The removable portion of form ties shall be withdrawn from the concrete immediately after the forms are removed. Holes left by such ties shall be filled with grout from a grout gun and the entire surface shall be finished with a steel spatula or rubbed with sackcloth in accordance with the subsection entitled Concrete Surfaces. On architectural concrete and on exposed interior surfaces of buildings, where appearance is important, white cement shall be added in the patching grout to achieve uniformity in color. Prior to patching tie holes in any area where appearance is important, a sample section varying the proportions of white cement to gray cement shall be prepared to determine the proper mixture necessary to achieve a uniformly colored surface.

W-5.16 Reshoring

In the event early stripping of forms becomes necessary, the Contractor shall develop a system for such early removal. The system shall include details and schedules for each element which is to be reshored.

W-5.17 Placing Concrete

Concrete shall be placed only in the presence of the Engineer. Where the procedure is not specified, the placing of concrete shall be in accordance with the recommendations of ACI 304.

No concrete shall be placed after its initial set has occurred, and no retempered concrete shall be used under any conditions. Concreting operations shall be continuous until the section, panel, or scheduled placement is completed. Should the concreting operations be unavoidably interrupted, construction joints shall be formed at proper locations as specified.

Concrete shall be conveyed and placed with minimum handling and shall be deposited in the forms as close as possible to its final position and in no case more than 5 feet in a horizontal direction therefrom. Rehandling of concrete will not be permitted.

Concrete shall be placed in horizontal layers shallow enough so that the previous layer is still soft when the next layer is added and the two layers can be vibrated together. Layers shall not exceed 18 inches in depth.

Wall and column concrete shall be deposited through heavy duck canvas or galvanized steel chutes equipped with suitable hopper heads. Chutes shall be of variable lengths so that the free fall of concrete shall not exceed 3 feet. Where required, illumination shall be provided inside the forms so that the concrete is visible from the deck and runways at the point of deposit.

Freshly placed exposed concrete shall be protected against damage from the elements or other sources.

W-5.18 Vibrating

All concrete shall be consolidated by means of mechanical internal vibrators applied directly into the concrete in a vertical position in accordance with the recommendations of ACI 309.

The intensity and duration of vibration shall be sufficient to cause concrete to combine with previously placed concrete, to fill corners, to compact thoroughly and to embed reinforcement, pipes, conduits, and similar work completely. Vibrators shall be inserted into and withdrawn from the concrete vertically at close intervals. Vibrators shall not be used to cause concrete to move laterally.

A sufficient number of vibrators shall be on hand to assure that the incoming concrete can be properly compacted within 15 minutes after placing. Reserve vibrators shall be on hand for use when others are being serviced. No placement of any concrete shall commence with a single vibrator on hand.

W-5.19 Hot Weather Requirements

For placement of concrete during hot weather, the recommendations of ACI 305.1 shall be followed. No concrete shall be placed if the temperature of the concrete at the time of placement exceeds 90 degrees F. Where the temperature of the concrete being placed is consistently above 75 degrees F and a noticeable decrease in slump or an increase in mixing water demand occurs, a retarding admixture shall be used. Admixtures shall conform to the Workmanship and Materials section headed "Concrete, Mortar and Grout Materials" and shall be used only with the written permission of the Engineer.

Unformed surfaces of concrete placed during hot weather shall be protected from drying by continuous moist curing for at least 24 hours. Curing shall be started as soon as the concrete has hardened sufficiently to withstand surface damage. If moist curing is not carried beyond 24 hours, the surface while damp shall be covered with a suitable heat-reflecting plastic membrane or sprayed with a white pigmented curing compound.

W-5.20 Cold Weather Requirements

For placement of concrete during cold weather, the recommendations of ACI 306.1 shall be followed, except set-accelerators will not be permitted.

Before placement of concrete, all ice, snow and frost shall be completely removed from all surfaces to be in contact with the concrete. Concrete shall not be placed on a frozen subgrade. Surfaces to be in contact with the concrete shall be at a temperature as near as practical to that of the concrete being placed.

When mean daily temperatures at the site are generally below 40 degrees F, the temperature of the concrete as placed shall be not less than 50 degrees F, except for mass concrete where the temperature of the concrete as placed shall be not less than 45 degrees F. Heating of aggregates or mixing water or both shall be used to obtain these placement temperatures. The concrete temperatures as mixed shall not be permitted to exceed the placement temperature by more than 10 degrees F for air temperatures of 0 degree to 30 degrees F, nor by more than 15 degrees F for air temperatures below 0 degree F.

Concrete in place shall be maintained at a temperature of 50 degrees F by keeping forms in place, covering with insulated blankets, heated enclosures or combinations of these for the following minimum time intervals except that forms shall not be removed in less than the time specified in the subsection headed “Removal of Forms.”

a.	Footings and walls below grade and slabs on grade	2 days
b.	Exposed walls and columns carrying no load	3 days
c.	Exposed floor slab, beams and girders above grade and partially loaded	6 days

Exposed surfaces of new concrete shall be protected from drying out. When dry heating is used for protection against low temperatures, exposed concrete surfaces shall be covered with an approved sheet material or membrane as specified in the subsection headed “Curing.” Water curing may be used if icing problems can be avoided.

Concrete shall be cured during the period of low temperature protection for such additional time as required. Curing shall conform to the requirements of the subsection headed "Curing." During periods of very cold weather, the Contractor shall continue the protection against low temperature during the extended curing period to prevent freezing of the concrete as required.

Concrete which is to be exposed to freezing temperatures shall be permitted to undergo some drying just prior to and during the period of adjustment to ambient cold-weather conditions. When protection against low temperatures is removed, the resulting temperature drop in any part of the concrete shall not exceed 5 degrees F per hour nor 40 degrees F for the first 24 hour period.

W-5.21 Curing

In general, the recommendations of ACI 308 shall be followed for curing concrete.

Standard portland cement concrete surfaces normally exposed to the atmosphere shall be protected against too rapid drying by curing for a minimum period of 7 days. When daily average temperatures are below 70 degrees F, the curing period shall be extended as required in the subsection headed "Cold Weather Requirements." The curing period shall commence immediately following the placing of the concrete. Curing shall be accomplished by one of the following methods. Should there be any delay in the application of the method of curing used, the concrete shall be covered with moistened burlap held in complete contact with the surface or kept wet by continuous sprinkling.

a. Water Curing. Water curing shall be accomplished by the use of quilted covers wetted and applied to the concrete surface as soon as the forms have been removed, or in the case of slabs, as soon as the concrete has set up sufficiently to prevent marring of the surface. These quilted covers shall consist of an outer covering of burlap or cotton or other approved material, and a needled, punched or sandwiched inner layer of cotton batting or other approved material, in all weighing not less than 20 ounces per square yard. The covering material shall be maintained in a thoroughly saturated condition and shall show the presence of free water between the mat and the surface of the concrete at all times throughout the curing period.

b. Sheet Materials. Curing of concrete slabs may be accomplished through the use of sheet materials such as waterproof paper or polyethylene film, both meeting the requirements of ASTM C 171, and applied to the concrete surface as soon as it has set sufficiently hard to prevent marring. The concrete surface shall first be thoroughly wetted, and the sheet materials shall then be placed in direct contact and anchored thereto in a manner to assure continuous contact throughout the curing period. The sheet materials shall be lapped a minimum of 3 inches with the seams taped, cemented, or glued. The paper shall consist of one ply of an approved type of fiber, reinforced waterproof building paper, consisting of cross fibers embedded in asphalt, between two layers of waterproof building paper, the whole being combined under heat and pressure to form a monolithic sheet. Polyethylene film shall be white opaque sheeting manufactured from virgin resin and shall contain no scrap or additives. It shall be not less than 4 mils in thickness and shall not easily tear, puncture, or otherwise become unfit for use. If, in the opinion of the Engineer, discoloration is objectionable, polyethylene film shall not be used on floors which have been steel troweled to a hard finish.

c. Membrane Curing. Membrane curing shall be started immediately after removal of forms or in the case of unformed surfaces, as soon as the water sheen has disappeared from the surface of the concrete and shall be accomplished by coating the entire exposed surface with a liquid membrane-forming compound containing a temporary color indicator applied uniformly by means of an approved pressure spray distributor at the rate of 200 square feet per gallon of material. The material shall be applied so that the concrete surface is completely coated and sealed at one application. The compound shall meet the requirements of ASTM C 309 Type I. Membrane shall not be applied to faces of construction joints or other surfaces against which additional concrete will be placed. Such surfaces shall be kept continuously wet by other means.

Membrane curing shall not be used on surfaces which are to be covered with a coating material applied directly to the concrete or with a covering material bonded to the concrete, such as other concrete, liquid floor hardener, waterproofing, dampproofing, membrane roofing, flooring, painting, and other coatings and finish materials unless otherwise approved by the Engineer.

W-5.22 Joints and Bonding

Construction joints shall be made where shown or permitted. Such joints shall be located to ensure stability, strength, and watertightness, and shall have a waterstop where shown. All corners shall be built monolithically, and the concrete on either side shall be continuous to points shown.

At least 2 hours shall elapse after placing concrete in the columns or walls before depositing concrete in beams, girders, or slabs supported thereon. Beams, girders, brackets, column capitals, and haunches shall be considered as part of the floor system and shall be placed integrally therewith.

Horizontal keyways shall be built to permit flushing water to escape from the keyways.

Joints shall have continuous, straight, and regular keys or grooves. Exposed concrete surfaces shall be brought to a true level line at the top of every horizontal construction joint. The exposed construction joints shall have a row of form ties located in the concrete at from 4 to 6 inches from the joint to tighten the forms for subsequent sections. Reinforcing rods shall be set to extend into subsequent sections of construction, as shown. Water stops, if required, shall have watertight splices and corner intersections and meet the requirements of the Workmanship and Materials section headed "Construction and Expansion Joints for Concrete." All bulkheads or other joint forming material shall be removed before placing adjacent concrete.

The placing of concrete shall be carried on continuously between the construction joints shown. If for any reason it becomes necessary to stop the placing of concrete at locations other than those indicated, such locations and the manner of making the joint shall be subject to the approval of the Engineer.

Concrete surfaces against which the new concrete is to be placed shall be thoroughly cleaned and wetted. Just prior to placing new concrete, horizontal surfaces and joints shall be slushed with at least 2 inches of cement grout of the same mixture as the concrete but with coarse aggregate omitted. Special care shall be used in placing and puddling concrete at vertical joints to ensure a bond with existing concrete. Vertical construction joints shall not be made in watertight construction, unless shown or approved in writing.

W-5.23 Inserts and Sleeves

Pipes, anchor bolts, sleeves, steps, castings, floor drains, manhole frames, cast-in reglets, dovetail anchor slots, and other inserts shall be encased in concrete as shown. Special care shall be taken to place and maintain them to the proper lines and grades and to compact concrete thoroughly around them to prevent the passage of water. Insofar as possible, they shall be set before placing concrete and thoroughly braced to prevent movement during the progress of the work.

Water stops which may intersect such inserts and sleeves shall be miter jointed around them in a manner and location approved by the Engineer. Concrete placement shall follow the arrangement of the water stop.

All concrete walls faced with masonry shall have dovetail anchor slots spaced not more than 24 inches apart.

W-5.24 Concrete Surfaces

All exposed interior and exterior concrete surfaces, the interior surfaces of cast-in-place concrete conduits, concrete tanks, channels, wet wells and other concrete water-holding or conveying structures shall be finished to achieve a neat and smooth appearance, except as otherwise shown or specified under the subsection headed "Architectural Finish."

Top edges of walls shall be finished with a ½-inch beveled edge, unless other details are shown, and any burr

remaining upon removal of forms shall be rubbed off.

Immediately after stripping the forms, all concrete surfaces shall be inspected. All fins, offsets, burrs, ridges, or other unsightly marks shall be removed from the exposed concrete.

Tie holes, pour joints, voids, stone pockets, or other defective areas shall be patched before the concrete is thoroughly dry. Defective areas shall be chipped away to a depth of not less than 1 inch with all edges perpendicular to the surface. The area to be patched, including at least 5 inches of the adjoining surface, shall be wetted prior to placing the patching mortar. A grout of equal parts of cement and sand mixed to a brushing consistency shall then be scrubbed onto the surface, followed immediately by the patching mortar. The patch shall be made of the same material and of approximately the same proportions as used for the concrete, except that the coarse aggregate shall be omitted. For exposed concrete, white cement shall be substituted for part of the gray cement so that the patch will match the color of the surrounding concrete. The proportion of white and gray cement shall be determined by making a trial patch. The amount of water shall be as little as consistent with requirements of handling and placing.

Mortar shall not be retempered. The mortar shall be thoroughly compacted and screeded off so as to leave the patch slightly higher than the surrounding surface. It shall then be left undisturbed for a period of 1 to 2 hours to permit initial shrinkage before being finally finished. The patch shall be finished to match the adjoining surface and shall be cured as specified for the original concrete.

Except as otherwise shown or required, interior building and tunnel walls, exterior walls to 6 inches below finished grade, and all interior tank walls to 6 inches below normal liquid level shall receive an architectural finish.

W-5.25 Concrete Floor Surfaces

Concrete floor surfaces shall be monolithic with the structural slab and shall consist of the structural concrete, being finished as indicated in the following schedule, unless otherwise shown or as specified:

1. Tank bottoms and other surfaces not to be used as walkway areas - screeded, wood floated, steel troweled.

2. Tank bottoms to receive grout swept in by mechanisms - screeded, wood floated.

3. Exterior walkways and platforms over tanks to be used as walking areas - screeded, wood floated, steel troweled, broomed.

4. Exterior sidewalks - screeded, wood floated, divided into panels, steel troweled, broomed.

5. Interior working spaces such as screen rooms, motor rooms and pump rooms - screeded, wood floated, steel troweled, chemically hardened.

6. Interior surface in areas to receive tile or carpeting such as offices, control rooms, toilet rooms and the like - screeded, wood floated, steel troweled.

7. Reservoir bottoms - screeded, wood floated.

Panels, where required, shall be approximately 10 feet square and constructed by using an edger to form dummy joints ¼-inch deep.

Troweled surfaces in decorative areas such as equipment rooms, offices, and the like shall be true planes within 1/8-inch in 10 feet. Other troweled surfaces shall be true planes within ¼-inch in 10 feet.

Where chemical hardening is required, the floor surface shall be thoroughly cleaned after it is completely cured, not less than 30 days after it is placed. It shall then be treated with at least two applications of floor hardener consisting of magnesium and zinc fluosilicate such as Lapidolith as manufactured by L. Sonneborn Sons, Inc. or Saniseal as manufactured by Master Builders Co., or equal, applied in accordance with the manufacturer's recommendations.

As an alternate to the above, where chemical hardening is required, a natural, nonmetallic aggregate surface hardener may be substituted, at the Contractor's option, at the time the floor is placed, in which case the latter application of chemical floor hardener may be omitted. The hardening shall be obtained by incorporating into the surface of the freshly floated concrete a dry shake of Master Builders Mastercron Pre-Mixed, Procron as made by Protex Industries, Inc. or equal, at the rate of 1/2 pound per square foot of floor surface. Preparation, application procedures, curing and precautions shall be performed in strict compliance with the manufacturer's recommendations and instructions and shall be submitted for approval prior to use.

Where brooming is required, the steel-troweled surface shall be broomed immediately after troweling. This brooming shall be just sufficient to leave marks without appreciably disturbing the troweled surface.

Where the floor surface is to be screeded by scraper mechanisms, the structural slab shall be finished as specified in the schedule, and a layer of grout placed thereon for final screeding by the mechanism.

All finished floors, walkways, and slabs shall be covered with boards, canvas, heavy paper or similar covering to protect them from damage.

W-5.26 Treads and Landings

Treads and landings of all exterior and interior concrete stairs shall receive a nonslip surface which is applied as an integral cement finish before the initial set of the slab has taken place, unless abrasive nosings or other finish is indicated. The finish shall consist of a ½-inch layer of stiff, thoroughly mixed mortar consisting of 1 part cement and 2 parts sand to which shall be added carborundum grit in the amount of 1/4 to 1/2 pound per square foot of finished surface. The mortar shall be screeded and troweled to a smooth and even surface.

W-5.27 Architectural Finish

All interior and exterior concrete surfaces exposed to view, including walls, columns, lintels, beams, underside of roofs, slabs, walks, stairs and like areas shall have an architectural finish. The interior surfaces of cast-in-place concrete conduits, concrete tanks, channels, wet wells and other concrete water-holding or conveying structures shall not have an architectural finish. The interior surfaces of such structures shall be finished as specified under the subsection headed "Concrete Surfaces".

Concrete with an architectural finish shall extend 6 inches below finish grade and have a smooth surface substantially free of air holes. Voids in the surface of 1/2-inch across or larger shall be patched and finished as specified hereinbefore under the subsection headed "Concrete Surfaces". All ridges and projections shall be ground smooth with the surface. Form joints shall be tight enough to prevent moisture loss and no departure from the plane shall be allowed between adjacent panels.

All tie holes left in exterior surfaces with an architectural finish shall be filled to within 1-inch of the concrete surface with nonshrink grout followed by caulking to within 1/2-inch of the surface, leaving an exposed recess. Caulking compound shall be of a color to match the cured concrete and shall be in accordance with the Workmanship and Materials section headed "Caulking and Sealing". Tie holes left in interior surfaces with an architectural finish shall be filled as

specified under the subsection headed "Concrete Surfaces."

Finishing of surfaces resulting from the use of special form liners shall consist of the removal of burrs and other work required to produce a uniform appearance.

Surfaces to receive an architectural finish shall be saturated thoroughly with water and kept wet during the entire operation. A grout of 1 part portland cement and 1-1/2 to 2 parts fine sand shall be applied uniformly by a brush, plasterer's towel, or rubber float.

Immediately after applying the grout, the surface shall be vigorously floated with a wood, sponge rubber, or cork float to fill any small air holes. Excess grout shall then be scraped off with a sponge rubber float. If the float pulls grout from the holes, a sawing motion should be tried.

The grout remaining on the surface shall be allowed to stand undisturbed until it loses some of its plasticity but not its damp appearance. The surface should then be rubbed with clean, dry burlap to remove all excess grout. All air holes shall remain filled with no visible film of grout remaining after the rubbing. Any section being cleaned with grout shall be completed the same day.

If possible, work should be done during cool damp weather. During hot and dry weather, the concrete shall be kept moist with a fine fog spray during the sack finishing. The completed surface shall be moist cured by keeping the area wet the entire day following the operation. The architectural finish shall not begin until all defects have been repaired.

W-5.28 Grouting

Grout shall be placed under column setting plates, under equipment bases, in conjunction with the setting of anchors or dowels in holes drilled in concrete, and elsewhere as required.

Grout shall be a flowable, prepackaged, nonshrink grout without dependence on gas expansion forces or enlargement of metal particles for its nonshrinking characteristics. There shall be no shrinkage below placement volume under ASTM C 827 and no drying shrinkage under CRD-C-621.

The Contractor shall furnish the Engineer with recent independent laboratory tests showing that the grout is nonshrink at various ages in accordance with CRD-C-621, shows no expansion after set (ASTM C 827), develops 3,000 psi with a trowelable mix within 24 hours (ASTM C 109), and has a placement time based on initial set of not less than 60 minutes (ASTM C 191). Test results shall be supplied showing that in projects of similar scope and size, the effective bearing area (EBA) shall be between 95 and 100 percent. Grout that contains water reducers, accelerators or fluidifiers shall have no drying shrinkage greater than the equivalent sand cement and water mix as tested under ASTM C 596.

Where grout will be exposed to the weather, it shall be free of discoloration without the necessity of special surface treatments. The grout shall be packed in moistureproof bags with general instructions for placement printed on the bag. All grout shall be mixed and placed in accordance with manufacturer's instructions. Technical service shall be supplied by manufacturer upon request.

W-5.29 Tunnel Grout

Grout for grouting around tunnel linings and other locations as specified or required shall be mixed in proportions of 1 part portland cement to 1 part sand by volume.

Nonshrink grout shall be mixed in the proportion of one part portland cement to one part sand by volume, to which shall be added a nonshrinking agent, Embeco as manufactured by the Master Builders Company, Cleveland, OH, Protalico as made by Protex Industries, Inc., or equal. The nonshrinking agent shall be added in the proportions recommended by

the manufacturer for the service intended.

Lean grout for backfilling the space surrounding the pipe sections in tunnels or other areas as specified or directed shall be mixed in the proportion of 1 part portland cement to 12 parts sand by volume.

W-5.30 Water Stops

Water stops shall be installed in construction joints on reglets cut into existing concrete work as shown or specified. Water stops shall be made of extruded polyvinyl chloride. Water stops shall be in accordance with the Workmanship and Materials section headed "Construction and Expansion Joints for Concrete".

W-5.31 Plastic Sheet Lining

Plastic sheet lining shall be installed in concrete conduits or structures as shown or specified. Plastic sheet lining shall be in accordance with the Workmanship and Materials section headed "Plastic Sheet Lining."

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SECTION 6 - REINFORCING STEEL

W-6.01 Standards

Reinforcing steel bars for concrete reinforcement shall be deformed bars meeting the requirements of ASTM Des: A 615, Grade 60, unless shown or specified otherwise. They shall be free from defects, kinks, and from bends that cannot be readily and fully straightened in the field. Test certificates of the chemical and physical properties covering each shipment shall be submitted for approval.

Reinforcing mesh shall be of the electrically welded type, with wires arranged in rectangular patterns, of the sizes shown or specified and shall meet the requirements of ASTM A 185.

W-6.02 General

Reinforcing steel bars shall be supplied in lengths which will allow them to be conveniently placed in the work and provide sufficient lap at joints. Dowels of proper lengths, size, and shape shall be provided for tying walls, beams, floors, and the like together when shown, specified, or ordered.

Stirrups and ties shall have a minimum inside radius of bend of 2-1/2 bar diameters. All other bars No. 7 and smaller shall have a minimum inside radius of bend of 3 bar diameters, and No. 8 bars and larger shall have a minimum inside radius of bend of 4 bar diameters.

Splices in all reinforcements shall be lapped as specified hereinafter in "Table 1 - Grade 60 Reinforcing Bar Splice Lapping Lengths" unless shown or specified otherwise. All splices shall be staggered, unless otherwise approved by the Engineer.

TABLE 1 - GRADE 60
REINFORCING BAR SPLICE LAPPING LENGTHS

Bar Size	#3	#4	#5	#6	#7	#8	#9	#10	#11
Top Bars - ACI Class B	13	17	22	28	38	50	64	81	100
Top Bars - ACI Class C	17	23	29	37	50	66	83	106	130
Other Bars - ACI Class B	12	12	16	20	27	36	46	58	71
Other Bars - ACI Class C	12	16	20	26	36	47	60	75	93

Notes:

1. Splice length given in inches.

2. Top bars are all horizontal reinforcement so placed that more than 12 inches of concrete is cast in the member below the bar. This includes horizontal wall reinforcement.

3. Where lapping bars of different sizes, use lap required for larger bar.

4. For all bars spaced closer than 6 inches, increase lap length 25 percent.

5. Unless otherwise specified, the length of lap for splices shall be as shown for ACI Class B where no more than 50 percent of the bars are lap spliced, and as shown for ACI Class C where more than 50 percent of the bars are lap spliced.

W-6.03 Detailing

The Contractor shall submit detailed placing drawings and bar listed to the Engineer for approval in accordance with the requirements for "Working Drawings" of the General Provisions, except as otherwise specified herein.

All provisions of the latest ACI "Manual of Standard Practice for Detailing Reinforced Concrete Structures" shall be followed in the preparation of placing drawings and bar lists.

Wall and slab reinforcing shall not be billed in sections. Complete elevations of all walls and complete plans of all slabs must be shown, except that when more than one wall or slab are identical only one such elevation or plan will be required. These plans or elevations need not be true views of the walls or slabs shown. Every reinforcing bar in a slab or a wall shall be billed on either a plan or an elevation. Where necessary, sections shall be taken to clarify the arrangement of the steel reinforcement. All bars shall be identified on such sections, but in no case shall bars be billed on such sections.

For all reinforcing bars, unless the location of a bar is perfectly obvious, the location of such bar or bars shall be given by a dimension to some structural feature which must be readily distinguishable at the time bars are placed.

The set of placing drawings shall be complete in and by themselves to the extent that the bar setters will have no occasion to refer to the design drawings.

Before submittal to the Engineer, every placing drawing and bar list shall be completely checked including the quantity, size, type, length, bend dimensions, and type of support for all bars or mesh, and all other information on the drawing and list. The checking shall be done by a qualified person and all necessary corrections made.

If after placing drawings and bar lists have been submitted to the Engineer for approval, a partial or spot check by the Engineer reveals that the placing drawings obviously have not been checked by a qualified person, they will be returned to the Contractor for such a check and corrections, after which they shall be resubmitted for approval by the Engineer.

W-6.04 Delivery

Reinforcing steel shall be delivered to the work in bundles strongly tied, and each group of both bent and straight bars shall be identified with a metal tag giving the identifying number corresponding to the shop drawings and bar schedules. All bars shall be properly stored in an orderly manner, at least 12 inches off the ground and kept clean and protected from the weather, as directed by the Engineer, after delivery at the site of the work.

W-6.05 Protection

Reinforcing steel shall be delivered without rust other than that which may have accumulated during transportation to the work. It shall at all times be fully protected from moisture, grease, dirt, mortar, and concrete. Before being placed in position, it shall be thoroughly cleaned of all loose mill scale and rust and of any dirt, coatings, or other material that might reduce the bond. If there is a delay in depositing concrete, the steel shall be inspected and satisfactorily cleaned immediately before the concrete is placed.

W-6.06 Fabrication and Installation - Bars

Bars shall be cut to required length and accurately bent before placing. Bars shall be bent in the shop unless

written approval of field bending is obtained from the Engineer. If field bending is permitted, it shall be done only when the air temperature where the bending operation is performed is above 30 degrees F.

The bars shall be placed in the exact positions shown with the required spacing and shall be securely fastened in position at intersections to prevent displacement during the placing of the concrete. The bars shall be fastened with annealed wire of not less than 18 gauge or other approved devices. Spacing chairs of a type approved by the Engineer shall be furnished and properly placed to support and hold reinforcing bars in position in all beams and slabs, including slabs placed directly on the subgrade. Chairs which rest on the forms for slabs, the underside of which will be exposed to view in the finished work, shall have those portions galvanized or plastic coated which come in contact with the forms.

Splices in all reinforcement shall be lapped as specified in "Table 1 - Grade 60 Reinforcing Bar Splice Lapping Lengths" in the subsection headed "General." Splices at points of maximum tensile stress shall be avoided wherever possible. Temperature bars shall have a minimum clear spacing of 2-1/2 diameters. All bar splices shall be staggered where possible.

All welded splices shall be full penetration, butt welds, made by certified welders in accordance with AWS D12.1. Thermite welding or Cadweld type couplers may be used where approved by the Engineer.

On any section of the work where horizontal bars run further than the length of the forms, the form or head against which the work ends shall be perforated at the proper places to allow the bars to project through a distance at least equal to the lap specified. The projecting ends, however, unless otherwise directed by the Engineer, shall be of different lengths so that in no place will laps in adjoining bars in the same place occur opposite each other.

W-6.07 Installation - Mesh

Reinforcing mesh shall be placed in the positions shown, specified, or required to fit the work. Suitable spacing chairs or supports as specified for bars shall be furnished and placed to maintain the mesh in correct location. Where a flat surface of mesh is required, the mesh shall be rolled or otherwise straightened to make a perfectly flat surface before placing. The length of laps not indicated shall be approved by the Engineer.

W-6.08 Concrete Protection for Reinforcing Steel

Reinforcing steel shall be placed and held in position so that the concrete cover, as measured from the surface of the bar to the surface of the concrete, shall be not less than the following, except as otherwise shown, specified, or directed:

1. General

   a. Concrete deposited directly against soil - 3 inches.
   b. Concrete in contact with soil or exposed to weather or sewage – 2 inches

2. Slabs (See Item 6)

   a. Top all surfaces - 2 inches

3. Beams - Girders - Columns (See Item 6)

a.	To main reinforcement	- 2 inches
b.	To ties	- 1-1/2 inches

4. Walls (See Item 6)

a.	12 inches or more thick		- 2 inches
b.	Less than 12 inches thick:		
	(1)	#6 bars or larger	- 2 inches
	(2)	#5 bars or smaller	- 1-1/2 inches

5. Footings and Base Slabs

a.	Top face	- 3 inches
b.	Sides and ends	- 3 inches
c.	Bottom, Concrete deposited directly against ground	- 3 inches
	Concrete deposited directly against lean concrete work mat	- 2 inches

6. Add 1/2 inch for surfaces contacting or exposed to water or sewage.

7. Laps - as specified in "Table 1 - Grade 60 Reinforcing Bar Splice Lapping Lengths" in the subsection headed "General."

8. Spacing - clear distance between parallel bars - 2 inches minimum.

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SECTION 7 - CONSTRUCTION AND EXPANSION JOINTS FOR CONCRETE

W-7.01 General

Construction and expansion joints shall be placed at all locations shown. No additions, deletions, or changes in location of construction and expansion joints shall be made without the written approval of the Engineer. Construction joints shall include a formed key and shall include a water stop where shown. Expansion joints shall include a joint filler between concrete faces, and shall include a water stop, and sealant with back-up rod where shown.

Water stops in the walls shall be carried into lower slabs and shall join the water stops in the slabs. All water stops shall be continuous. Water stops shall be set accurately to the position and line shown. Edges shall be held and securely fixed in position at intervals of not more than 24 inches so that they will not move during the placing of the concrete. No nails shall be driven through the water stops.

The Contractor shall submit samples and specifications of the materials he proposes to use.

All materials shall be installed or applied in accordance with the manufacturer's recommendations, unless otherwise specified herein.

W-7.02 Water Stops

Water stops shall be made of extruded polyvinyl chloride. No reclaimed plastic material shall be used in the manufacture of the water stops. Plastic water stops shall meet the requirements of the Corps of Engineer Specification CRD-C572, except as modified herein. The Shore A/10 durometer hardness shall be between 73 and 79, the tensile strength not less than 1,850 psi, and the specific gravity not more than 1.38.

Unless otherwise shown, water stops for construction joints shall be flat, at least 6 inches wide, and not less than 3/8 inch thick at the thinnest section. The water stop shall have ribbed longitudinal strips.

Unless otherwise shown, water stops for expansion joints shall be at least 9 inches wide and not less than 1/4 inch thick at the narrowest point and not less than 3/8 inch thick immediately adjacent to the center of the water stop. The water stop shall have ribbed longitudinal strips with a 3/4-inch inside diameter hollow bulb center. The water stop shall permit a joint movement of 1/4 inch under a tensile force of not more than 500 pounds per lineal inch.

Corners and intersections for all water stops shall be prefabricated so that only butt joints need be made in the field. Field fabrication of corners and intersections requires approval of the Engineer. Corners and intersections shall be mitered and assembled with approved equipment, as described for field joints.

Field joints shall be made by cutting the ends of the sections to be spliced so they will form a smooth even butt joint. The cut ends shall be heated with the splicing tool until the plastic melts. The two ends shall be pressed together until the plastic cools. Splicing shall cause as little damage to the continuity of the ribbed strips as possible.

W-7.03 Joint Filler for Expansion Joints

Joint filler shall be used for all expansion joints. Joint filler shall be closed cell polyethylene Sonoflex F Foam as manufactured by Sonneborn Building Products, or PVC joint filler No. 327, by A. C. Horn, or equal, of the thickness shown.

Joint filler shall be placed against the completed portion of the work before the concrete for the next section is

placed. The filler shall be fastened to the hardened concrete with a compatible adhesive in accordance with manufacturer's instructions. The filler shall extend through the thickness of the wall or slab and shall be flush with the finished surface, except where a joint sealant is shown. In joints having a water stop, the filler shall be fitted accurately on each side of the water stop to prevent the intrusion of concrete.

W-7.04 Joint Sealant

Expansion joints shall be finished with a join sealant where shown or specified.

Joint sealant materials may be either a single component urethane compound meeting the requirements of Fed. Spec. TT-S-00230C, or a two-component urethane compound meeting the requirements of Fed. Spec. TT-S-00227E, except as modified herein.

The urethane sealant shall be 100 percent polymer, nonextended, containing no solvent, lime, or coal tar. Color shall be as selected by the Engineer, but shall not be black. Sealant properties shall conform to the following table:

Property	Value	Test Method
Maximum final cure (days)	3	
Tensile strength (psi)	250-400	ASTM D 412
Minimum elongation (%)	400	ASTM D 412
Modulus at 100% elongation (psi)	40-60	Fed. Spec.
Shore A hardness	30-40	Shore Durometer
Solid content (%)	98-100	
Peel strength (lb/in.)	50-60	Fed. Spec.
Minimum recovery (%)	75-85	Fed. Spec.
Initial tack-free cure (hrs.)	24-48	Fed. Spec.

The two-component sealant shall be mixed using a slotted paddle and slow speed mixer for 5 to 8 minutes, continually working paddle from top to bottom until sealant color is uniform. The side of the container and paddle blade shall be scraped down several times during the mixing operation to ensure uniform mixing.

Joint surfaces shall be properly prepared by removing all foreign matter and concrete laitance so that concrete surfaces are structurally sound, clean, dry, and free of all oil, grease, wax, waterproofing compounds, or form release materials prior to the application of primer and sealant. All concrete joint surfaces and all surfaces exposed to water shall be primed prior to sealing, with no exceptions. Priming of other surfaces shall be as recommended by the manufacturer of the sealant. The primer shall be as recommended by the manufacturer of the sealant, subject to the approval of the Engineer. Primer shall be applied by either brushing or spraying on the joint surfaces. Sealant shall be installed within 2 to 24 hours after the application of primer.

For horizontal joints, sealant may be installed by pouring directly from a suitable shaped can or by flowing from a bulk-loading gun. Vertical joints shall be filled from a gun, starting from the bottom, to avoid bridging and the formation of air voids. Overhead joints shall be filled from a gun, by laying a bead along each side of the joint and then filling the middle. Immediately after installation, sealant shall be tooled in order to establish firm contact with joint surfaces and to provide a smooth sealant surface. Method of tooling shall be in accordance with manufacturer's instructions.

Joint depth shall be controlled with the use of joint fillers and backup materials. Fillers and backup materials in contact with sealant shall be nonimpregnated and free from asphalt, creosote, oil, or extractable plasticizers. Backup material shall be closed cell polyethylene foam rod, such as Sealtight Backer Rod, Sonofoam Backer Rod, or equal, with a diameter 1/4 inch larger than the joint width. Joint widths and sealant depths shall be as shown, except that sealant depth shall not exceed 1/2 inch.

W-7.05 Unbonded Horizontal Joints

Unbonded horizontal joints shall be used as shown or required where slabs or beams must be prevented from bonding to footings, walls, columns, or other rigid parts of the structure.

Bonding shall be prevented by use of structural grade neoprene pads meeting the requirements of Section 25, Division 2 of the AASHTO Standard Specifications for Highway Bridges. The pads shall be placed over the bearing surface of the footing, wall, or other supporting part of the structure so as to isolate it from the new concrete being placed. The neoprene pads shall not be thinner than 1/4 inch.

* * *

SECTION 10 - DUCTILE IRON PIPE AND FITTINGS

W-10.01 General

All ductile iron pipe shall meet the requirements of AWWA C151. The type and configuration of pipe bedding for buried pipe shall be as shown on the Plans. Coatings and linings for ductile iron pipe and fittings shall conform to the subsection headed "Coatings and Linings," contained herein. Pipe joints shall be bell and spigot, flanged, or mechanical joint as shown on the Plans.

Ductile iron pipe for buried service shall be Pressure Class 350 for 4 to 16-inch diameters and Pressure Class 250 for 18 to 64-inch diameters. Ductile iron pipe installed above ground, in valve vaults, or in pumping stations shall be Special Thickness Class 53 unless specified otherwise on the construction plans.

W-10.02 Flanged Pipe

Flanged pipe shall conform to the requirements of AWWA C115. Flanges shall be ductile iron and shall have long hubs. There shall be no leakage through the pipe threads, and the flanges shall be designed to prevent corrosion of the threads from outside.

W-10.03 Fittings

Fittings for buried service shall be compact ductile iron with mechanical joint bells in accordance with AWWA C153 for 4 thru 24-inch diameters. Compact ductile iron fittings shall have a working pressure rating of 350 psi. Fittings for buried service for 30 thru 48-inch diameters with mechanical joint bells shall be in accordance with AWWA C110. These fittings shall have a working pressure rating of 250 psi. Gaskets shall be EPDM rubber. Flanged fittings for above ground service shall be in accordance with AWWA C110 and ANSI B16.1 Class 125 for flanges. The flanged fittings shall have a working pressure rating of 250 psi. Gaskets shall be EPDM rubber.

W-10.04 Flanged Joints

Flanged joints for Class 125 flanges shall meet the requirements of ANSI Specification B16.1. Flanges, flange facing drilling, and protecting shall be as specified for flanged pipe. Bolts and nuts for flanged joints shall be Type 316 stainless steel unless otherwise stated on the Plans or directed by the Engineer.

Except where otherwise directed by the Engineer, gaskets for flanged joints shall be of the full-face type, meeting the requirements of ANSI B16.21. Gaskets shall be EPDM rubber.

W-10.05 Mechanical Joints

Mechanical joints shall meet the applicable requirements of AWWA C111.

W-10.06 Push-on Joints

Push-on joints shall be of the bell and spigot type which employs a single, elongated grooved gasket to effect the joint seal. Push-on joints shall meet the applicable requirements of AWWA C111.

W-10.07 Wall Castings, Connecting Pieces, and Special Fittings

Wall castings and connecting pieces, such as bell and bell, bell and spigot, bell and flange, flange and flange, flange and spigot, and flange and flare, shall meet the requirements of ANSI Specification A21.10. Unless otherwise shown or specified, fittings 14 inches and larger shall have a pressure rating of 250 psi.

Where special fittings are required, they shall be of an approved design and shall have the same diameters and thicknesses as standard fittings, unless otherwise required, but their laying lengths and other functional dimensions shall be determined by their positions in the pipelines and by the particular piping materials to which they connect.

Where watertightness is essential and at other locations where indicated, wall castings shall be provided with an integrally cast intermediate collar located at the center of the wall.

W-10.08 Sleeve-Type Couplings

Except where standard solid sleeves or split sleeves are shown or specified, sleeve-type couplings for ductile iron pipe shall be Style 38 couplings as made by Dresser Industries, Inc., or Type 411 as made by Smith-Blair, or equal. Gaskets shall be of molded rubber, Dresser Plain Grade 27, Smith-Blair 003, or equal. Middle rings shall be without a pipe stop and shall be at least 1/4 inch thick and 5 inches wide for 8-inch and smaller pipe, 3/8 inch thick and 7 inches wide for 10-inch through 30-inch pipe, and 1/2 inch thick and 10 inches wide for 36-inch and larger pipe with follower rings of appropriate thickness, unless otherwise shown or specified.

Sleeve-type couplings shall be shop coated with Dresser Red "D" Shop-Coat, Smith-Blair Standard Blue Shop Coat, or equal nontoxic material compatible with the finished coatings specified.

W-10.09 Coatings and Linings

Pipe which is to be buried shall have the standard one mil coal-tar epoxy outside coating specified in AWWA C151-8.1.

Unless otherwise shown on the Plans or specified, all ductile iron pipe and fittings shall have a cement-mortar lining with seal coat meeting the requirements of AWWA C104.

The weight and class designation shall be painted conspicuously in white on the outside of each pipe, fitting, and special casting after the shop coat has hardened.

W-10.10 Harnessing

Ductile iron pipe and fittings with mechanical joints that require harnessing shall be provided with ductile iron retainer glands, Megalug, as manufactured by EBAA Iron, or equal. The glands shall be installed in accordance with the manufacturer's recommendations. Set screws shall be tightened to 75 foot-pounds torque. Where the glands are to be buried or not exposed to view, the assembly shall be given 2 heavy coats of asphalt varnish after installation. Ductile iron pipe and fittings with push-on joints that require harnessing shall be Clow F-128 "Super Lock Joint," American Cast Iron Pipe "Lok-Fast Joint," U.S. Pipe and Foundry Company "TR Flex," or equal.

W-10.11 Lining for Ductile Iron Gravity Pipe

Deleted

W-10.12 Polyethylene Encasement

Polyethylene encasement shall be installed on all buried ductile iron pipe and fittings within the sections indicated on the Plans or as directed by the Engineer and in accordance with ANSI/AWWA C105/A21.5.

Although not intended to be a completely air-and-water-tight enclosure, the polyethylene shall prevent contact between the pipe and the surrounding backfill.

Polyethylene encasement shall be installed in accordance with the pipe manufacturer's instructions, or in a manner acceptable to the Engineer. Polyethylene encasement shall extend 1 foot beyond the joint in both directions (a total of 2-foot overlap) and shall be adhered to said joint with 2-inch wide green marking tape. The slack width shall be taken up at the top of the pipe to make a snug, but not tight, fit along the barrel of the pipe, securing the fold at quarter points. Upon installation of the encasement, any cuts or damaged portions of the polyethylene encasement shall be securely mended with tape or with a short length of polyethylene sheet, or a tube cut open, wrapped around the pipe to cover the damaged area, and secured in place.

Backfill material shall be the same as specified for pipe without polyethylene wrapping; however, extra care should be taken that the backfill be free from cinders, refuse, boulders, rocks, stones, or other materials that could damage the encasement. Special care shall be taken to prevent damage to the polyethylene wrapping when placing backfill.

Because prolonged exposure to sunlight will deteriorate polyethylene film, such exposure prior to backfilling the wrapped pipe shall be kept to a minimum.

W-10.13 Ductile Iron Pipe Exterior Coating

All pipe and fittings shall have an exterior asphaltic coating conforming to the following requirements:

Viscosity, KU at 25 degrees C	56-60
Flashpoint, degrees F (TCC)	40 degrees F Min
Dry set to touch, minutes	6
Dry hard, minutes	22

W-10.14 Force Main Identification

Ductile iron pipe stormwater force main shall be continuously spiral wrapped with 2-inch wide black stick-on vinyl tape prior to installation for permanent identification purposes. The tape shall have a minimum thickness of 6 mils with a minimum tensile strength of 22 pounds per inch and a minimum adhesive factor of 40 ounces per inch. The pipe shall be clean and dry when wrapped.

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SECTION 11 - PVC PIPE GRAVITY

W-11.01 General

All pipe and fittings, 6"-27" nominal diameter, shall be solid wall Polyvinyl Chloride (PVC) Pipe **MANUFACTURED** to standards as outlined in the following sections.

All references to ASTM Designations shall include Manufacturing (PVC Cell Classification) and Performance (Inspection, Sampling and Testing) Specifications, and the most recent shall govern. Pipe and fittings meeting **ONLY** the Performance Test Specification will not be acceptable. The minimum nominal diameter for mainline pipe is 8 inches and for laterals is 6 inches. The maximum laying length shall be 13.0 feet.

W-11.02 Standards (6"-15" Diameter)

Solid wall PVC pipe shall comply with ASTM D 3034 and all applicable ASTM documents as covered in Section No. 2 of ASTM D 3034. All pipe and fittings shall be made of PVC plastic having cell classifications as outlined in Section No. 5 "Materials" of ASTM D 3034 and as defined in ASTM D 1784. For depths of cut through 18 feet, a minimum wall thickness of SDR-35 is required. For depths of cut greater than 18 feet, a minimum wall thickness of SDR-26 is required. Fittings shall be either integrally cast (factory molded) or factory solvent welded and a separate section from the mainline pipe. SDR-26 fittings shall be used with SDR-26 pipe.

W-11.03 Standards (18"-27" Diameter)

Solid wall PVC pipe and fittings shall comply with ASTM F 679 and all applicable ASTM documents as covered in Section No. 2 of ASTM F 679. All pipe and fittings shall be made of PVC plastic having cell classifications as outlined in Section No. 4 "Materials" of ASTM F 679 and as defined in ASTM D1784. All pipe and fittings shall meet the wall thickness and cell classification requirements of either T-1 or T-2 of Table 1 "Pipe Dimensions and Minimum Pipe Stiffness" of ASTM F 679. Fittings shall be either integrally cast (factory molded) or factory solvent welded and a separate section from the mainline pipe.

W-11.04 Joints (6"-27" Diameter)

Joints for solid wall PVC pipe and fittings shall be gasket, bell and spigot, push-on type. Joints shall be a molded integral part of the pipe section. Joints or couplings furnished loose shall not be permitted. Solvent cemented joints shall not be permitted. Lubricant shall be as recommended by the pipe manufacturer. (Assembly of gasketed joints is outlined in the Section "Joining of PVC Pipe").

Joints for pipe and for fittings shall comply with ASTM D 3212 "Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals." Elastomeric gaskets shall meet the requirements of ASTM F 477. Joints for pipe and fittings shall comply with ASTM D 3034 for 6"-15" diameter, ASTM F 679 for 18"-27" diameter, and ASTM F 1336 for 6"-27" diameter.

W-11.05 Pre-installation Tests, Reports, Markings and Submittals

All 6"-15" pipe and fittings shall be marked per Section No. 12 "Marking" of ASTM D 3034. All 18"-27" pipe and fittings shall be marked per Section 11 "Marking" of ASTM F 679. All required information shall be marked on the pipe. If in code, the markings shall be decoded in writing by letter to the City in advance.

PRIOR TO SHIPMENT of the pipe and fittings to the project site, the Contractor shall submit to the Engineer certifications as described below duly certified by the manufacturer's testing facility or an independent certified testing laboratory demonstrating full compliance with the applicable ASTM specifications described above. Certification from the supplier is **not** acceptable.

An original plus four (4) copies of the following shall be submitted to the Engineer.

1. The name, address, and phone number of the pipe and fittings manufacturer and the location of the plant at which they will be manufactured.

2. A letter of certification stating that each lot of pipe used on this project has been manufactured, sampled, tested, and conforms to Section 8 "Test Methods" of ASTM D 3034 for 6"-15" diameter and Section 7 "Test Methods" of ASTM F 679 for 18"-27" diameter pipe. A letter of certification from the fittings manufacturer shall be provided stating that all fittings conform with ASTM D 3034 for 6"-15" diameter, ASTM F 679 for 18"-27" diameter, and ASTM F 1336 for 6"-27" diameter.

W-11.06 Bedding Requirements

Unless otherwise indicated on the Plans, solid wall PVC pipe shall be installed with Class "C" bedding as described in Section W-2 - Backfilling." If soil conforming to subsection W-2.04 "Select Fill Material-Sand" is not excavated at the project site, it shall be imported. Compaction requirements are described in subsection W-2.07 "Bedding Placement for Pipelines." In no case shall a concrete cradle be used. In the event the Plans call for or the Contractor opts to install crushed stone, it shall be NO GREATER THAN a #57 stone.

W-11.07 Post-installation Tests

Not Applicable

W-11.08 Leakage Testing

Not Applicable

W-11.09 Joining of PVC Pipe

The assembly of gasketed joints shall be performed as recommended by the pipe manufacturer. In all cases, clean the gasket and bell, especially the groove area and the spigot area with a rag, brush, or paper towel to remove any dirt or foreign material before the assembly. Lubricant shall be applied as specified by the pipe manufacturer.

Align the spigot to the bell and insert the spigot into the bell until it contacts the gasket uniformly. Apply firm steady pressure either by hand or by bar and block assembly until the spigot easily slips through the gasket.

If undue resistance to insertion of the pipe end is encountered or the reference mark does not position properly, disassemble the joint and check the position of the gasket. If it is twisted or pushed out of its seat ("fish-mounted"), inspect components, repair or replace damaged items, clean the components, and repeat the assembly steps. Be sure both pipe lengths are in concentric alignment. If the gasket was not out of position, verify proper location of the reference mark.

To join field-cut pipe, first square cut the pipe end. Use a factory-finished beveled end as a guide for proper bevel angle and depth of bevel plus the distance to the insertion reference mark. Bevel the end using a pipe beveling tool or a wood rasp which will cut the correct taper. Round off any sharp edges on the leading edge of the bevel.

W-11.10 Joining PVC Pipe to Clay Pipe

Not Applicable

W-11.11 Joining PVC Pipe to Ductile Iron Pipe

The joining of PVC pipe to ductile iron pipe shall be accomplished with rigid PVC C900 x SDR-35 adapter couplings. Such couplings shall be molded of PVC material meeting ASTM D-1784 specifications. Joints shall meet ASTM D-3213 requirements with gaskets conforming to ASTM F-477. The adapter couplings shall be manufactured by Harco, Lynchburg, Virginia, or equal. Installation of rigid couplings shall be done in accordance with the manufacturer's instructions.

After the joint has been completed, any voids in the excavation beneath the coupling shall be thoroughly tamped full of granular fill material to provide a full bearing for the pipe and prevent excessive pressure on the bottom of the joint.

W-11.12 Connection to Manholes

Not Applicable

W-11.13 Storage of PVC Pipe

Pipe shall be stored at the job site in unit packages provided by the manufacturer. Caution shall be exercised to avoid compression, damage, or deformation to bell ends of the pipe. When unit packages of PVC pipe are stacked, ensure that the weight of upper units does not cause deformation to pipe in lower units.

PVC pipe unit packages shall be supported by racks or dunnage to prevent damage to the bottom during storage. Supports shall be spaced to prevent pipe bending.

PVC pipe shall not be stored close to heat sources or hot objects such as heaters, boilers, steam line, engine exhaust, etc.

When unit packages of PVC pipe are stacked, ensure that the height of the stack does not result in instability which could cause stack collapse, pipe damage, bodily injury, and property damage.

The interior as well as all sealing surfaces or pipe, fittings, and other accessories shall be kept free from dirt and foreign matter.

Gaskets shall be protected from excessive exposure to heat, direct sunlight, ozone, oil and grease.

W-11.14 Handling of PVC Pipe - Standard Procedures

When using fork lifts or other handling equipment, prevent damage to PVC pipe.

When handling PVC pipe, avoid severe impact blows, abrasion damage and gouging or cutting by metal surfaces or rocks. Avoid stressing bell joints and damage of bevel ends.

Pipe shall be lowered, not dropped, from trucks and into trenches.

In preparation for pipe installation, placement (stringing) of pipe shall be as close to the trench as practical and on the

opposite side from excavated earth. Bell ends shall point in the direction of work progress.

The Engineer may reject any pipe that shows visible signs of damage resulting from poor storage and handling practices.

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SECTION 14 - PIPE CRADLES AND ENCASEMENT

W-14.01 General

The Contractor shall furnish and place pipe cradles or pipe encasement, having dimensions as shown on the Plans, when specified in the Contract Items, when shown on the Plans, or when ordered in writing by the Engineer. Pipe cradles and pipe encasement shall be constructed of Class D concrete.

W-14.02 Concrete Cradle for Pipe

When concrete cradle is to be provided, as shown on the Plans or ordered by the Engineer, the sewer shall be laid to grade and supported on concrete blocks near each end. The tops of the blocks shall be shaped to conform to the dimensions of the pipe being laid and shall be set approximately 3/8 inch low. The pipe shall be placed on the blocks on stiff mortar of sufficient thickness to bring the pipes to exact grade. Timber blocking, or a type approved by the Engineer, may be employed in place of concrete blocks. The concrete cradle shall be placed against undisturbed earth on the bottom and sides of the trench. The Class D concrete shall be placed on one side only until it has risen above the invert on the other side, after which the remainder of the concrete shall be deposited on both sides. Suitable means shall be provided to prevent movement of the pipe during the placement of the concrete.

W-14.03 Concrete Encasement of Pipe

The pipe shall be supported and the Class D concrete encasement shall be placed as specified under concrete pipe cradle. The concrete shall be placed against undisturbed earth on the bottom and sides of the trench and continued over the pipe to provide the required thickness of complete encasement.

* * *

SECTION 15 - LAYING AND JOINTING PIPE FOR FORCE MAINS AND SEWERS

W-15.01 General

The installation, delivery, transportation, unloading, and stringing of pipes, fittings, and accessories for force mains and sewers shall be done in accordance with AWWA C600 for ductile iron pipe and ASTM Des: C 12 for clay and concrete pipe and ASTM D 2321 and pipe manufacturer's recommendations for PVC pipe, as modified or supplemented by the specifications of this section and by the details shown on the Plans.

Proper and suitable tools and appliances for the safe and convenient cutting, handling, and laying of the pipe and fittings shall be used.

Suitable fittings shall be used where shown and at connections where grade or alignment changes require offsets greater than those recommended by the pipe manufacturer.

Pipes and fittings shall be thoroughly cleaned before they are laid and shall be kept clean until they are accepted in the completed work.

All lines shall be closed off with bulkheads when pipe laying is not in progress.

Before being laid, all pipe and specials shall be thoroughly examined for defects, and no piece shall be installed which is known to be defective. If any defective piece should be discovered after having being installed, it shall be removed and replaced with a sound one in a satisfactory manner by the Contractor at his own expense.

Pipe shall be thoroughly cleaned before it is laid and shall be kept clean until it is accepted in the completed work. Special care shall be exercised to avoid leaving bits of wood, dirt, and other foreign particles in the pipe. If any such particles are discovered before the final acceptance of the work, they shall be removed and the pipe cleaned at the Contractor's expense.

Pipe laying for sewers shall begin at the low end of a run and proceed upgrade. Generally, all such pipe shall be laid with bells or grooves pointing uphill. Each pipe shall be carefully placed and checked for line and grade.

Adjustments to bring pipe to line and grade shall be made by scraping away or filling in granular material under the body of the pipe, but in no case by wedging or blocking up the barrel. The faces of the spigot ends and the bells shall be brought into fair contact, and the pipe shall be firmly and completely shoved home. As the work progresses, the interior of the pipelines shall be cleaned of all dirt and superfluous materials of every description. All lines shall be kept absolutely clean during construction. Pipelines shall be laid accurately to line and grade.

Gaskets for pipe joints shall be stored in a cool place and protected from light, sunlight, heat, oil, or grease until installed. Any gaskets showing signs of checking, weathering, or other deterioration will be rejected.

Pipe shall be of the types, sizes, and classes shown on the Plans or as listed in the Contract Items.

Each piece of pipe shall be inspected and cleaned before it is lowered in the trench and any lumps or projections on the face of the spigot or tongue end or the shoulder shall be cut away. No cracked, broken, or defective pieces shall be used in the work.

Concrete pipe manufactured with a plastic sheet liner shall be laid so that the liner is on the crown of the pipe and placed symmetrically about the vertical centerline of the pipe.

Pipe laying will be permitted only in dry trenches having a stable bottom. Where groundwater is encountered, the Contractor shall make every effort to secure an absolutely dry trench bottom.

If, in the opinion of the Engineer, the Contractor has failed to obtain an absolutely dry trench bottom by improper or insufficient use of all known methods of trench dewatering, the Engineer may then order the Contractor to excavate below grade and place sufficient selected fill material, crushed stone, or Class D concrete over the trench bottom at the Contractor's own expense.

If all efforts fail to obtain this condition and the Engineer determines that the trench bottom is unsuitable for pipe foundation, he will order in writing the kind of stabilization to be constructed.

W-15.02 Transportation and Delivery

Every precaution shall be taken to prevent injury to the pipe during transportation and delivery to the site. Extreme care must be taken in loading and unloading the pipe and fittings. Such work must be done slowly with skids or suitable power equipment, and the pipe shall be under perfect control at all times. Under no condition shall the pipe be dropped, bumped, dragged, pushed, or moved in any way which will cause damage to the pipe or coating. When handling the pipe with a crane, a suitable pipe hook or sling around the pipe shall be used. Under no condition shall the sling be allowed to pass through the pipe unless adequate measures are taken to prevent damage to the pipe ends.

If in the process of transportation, handling, or laying, any pipe or special is damaged, such pipe or pipes shall be replaced or repaired by the Contractor at his own expense.

The Contractor shall furnish and install suitable blocking and stakes so as to prevent the pipe from rolling. The type of blocking and stakes, and the method of installation, shall be approved by the Engineer.

W-15.03 Pipe Laying - Trenches

Pipelines shall be laid in trench excavation on bedding material as specified under the Workmanship and Materials section headed "Backfilling," Class D concrete cradle or other foundations as shown on the Plans, specified, or ordered in writing by the Engineer. The pipe shall be properly secured against movement and pipe joints shall be made in the excavation as required.

The pipe bedding shall be carefully graded, compacted, and formed to fit the bottom quadrant of the pipe. Bell holes shall be cut out for each joint as required to permit the joint to be properly made and allow the barrel of the pipe to have full bearing throughout its length.

Where pipelines are laid in Class D concrete cradle or encasement, the installation shall conform to the requirements of the Workmanship and Materials section headed "Pipe Cradles and Encasements."

Pipelines laid on other type foundations shall be installed as specified for such other foundations or as directed in writing by the Engineer.

W-15.04 Lateral Detection Tape

Deleted

W-15.05 Mechanical Joints for Ductile Iron Pipe

In making up mechanical joints, the spigot shall be centered in the bell. The surface with which the rubber gasket comes in contact shall be cleaned thoroughly and the gasket shall be washed thoroughly with soapy water just prior to assembly of the joint. The gasket and gland shall be placed in position, the bolts inserted, and the nuts tightened fingertight. The nuts then shall be tightened by means of a torque wrench in such a manner that the gland shall be brought up evenly into the joint. The following range of bolt torques shall be applied:

Bolt Size Inches	Range of Torque Foot-Pounds
5/8	45 - 60
3/4	75 - 90
1	80 - 100
1-1/4	105 - 120

If effective sealing is not obtained at the maximum torque listed above, the joint shall be disassembled and reassembled after a thorough cleaning.

All bolts and nuts shall be field coated with a bituminous coating after assembly of the joint.

W-15.06 Push-on Joints for Ductile Iron Pipe

In making up push-on joints, the gasket seat in the socket shall be cleaned thoroughly and the rubber gasket shall be wiped clean with a cloth. The gasket shall be placed in the socket and a thin film of lubricant shall then be applied to the inside surface of the gasket that will come in contact with the entering pipe. The plain end of the pipe to be entered shall be cleaned thoroughly and placed in alignment with the bell of the pipe to which it is to be joined. The joint shall be made up by exerting sufficient force on the entering pipe so that its plain end is moved past the gasket until it makes contact with the base of the socket.

W-15.07 Joining Clay Pipe

The joining of clay pipe with flexible plastic joints shall be done in accordance with the manufacturer's instructions. The joint surface on both the bell and spigot ends shall be wiped clean and coated with a lubricant furnished by the manufacturer to facilitate assembly. The spigot end shall be inserted in the bell and pressure applied sufficient to seat the pipe properly. After the joint has been completed, any voids in the excavation beneath the spigot shall be thoroughly tamped full of granular fill material to provide a full bearing for the pipe and prevent excessive pressure on the bottom of the joint.

W-15.08 Joining of PVC Pipe-Gravity

The assembly of gasketed joints shall be performed as recommended by the pipe manufacturer. In all cases clean the gasket and bell, especially the groove area and the spigot area, with a rag, brush or paper towel to remove any dirt or foreign material before the assembly. Lubricant shall be applied as specified by the pipe manufacturer.

Align the spigot to the bell and insert the spigot into the bell until it contacts the gasket uniformly. Apply firm steady pressure either by hand or by bar and block assembly until the spigot easily slips through the gasket.

If undue resistance to insertion of the pipe end is encountered or the reference mark does not position properly, disassemble the joint and check the position of the gasket. If it is twisted or pushed out of its seat ("rolled"), inspect

components, repair or replace damaged items, clean the components, and repeat the assembly steps. Be sure both pipe lengths are in concentric alignment. If the gasket was not out of position, verify proper location of the reference mark.

To join field-cut pipe, first square cut the pipe end. Use a factory-finished beveled end as a guide for proper bevel angle and depth of bevel plus the distance to the insertion reference mark. Bevel the end using a pipe beveling tool or a wood rasp which will cut the correct taper. Round off any sharp edges on the leading edge of the bevel.

W-15.09 Joining Concrete Pipe

Before joining concrete pipe using flexible rubber gaskets, the joint surfaces of both the bell and spigot (tongue and groove) ends shall be wiped clean. Any lumps, projections, burrs, or chips which would interfere with the proper compression of the gasket shall be repaired. The spigot or tongue end with the gasket in place and with all surfaces lubricated as recommended by the manufacturer, shall be inserted into the bell or groove. Pressure shall be applied to seat the pipe properly in the bell or groove. Voids under the pipe shall be tamped full of granular material to provide full bearing for the pipe.

Curves for reinforced concrete pipe sewers shall be constructed with standard pipe where the opening of the joint on the outside of the curve is less than 1/2 inch. Where greater opening of the joint would be required, the curves shall be constructed using beveled or radius pipe with standard joints.

Curves for reinforced concrete pressure pipe or prestressed concrete pipe shall be constructed with standard pipe sections, where the opening of the joint on the outside of the curve is less than 1/2 inch, or with beveled pipe, precast elbows or combination of these methods.

W-15.10 Concrete Pipe Rubber Gasket Joints

Rubber gaskets shall be of the O-ring type or equivalent cross section approved by the Engineer. The composition and properties of the gaskets for gravity flow sewers shall meet the requirements of ASTM Des: C 443.

Composition and properties for concrete pressure pipe gaskets shall meet the requirements of the specifications for the concrete pressure pipe with which the gasket will be used.

In making O-ring rubber gasketed joints, the gasket and the pipe socket shall be lubricated with an approved rubber gasket lubricant, and the gasket shall be stretched over the spigot and placed accurately in position. The tongue or spigot end shall be carefully centered in the socket of the preceding pipe so as to avoid displacement of the gasket, and the pipe shall be drawn home fully compressing the gasket. Adjustments to line and grade shall be made in such a manner that the compressed rubber gasket will not be disturbed. Before proceeding with backfilling, the joint shall be felt completely around to determine whether the gasket is in its proper position. If the gasket can be felt out of place, the pipe shall be withdrawn and the gasket examined for cuts or breaks. If the gasket has been damaged, it shall be replaced with a new one before the pipe is replaced.

Rubber gaskets shall be stored in a cool place and protected from light, sunlight, heat, oil, or grease until installed. Any gaskets showing signs of checking, weathering, or other deterioration will be rejected.

W-15.11 Temporary Bulkheads

At the ends of contract sections, where adjoining pipelines have not been completed, and in connections built into pipelines where adjoining pipelines or structures have not been completed and are not ready to be connected, temporary bulkheads, approved by the Engineer, shall be built. Such bulkheads encountered in connecting sewers or structures included in the Contract, or pipelines or structures previously built, shall be removed by the Contractor when the need for them has passed or when ordered by the Engineer.

W-15.12 Testing

Deleted

W-15.13 Joining Clay or PVC Pipe to Ductile Iron Pipe

The joining of clay pipe to ductile iron pipe shall be accomplished with flexible compression couplings. Such couplings shall meet the requirements of ASTM DES: C 425 and shall be Series No. 1002 flexible polyvinyl chloride couplings with stainless steel compression bands as manufactured by Fernco Joint Sealer Co., Ferndale, Michigan; Band-Seal couplings as manufactured by Mission Clay Products Corp., Whittier, California; or approved equal. Installation of flexible couplings shall be done in accordance with the manufacturer's instructions. After the joint has been completed, any voids in the excavation beneath the coupling shall be thoroughly tamped full of granular fill material to provide a full bearing for the pipe and prevent excessive pressure on the bottom of the joint.

The joining of PVC pipe to ductile iron pipe shall be accomplished with rigid PVC C900 x SDR-35 adapter couplings. Such couplings shall be molded of PVC material meeting ASTM D-1784 specifications. Joints shall meet ASTM D-3213 requirements with gaskets conforming to ASTM F-477. The adapter couplings shall be manufactured by Harco, Lynchburg, VA, or equal. Installation of rigid couplings shall be done in accordance with the manufacturer's instructions. After the joint has been completed, any voids in the excavation beneath the coupling shall be thoroughly tamped full of granular fill material to provide a full bearing for the pipe and prevent excessive pressure on the bottom of the joint.

W-15.14 Connection to Manholes

The Contractor will be required to submit a shop drawing, detailing the method of connecting the proposed pipe to the manhole and making it watertight:

1. For connecting vitrified clay or ductile iron pipe, the Contractor shall use nonshrink grout to seal the opening between the pipe O.D. and manufactured opening in the manhole or flexible rubber boot, precast into the manhole. The boot shall have stainless steel bands to compress and seal to the proposed pipe or shall be a compression type, such as A-Lock.

2. For connecting PVC pipe, the Contractor shall use a flexible rubber boot, precast into the manhole. The boot shall have stainless steel bands to compress and seal to the proposed pipe or shall be a compression type, such as A-Lock. Should the flexible rubber boot need to be relocated or when connecting to an existing manhole, the Contractor shall perform the connection by one of two methods. The preferred method is to core the manhole and install a rubber boot. The rubber boot shall be manufactured by Kor-n-Seal, or equal. The boot shall be installed and the PVCP connection shall be in accordance with the manufacturer's instructions. If the manhole cannot be cored or if the manhole is constructed of brick, the connection shall be made with a PVC manhole adapter which has an exterior impregnated silica surface layer. The adapter shall be manufactured by GPK Products, Inc., Fargo, ND, or equal. The adapter shall be installed and grouted into the manhole wall in accordance with the manufacturer's instructions with nonshrink grout. The PVCP shall be inserted through the adapter.

W-15.15 Joint Grouting

Joints for concrete pipelines using rubber gaskets and steel end rings shall be grouted on the outside with cement mortar composed of one part Type IA portland cement to one part sand by volume. The materials shall be thoroughly mixed to produce a uniform mortar with all aggregate particles well coated.

The joint grouting shall not advance closer than two pipe lengths to the laying operations. In grouting the joint, a cloth diaper shall be used to encase the outside diameter of the bell of the pipe and adequately straddle the joint recess so as to keep out dirt and to serve as a form for grouting. The joint space shall be filled with cement mortar, just thin enough to run around the joint. The diaper is to be left in place permanently. Before the mortar has taken its initial set, the diaper shall be examined, and if not completely filled, additional mortar shall be forced into the joint.

* * *

SECTION 16 - RESTORATION OF STREET PAVEMENTS

W-16.01 General

The various street surfaces disturbed, damaged, or destroyed during the performance of the work under this Contract shall be restored and maintained as shown, specified, and directed. Included in this classification are permanent pavement surfaces of all types, pavement bases, curb, curb and gutter, alleys, driveways, and sidewalks.

The quality of workmanship and materials used in the restoration shall produce a street surface equal to or better than the condition before the work began.

Service boxes, manhole frames and covers, and similar structures not conforming to the new work shall be set to established grade at the Contractor's expense, and no separate payment will be made therefor.

All portland cement and asphaltic concrete pavements shall be removed in rectangular sections with sawed vertical cuts, or to existing joints, as directed by the Engineer. Concrete pavements shall be cut with a concrete saw. Asphaltic concrete pavements one-inch thick or greater shall be cut with a tool having a square neat edge. The edges of adjacent pavement shall be trimmed to straight lines which a roller can follow. Where reinforced concrete pavement is removed, one foot of existing reinforcement on each side of the excavation shall be left exposed and tied to the replaced reinforcing steel.

The equipment necessary for the proper performance of pavement replacement shall be on the site in satisfactory working condition and shall be subject to approval of the Engineer before the work is started.

All replaced concrete pavements shall have a minimum bearing on undisturbed earth outside the line of excavations of at least nine (9) inches.

W-16.02 Standards

The restoration of street pavement shall be performed in strict conformance with the standards relating to equipment, materials, and methods of construction of the authority having jurisdiction over the pavements, unless otherwise specified herein. Pavements to be restored are under the jurisdiction of the several agencies as follows:

1. State Highways are under the jurisdiction of the State of Florida Department of Transportation. Work on such pavements shall conform to the Department of Transportation Standard Specifications for Road and Bridge Construction.

2. City Streets are under the jurisdiction of the City of Tampa Department of Public Works. Work on such pavements shall conform to the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition, except that densities (including for subgrade) and other testing requirements shall follow current Department of Public Works specifications, and except that Sections 330 and 331 shall be modified as shown in this Section. The type and thickness of pavement, base and stabilization shall be as shown, specified, and directed by the Engineer.

3. County Roads are under the jurisdiction of the Hillsborough County Engineering Department. Work on such pavements shall conform to County specifications.

All specifications of the several agencies having jurisdiction over pavement restoration work shall be the current issue of such specifications as of the date of the "Notice to Bidders," except as specified otherwise herein.

W-16.03 Temporary Restoration

Upon completion of backfilling, the street or sidewalk surface damaged or destroyed shall be promptly placed in condition for safe temporary use. Temporary work shall be maintained in a suitable and safe condition for traffic until the permanent pavement is laid, or until final acceptance of the work.

Where the area over which existing pavement has been disturbed is to be repaved as part of an overall project by the agency having jurisdiction, any special temporary pavement replacement shall be as specified in the "Specific Provisions."

Pavement surfaces shall be temporarily restored by placing thereon, to proper line, grade and transverse profile, a layer or layers of compacted limerock conforming to all requirements regarding configuration, thickness, and density as detailed in the Plans, specified, and directed by the Engineer. When the compacted thickness of the limerock layer is greater than 6 inches, the base shall be constructed in multiple courses. Each course shall not exceed 6 inches in compacted thickness. Where the existing pavement has a permanent wearing surface, the temporary pavement shall be finished with a suitable grade of asphalt and sand to provide a temporary wearing course and to eliminate dust nuisance.

Curbs, where possible, shall be temporarily reset in place, as part of the work of temporary restoration of pavement.

Damaged or destroyed sidewalks shall be temporarily restored, immediately upon placing of the backfill, by placing a compacted layer of fine crushed limestone, choked with limestone screenings, which shall have a minimum thickness of three inches below the existing finished sidewalk grade.

The temporary pavement shall be maintained by the Contractor and all holes and depressions filled until the permanent pavement is placed.

Limerock or shell placed in areas where the existing pavement is shell, limerock, crushed stone, or other similar material and is classed as nonpermanent pavement, will not be measured for separate payment. Placement of limerock or shell as nonpermanent pavement replacement will be included for payment under the various classified Unit Price Contract Items for pipelines.

Temporary sand and asphalt wearing courses placed on limerock base on which a permanent pavement surface will be constructed shall be incidental to the permanent pavement base work, and no separate payment will be made therefor.

Limestone screenings for temporary sidewalk surface shall be incidental to sidewalk replacement, and no separate payment will be made therefor.

Limerock base placed in areas to receive a permanent pavement surface will be measured for payment under the appropriate Contract Item for permanent pavement base.

W-16.04 Preparation of Temporary Pavement for Permanent Pavement Replacement

After due notice and within the time specified, the temporary limerock pavement shall be prepared as the base to receive the new permanent pavement surface.

Prior to construction of the pavement base, the City will furnish the Contractor with the preconstruction survey notes for the streets disturbed by construction. The Contractor shall use these notes in bringing the base installed to grade allowing for the permanent pavement surface to be constructed.

The preparation of the base shall consist of bringing the area to be replaced to a grade conforming to the required grade and cross section, of uniform density, ready to receive the permanent pavement. This is to be accomplished by excavating or backfilling as needed, shaping, watering as required, or permitting to dry to proper consistency, and rolling the entire area with an approved self-propelled roller weighing not less than eight tons. Shaping and rolling shall be continued until the base has been properly prepared and shows that no further compaction of any practical benefit would result from continued rolling. The base shall be tested as to cross section, crown, and elevation. After being properly prepared, it shall be so maintained until the permanent pavement is constructed. Any part of the base area not accessible to the roller shall be thoroughly compacted by hand or by mechanical compaction in a manner acceptable to the Engineer. Preparation shall include sawing, cutting and trimming edges of existing pavements to provide a neat, uniform edge to abut the new pavement.

After completion of the base, the Contractor shall furnish the Engineer with survey notes verifying the base has been constructed to grade. Upon approval, payment will be made for permanent pavement base.

W-16.05 Certification for Limerock for Pavement Base

The Contractor shall furnish notarized certifications from all suppliers of limerock stating that all limerock supplied for use as pavement base conforms to the requirements of the applicable sections of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction.

W-16.06 Permanent Pavement Base Densities

Permanent base material shall be installed and compacted to the required densities (98% modified proctor) in layers not exceeding six inches.

W-16.07 Permanent Pavement Surface Restoration

Permanent restoration of pavement shall be pavement of the type and thickness detailed in the Plans, Specific Provisions, or as directed by the Engineer.

If the existing type of pavement is classified as nonpermanent pavement, the temporary restoration shall be reworked and completed and left in a condition at least equivalent to the existing nonpermanent pavement.

W-16.08 Replacement of Curb, Curb and Gutter, Sidewalk and Driveways

All permanent restoration of street curb or curb and gutter shall be of the same type and thickness as the curb or curb gutter which abuts. The grade of the restored curb and curb and gutter shall conform with the grade of the existing adjacent curb or curb and gutter.

Except as otherwise specified herein or detailed in the Plans, all permanent restoration of driveways and

sidewalks shall conform to the manner of construction as originally placed and to the lines and grades as given by the Engineer. No patching of concrete driveway areas will be allowed between joints or dummy joints.

Where sidewalks are replaced, the replacement shall be the full width of the walk and minimum lengths shall be 60 inches. Restoration of adjacent lawn is incidental to sidewalk replacement, and no separate payment will be made therefor.

W-16.09 Replacement of Traffic Markings and Signalization Loops

The Contractor shall furnish all labor, equipment and materials to replace, test and maintain all traffic markings (temporary and permanent) and signalization loops removed or damaged by pipeline construction and appurtenance work as shown on the Plans, specified and directed by the Engineer.

The replacement of traffic markings (temporary and permanent), signalization loops and all appurtenant work shall be replaced by the Contractor in kind.

It shall be the Contractor's responsibility to field verify before construction begins all markings and signalization loops to be replaced.

All traffic markings and signalization loops shall conform to the Workmanship and Materials standards set forth in the latest edition of the Florida Department of Transportation Standard and Supplemental Specifications.

Payment for the replacement of temporary and permanent traffic markings, signalization loops and all appurtenant work shall be included in the unit bid price for Permanent Pavement Surface Replacement, Asphaltic Concrete, and no separate payment shall be made therefor.

W-16.10 Hot Bituminous Mixtures (Section 330) Type S Asphaltic Concrete (Section 331)

This Subsection shall Replace and/or Modify Portions of F.D.O.T. Standard Specifications for Road and Bridge Construction (1991) Sections 330 and 331.

330-10.3 Density Control

330-10.3.1 Density Control Nuclear Method:

The inplace density of each course of asphalt mix construction, with the exceptions of patching courses, leveling and intermediate courses less than 1 inch thick or a specified spread rate less than 100 pounds per square yard, overbuild courses where the minimum thickness is less than 1 inch, and open-graded friction courses, shall be determined by the use of the Nuclear Density Backscatter Method as specified by FM 1-T238 (Method B). The required density of a completed course shall be at least 95% of the job mix design laboratory density submitted by the Contractor and approved by the construction engineer or 96% of the laboratory density which results from a sample of the same day's productions and determined by the City laboratory performing all acceptance testing.

330-10.3.2 Control Strips:

Control strips may be constructed by the Contractor for the purpose of determining the necessary pattern of compacting procedures to achieve the density requirements specified. However, control strips are not used for the validity of acceptance testing.

330-10.3.3 Lots:

For the purpose of acceptance and partial payments, each day's production will be divided into lots. The standard lot size shall be 500 linear feet and consist of one sublot with its appropriate test per every 100 linear feet of any pass made by the paving train, regardless of the width or thickness of the course being laid. Any partial lot will be redefined as a whole lot and the evaluation of it will be based on its sublot test determinations.

For the standard lot (500 linear feet), five density determinations - one for each sublot - will be made at random locations within the lot, but not to be taken within one foot of any unsupported edge.

For the Contractor to receive full payment for density, the average density of a lot will be a minimum of 95% of the submitted and approved job mix design laboratory density or 96% of the same day sampled laboratory density performed by the City laboratory performing acceptance testing. To calculate the average density of a lot, the lowest sublot test will be discarded and the remaining four sublots will be averaged. Once the average density of a lot has been determined, the Contractor will not be permitted to provide additional compaction to raise the average. The average density will be rounded off according to City standards.

330-10.3.4 Acceptance:

The completed pavement will be accepted with respect to density on a lot basis. Partial payment will be made for those lots that have an average density less than the specified 95% of the approved job mix design laboratory density or 96% of the same day sampled laboratory density based on the following table:

City of Tampa Revised Table 330-3
Payment Schedule for Density

Percent of Control Strip Density	Percent of Payment
95.0 (job mix design)$_1$ or 96.0 (lab density sample)$_2$ & above	100
94.0 to < 95.0$_1$ or 96.0$_2$	95

Percent of Control Strip Density	Percent of Payment
93.0 to < 94.0 (Applies to both $_1$ & $_2$)	90
< 93.0 (Applies to both $_1$ & $_2$)	75

330-10.3.5 Density Requirements for Small Projects:

For projects less than 500 linear feet in length including intersections, turnouts, patches, crossings, etc., the requirements for specified densities are the same as a standard lot. For the purpose of acceptance and partial payment determination, the project less than 500 linear feet will be considered as a lot in its entirety and payment will apply accordingly with Table 330-3. The Contractor will use standard rolling procedures in 330-10.

331-5 Acceptance of the Mixture

331-5.1 General:

The bituminous mixture will be accepted at the site with respects to a gradation and asphalt content on a lot to lot basis. The material will be tested for acceptance in accordance with the provisions of 6-8.2 and the following requirements. However, any load or loads of mixture which, in the opinion of the City representative, are found unacceptable for reasons of being excessively segregated, aggregates improperly coated, or of excessively high or low temperature shall be rejected for use in the work. The composition and physical test properties for all mixes must meet the specification ranges provided in Tables 331-1 and 331-2.

A standard size lot at the site shall consist of one day's placement or equivalent to a standard quantity of 1,000 tons. The number of samples required to evaluate the lot will be divided into one or two sublots as indicated below. Testing for acceptance of the lot will be performed by the City material testing laboratory or by a licensed private testing laboratory of the City's choice. Quantities between 500 tons and 1,000 tons shall have 2 sublots; quantities between 50 tons and 500 tons shall have 1 sublot; quantities up to 50 tons will be accepted by the City representative on the basis of visual inspection.

331-5.2 Acceptance Procedures:

Sample selection for acceptance tests will be by random sampling of loaded trucks on site at the discretion of the City testing technician in accordance with FM-T168. The use of a random sample chart may be used but it is not required. Sampling shall not be taken in any of the following circumstances:

1) First load produced that day.
2) Last load produced that day.
3) Near end of quantity reached because of an underrun.

The Contractor and/or the plant quality control technician (Q.C.T.) will be notified of the time of sampling and may:

1) Observe the sampling.
2) Take a sample at the same time and run the tests.
3) Ask for a split sample and run the tests.
4) Observe the City testing technician run the tests.

The five acceptance determinations made from the sample are:

1) The % bitumen content per F.M.I. - T164.
2) The % passing the No. 4 sieve per F.M.I. - T030.
3) The % passing the No. 10 sieve per F.M.I. - T030.
4) The % passing the No. 40 sieve per F.M.I. - T030.
5) The % passing the No. 200 sieve per F.M.I. - T030.

For each acceptance sample taken, the technician will box and keep two split portions for referee tests. If the lot receives 100% payment, the referee sample will be discarded. If the lot sample shows a pay reduction, then one or both of the referee samples will be submitted for a second analysis to determine the validity of the acceptance test results. Referee samples will be tested by a licensed private laboratory of the City's choice. This second analysis will only be done at the request of the Contractor and will be paid for by the Contractor in the event that the original analysis results requiring a pay reduction is confirmed.

In the event that the second analysis does not confirm the pay reduction, the City will pay for the second analysis.

Acceptance of the mixture shall be on the basis of test results on consecutive random samples from each lot. One random sample shall be taken from each sublot. (The bituminous mixture will be sampled at the site in accordance with FM 1-T168.) The percent bitumen content of the mixture will be determined in accordance with FM 1-T164 (as modified by DOT test procedures). The percents passing the No. 4, No. 10 and No. 200 sieves will be determined in accordance with FM 1-T030.

Calculations for the acceptance test results for bitumen content and gradation (percent pass No. 4, percent pass No. 10, percent pass No. 40 and percent pass No. 200) shall be shown to the nearest hundredth (0.01). Calculations for arithmetic averages shall be carried to the thousandths (0.001) and rounded to the nearest hundredth (0.01) in accordance with the Department's rules of rounding.

When the Contractor or producer chooses to use a storage bin for mix storage overnight or longer, the material processed in this manner will be sampled and tested for acceptance after the mix has been removed from the storage bin. The City representative may reject a mix at any time that is obviously defective due to asphalt content, insufficiency of mixing, inadequacy of coating, improper proportions of fine and coarse aggregates, temperature, contamination, etc. The Contractor and/or the L.Q.C.T. will be given the option of not placing the mix and sampling the following truck, or if it has been placed, sample it. The City reserves the right to test or have the mix tested by a licensed private testing laboratory of their choice. Payment will be made on the basis of the City's revised Table 331-6 "Acceptance Schedule of Payment."

City of Tampa Revised Table 331-6
Acceptance Schedule of Payment
(Asphalt Plant Mix Characteristics)

Characteristics	Factor	Deviation of the Arithmetic Average of the Lot Acceptance Tests from Job Mix Formula: One Test	Two Tests	
Asphalt Cement Content (Extraction)		1.00	0.00 - 0.55	0.00 - 0.43
		0.95	0.56 - 0.65	0.44 - 0.50
		0.90	0.66 - 0.75	0.51 - 0.57
		0.80*	Over 0.75	Over 0.57
No. 4 Sieve**		1.00	0.00 - 8.00	0.00 - 5.95
		0.95	8.01 - 9.00	5.96 - 6.66
		0.90	9.01 -10.00	6.67 - 7.36
		0.80	Over 10.00	Over 7.36
No. 10 Sieve**		1.00	0.00 - 6.50	0.00 - 5.04
		0.95	6.51 - 7.50	5.05 - 5.74
		0.90	7.51 - 8.50	5.75 - 6.45
		0.80*	Over 8.50	Over 6.45
No. 40 Sieve**		1.00	0.00 - 5.50	0.00 - 4.62
		0.95	5.51 - 6.50	4.63 - 5.33
		0.90	6.51 - 7.50	5.34 - 6.04
		0.80*	Over 7.50	Over 6.04
No. 200 Sieve**		1.00	0.00 - 2.00	0.00 - 1.71
		0.95	2.01 - 2.40	1.72 - 1.99
		0.90	2.41 - 2.80	2.00 - 2.04
		0.80*	Over 2.80	Over 2.04

* If approved by the City, the Contractor may accept the indicated partial pay. The City may require removal and replacement at no cost. The Contractor has the option to remove and replace at no cost to the City at any time.

** When there are two or more reduced payments for these items in one lot of material, only the greatest reduction in payment will be applied. CAUTION: This rule applies only to these four gradation test results.

Note: 1) The No. 40 sieve applies only to Types S-I, S-II, S-III, FC-1, and FC-4.
2) Deviations are absolute value with no plus or minus signs.

* * *

SECTION 17 - LAWN REPLACEMENT

W-17.01 General

The Contractor shall replace all lawn areas which have been removed or damaged due to construction. Lawn replacement includes fine grading the areas to be restored and furnishing and placing topsoil, fertilizer, sod, sprigs, seeding, and maintaining all areas. Grassing and mulching or sodding lawn areas will be required as directed. Grassing shall be accomplished by seeding.

Sod shall be Argentine Bahia, St. Augustine, or other approved native grass sod, and shall be well matted with grass roots. It shall be sufficiently thick to secure a dense stand of live grass, with a minimum thickness of 2 inches. The sod shall be live, fresh and uninjured, and shall contain sufficient moisture at the time of planting to induce growth. The type and quality of sod shall be approved by the Engineer before placing.

Grass seed shall be Argentine Bahia, 60 #/acre from March 1 to November 1; 50 #/acre with 20 #/acre of rye grass seed from November 1 to March 1. Argentine Bahia seed shall be a scarified seed having a minimum active germination of 40% and total of 85%.

Mulch material shall be free of weeds and shall be oat straw or rye, Pangola, peanut, Coastal Bermuda or Bahia grass hay.

W-17.02 Topsoil

Where areas are to be restored by sodding, topsoil shall be placed to a minimum compacted depth of 2 inches over the subgrade. Where areas are to be restored by grassing, topsoil shall be placed to a minimum compacted depth of 4 inches over the subgrade. All topsoil shall be suitable excavated topsoil which has been segregated or other topsoil material approved by the Engineer. Topsoil shall be free from stones, roots, sticks, or other foreign substances.

W-17.03 Water

The Contractor shall furnish at his own expense all water required for lawn replacement and maintenance of the work until final acceptance.

W-17.04 Construction Methods

Prior to sodding or grassing, the Contractor shall fine grade the subgrade to 4 inches below finished grade. Topsoil shall be spread over the subgrade to a uniform depth and density. Topsoil shall be uniformly compacted by a light hand roller weighing between 250 and 750 pounds to the specified depths for sodding or grassing.

Immediately before sodding, 14-4-14 or 15-0-15 fertilizer shall be applied at the rate of approximately 600 pounds per acre, either in the furrows or by broadcasting and raking, into the planting area. After the surface has been properly prepared, the sod shall be placed and firmly embedded by light tamping. Additionally, dolomite (lime) shall be applied at a rate of 2 tons per acre.

Immediately after the sod has been planted, if the soil does not contain sufficient moisture to ensure growth, water shall be applied twice daily for the first week, once in the morning or late evening and once at approximately 2:00 P.M. Water shall then be applied once a day over the next 2 weeks and alternating days for an additional 2 weeks. If rooting has not taken place by the end of the third week, 1 daily watering shall continue until sod is firmly rooted.

One week after the sod has been planted, a complete fertilizer with minor elements shall be applied weekly at the rate of 1# nitrogen per 1,000 square foot in a 2-1-2 or 4-1-2 formula for a period of 4 weeks, and thereafter every 2 weeks for an additional 30 days. The ground shall not be wet when the fertilizer is applied but will be immediately watered after application of the fertilizer to remove it from the leaf area.

Prior to grassing, 14-4-14 or 15-0-15 fertilizer shall be applied to the soil at the rate of approximately 300 pounds per acre. Grass seed at the specified rate per acre shall then be raked into the soil and covered with mulching material. The area shall then be thoroughly rolled with approved equipment.

After the grass has been planted, if the soil does not contain sufficient moisture to ensure growth, water shall be applied as directed by the Engineer. After the grass has started growing, fertilizer shall be applied uniformly over the area weekly, at a rate of 0.5# nitrogen and potash per 1,000 square feet, until turf cover the area. The fertilizer shall not be applied unless the surface of the ground or sod is sufficiently moist to quickly dissolve the fertilizer.

W-17.05 Caretaking

The Contractor shall keep all replaced lawn areas in good, healthy, insect free, moist condition by watering, replanting or resodding, weeding, fertilizing, and cutting as specified, and directed by the Engineer.

* * *

SECTION 25 - LANDSCAPE WORK

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Contract Provisions:

1. All work of this section shall conform to the highest standard landscaping practices.

2. Plant lists included with these plans are provided only for the Contractor's convenience; they shall not be construed as to conflict or predominate over the plans. If conflict between the plans and the specifications exists, the plans shall predominate and be considered the controlling document.

3. During this work, the Contractor shall be responsible for maintaining safety among persons in his employ in accordance with the standards set by The Occupational Safety and Health Act of 1970 (and all subsequent amendments). The City shall be held harmless from any accident, injury or any other incident resulting from compliance or non-compliance with these standards.

4. The Contractor shall cooperate with and coordinate with all other trades whose work is built into or affects the work in this section.

5. The Contractor shall obtain all necessary permits for the work of this section and comply with the requirements of all governing agencies. All appropriate utility companies and agencies shall be contacted prior to digging.

6. The Contractor shall carefully examine the site and all existing conditions affecting the work, such as: soil, obstructions, existing trees, utilities, etc. Report any conditions in conflict with the work to the Engineer.

B. Alternates, Additions, Deletions, Substitutes:

1. The City reserves the right to add or deduct any of the work stated herein without rendering void the contract.

2. The Contractor must have written approval by the Engineer for any substitutions not previously agreed to in the contract: installation without approval is entirely at the Contractor's risk.

3. All material acquired through additions or substitutions shall be subject to all conditions and guarantees stated herein.

C. Abbreviations:

1. O.A.: The overall height of a plant measured to the natural untied state of the majority of the foliage, not including extreme leaves, branches or fronds.

2. C.T.: Clear trunk measured from the ground to the bottom of the first leaf or frond stem.

3. C.W.: Clear wood measured from the ground to the bottom of the base of the lowest leaf sheath or boot, trimmed in a natural manner.

4. SPD.: Spread - branches measured in natural un-tied position to the average crown diameter, not including extreme leaves, branches or fronds.

5. MIN.: Minimum

6. GAL.: Gallon container size, example: 1 Gal., 2 Gal., 5 Gal. container

7. O.C.: On center - distance between plant center; or C.C.: - Center to center

8. DIA.: Diameter - See Caliper

9. CAL.: Caliper - the diameter of up to a 4" tree is measured 8" above the ground line; larger trees are measured at 12" above the original grade line.

10. D.B.H.: Diameter at Breast Height (approximately 4' above grade).

11. B&B: Balled and burlapped in accordance with horticultural standards of the American Association of Nurserymen.

1.02 DESCRIPTION OF WORK

A. Scope of Work

1. The scope of work includes everything for and incidental to executing and completing all landscape work shown on the drawings, schedules, notes and as specified herein.

2. Unless otherwise hereinafter specifically excluded, the plans and specifications are intended to include everything obviously requisite to furnishing all phases of work specified. Accordingly, all work is to be done under all headings to carry out the plans and specifications, whether each item is mentioned or not.

1.03 QUALITY ASSURANCE

A. Subcontractors:

1. All Subcontractors under the control of the Contractor, involved in the completion of the landscape work, shall be approved by the Engineer prior to their commencement of work on the project.

B. Plant Materials:

1. Plant materials shall conform to the American Association of Nurserymen Standards, ANSI Z60 1973, and to Florida Grades and Standards for Nursery Stock for size and quality.

2. The Contractor shall provide trees and sod grown in a recognized nursery in accordance with good horticultural practices. Some plant materials may be collected stock with the approval of the Engineer. Provide healthy, vigorous stock grown under climatic conditions similar to conditions in the locality of the project, and free of disease, insects, eggs, larvae, and defects such as knots, sun-scale, injuries, abrasions and/or disfigurement.

3. The Engineer reserves the right to inspect plant materials either at the place of growth or at the project site prior to planting, for compliance with requirements for name, variety, size and quality.

4. Plant materials shall have a habit of growth that is normal for the species. They shall be well branched and densely foliated when in leaf and shall have healthy, well developed root systems.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Plant Materials:

1. The Contractor shall time delivery so that sod will be placed within 24 hours after stripping. Protect sod against drying and breaking of rolled strips.

2. The Contractor shall provide container-grown or, if appropriate, freshly dug trees and shrubs. Do not use trees or shrubs which have been in cold storage or heeled-in the ground. Do not prune prior to delivery. Do not bend or bind-tie trees or shrubs in such a manner as to damage bark, break branches or destroy natural shape. Provide protective covering during delivery.

3. No plant shall be bound with wire or rope at any time so as to cause damage to the bark or break branches. All plants are to be handled at all times so that roots or root balls are adequately protected from sun, cold or drying winds. No root balls for trees and container plants that have been cracked or broken shall be planted except upon special approval. Metal canned stock shall be carefully removed from cans after containers have been cut on two sides with approved cutter. A spade shall not be used to cut cans. Plants shall not be pulled by the tops or stems, nor handled in a rough or careless manner at any time.

4. Balled and burlapped plants shall be moved with firm, natural balls of soil, not less than 1' diameter of ball to every 1" of caliper of trunk; root ball depth shall not be less than 2/3 of root ball diameter.

5. Trees shall be dug with adequate balls, burlapped, wire bound if needed. Root pruning shall be done a minimum of four weeks before planting.

6. Only a minimum of palm fronds shall be removed from crown to facilitate moving and handling. Clear trunks shall be determined after minimum fronds have been removed.

7. The Contractor shall deliver trees after preparations for planting have been completed and plant immediately. If planting is delayed more than 6 hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist.

8. Do not remove container-grown stock from containers until planting time.

9. The Contractor shall label at least one tree and one shrub of each variety with a securely attached waterproof tag bearing legible designation of botanical and common name.

1.05 JOB CONDITIONS

A. Acceptance of Job Site:

1. The Contractor shall examine the subgrade, verify the elevations, observe the conditions under which work is to be performed, and notify the Contractor of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to installer.

2. If necessary to complete the work within the time stated in the Contract, or in order to maintain the progress schedule, the Contractor incurs unforeseen costs, such as overtime hours, holiday, etc., all said costs shall be born by the Contractor at no additional cost to the City.

C. Utilities:

1. The Contractor shall determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others until removal is mutually agreed upon by all parties concerned.

1.06 GUARANTEE

A. Warranty Period:

1. The contractor shall guarantee all trees furnished under this contract for a period of one (1) year and all shrubs for a period of (120) days. Material which is either dead or in poor health during this period or at its completion will be replaced at no charge to the City. Should any of the plant materials show 50% or more defoliation during the guarantee period, due to the Contractor's use of improper materials or workmanship, the Contractor, upon written notice, shall replace same without additional cost to the City.

PART 2 - PRODUCTS

2.01 TOPSOIL

A. Topsoil shall be stockpiled during site preparation for reuse in landscape work. If quantity of stockpiled topsoil is insufficient, provide additional topsoil as required to complete landscape work.

B. Additional topsoil must be taken from ground that has never been stripped and be in a loose, friable condition and must not contain clay or excessive organic materials. There must be slight acid reaction to the soil with no excess weeds or other objectionable materials.

2.02 FERTILIZER

A. All plant material shall be fertilized with Agriform 20-10-5 planting tablets, or equal, at time of installation and prior to completion of pit backfilling. The planting tablets shall be placed uniformly around the root mass at a depth that is between the middle and bottom of the root mass.

B. Application Rate:

1.

1 Gallon can	1 - 21 gram tablet
3 Gallon can	2 - 21 gram tablets
5 Gallon can	3 - 21 gram tablets
7 Gallon can	4 - 21 gram tablets
Trees	3 tablets each 1/2" of caliper

2. Groundcover and annual areas shall receive fertilization with Ozmocote Time Release Fertilizer, or equal, according to product instructions and rates.

C. Sod and Seeded Areas:

1. Fertilize sod and seeded areas with a 10-5-5 formulation (or a mixture recommended by the local County Agricultural Agent) at the rate of 10 pounds per 1,000 square feet.

2.03 PLANT MATERIALS

A. Nomenclature:

1. Plant species and size are to be as per drawings and plant materials schedule. Nomenclature as per Standardized Plant Names; names of varieties not included therein conform generally with names accepted in the nursery trade. All material shall be identified with variety name or the invoice supplied by the nursery stock grower.

B. Quality Assurance:

1. Trees shall have straight trunks (unless otherwise specified) with leader intact, undamaged and uncut. All old abrasions and cuts shall be completely calloused over. Trees shall be tied securely to stakes on delivery.

2. Height of trees and shrubs shall be measured from the ground up; width measurement shall be normal spread of branches with plants in their normal position. These measurements shall not include immediate terminal growth. All measurements shall be taken before pruning for specified sizes. All trees shall conform to measurements specified in the plant lists, except that plant materials larger than specified may be used with the approval of the Engineer, with no increase to the Contract price. Plant materials shall not be pruned prior to delivery.

3. Plant material shall be symmetrical, typical for variety and species, and shall conform to measurements specified on the plan. Plants used where symmetry is required shall match as nearly as possible.

4. The Contractor shall provide trees, shrubs and other plants conforming to the standards for "Florida #1" grade as designated by the Division of Plant Industry, Florida Department of Agriculture.

5. Container stock shall have been grown in containers in which delivered for at least four months, but not

over two years. If requested, samples must be shown to prove no root bound condition exists.

2.04 SOD OR SEED

A. Sod or seed shall be species most commonly grown and used in the area or as stated on the plans. Solid sod shall be of even thickness and with a good root structure, 95% free of noxious weeds, freshly mowed before cutting, in good healthy condition when laid. It must not be stacked more than 24 hours before laying and it must be grown in soil compatible to that in which it will be installed. Seed shall be delivered to the site in unopened bags with certification requirements.

2.05 MULCH

A. Mulch shall be 100% finely shredded wood or bark as specified on the plan.

2.06 PLANTING SOIL

A. Trees and Shrubs:

1. The Contractor shall provide not less than 1 part of loose Florida peat humus to 2 parts of clean native topsoil or topsoil delivered to the site by volume. Mix peat and topsoil thoroughly before backfilling plant pits.

2. Soil may be an approved commercially prepared mix.

B. Groundcovers

1. For plants grown in containers less than one gallon size, spread two inches of clean Florida peat, or other approved organic soil amendment, over full length and width of planting area. Rototil organic layer 4-5" into native soil.

2.07 PESTICIDES:

1. Pesticides shall be only approved, safe brands applied according to manufacturer's direction.

PART 3 - EXECUTION

3.01 PREPARATION

A. Obstructions Below Ground:

1. It shall be the responsibility of the Contractor to locate and mark all underground utilities, irrigation lines and wiring prior to commencement of work.

2. If underground construction, utilities or obstructions are encountered in excavating of planting areas or plant pits, the Engineer will be notified and it will be his decision to select the relocation for that material.

B. Grading:

1. Finish (fine) grade all planting and sod areas to remove all debris, bumps and depressions.

2. Allow for sod and mulch thickness adjacent to all paved surfaces.

C. Preparation for Seeding and Sodding:

The Contractor shall:

1. Loosen subgrade of seed and sod areas to a minimum depth of 4". Remove stones over 1 1/2" in any dimension and sticks, roots, rubbish and other extraneous matter.

2. Spread fertilizer specified herein at a minimum rate of 25 pounds per 1000 square feet, and thoroughly work into the top 4" of soil.

3. Limit preparation to areas which will be planted promptly after preparation.

4. Moisten prepared seed and sod before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.

D. Preparation of Planting Beds:

1. The Contractor shall loosen subgrade of planting bed areas to a minimum depth of 6" using a cultimulcher or similar equipment. Remove stones over 1 1/2" in any dimension, and sticks, stones, rubbish and other extraneous matter.

E. Berms:

1. The Contractor shall construct small berms (18" or less in height) using clean topsoil.

2. Large berms may be built-up of clean fill (sand only), free of roots, rocks or other debris. A minimum of 12" of clean topsoil shall cover this fill material at all points.

3.02 PLANTING

A. Layout:

1. Unless otherwise stipulated, plant materials will be located by scale shown on the plan. Slight shifting may be required to clear wires, prevent blockage of signage, etc. Shrubs and groundcovers shall be located and spaced as noted on plant list and/or details (if provided). Otherwise plants will be placed in the planting beds at the normally accepted spacing for each species. Leave a border of 12" minimum of space between outer leaves of installed plant material and the bedline.

B. Installation of Plant Materials:

1. Plants shall be set straight or plumb, in locations shown, at such level that after settlement, normal relationship of crown of such plant with ground surface is established. Plants shall be backfilled 2/3 of plant pit with planting soil, thoroughly watered-in, puddled before bringing backfill to proper grade.

2. Balled and burlapped plants are to be set with planting soil carefully tamped in, under and around base of balls to prevent voids. Ropes and wires are to be removed, lay open burlap but do not remove so as to keep root ball intact. Duplicate procedure stated in specification above for planting. Roots of bare rooted plants are to be properly spread out, planting soil carefully worked in among them. Failure to comply is cause for rejection.

3. Tree pits shall be dug twice the diameter and depth of the root ball. Backfill 1/2 of the pit with planting soil mixture as recommended by state or county agricultural agent, or as specified, water thoroughly until puddled before bringing backfill to proper grade. Establish water basin to diameter of pit, height of basin is to be a minimum of 3". Trees should have 1 - 1 1/2 yards of planting soil per tree unless otherwise specified.

4. Stake all trees according to planting details on landscape plans. If no details are provided, stake according to American Association of Nurserymen Standards.

5. Mulch shall be installed evenly in all planting areas, unless otherwise specified, at a depth of 2" thick.

C. Installation of Sod and Seeding:

1. Fine grade for smooth surface, water, roll and float. Grades shown on drawings shall be maintained in a true, even condition.

2. The work shall be performed only during periods when beneficial results are likely to be obtained. When conditions are such that satisfactory conditions are not likely to be obtained, work will be stopped and resumed again when conditions are satisfactory.

3. Seed shall be installed as per the specifications of the State Department of Transportation. See plan for types of seed.

4. Sodding shall be locally suitable variety. Sod is to be cut with 5/8" soil, not including top growth or thatch. Sod shall be covered or placed in a shaded area until installed. The Contractor shall lay sod in straight lines, butt pieces tightly and stagger joints. Work sifted sand into minor cracks between pieces of sod. Within two hours after installing sod, and prior to rolling, the sod shall be lightly irrigated. Roll sod until tightly bonded to subgrade and water thoroughly. Watering shall be repeated as necessary to keep sod moist until rooted to subgrade.

5. Sodded and seeded areas shall be protected from foot traffic until well established.

3.03 BERM CONSTRUCTION

A. The Contractor shall install berms at location shown on the plan and at the height and slope indicated. Height stated is for finished berm with soil at natural compaction. Large berms may be built of suitable subsoil with a minimum of 12" topsoil cover at all points. No heavily organic soils, such as muck or peat shall be used in berm construction.

B. Exact location and configuration of berms may require change to allow proper drainage; such changes will be coordinated with the Engineer.

3.04 PRUNING

A. Pruning shall be done by an experienced plantsman. Prune immediately upon acceptance by the Engineer, including any broken branches, thinning all small branches, tipping back main branches (except main leaders).

B. Pruning shall maintain the natural shape and form of the plant.

C. All wounds over 3/4" diameter shall be treated with an appropriate tree wound dressing coating.

3.05 MAINTENANCE

A. Begin maintenance immediately after planting.

B. Maintain trees, plants, seeded and sodded areas until final acceptance by Engineer.

1. Maintain trees, shrubs and other plants by watering, pruning, cultivating and weeding as required for healthy growth. Restore planting saucers. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical position as required. Restore or replace damaged wrappings. Spray as required to keep trees and shrubs free of insects and disease. Perform any other procedure consistent with good horticultural practice necessary to insure normal, vigorous and healthy growth of all work under this contract.

2. Maintain seeded or sodded areas by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, leveling, regrading, and replanting as required to establish smooth, acceptable areas, free of erosion or bare spots. Lawn that is seeded is to receive first mowing on reaching an average height of 2 1/2", and subsequent mowing as required for height standard for that variety. Sodded areas are to receive first mowing within 2 weeks after installation and subsequent mowing as required to maintain height standard for that variety.

* * *

SECTION 27 - DEMOLITION

W-27.01 General

Demolition includes all work necessary for the removal and disposal of masonry, steel, reinforced concrete, plain concrete, wastewater equipment, piping, electrical facilities, and any other material or equipment shown or specified to be removed. Dust control shall be provided and provision made for safety.

Demolition shall be carried out in such a manner that adjacent structures, which are to remain, shall not be endangered. The work shall be scheduled so as not to interfere with the day to day operation of the existing facilities, all in accordance with the Sequence of Operations specified in the Specific Provisions. Doorways or passageways in existing facilities shall not be blocked.

Care shall be taken to assure that concrete shall be broken and removed in reasonably small masses. Where only parts of a structure are to be removed, the concrete shall be cut along limiting lines with a specially designed saw so that damage to the remaining structure is held to a minimum.

W-27.02 Requirements Prior to Demolition

The Contractor shall visit the site and inspect all existing structures. Special care shall be taken to observe and record any defects, which may exist in buildings or structures adjacent to but not directly affected by the demolition work. Prior to commencing the demolition, the Contractor shall provide the Engineer with a copy of this inspection.

Drawings of existing structures and equipment will be available for inspection by the Contractor at the office of the Engineer and Owner.

Warning signs, protection barriers and red warning lights shall be provided as necessary adjacent to the work as approved by the Engineer and shall be maintained during the demolition period.

Demolition work shall not be undertaken until all mechanical and electrical services affected by the work have been properly disconnected. Interconnecting piping or electrical services that are to remain in service either permanently or temporarily shall be capped, rerouted or reconnected in a manner that will not interfere with the operation of the remaining facilities.

Where the presence of hazardous chemicals, gases, flammable materials or other dangerous substances is apparent or suspected, testing and purging shall be performed and the hazard eliminated before demolition is started.

W-27.03 Requirements During Demolition

The use of explosives will not be permitted.

All mechanical and electrical equipment shall be carefully protected against dust and debris.

All debris shall be removed from the structures during demolition and not allowed to accumulate in piles.

Safe access to and egress from all working areas shall be provided at all times with adequate protection from falling material.

Adequate scaffolding, shoring, bracing and protective covering shall be provided during demolition to protect personnel and equipment against injury or damage. Floor openings not used for material drops shall be covered with material substantial enough to support any loads placed on it. The covers shall be properly secured to prevent accidental movement.

Adequate lighting shall be provided at all times during demolition.

Areas below demolition work shall be closed to workmen while removal is in progress.

No material shall be dropped to any point lying outside the exterior walls of the structure unless the area is effectively protected.

No workmen shall stand on any wall to remove material except when adequate staging or scaffold protection is provided at a distance not exceeding 12 feet below the top of such walls and other reasonable precautions are taken. Whenever a workman is required to work at a height of more than 12 feet above a floor, platform, scaffold or the ground, he shall be equipped with a safety belt with a life line attached.

W-27.04 Disposal of Materials

All debris, rubbish, scrap pieces, equipment, and materials resulting from the demolition shall become the property of the Contractor and shall be removed from the site, except for the items designated by the Engineer to be salvaged.

* * *

SECTION 77 - NON-WOVEN GEOTEXTILE

W-77.01 General

The Contractor shall furnish all labor, materials, and equipment required to install a non-woven geotextile product on the prepared slope of the areas to receive the cellular confinement slope protection.

W-77.02 Scope of Work

The Contractor shall place the specified non-woven geotextile fabric on the prepared slope as indicated above from Station 1+25 to 2+85 and from Station 4+55 to 5+22.

W-77.03 Submittals

General: Submit listed submittals in accordance with the General Conditions of the Contract and as specified and directed by the Engineer.

Product Data: Submit product data, including manufacturer's SPEC-DATA product sheet, for specified products.

Samples: Submit selection and verification samples for finishes, colors, and textures.

Quality Assurance Submittals: Submit the following:

1. Certificates: Product certificates signed by the manufacturer certifying materials comply with specified physical requirements.

2. Manufacturer's Instructions: Manufacturer's installation instructions.

Closeout Submittals: Submit Warranty documents.

W-77.04 Delivery, Storage, and Handling

The Contractor shall comply with the manufacturer's ordering instructions and lead time requirements to avoid construction delays. Materials shall be delivered in accordance with ASTM D4873 in the manufacturer's original, unopened, undamaged containers with identification labels intact. The Contractor shall store materials in such manner as to be protected from exposure to harmful weather conditions and at the temperature conditions recommended by the manufacturer as stated in ASTM D4873.

W-77.05 Warranty

The Contractor shall submit, for the City's acceptance, the manufacturer's standard warranty document executed by the authorized company official. The manufacturer's warranty is in addition to, and not a limitation of, other rights the City may have under the Contract documents.

W-77.06 Manufacturer

Non-woven geotextile shall be Mirafi 140N (4 oz.), or equal, and shall comply with manufacturer's product data, including product technical bulletins and product catalog installation instructions.

W-77.07 Site Verification of Conditions

The Contractor shall verify that substrate conditions are acceptable for product installation in accordance with the manufacturer's instructions.

W-77.08 Installation

The Contractor shall install geosynthetics in accordance with the Plans or as directed by the Engineer. Adjacent rows of geotextiles shall be overlapped to form a monolithic sheet without gaps to provide a minimum 12-inch wide overlap. The outer edge of the geotextile shall be buried a minimum of six (6) inches below finished subgrade throughout the entire perimeter of the covered area in order to prevent the uncontrolled flow of surface runoff below the geotextile.

W-77.09 Protection

The Contractor shall protect the installed product from damage during construction in accordance with ASTM D4873.

* * *

SECTION 105 - ROOT PRUNING

W-105.01 General

The Contractor shall make provisions for tree protection to the satisfaction of the Engineer prior to any excavation. All applicable site inspections by the City of Tampa Parks Department, and permits, shall be obtained prior to commencing work.

The Contractor shall provide root pruning services as directed by the Engineer.

W-105.02 Performance of Work

All root pruning shall be performed by a qualified, licensed tree professional as approved by the Engineer.

All roots designated to be removed shall be severed leaving a smooth, uniform section at the remaining root end to prevent root damage.

Root pruning shall be performed with a chain saw, Dosco root pruner, or equal, as approved by the Engineer.

Root pruning shall not occur within 6 feet of the base of the tree without guidance from Parks Department staff, and no excavation shall occur inside the circumference of the root-pruned area.

* * *

SECTION 0113 - UNDERGROUND SPRINKLER

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK:

Furnish all materials, equipment and labor as necessary for the installation of an irrigation system per the drawings and specifications. All work shall meet City of Tampa standards for materials and workmanship.

Related Work:
1. Trees
2. Sodding

1.2 RELATED DOCUMENTS:

A. Drawing and general provisions of Contract, including General Provisions, Supplementary General Provisions, Special Conditions, and Division – 1 Specification sections apply to work specified in this section.

1.3 DESCRIPTION OF WORK:

A. Design and Installation of system is included in this section.

1.4 QUALITY ASSURANCE:

A. On-Site Observation: At any time during the installation of the irrigation system by the Contractor, the City of Tampa may visit the site to observe work underway. Upon request, the Irrigation sub-contractor shall be required to undercover specified work as directed by the City of Tampa without compensation. Should the materials, workmanship or method of installation not meet the standards specified herein, the Contractor shall replace the work at his own expense.

B. Workmanship: All work shall be installed by skilled personnel, proficient in the trades required, in a neat, orderly and responsible manner with recognized standards of workmanship. The sub-contractor shall have had considerable experience and demonstrated ability in the installation of sprinkler irrigation systems of this type.

1.5 SUBMITTALS:

A. Product Data: Submit manufacturer's technical data for all materials and installation instructions for underground sprinkler system.

B. Drawings: Submit in two phases. Prior to detailed design submit a drawing showing the preliminary design and layout of the proposed irrigation system, overlayed on the Landscape Plan. Obtain approval of this design prior to submitting Final Design of Irrigation System. Final design must be submitted and approved before starting irrigation construction and shall include plan layout and details illustrating location and type of heads, valves, piping circuits, controls and accessories. If requested by the City, provide design calculations demonstrating how system component sizes were derived.

1. Format: The irrigation system design plans shall be done in AutoCAD to scale. These plans shall be provided to the City of Tampa prior to final acceptance of the project. Provide CD and 2 sets of blueprints.

C. Bidders shall furnish, with their bid, evidence in writing that they maintain a permanent place or places of business and have adequate equipment, finances, and personnel to provide the specified services.

PART 2 – PRODUCTS

2.1 MATERIALS:

A. Backflow Preventer: –Top Ported – Double Check Vacuum Breaker sized to match the system and installed underground in a valve box.

B. Irrigation Pipe: All main and lateral lines shall be PVC pipe ASTM D1785 1120 schedule 40. Exception would be galvanized steel pipe, when specified, and paint all with 2 coats of forest green enamel.

C. Pipe Size: Increased to allow expansion or nozzle size change.

1. No flow shall exceed 4' per second.
2. All laterals to heads will be 1".

D. Pipe Fittings:

1. ASTM D 2466 socket fittings schedule 40 shall be used for PVC pipe with ASTM A 2564 solvent cement and purple primer.
2. ANSI B 16.3 galvanized malleable iron screwed fittings shall be used for all galvanized pipe.

E. Manual Valves: Manufactured as follows: PVC Schedule 40 ball valves unless otherwise indicated.

F. Electric Valves: Irritrol 200B series electric valve with flow control. AC or DC depending upon power source. If DC is utilized, provide separate common wire for each 4 zones. Master valve to be used with more than 2 zones or if main line crosses a roadway.

G. Automatic Valve Wiring: 14 gauge direct burial wire, color coded as follows: red for zones, white for common, blue for master valve and black for extras. Two black extra wires to be run to the furthest valve in each direction. Wire splices shall be made at a common location, contained in a valve box and spliced using greased filled King wire nuts. All wire to be brought to timer location with 6' pigtail to facilitate hook-up.

H. Sprinkler Heads: Manufacturer's standard unit designed to provide uniform coverage over entire area shown on drawings at available water pressure and installed using K-Flex pipe and schedule 40 PVC connectors as follows:

1. Rainbird Bubbler: #1402 – 0.5 GPM on K-Flex pipe (2 per tree).

I. Valve Box: Plastic valve box with cover, size as needed, or as specified on drawings.

J. Automatic Control System:

1. Exterior Control Enclosure: Manufacturer's standard weatherproof enclosure with locking cover, complying with NFPA 70 (National Electric Code).
2. Interior Control Enclosure: Manufacturer's standard with locking cover, complying with NFPA 70.
3. Controller Type: Specified by City of Tampa.
4. Provide Mini-Click model 502 Rain Sensor on all systems.

PART 3 – EXECUTION

3.1 SYSTEM DESIGN:

A. Design Pressures: Verify available pressure prior to system design. Design system throughout compatible with available water source.

B. Location of Bubblers: Design locations in accordance with accepted sprinkler practice to provide proper coverage. Make minor adjustments as necessary to avoid plantings and other obstructions.

C. Minimum Water Coverage:

Tree areas, 100%.

Layout may be modified, if necessary to obtain coverage, to suit manufacturer's standard heads. Do not decrease number of bubbler heads indicated unless otherwise acceptable to Engineer and/or Architect.

D. Group valves in one or two locations when possible and minimize the number of zones as is practical.

E. No flow shall exceed 4 feet per second.

3.2 ELECTRIC WATER SERVICE:

A. Contractor shall include in bid price all costs associated with providing electric power and water service to system. This includes, but is not limited to, coordination with TECO and City of Tampa Water Department to provide service, connection fees, preparation of riser diagram sufficient for obtaining Electrical Permit, and all materials and labor for a complete functioning system.

3.3 TRENCHING AND BACKFILLING:

A. General: Protect existing utilities, paving, plants, trees and other facilities caused by irrigation operations. Contractor shall be responsible for the repair of any damage to existing utilities and paving. Excavate straight and true with bottom uniformly sloped to low point.

B. Sunshine: Contractor shall be responsible for notifying underground utilities 48 hours prior to beginning work at (800) 432-4770.

C. Trench Depth: Excavate trenches to a depth of 18" below grade, unless otherwise indicated.

D. Minimum Cover: Provide 18" minimum cover over top of installed piping for conventional irrigation systems.

E. Backfill: Backfill with clean material from excavation. Remove organic material as well as rocks and debris larger than 1" diameter. Place acceptable backfill material in 6" lifts, compacting each lift.

F. Existing Lawns: Where trenching is required across existing lawns, trench no wider than necessary to accommodate pipes.

1. Backfill trench to within 6" of finished grade. Continue fill with acceptable topsoil and compact to bring area to the elevation of existing lawn.
2. If trench is more than 6" in width relay or plant new sod within 7 days after removal, roll and water generously.
3. Re-seed and restore to original condition any sod areas not in healthy condition equal to adjoining lawns 30 days after replanting.

G. Existing Trees: All trenching or other work under the limb spread of any and all trees shall be done by hand or by other methods so that no limbs or branches are damaged in any way.

1. Trenching, per existing tree schedule below, shall be done to minimize root disturbance. Coordinate with City of Tampa representative prior to beginning, to determine limits of root pruning shall approve any work-taking place within 10' of protected tree. All other tree roots shall be severed cleanly per the City of Tampa Site Clearing Ordinance.

Existing Tree Schedule

1" caliper	3' from tree trunk
2" caliper	4' from tree trunk
3" caliper	6' from tree trunk
4" caliper	8' from tree trunk
6" caliper	10' from tree trunk

H. Pavements: Where existing pavements must be crossed to install landscape irrigation system, either saw cut straight clean lines 6" wider than trench or bore. Boring is the preferred method.

1. Excavate trench to required depth and width.
2. Remove cut out pavement and excavated material from the site.
3. At walkways, jack piping under paving material if possible.
4. Backfill with dry sand fill material, placing in 6'inch lifts.
5. Repair or replace pavement cuts with equivalent materials and finishes.
6. If a concrete sidewalk is cut or damaged the full section must be replaced.

3.4 INSTALLATION:

A. Pre-con on site prior to starting will take place.

B. General: Contractor shall be responsible for filing and obtaining any and all agency permits. Al work must conform to City of Tampa and the uniform plumbing code. Any work taking place along a city, county or state road or median must comply with appropriate regulating authority guidelines for Traffic Control for Construction and Maintenance Operations.

C. Inspections
   1. Piping before covering.
   2. All materials prior to planting and/or mulching.
   3. 24 hour notice of inspection needed.

D. Connection to Main: Connect to project side of meter in location.

E. Control Valves: Install in valve box, arrange for easy adjustment and removal.

   1. Adjust size of automatic control valves to provide flow rate of rated operating pressure required for each sprinkler circuit.
   2. All zone wiring to be installed under the main line.

F. Piping: Lay pipe on solid subbase uniformly sloped without humps:

   1. Install PVC pipe in dry weather when temperature is above 40 degrees F in strict accordance with manufacturer's instructions. Allow joints to cure at least 24 hours at temperatures above 40 degrees F (4 degrees C) before testing, unless otherwise recommended by manufacturer. All PVC connections will be cleaned with purple primer prior to cementing.
      a. Mainline depth shall be 18".
      b. Lateral line depth shall be 12".

H. Dielectric Protection: Use dielectric fittings at connection where pipes of dissimilar metal are joined.

3.5 ACCEPTANCE:

A. Maintenance: Irrigation Sub-contractor is responsible for all maintenance of this system until final acceptance by City of Tampa.

B. Inspection: The acceptance of irrigated areas will be made by the City of Tampa representative upon irrigation sub-contractors request. Provide notification at least 2 working days before requesting inspection date. The City of Tampa will provide a punch list of those items which must be corrected before re-inspection for final acceptance. The City of Tampa representative will determine an appropriate time period in which the punch list item must be corrected. Provide 48 hours notification of need for re-inspection.

C. As Built Drawings: After final acceptance of the completed installation, and prior to final payment, the Contractor shall be responsible for having complete electronic drawings prepared showing any changes from approved Shop Drawings and these shall be included as part of required "As Built Drawings".

   1. As-built drawings shall include the following:

      a. Water source location and size.
      b. Power source location.
      c. Changes to controller type or location.
      d. Any wiring changes in location, number, type, color.
      e. Valve locations should be dimensioned and areas controlled identified.

f. Location, depth and size of main line and feeder lines. Off-set to main line requested.

D. Final Acceptance: The point in time when all requirements of the project drawings and specification are completed, including any punch list items, to the satisfaction of the City of Tampa representative. A City of Tampa representative shall notify the contractor in writing of final acceptance.

3.6 GUARANTEE:

A. Guarantee: All work shall be guaranteed for one year from date of final acceptance against all defects and malfunctions in materials, equipment and workmanship.

1. The guarantee shall also cover repair of damage to any part of the premises resulting from leaks or other defects in materials, equipment and workmanship, to the satisfaction of the City of Tampa. Repairs, if required, shall be done promptly at no cost to the City of Tampa. The irrigation sub-contractor shall not be responsible for work damaged by others. The guarantee shall state the name of the owner, provide full guarantee terms, effective and termination date, name and license number. It shall be signed by the chief executive of the Irrigation sub-contractor and notarized. Manufacturer's warranties shall not relieve the Irrigation sub-contractor of his liability under the guarantee. Such warranties shall only supplement the guarantee.

2. The Irrigation sub-contractor will make necessary repairs within 72 hours notice, if the sub-contractor shall neglect to make or undertake with the due diligence to make the same, the City of Tampa may make such repairs at the sub-contractors expense. In the case of emergency where, in the judgement of the City of Tampa, delay would cause serious loss or damage, repairs or replacement may be made without notice being sent to the contractor, and the sub-contractor shall pay the cost thereof.

END OF SECTION

SECTION 118 - CELL INFILL FOR EROSION CONTROL SYSTEM

W-118.01 General

The work specified in this section shall include the furnishing of all labor, materials, equipment, services, and incidentals required for the infilling of the cells of the cellular confinement erosion control system.

Materials furnished and installed under this section shall be provided and placed in full conformity with the project plans and specifications. Refer to Section 150.05 for detail regarding placement requirements.

The infill areas shall be filled, graded and tamped such that they are stable and each cell is filled, without excessive overfilling.

W-118.02 Materials Handling and Storage

Care shall be taken such that cell infill material is not contaminated by mixing with other materials. Material shall be kept clean and dry prior to placement.

W-118.03 Material (Select Fill Material - Crushed Stone)

Number 57 crushed stone shall be used as cell infill material. Crushed stone shall consist of clean, durable rock, and shall be angular in shape, and uniform in size.

W-118.04 Submittals

The Contractor shall submit a material sample to the Engineer and shall obtain approval prior to the commencement of any infill operations on the project.

* * *

SECTION 150 - CELLULAR CONFINEMENT EROSION CONTROL SYSTEM

W-150.01 General

The work specified in this section shall include the furnishing of all labor, materials, equipment, services, and incidentals required for the grading of the ditch bank, placement of the cellular confinement erosion control system, and restoration as specified herein.

Materials furnished and installed under this section shall be provided and placed in full conformity with detailed drawings, specifications, engineering data, and instructions and recommendations of the manufacturer as approved by the Engineer.

The surfaces to be protected shall be prepared, graded and tamped to such an extent that they are normally stable in the absence of erosive forces. A geotextile mat shall be placed over these surfaces as described in the plans and specifications, Section 77.

W-150.02 Materials Handling and Storage

The Contractor shall check all materials delivered to the site to ensure that the correct materials have been received. Materials shall be stored on-site in a manner that ensures that no damage occurs to any of the materials. Damaged materials shall be replaced at the Contractor's expense.

W-150.03 Materials

The erosion control system shall be Geoweb Cellular Confinement System as manufactured by Presto Products Company, Geosystems Products, P.O. Box 2399, Appleton, WI 54913-2399, or equal. Phone: 920-738-1222, E-mail: info@prestogeo.com, Website: www.prestogeo.com.

The Geoweb system consists of an assembly of perforated HDPE sheet strips connected in series at off-set, full-depth ultrasonic seams, aligned perpendicular to the longitudinal axis of the strips. When expanded, the interconnected strips form the walls of a flexible, three-dimensional cellular confinement structure into which the specified infill materials can be placed. The system shall include Geoweb geocells, ATRA GFRP (Glass Fiber Reinforced Polymer) Anchors, Geotextile (see Section 77,) anchor trench backfill and cell infill materials (see Section 118).

The Project is designed using Geoweb GW20 (4-inch cell depth) sections. It is recommended that Geoweb sections 10 cells wide by 15 cells long (8 feet by 10 feet when expanded) are used. Suggested Product Code is GW20041015P30. The Contractor shall consult the manufacturer's representative to obtain any necessary technical assistance.

Geoweb sections shall be anchored with rows of ATRA GFRP Anchors that bear against, and hook over, the cell walls. The ATRA GFRP Anchor shall be made by properly inserting the ATRA Clip to the ATRA Stake so that the end of the Stake is flush with or 1/8 inch maximum above the top of the ATRA Clip. Prior to inserting the ATRA Clip on the end of the stake, the stake end shall be ground or filed so that it has a bevel and is free from all burrs.

W-150.04 Site Preparation

Before installing the cellular confinement system, the slope shall be filled and shaped to the grade indicated in the plans. Select material meeting specifications Section 119 shall be used for fill. Projections or other foreign

matter shall be removed from the slope prior to filling. Any existing rip-rap, rubble, or other rock or concrete matter in conflict with the proposed cellular confinement system shall be removed and disposed of by the Contractor.

W-150.05 Placement and Anchoring of Cellular Confinement System

Geoweb sections shall be expanded uniformly into position over the geotextile or foundation soil as shown in the plans. The Geoweb system shall be anchored at the crest of the slope and expanded down the slope surface. Non-uniform expansion of Geoweb sections and cutting and stapling of sections may be required in order to conform to the slope and to work around existing trees or other vegetation to remain.

The Geoweb sections shall be permanently anchored with the specified stake anchors in the pattern prescribed by the plans or by the manufacturer's representative. At each anchor location, place the ATRA GFRP Anchor against the upslope cell wall and drive the stake until the Clip arm is over the cell wall.

The edges of adjacent sections of Geoweb shall be inter-leafed or butt-jointed according to which side-wall profiles abut. In all cases, the upper surfaces of adjoining Geoweb sections shall be flush at the joint. The Contractor shall interleaf the side connections between Geoweb sections. Welded edge seams shall be overlapped and aligned when stapling. Abut end connections between Geoweb sections. The longitudinal centerlines of abutting external cells shall be aligned and stapled at the cell wall contact point.

Adjoining sections shall be stapled together using a Stanley Bostitch S32SL modified pneumatic stapler and one-half inch SL5035 staples or a Stanley Bostitch P50-10B pneumatic stapler and one-half inch SB103020 wire staples, or equal.

The specified infill material shall be placed into the expanded cells with suitable materials handling equipment such as a backhoe, a front-end loader, a conveyor, or crane-mounted skip. In all cases, maximum drop height into the cells shall be limited to three (3) feet to avoid damage or displacement of the cell walls. Filling shall proceed from the top of the slope to the toe of the slope to minimize displacement of the Geoweb sections.

Refer to Presto Products standard drawings for additional details regarding placement and anchoring.

W-150.06 Submittals

The Contractor shall submit shop drawings, product data and samples to the Engineer and shall obtain approval prior to the commencement of any work on the project.

* * *

SECTION 327 - MILLING OF EXISTING ASPHALT PAVEMENT

W-327.01 General

The work specified in this section consists of removing existing asphaltic concrete pavement by milling to improve the rideability of the finished pavement, to lower the finished grade adjacent to existing curb prior to resurfacing, or to completely remove existing pavement.

When milling to improve rideability, an average depth of cut will be specified in the plans.

Unless otherwise specified, the milled material becomes the property of the Contractor.

W-327.02 Equipment

The milling machine shall be capable of maintaining a depth of cut and cross slope that will achieve the results specified in the plans and specifications. The overall length of the machine (out to out measurement excluding the conveyor) shall be a minimum of 18 feet. The minimum cutting width shall be six feet.

The milling machine shall be equipped with a built-in automatic grade control system that can control the transverse slope and the longitudinal profile to produce the specified results.

Any commercially manufactured milling machine meeting the above requirements will be approved to start the project. If it becomes evident after milling has started that the milling machine cannot consistently produce the specified results, the milling machine will be rejected for further use.

When milling to lower the grade adjacent to existing curb or other areas where it is impractical to use the above described equipment, the use of a smaller milling machine will be permitted.

The milling machine shall be equipped with means to effectively limit the amount of dust escaping the removal operation.

For complete pavement removal, the use of alternate removal and crushing equipment, in lieu of the equipment specified above, may be approved by the Engineer.

W-327.03 Construction

When milling to improve rideability, the existing pavement shall be removed to the average depth specified in the plans, in a manner that will restore the pavement surface to a uniform cross section and longitudinal profile. The Project Engineer may require the use of a stringline to ensure maintaining the proper alignment.

The longitudinal profile of the milled surface shall be established on the side of the cut nearest the centerline of the road. The cross slope of the milled surface shall be established by a second sensing device near the outside edge of the cut or by an automatic cross slope control mechanism. The plans may waive the requirement for automatic grade or cross slope controls where the situation warrants such action.

The Contractor may elect to make multiple cuts to achieve the required pavement configuration or depth of cut.

The milling machine shall be operated to effectively minimize the amount of dust being emitted from the machine. Prewetting of the pavement may be required.

If traffic is to be maintained on the milled surface prior to the placement of the new asphaltic concrete, the pattern of striations shall be such as to produce an acceptable riding surface. The Project Engineer will control the traveling speed of the milling machine to produce a texture that will provide an acceptable riding surface.

Prior to opening an area which has been milled to traffic, the pavement shall be thoroughly swept with a power broom or other approved equipment to remove to the greatest extent practicable, fine material which will duct under traffic. This operation shall be conducted in a manner so as to minimize the potential for creation of a traffic hazard and to minimize air pollution.

Sweeping of the milled surface with a power broom will be required prior to placing asphaltic concrete.

In urban and other sensitive areas where dust would cause a serious problem, the Contractor shall use a street sweeper (using water) or other equipment capable of removing and controlling dust. Approval of the use of such equipment is contingent upon its demonstrated ability to do the work.

To prevent, to the greatest extent practicable, the infiltration of milled material into the storm sewer system when the milling operation is within the limits of, and adjacent to a municipal curb and gutter or a closed drainage system, the sweeping operation shall be performed immediately after the milling operations or as directed by the Engineer.

This operation shall also include the thorough removal of all milled material from the gutter in such a manner as to protect the curb from damage and to prevent the material being swept into the inlet openings or inlet grates. The equipment and methods utilized to sweep the gutter shall be approved prior to beginning and may be changed or revised to achieve the desired results as directed by the Engineer.

W-327.04 Milled Surface

The milled surface shall have a reasonably uniform texture and shall be within 1/4 inch of a true profile grade and shall have no deviation in excess of 1/4 inch from a straight edge applied to the pavement perpendicular to the centerline. The variation of the longitudinal joint between multiple cut areas shall not exceed 1/4 inch. Areas varying from a true surface in excess of the above stated tolerance may be accepted without correction if the Engineer determines that they were caused by a pre-existing condition which could not have reasonably been corrected by the milling operations. Any unsuitable texture or profile, as determined by the Engineer, shall be corrected by the Contractor at no additional compensation.

The Engineer may required remilling of any area where a surface lamination causes a non-uniform texture to occur.

* * *

SECTION 345 - PORTLAND CEMENT CONCRETE

W-345.01 General

This section specifies the requirements for the materials for all classes of concrete, and includes methods and equipment for the handling and storing of the materials and the mixing and transporting of the concrete to the site.

The concrete shall be composed of a mixture of portland cement, fine aggregate, coarse aggregate and water and, where specified or allowed by the specifications, shall include approved admixtures.

Unless written permission is obtained, coarse aggregate of different types shall not be mixed; used alternately in sections of concrete pavement less than one mile in length; nor shall coarse aggregates of different types be used in any one continuous pour.

W-345.02 Types of Cement to be Used

Unless the particular type of cement is designated in the plans or special provisions, either Type I, Type I-S, or Type II portland cement may be used for any class of concrete. Type III cement may be used in all concrete (except for composite concrete and steel piles) provided that a retardant admixture is used in concrete for bridge decks and for cement concrete pavement.

Type I-P cement will be allowed as an alternate to Type I in all classes of concrete and soil-cement work subject to the following conditions:

(a) Type I-P Portland Pozzolan Cement shall meet the requirements of ASTM C 595 except that the pozzolan constituent (fly ash) shall not exceed 20 percent by weight.

(b) The pozzolan shall conform to ASTM C 618, Type C or Type F, except that the loss on ignition for Type F shall not exceed six percent.

(c) The Contractor shall assume full responsibility for obtaining concrete having the minimum strength requirements set forth in the specifications.

Fly ash may be used to replace up to 20 percent by weight of the cement content in all classes of concrete where Type I, Type II, or Type III cement is used, in accordance with the following conditions:

(a) The fly ash shall conform to ASTM C 618, Type C or Type F, except that the loss on ignition for Type F shall not exceed six percent.

(b) Fly ash will not be permitted with Type I-S cement.

(c) The Contractor shall assume full responsibility for obtaining concrete having the minimum strength requirements set forth in the specifications.

Fly ash may be used to replace not more than 20 percent by weight of the cement used in concrete pavement.

W-345.03 Classification of Concrete

The separate classifications of concrete prepared under these specifications are designated herein as Classes I through IV, in accordance with the intended use and the proportions, strength, and other requirements.

Locations of Use of Each Class

(a) Class I concrete shall be used for cement concrete pavement (both plain and reinforced) and for headwalls, curb and gutter, valley gutter, slope pavement, ditch pavement, pipe endwalls, and other miscellaneous concrete items which are not structurally reinforced.

(b) Class II concrete shall be used for bridge concrete and box culverts, except where Class III or Class IV is specifically required for such uses, as specified below. Class II shall also be used at other locations as may be specifically called for in the plans or in the special provisions.

(c) Class III concrete is required for the following uses:

(1) For prestressed members.

(2) For concrete piles of all types.

(3) For seal concrete in foundation areas where the concrete must be placed under water and the foundation cannot be dewatered before the concrete is placed.

(4) For bridge concrete and other work where specifically required by the plans.

(d) Class IV concrete shall be used for all concrete (except seal concrete) placed in a location which is in or over salt or brackish water, and elsewhere as may be specifically called for in the plans.

High Early Strength Concrete

High early strength concrete is determined under either of the two following criteria:

(a) Any class concrete may be converted to high early strength concrete by using Type III portland cement in accordance with the master proportion table subject to restrictions in use as outlined in 345.02.

(b) When approved, a higher class (greater strength) concrete may be substituted for a lower class (less strength) concrete, in which case the higher class concrete substituted will be considered high early strength concrete for that application as follows:

(1) Class IV (minimum required strength 5,500 psi) when substituted for Classes II and I.

(2) Class III when substituted for Classes II and I.

(3) Class II when substituted for Class I.

(4) Class IV concrete (minimum required strength 5,500 psi) when substituted as high early strength concrete for Class IV concrete (minimum required strength 3,400 psi).

W-345.04 Composition of Concrete

Master Proportion Table

Concrete	Grade of Coarse Coarse Aggregate (*a)	Water Cement Ratio (lbs/lb) (*e)	Minimum Cement Factor Lbs per Cubic Yard of Concrete	Slump Range (inches) Non-Vibrated Placing	Slump Range (inches) Vibrated Placing
I	(*b)357 or 57	0.55	508	0-6	(*d)0-3½
II	57	(*f)0.49	564	3-5	0-3½
III	(*g) 57	0.50	611	(*c)7-9	0-3½
IV	(*g) 57	0.41	658	Not Applicable	0-3½

(*a) When requested by the Contractor and approved by the Engineer, Grade 7 aggregate may be used as a substitute for Grade 57, in any mix design for the concrete which is heavily reinforced, when shrinkage does not cause cracking and is not a detrimental factor in the function of the concrete element. Grade 89 coarse aggregate may be substituted in the design mix for concrete which is to be slip formed when requested by the Contractor and approved.

(*b) Grade 357 aggregate shall be used only in Class I concrete for use in concrete pavement.

(*c) Slump range is applicable only when used as seal concrete.

(*d) When the slip-form paver is used, the consistency of the concrete shall be such that there will be no slumping at the edge of the concrete after the forms have passed. Extreme care shall be taken to assume uniformity of the batches, with respect to materials, moisture content, consistency, and mixing time.

(*e) When Type III cement is used in non-vibrated mixtures, an increase in the maximum water of 0.03 pound per pound of cement may be required. (Not applicable for Class IV concrete.) The water/cement ratio shall be 0.44 per pound for bridge deck construction.

(*f) For counterweight concrete and non-vibrated concrete mixes, the maximum water/cement ratio shall be increased to 0.56 pound per pound.

(*g) Grade 67 coarse aggregate may be used in Class III and Class IV at the Contractor's option.

Actual Proportions to be Used

The Contractor will be required to designate the actual proportions to be used, in order to produce a concrete of the strength required as specified in 345.08.

Prior to mixing any concrete, the Contractor shall submit his design mix for approval, and only mixes approved by the Engineer shall be incorporated into the work.

The City will exercise control over the concrete by rigid inspection of the consistency, yield and strength of the concrete, and of the air content, where applicable.

W-345.05 Certification (For Ready-Mixed Concrete)

The manufacturer of concrete shall furnish to the Engineer with each batch of concrete before unloading at the site, a delivery ticket on which is printed, stamped or written, the following information:

(1) Name of ready-mix batch plant.
(2) Serial number of ticket.
(3) Date and truck number.
(4) Name of contractor.
(5) Job number.
(6) Specific class or designation of concrete.
(7) Quantity of concrete (cubic Yards).
(8) Time loaded, or of first mixing of cement and aggregates.
(9) Water added by receiver of concrete (if any), and his initials.
(10) Type and name of admixture, and amount of same.
(11) Mixing time, or reading of revolution counter at beginning and end of mixing period.
(12) Signature or initials of ready-mix representative.
(13) Type and brand of cement.
(14) Amount of cement.
(15) Total water content by producer (or W/C ratio).
(16) Maximum size of aggregate.
(17) Weight of fine and of coarse aggregate.
(18) Indication that all ingredients and mix proportions are certified as being previously approved.

W-345.06 Chloride Content

Chloride content for all concrete to be used for the construction of prestressed members for coastal salt water crossings and corrosive environments shall not exceed 0.40 pound of chloride per cubic yard of concrete. The chloride content shall be determined as the average of three tests on samples taken from the concrete. The range of results of the three tests shall not exceed 0.15 pound of chloride per cubic yard of concrete for a valid determination of chloride content. When test results are outside the 0.15 pound of chloride per cubic yard allowable range, an additional three tests shall be run until the test results are within the required range. Samples may be obtained from representative concrete cylinders or cores tested for compressive strength. However, if the cylinders or cores have been exposed to a salt or corrosive environment, the outer one-inch surface shall be discarded.

Chloride content shall be determined by the Florida Department of Transportation Method for Determining Low-Levels of Chloride in Concrete and Raw Materials as outlined in FDOT Research Report No. 203 and FDOT Corrosion Report No. 78-1.

The frequency of chloride content determinations made in accordance with these specifications and approved procedures shall be as follows:

(a) When the chloride content is 0.20 pound of chloride per cubic yard or less, subsequent tests shall be made on a frequency of not less than one for every 4 weeks of pouring as long as the test values remain at or below 0.20 pound of chloride per cubic yard.

(b) When the chloride content is in the range from 0.20 to 0.30 pound of chloride per cubic yard, subsequent tests shall be made on a frequency of not less than one for every two weeks of pouring as long as test values remain at or below 0.30 pound of chloride per cubic yard.

(c) When the chloride content is greater than 0.30 pound per cubic yard, subsequent chloride content tests shall be made at the same frequency that concrete test cylinders are made for strength determination.

For any case listed above, when the source of any component material for the concrete is changed or when the design mix is altered, a chloride content determination test shall be made immediately when the change is made.

Test results taken at the frequency provided above shall represent the amount of chloride per cubic yard in all members cast, subsequent to the immediate preceding test for determination of chloride content.

Chloride determination shall be made by the Contractor, who will certify the chloride content for each structural member. The certification must show all pertinent data as required by the Engineer. Properly executed certificates showing the chloride content within the required limits will be required for acceptance of any prestressed member constructed under these specifications. The City reserves the right to monitor the chloride content through tests on samples obtained by its own personnel.

The Contractor shall determine the chloride content of the component concrete materials (excluding admixtures for concrete) and provide this information to the Engineer when he submits his mix design. Design mixes will not be approved when the sum of chloride content of component materials indicate that the concrete mix derived from those materials will have a chloride content exceeding 0.40 pound per cubic yard of concrete.

W-345.07 Admixtures

Air-entraining Admixtures

Air-entraining admixtures will be required in all paving concrete and in all structural concrete except counterweight concrete. The amount of air entrained shall be from three to six percent. Air entrainment shall be produced by the addition of the air-entraining admixture to the mixing water, during batching. Air-entraining cement will not be permitted. The amount of the admixture to be used per batch shall be determined in the field by trial.

Retardants

Unless specifically shown otherwise in the plans or in the special provisions, the use of retardants for the various classes of concrete shall be as follows:

(a) Classes I and II concrete may be used with or without a retardant.

(b) For Classes III and IV concrete, a retardant is required.

(c) A subaqueous retarding plasticizer shall be added to seal concrete. One-half pound per bag of cement shall be added for the concrete in the bottom one-half of the seal and one-quarter pound per bag of cement shall be added for the concrete in the top one-half of the seal. The type plasticizer shall be approved by the Engineer.

When retardant admixtures are used, they also shall be added with the mixing water.

High Range Water Reducer Admixtures

The Contractor may propose the use of approved High Range Water Reducer (HRWR) admixture either Type F or Type G. The proposal to use HRWR for precast items shall include a list of precast items for which it is proposed. The Contractor may also propose the use of HRWR for cast-in-place concrete. The proposal to use HRWR for cast-in-place

concrete shall include a detailed listing of the uses (area, locations, elements, etc.) for which its use is proposed and the anticipated benefits to be derived from the use of HRWR in each instance.

Value Engineering credits or other price adjustments will not be considered for proposals to utilize HRWR in order to reduce the specified minimum cement requirements for the various classes of concrete.

The Contractor's proposal to use HRWR in concrete shall include the following:

(a) A certification from the HRWR supplier that the HRWR admixture proposed meets the requirements of ASTM C 494, Type F or G. The certificate shall state that the one-year tests representing the admixture to be supplied have been performed by an independent laboratory approved by the Cement and Concrete Reference Laboratory and records of such tests will be furnished to the Engineer on request. The certification shall also include an additional statement from the HRWR supplier or an approved independent testing laboratory that the proposed HRWR admixture is compatible with all other admixtures to be included in the concrete design mix.

(b) When HRWR admixture is proposed for use in the design mix, the Contractor shall propose for approval a target slump value with a target range value of ± 1½ inches. The target slump shall not exceed 6½ inches. All other control requirements and ranges, other than slump, contained in Section 345 shall remain unchanged.

(c) Design mix approval request for each class of concrete for which HRWR is proposed shall be submitted to the Engineer with all confirming data for approval. Confirming data shall include all details of the design mix ingredients, all required certificates from the supplier and independent testing laboratory and a certificate from the witnessing Engineer that the Contractor has demonstrated through production and placement of at least ten batches that concrete containing HRWR has been produced meeting all test requirements, that the HRWR concrete has been satisfactorily mixed in accordance with the Contractor's proposed methods and sequences, and that the concrete was acceptably placed, consolidated, and cured.

Before any design mix is approved by the Engineer, the Contractor shall demonstrate through production of at least ten (three cubic yard minimum size) batches of concrete containing the HRWR that his concrete plant can produce concrete consistently meeting specified slump, air content, and compressive strength requirements. Disposal, and the cost therefore, of concrete produced for demonstration purposes is a Contractor's obligation. Subject to approval of the Engineer, this concrete may be incorporated into unreinforced concrete items such as curb and gutter, sidewalk, gravity retaining walls, roadway concrete barrier walls, etc. The Contractor shall also demonstrate to the witnessing Engineer that the concrete containing the HRWR admixture in accordance with his proposed design mixes can be placed, consolidated, and finished under conditions existing for the proposed uses.

The design mixes shall each include descriptions of methods, sequences, times, and places that HRWR will be introduced into the concrete mix for each proposed use. Methods, sequences, times, and places for introduction for HRWR shall be adjusted to suit the requirements for each proposed use and condition. Design mixes including HRWR may be transferable based on demonstrated ability of the mix to perform its intended function.

Consideration of submitted design mixes for approval will begin when the Engineer has received certification from the witnessing Engineer that the Contractor has demonstrated that he can produce concrete containing HRWR admixture in conformance with his proposed design mixes meeting minimum strength requirements within specified ranges for slump and air and placed, consolidated, and finished under conditions existing for the uses proposed. In addition, the certification shall include the test values of the slump, air, and 28-day strength tests for all demonstration batches of concrete and an evaluation and description of the Contractor's actual sequences, methods, and time required for the placement and

consolidation of each batch of concrete. The certification shall also include the witnessing Engineer's evaluation of the appearance, apparent consolidation, and finish texture after form removal of each item cast.

Except for casting unreinforced concrete items approved by the Engineer for demonstration, no concrete containing HRWR admixture shall be produced and placed for payment under contract pay items until design mixes containing HRWR have been approved. To qualify for payment under contract pay items, unreinforced demonstration concrete, cast with the approval of the Engineer, shall meet minimum strength and entrained air requirements contained in these specifications and the slump shall be within 1½ inches of the target slump proposed by the Contractor.

Types of Admixtures to be Used

The Contractor shall designate in advance the particular type and product of admixtures he proposed to use and only such admixtures as are approved by the Engineer shall be incorporated into the concrete. Admixtures designated by the Contractor shall be compatible to all other components of the concrete.

W-345.08 Required Strength of Concrete

Except as may be modified in the plans or special provisions, the required minimum 28-day compressive strength for the various classes of concrete shall be as follows:

Class I	(*a)	2,500 psi
Class II.		3,400 psi
Class III	(*c)	5,000 psi
Class IV.	(*b)	3,400 psi

(*a) When used for cement concrete sidewalks and pavement, for curb and gutter, valley or special gutter, median or other type curb, and for culvert headwalls and outfall structures, inlets, manholes, junction boxes or other minor drainage structures, Class I concrete shall have a minimum strength of 3,000 psi. This does not apply to concrete used for pipe encasement, collars, fill or ballast concrete or other concrete items where the plans specify or conditions justify a 2,500 psi mixture.

(*b) When used for prestressed members, Class IV concrete shall have a minimum strength of 5,500 psi.

(*c) No minimum strength is required when Class III concrete is used as seal concrete.

In the event that the proportions of the concrete mixture designated by the Contractor, in accordance with 345.04 above, do not produce concrete of the desired strength, the Contractor shall adjust the mix accordingly in order to obtain the required strength, and at no additional cost to the City.

W-345.09 Concrete Failing to Meet Strength Requirements

For concrete which has been mixed and placed in accordance with these specifications, and which fails to meet the minimum 28-day strength requirements applicable to the particular class, the conditions under which such concrete may be accepted shall be determined as shown below.

(a) Class I Concrete: Class I concrete having 28-day strength of less than the minimum required strength shall be removed and disposed of by the Contractor, at his expense, unless specifically authorized by the Engineer, in writing, to remain in place. The removal shall be in such manner as will not cause damage to the remaining concrete or to other structural units or other facilities and property.

The Engineer may, at his discretion, allow concrete which fails to meet the minimum strength requirement to remain in place. Payment for this concrete will be at a reduced price to compensate the City for loss of durability. The amount of the reduction shall be determined by negotiation and shall be based on the particular circumstances.

(b) Classes II, III, and IV Concrete: Classes II, III, and IV concrete which fails to meet the minimum strength requirements may be accepted at the discretion of the Engineer, subject to the following provisions:

(1) Generally these classes of concrete are used for structural applications where compressive strength is critical and is anticipated in the design. Where these classes of concrete are used in such installations, all such concrete failing to meet the minimum strength requirements shall be removed and disposed of by the Contractor at his expense, and removal shall be in the manner as specified for Class I concrete above.

(2) Where these classes of concrete are used in structural elements for which the strength of the concrete is not critical and the structural integrity is not affected, the Engineer may, at his discretion, allow the concrete to remain in place. Payment for this concrete will be at a reduced price to compensate the City for loss of durability. The amount of reduction shall be determined by negotiation and shall be based on the particular circumstances.

W-345.10 Test Requirements

The Contractor shall furnish to the City sufficient concrete of the design mix as may be required to verify specification compliance. The City will sample the fresh concrete and perform tests as required by these specifications at frequencies established in the Florida Department of Transportation's "Sampling, Testing and Reporting Guide" or as otherwise required. The Contractor shall furnish and maintain facilities suitable for curing concrete test specimens in compliance with the requirements of AASHTO T 23. The Contractor shall furnish and maintain power supplies and all equipment and materials necessary for proper operation and shall maintain the curing facilities throughout the curing periods.

A set of cylinders for determination of compressive strength shall consist of two individual cylinders. Additional cylinders may be made at the option of the Engineer for determination of concrete compressive strength at various ages. Specific requirements for sampling frequency for the purpose of determining strength of concrete shall be in accordance with the following:

(a) A set of three (3) test cylinders shall be made for each class of concrete for each 50 cubic yards or fraction thereof placed each day, provided no extra cylinders will normally be required for less than 10 cubic yards of additional concrete.

TWO exceptions to the above requirement are:

(1) When High Early Strength concrete is used or early form stripping is desired, a set of cylinders shall be four instead of three.

(2) Only one set of test cylinders will normally be required for each pour of seal cement.

(b) One set of cylinders shall be made for each 4,000 square yards of paving concrete, or fraction thereof, placed each day.

Suitable field curing of test specimens may be accomplished by, but not limited to, tightly enclosing each

specimen in a suitable polyethylene plastic bag, or by covering the surface with an approved waterproofing spray material.

Tests for Strength of Concrete

The method of determining the strength of the concrete shall be in accordance with the following procedures:

Unless specifically stated to the contrary, compressive strength shall be based upon 28-day results. The compressive strength of the quantity of concrete placed and represented by one set of cylinders shall be determined as the average of the two cylinders comprising the set. If either of the test cylinders of a set of two shows evidence of improper sampling, molding, handling, curing or testing, the test result of the defective cylinder shall be discarded and the compressive strength of the concrete represented shall be determined from the test result of the remaining cylinder. Low strength shall not be a basis for discarding a cylinder test result.

If the 28-day cylinder test results indicate low strength concrete, the Contractor may elect to drill core samples from the actual concrete placed. If the Contractor elects to drill core samples from the hardened concrete, the costs of obtaining the cores and repairing the core holes shall be borne by him. The cores shall be drilled, as directed by the Engineer, at the same approximate locations from which the test cylinder was obtained. The location of the drilled cores shall be selected so that the remaining structure will not be impaired or sustain permanent damage after the core holes are repaired by the Contractor. When the Contractor elects to supply drilled core samples, two undamaged samples will be required. If the Contractor obtains cores following notification of failing strength in sufficient time for such cores to be tested by the City prior to the lapse of a 42-day time limit, the 28-day strength of the concrete placed and represented by the drilled core samples shall be determined as the average of the test results of the two drilled cores. If, however, the Contractor delays in obtaining core samples for strength determination, they shall be acceptable to the City for testing only when the Contractor submits a correlation curve developed by an approved independent testing laboratory to relate strength at the actual test age to 28-day strength for the particular class and design mix represented by the cores. When the Contractor elects to supply drilled cores and submits acceptable drilled cores to the City for testing, both the Contractor and the City shall accept the results of the tests of drilled cores in lieu of the results of the tests on the test cylinders.

Methods of Sampling and Testing

Test cylinders cast to determine acceptability for minimum strength requirements shall be made and cured in accordance with AASHTO T 23 and tested in accordance with AASHTO T 22. Test cylinders cast to determine when a precast unit or a structure may be put into service or to determine when a tensioning load may be transferred shall be cured by methods identical to those used in curing the concrete member, and tested in accordance with AASHTO T 22.

Drilled core samples shall be taken and tested in accordance with AASHTO T 24.

Test beams shall be made and cured in accordance with AASHTO T 23 and tested in accordance with AASHTO T 97.

Slump shall be determined in accordance with AASHTO T 119.

The amount of air entrained shall be determined by pressure or volumetric meters of approved design and in accordance with AASHTO Method T 152 or AASHTO Method T 196, except that AASHTO T 199 may be used as an indicator only. The Chase Air Indicator shall not be used for acceptance testing.

Concrete Cylinder Curing Box

The Contractor, at his option, may furnish a concrete cylinder curing box meeting the following requirements:

(a) The curing box shall have suitable internal dimensions. The top of the curing box shall be a lid with hinges at the back and two securing latches capable of locking the curing box on the front of the lid. The free movements of the lid shall be restricted to no more than 100 degrees of rotation from the closed position by a chain attached between the lid and the body of the curing box.

(b) All interior surfaces of the curing box shall be constructed of noncorroding materials. A moisture proof seal shall be provided between the lid and the body of the curing box.

(c) Heat requirements of the curing box shall be supplied by an immersible electric heater (minimum 1,500 watts) located near the bottom of the curing box. Heater elements shall be located to provide free access to cleaning and adequate circulation of the surrounding water. A combination hose connection and drain shall be provided at the lower front edge of the curing box so that it may be drained or water may be circulated. A drain shall be provided on the rear face of the curing box in such a position that when open, it will allow water to drain to within one inch over the top of the cylinders.

(d) A rack, constructed of noncorroding metallic material, set approximately four inches above the bottom of the curing box shall be provided to support the cylinders in an upright position. This rack shall be positioned to allow free circulation of water around the cylinders. Access for cleaning shall be provided to all parts of the curing box. The electrical utility connection shall be made in a lockable switch box that is securely attached to the side of the curing box.

(e) A bimetallic thermometer shall be installed so that it will measure the internal temperature of the curing box, and can be read from the outside without opening the curing box. This thermometer shall have minimum graduations of 2°F and shall be protected from physical damage by suitable shielding.

(f) The curing box shall be capable of maintaining an internal water temperature of 63.4°F, through an ambient air temperature range of -10°F to +100°F. When filled with water, the curing box shall not leak.

(g) The curing box will be accepted for use based on the above criteria.

W-345.11 Care and Storage of Aggregates

Prevention of Contamination and Segregation

The handling and storage of concrete aggregates shall be in such manner as to minimize any segregation and to prevent contamination by foreign materials. When fine and coarse aggregates cannot be stored sufficiently remote from each other to prevent mixing, suitable baffles shall be provided which will prevent intermingling of the different aggregates.

Stockpiles

Whichever of the allowable methods of stockpiling aggregates, as specified below, is used by the Contractor or the concrete supplier, it shall be their responsibility to handle the aggregates in such manner as will minimize segregation and to recover material from the stockpile for use in the mix in such manner that it will fall within the limits of the specifications. The Contractor shall make available to the City's personnel, for sampling, the necessary quantities of aggregate on the recovery side of the stockpile where feasible, for their testing at a frequency necessary to ensure compliance with the specifications.

Stockpiles, of either coarse or fine aggregates, shall be built up in layers not to exceed three feet in height, and each layer shall be completely in place before the next layer is started. Coning of stockpiles will not be permitted.

When trucks and bulldozers are used to form a ramp-type stockpile, such stockpiles shall be constructed in lifts not exceeding three feet in height and shall have a slope not to exceed thirty degrees. Generally, only rubber-tired equipment will be permitted on the stockpile. Equipment other than rubber-tired equipment may be permitted by the Engineer when the Contractor can show that the equipment produces no detrimental effect.

When the stockpile is formed by a belt conveyor system, the discharge end of the conveyor shall be adjustable in height and capable of moving circularly, or the Contractor shall provide means of preventing high coned piles which promote segregation.

When aggregates are stored in silos, the overhead discharge shall be so arranged that segregation of the aggregates does not occur. The silos shall be maintained in a reasonably full condition, as far as practicable.

Coarse aggregate stockpiles shall be maintained in a continuously wet condition during patching operation, such as to assume uniformity of concrete consistency.

W-345.12 Plant and Equipment

Equipment used for handling elements, mixing concrete, handling the mixed concrete, transporting concrete, and depositing concrete shall be constructed of materials which have no detrimental effects on the completed structure. These limitations refer only to the surfaces of equipment which are at any time in physical contact with the elements of concrete or the mixed product, up until the depositing of the concrete. Equipment surfaces which are in physical contact with the elements of concrete or the mixed product shall not be made of aluminum. These restrictions do not apply to equipment used in finishing the concrete or to handling equipment used to transport the element of concrete from source to the batch plant. In the event the Engineer determines that the completed structure has suffered damage growing out of the use of equipment chosen by the Contractor, the repair or the replacement of the damaged portions of the structures shall be made at the Contractor's expense.

Safe and suitable facilities shall be provided for sampling cement and fly ash with a sampling tube or scoop from the storage silo, from the weighing hopper or from the feedline immediately before entering the hopper. The sampling port of plate shall be of size to accommodate a 1½-inch diameter sampling tube or a scoop and shall be equipped, where necessary, with a valve or flap which will prevent blow-back or spillage.

Measuring Devices

All materials shall be measured by approved measuring devices. Batch plants may include manual equipment, in which the operator sets batch weights and discharges materials manually; may be semi-automatic plants, in which batch weights are set manually and materials are discharged automatically; or may be fully automatic, electronically controlled plants, in which mixes are controlled by means of selectors or punch cards.

Where beam type scales are used, suitable means shall be provided to hold poises securely in position after they are set. Frequent inspection of the scale poises shall be made to ensure that they are properly set and secured. The batch plant shall be constructed in such a manner that wind will not affect the accuracy of the weighing of materials.

The batch plant shall be equipped with adequate hoppers to provide separate weighing of all aggregates and of cement.

Measuring Water

Water may be measured by volume or by weight. Whichever method is used, the equipment shall be so arranged that the accuracy of measurement will not be affected by variations in pressure in the water supply line. The weighing device shall be capable of being set to deliver the required quantity and to automatically cut off the flow when the quantity has been discharged. It shall have an accuracy, under all operating conditions, within one percent of the quantity of water required for the batch. Tests for accuracy of the device shall be performed by a commercial laboratory or other qualified testing agency as approved by the Engineer, and such tests shall be made prior to the beginning of the work and at least once each three months thereafter.

Devices for Measuring Admixtures

The batching equipment shall be provided with a sufficient number of approved measuring devices which will automatically dispense the required amounts of admixtures for each batch. The measuring devices shall be so arranged as to add each admixture separately in individual sequence during the time mixing water is added.

Dry admixtures shall be measured by weight and paste or liquid admixtures by weight or volume, within a limit of accuracy of three percent.

Measuring Bulk Cement

Bulk cement shall be batched by weight and shall be weighted separately from other materials. The scales may be of either the beam type or the springless-dial type, and shall be the product of a recognized scales manufacturer. The weigh beams, or dials, shall be graduated to permit reading to one tenth of one percent of the capacity of the scales. A device such as a springless-dial indicator or tare beam shall be provided to indicate to the operator that the required load in the hopper or container is being approached. The device shall indicate at least the last 50 pounds of load. After the cement is weighed, it shall be protected from loss in handling or in transit.

Measuring Fine and Coarse Aggregates

The weighing equipment for aggregates shall comply with the following requirements:

(a) At least that part of the total load weighed which is a fraction of 100 pounds shall be indicated on a graduated beam or dial. The final reading shall be taken only when the scale beam is balanced.

(b) The weighing equipment shall be so arranged that, when batching, the weighing beam or dial is in full view of the operator.

(c) There shall be enough clearance at the top of the weighing hopper to permit the scales operator to shovel material from the weighing hopper.

(d) Weighing hoppers on platform scales shall be mounted with the center of gravity of the loaded hopper vertically over the center of the scale platform.

(e) Accurate and efficient operation of the scales shall be assured by frequent cleaning of such parts of the weighing equipment as may be required.

Accuracy of Scales

Prior to beginning any work, all scales and other measuring devices used in batching shall be checked for accuracy by a qualified representative of a scale company registered with the Bureau of Weights and Measures of the Florida Department of Agriculture.

Scales shall be rechecked once every three months or more often if deemed necessary. Scales shall be checked up to at least the maximum load normally handled on that scale.

Maintenance tolerances for cement scales, fly ash scales, or coarse and fine aggregate scales shall be checked up to at least the maximum load normally handled on that scale.

A certificate of inspection bearing the date of the certification and signed by the scale company representative shall be affixed to each measuring device. A copy of the scale company's report corresponding with the current certificate of inspection, showing the date of inspection; signature of the scale company representative; the observed scale deviations for the loads checked, and a statement that the scale conforms to Department of Transportation specifications and Chapter 531 of Florida Statutes shall be available at the plant.

W-345.13 Mixers

All mixers shall be of an approved type and shall be capable of combining the components of the concrete into a thoroughly mixed and uniform mass and of discharging the concrete with a satisfactory degree of uniformity.

Mixers may be of the rotary type or the turbine type and may be mobile (truck mixers) or stationary (central mix), except that mixers for concrete paving when the concrete is mixed on the roadway shall be dual-drum type, equipped with a fully power-controlled boom-and-bucket which shall be so operated that the batches will be uniformly distributed on the subgrade.

A copy of the manufacturer's design, showing dimensions and arrangement of blades shall be available at the plant at all times. The use of mixers that have been altered from such design in respect to blade design and arrangement, or to drum volume, may be permitted when recommended by the manufacturer and approved by the Engineer.

Each mixer shall have attached by the manufacturer, a metal plate, or plates, on which are plainly marked the various uses for which the unit is designed. The data shall include the agitating and mixing capacity of the unit, the speed of rotation of the drum, and the serial number of the unit.

When mixers are equipped with skips, the skip shall be provided with a barrier to prevent dirt, mud, and other extraneous material entering the mix from truck tires.

Special Requirements for Central Mixing

When central-plant mixing is used for the entire mixing of concrete which is to be transported as wet batches, the mixing time shall be not less than 60 seconds.

If necessary in order to produce a homogeneous mixture, the minimum allowable mixing time specified above may be increased.

The mixer shall be operated at the drum speed stipulated on the manufacturer's nameplate on the mixer.

Truck Mixers

The drum of truck mixers may be actuated by a power source independent of the truck engine or by a suitable

power take-off. Either system used shall provide control of the rotation of the drum within the limits specified on the manufacturer's nameplate, regardless of the speed of the truck. Truck mixers of the revolving-drum type shall be equipped with a hatch in the periphery of the drum shall which permits ready access to the inside of the drum for inspection, cleaning, and repair of blades.

Truck mixers shall be equipped with revolution counters of approved type and mounting, by which the number of revolutions of the drum may be readily verified. (The counters shall be actuated only after the mixing speed has been reached.) The water supply system mounted on truck mixers shall be equipped with a volumetric water gauge, in operating condition.

Timing Devices and Batch Meters

Both stationary and boom-and-bucket type mixers shall be equipped with an approved timing device which will automatically lock the discharge lever when the drum is charged and release it at the end of the mixing period. In the event of failure of the timing device, the Engineer may allow operations to continue, under his direct supervision, as may be necessary to avoid critical or uneconomical conditions, but not to extend beyond the end of that working day.

A batch meter or other satisfactory device for accurately recording the number of revolutions for each batch shall be attached.

Volume of Material Mixed

For boom-and-bucket type mixers, the volume of the material in a batch shall not exceed by more than ten percent, the mixer's capacity in cubic feet as shown on the standard rating plate on the machine. For all other types of mixers, the volume of material mixed per batch shall not exceed the manufacturer's rated capacity of the drum.

Maintenance of Mixers

All mixers shall be examined by the Contractor or supplier at least once each week for changes due to accumulation of hardened concrete or to wear of blades. The blades shall be replaced when any part or section is worn as much as one inch below the manufacturer's original design height and any appreciable accumulation of hardened concrete shall be removed before any mixer may be used under these specifications.

W-345.14 Mixing Concrete

No concrete shall be mixed when the atmospheric temperature is below 40ºF except as provided herein.

The Contractor shall assume all risk when placing concrete under extreme weather conditions, and permission to place concrete will in no way relieve the Contractor of the responsibility for satisfactory results.

Only the amount of concrete required for immediate use shall be mixed, and any concrete which has developed initial set shall be discarded. Retempering of concrete will not be permitted.

Adjustment to mix consistency, within the allowable limit for the addition of water at the job site, shall be made upon initial arrival at the job site and not thereafter. The consistency of concrete and adjustments thereto, shall be a Contractor's responsibility; however, the specified water/cementitious ratio on the approved mix design for each class of concrete shall not be exceeded.

When water is added at the job site, the concrete shall be mixed 30 additional mixing revolutions. All mixing shall be completed before the total revolutions at mixing speed exceed 150.

All concrete shall be mixed a minimum of sixty seconds after all materials are in the drum, unless a reduced mixing time is authorized by written permission, except that when truck mixers are used, each batch shall be mixed not less than 75 nor more than 100 revolutions of the drum, at a rate of not less than 8 r.p.m. nor more than the maximum r.p.m. specified by the manufacturer. Any further mixing shall be at agitator speed unless it is necessary either to adjust the consistency of the mix or in order to achieve uniform mixing, which in either case the Engineer may require a longer mixing period. The mixing drum speed of all type mixers shall be that recommended on the manufacturer's nameplate and any further agitation required prior to discharge shall be at the agitator speed recommended on the manufacturer's nameplate.

Cleaning Mixer

The entire contents of the mixer shall be removed from the drum before the materials for the succeeding batch are placed therein. The skip and throat of the drum shall be kept free of accumulations. Upon the cessation of mixing for a considerable length of time, the mixer shall be flushed with water and thoroughly cleaned.

Charging the Mixer

Each batch shall be so charged into the drum that some water will enter both in advance and after the cement and aggregates, as well as during the charging of the cement and aggregates. If fly ash is used in the mix, it shall be charged into the drum over approximately the same interval as the cement.

Mixing at the Site

Concrete mixing at the job site shall be by a mixer of sufficient capacity to prevent delays that may be detrimental to the quality of the work. The batching equipment shall be in accordance with the requirements of this section.

Mixing for Concreting in Cold Weather

When the atmospheric temperature is such that concreting in cold weather procedures are required, the temperature of the concrete shall be controlled by heating the aggregates and water to a temperature of at least 70°F but not more than 150°F. The aggregates may be heated by either steam or dry heat. The Contractor shall supply such heating apparatus as stoves, salamanders, or steam equipment and the necessary fuel. The apparatus used to heat the aggregate shall be capable of heating the materials uniformly. When dry heat is used, a means of maintaining atmospheric moisture shall be provided. The aggregate shall not be heated directly by gas or oil flame or on sheet metal over a fire. When approved, the torch method of heating mixed concrete may be used provided the heating apparatus is capable of heating the mass uniformly and no hot spots will occur which will burn the materials. The use of steam on or through binned aggregates will not be permitted.

Mixing for Concreting in Hot Weather

When hot weather concreting procedures are required to control the concrete temperature at the point of placement, the Contractor shall submit for review and approval his proposed methods of control which will be applied at the concrete batch plant.

W-345.15 Transportation Equipment

Wheelbarrows will be permitted for transporting aggregates to the mixer only when a two-bag or other small type mixer is used.

When dry batches are transported to the mixer, the truck bodies shall be divided into compartments of sufficient

size to contain all materials and prevent spilling from compartment to compartment and shall carry suitable covers for protection against inclement weather when necessary. The cement container shall be of a box type that will prevent loss, keep out moisture, dump clean and hold its shape. It shall be of sufficient size to hold the required amount of cement without spilling and shall have a waterproof cover. Truck compartmentation shall be approved prior to use.

Wet batches of concrete may be transported in either agitating or nonagitating trucks. Bodies of nonagitating trucks shall be smooth, mortartight metal containers with round internal corners and shall be capable of discharging the concrete at a satisfactory controlled rate without segregation. Covers shall be provided when needed for protection.

When nonagitator trucks are used, the elapsed time between the addition of water to the mix and depositing the concrete in place shall not exceed 45 minutes, except that when a retardant admixture is used, such elapsed time shall not exceed 75 minutes. When the hauling is done in truck agitators, such elapsed time shall not exceed 60 minutes, except that when a retardant admixture is used, a maximum elapsed time of 90 minutes will be permitted.

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SECTION 430 - PIPE CULVERTS AND STORM SEWERS

W-430.01 General

The work specified in this section consists of furnishing drainage pipe and mitered end sections, conforming to these specifications and of the particular types, sizes, and dimensions shown in the plans. This work shall include the installation of the pipe and mitered end sections at the locations called for, in conformity with the lines and grades given, and the furnishing and construction of such joints and connections to existing pipes, catch basins, inlets, manholes, walls, etc., as may be required to complete the work as indicated in the plans.

W-430.02 Laying Pipe

General: Each section of pipe shall be inspected for defects before being lowered into the trench. All pipe shall be carefully laid, true to the lines and grades given, with hubs upgrade and tongue end fully entered into the hub. When pipe with quadrant reinforcement, or circular pipe with elliptical reinforcement, is used, the pipe shall be installed in a position such that the manufacturer's marks designating "top" and "bottom" of the pipe shall not be more than five degrees from the vertical plane through the longitudinal axis of the pipe. Any pipe that is not in true alignment or which shows any settlement after laying shall be taken up and relaid without additional compensation.

Trench Excavation: The excavation of the trench for pipe culverts and storm sewers shall be as specified in Section 1.

Foundation: Where the foundation material is of inadequate supporting value, a suitable foundation shall be provided, as directed by the Engineer, by the removal of unsuitable material and replacing with suitable material as specified in Section 2. Where in the Engineer's opinion, the removal and replacement of unsuitable material is not practicable, he may direct alternates in the design of the pipeline, as required to provide adequate support. Should such alteration in the design result in an increase in the costs of the installation, an appropriate adjustment will not be considered as an adequate basis for extra compensation.

Pipe shall not be laid on blocks or timbers, or on other unyielding material, except where the use of such devices is called for in the plans.

Backfilling: The backfilling around the pipe shall be as specified in Section 2.

Plugging Pipe: When so shown in the plans, the ends of the pipe culverts shall be sealed with a masonry plug a minimum of eight (8) inches in thickness unless otherwise shown in the plans.

End Treatment: The end treatment required at each cross drain, side drain, or storm sewer pipe end is shown in the plans. Alternate types are permitted only when shown. Details for each type of end treatment are contained in the standard index drawings.

As an exception to the above, when concrete mitered end sections are permitted, reinforced concrete U-endwalls may be used but shop drawings must be submitted to the Engineer for approval prior to use.

Metal pipe Protection: To protect corrugated steel or aluminum pipe embedded in a concrete structure, such as an inlet, manhole, junction box, endwall, or concrete jacket, a bituminous coating shall be applied to the surface area of the pipe within and 12 inches beyond the concrete or mortar seal prior to sealing.

The surface preparation, application methods (dry film thickness and conditions during application), and equipment used shall be in accordance with the coating manufacturer's published specifications.

All coating products used must be approved by the Bureau of Materials and Research, Florida Department of Transportation, Gainesville, Florida.

The cost of furnishing and applying the bituminous material shall be included in the contract unit price for new pipe.

W-430.03 Removing and Relaying Existing Pipe

Removal: If the plans indicate that existing pipe is to remain the property of the City, all existing pipe or pipe arch so indicated in the plans to be removed or that does not conform to the lines and grades of the proposed work and that is not to be relaid, shall be taken up and stacked neatly along the right of way, as directed by the Engineer. Due care shall be exercised to prevent damage to salvageable pipe during removal and stacking operations.

Relaying: Where so shown in the plans, existing culvert pipe shall be taken up and cleaned and shall be relaid in the same manner as specified for new culvert pipe. Where necessary, existing metal pipe or pipe arch shall be straightened before it is relaid.

W-430.04 Placing Pipe Under Railroad

General: Pipe culverts to be constructed under railroad tracks shall be constructed in accordance with the requirements of the railroad company.

Unless the specific provisions specifically stipulate that the work of shoring under the tracks, and sheeting and bracing of the trench, is to be done by the railroad company, all such work required by the railroad company or deemed necessary by the Engineer in order to assure safe and uninterrupted movement of the railroad equipment, shall be done by the Contractor ar his expense.

Requirements of the Railroad Company: The method of installation shall be as required by the railroad company as specified in the specific provisions.

When the general method of installation which the railroad company will require is indicated in the plans, such method and any other specific details of the installation which might be indicated in the plans, shall not be changed without written approval of the Engineer, after the approval (or the direction) for such change has been obtained from the railroad.

Notification to Railroad Company; The Contractor shall notify the railroad company of the date on which he expects to begin the work of placing pipe under the railroad tracks at least ten days prior to such date.

Placing Pipe by Jacking: When the placing of the pipe through the railroad embankment is done by the jacking method, the details of the jacking method to be used must be approved by the Engineer and the railroad company before the work is started.

Use of Tunnel Liner: When the railroad company requires that a tunnel liner be used for placing the pipe in lieu of the jacking method, separate payment for the tunnel liner material will be made only in cases where the plans or specifications do not specifically provide that a tunnel liner will be required; in which cases the City will reimburse the Contractor for the actual cost of the liner, delivered at the site. Such cost shall be based on a liner having the minimum gauge acceptable to the railroad.

W-430.05 Specific Requirements for Concrete Pipe

Sealing Joints:

(1) Round Concrete Pipe Other than Side Drain: For all round concrete pipe other than side drain pipe, the pipe joints shall be sealed by the use of round rubber gaskets. When rubber gaskets are used, the pipe joints shall meet the requirements specified in Section W-941.05. The gasket and the surface of the pipe joint, including the gasket recess, shall be clean and free from grit, dirt, and other foreign matter at the time the joints are made. In order to facilitate closure of the joint, application of an approved vegetable soap lubricant immediately prior to closing of the joint will be permitted.

(2) Side Drain Pipe: For all concrete pipe which does not have rubber-gasket joints, the joints shall be thoroughly wetted before the inside mortar is placed; and before succeeding sections of the pipe are laid, the lower half of the joint portion of the pipe in place shall be filled on the inside with cement mortar and the upper half of the tongue portion of the next joint wiped with cement mortar, both in sufficient thickness to bring the inner surface of the abutting pipe flush and even, when the pipe is laid. After the pipe is laid, the inside of the joint shall be wiped and finished smooth and a mortar bead not less than 3/4 inch thick shall be formed completely around the outside of the joint.

Laying Requirements for Concrete Pipe with Rubber Gasket Joints: For concrete pipe laid with rubber gasket joints, any deviation from true alignment or grade which would result in a displacement from the normal position of the gasket of as much as 1/4 inch, or which would produce a gap exceeding 1/2 inch between sections of pipe for more than 1/3 of the circumference of the inside of the pipe, will not be acceptable and where such occurs the pipe shall be relaid without additional compensation. Where minor imperfections in the manufacture of the pipe cause a gap greater than 1/2 inch between pipe sections, the joint will be acceptable provided the gap does not extend more than 1/3 the circumference of the inside of the pipe. No mortar, joint compound, or other filler which would tend to restrict the flexibility of the gasket joint shall be applied to the gap.

Field Joints for Elliptical Concrete Pipe: Field joints for elliptical concrete pipe will be detailed in the plans or may be made with a preformed plastic gasket material. Pipe o be laid with joints made from preformed plastic material shall be subject to the following requirements:

(1) General: Installation shall be in accordance with the manufacturer's instructions and these specifications. The Contractor shall be responsible for obtaining a permanent watertight joint.

(2) Material: The preformed gasket material shall conform to the requirements of Section W-942.02.

(3) Joint Design: The pipe manufacturer shall furnish the Engineer with details in regard to configuration of the joint and the amount of gasket material required to effect a satisfactory seal. Joint surfaces which are to be in contact with the gasket material shall not be brushed or wiped with a cement slurry. Minor voids may be filled with cement slurry provided that all excess cement slurry is removed from the joint surface at the point of manufacture.

(4) Primer: Prior to application of the gasket material, a primer of the type recommended by the manufacturer of the gasket material shall be applied to all joint surfaces which are to be in contact with the gasket material. The surface to be primed shall be thoroughly cleaned and dry when the primer is applied.

(5) Application of Gasket: Prior to placing a section of pipe in the trench, gasket material shall be applied to form a continuous gasket around the entire circumference of the leading edge of the tongue and the groove joint in accordance with the detail entitled "Detail for Application of Gasket Material (Before Joint Pull-Up)." The paper wrapper on the exterior surface of the gasket material shall be left in place until

immediately prior to joining of sections. The gasket material shall be checked to assure that it is bonded to the joint surface, immediately prior to placing a joint in the trench. Plastic gasket material shall be applied only to surfaces which are dry. A hand heating device shall be kept at the job site to dry joint surfaces immediately before application of the plastic gasket material. When the atmospheric temperature is below 60 degrees F., plastic joint seal gaskets shall either be stored in an area warm to above 70 degrees F., or artificially warmed to this temperature in a manner satisfactory to the Engineer.

(6) Installation of Pipe: Handling of a section of pipe after the gasket material has been affixed shall be carefully controlled to avoid displacement of gaskets or contamination of gasket material with dirt or other foreign material. Any gasket displaced or contaminated in handling of the pipe shall be removed and repositioned or replaced as directed. The pipe shall be installed in a dry trench. The bottom of the trench shall be carefully shaped so as to minimize the need for realignment of sections of pipe after they are placed in the trench. Care shall be taken to properly align each section of pipe prior to the gaskets coming into contact. Realignment of a joint after the gaskets come into contact tends to reduce the effectiveness of the seal and shall be held to a minimum. When the pipes are joined, the entire joint shall be filled with gasket material and there shall be evidence of squeeze-out of gasket material for the entire internal and external circumference of the joint. Excess material on the interior of the pipe shall be trimmed to provide a smooth interior surface. After the pipe is in its final position, the joint shall be carefully examined to determine that the gasket material is satisfactorily adhering to all surfaces of the joint and that the entire joint is filled with gasket material. If a joint is defective, the leading section of pipe shall be removed and the joint resealed.

Requirements for Concrete Radius Pipe:

Design: Concrete radius pipe shall be constructed in segments not longer than four feet (along the pipe centerline), except where another length is called for in the plans or the specific provisions. Each segment shall be joined by round rubber gaskets. The pipe manufacturer shall submit details of his proposed joint and the segment length and shape for approval by the Engineer prior to manufacture.

Pre-Assembly: Prior to acceptance of the pipe, the manufacturer shall pre-assemble the entire radius section in his yard to assure a proper fit for all parts. This assembly may be made without gaskets at the option of the manufacturer. Upon satisfactory assembly, the joints shall be consecutively numbered on both the interior and exterior surfaces of each joint, and match marks showing proper position of joints shall be made. Installation on the project shall be in the order of pre-assembly.

W-430.06 Field Joints for Aluminum Pipe

General: Field joints for aluminum pipe shall be made with bands fabricated of the same alloy as the culvert sheeting and shall meet the requirements of AASHTO M 196.

Aluminum Cross Drains, Storm Sewers, and Gutter Drains: The provisions specified above for corrugated steel pipe for these installations shall apply also to aluminum pipe (for circular and helical corrugations) except that the material used in the bands and band connections for the alternate combination of joint materials shall be fabricated of the same alloy as the culvert sheeting.

W-430.07 Joints in Cast Iron Pipe

The provisions of Section 430.07 for mortaring and wetting inside the joints, as specified for concrete side drain pipe without rubber gaskets, shall apply to the inside joints of all cast iron pipe.

* * *

SECTION 524 - FILTER POINT FABRIC FORMED CONCRETE

W-524-01 General

This work shall include the furnishing of all labor, materials, equipment, services, and incidentals required for the grading of the ditch bank, placement of the filter point style revetment and erosion control system, and restoration as specified herein. The work shall consist of installing an unreinforced concrete lining by positioning specially woven, double-layer synthetic forms on the surface to be protected and filling them with a pumpable, fine aggregate concrete (structural grout) in such a way as to form a stable lining of required thickness, weight and configuration.

Materials furnished and installed under this section shall be provided and placed in full conformity with detailed Drawings, specifications, engineering data, and instructions and recommendations of the manufacturer as approved by the Engineer.

The surfaces to be protected shall be prepared and graded to such an extent that they are normally stable in the absence of erosive forces. A fabric envelope in a mat configuration shall be positioned over these surfaces and filled with a pumpable sand/cement slurry in such a way as to form a stable mat of suitable weight and configuration.

The Contractor shall furnish records of past successful experience in performing this type of work.

W-524.02 Technical Services

The Contractor shall retain the services of a manufacturer's representative to provide technical assistance in the field. The representative shall be present prior to and during placement of the erosion control materials to instruct in their proper installation.

W-524.03 Materials

A. Fine Aggregate Concrete:

Fine aggregate concrete shall consist of a proportioned mixture of Portland cement, fine aggregate (sand) and water. The consistency of the fine aggregate concrete delivered to the concrete pump shall be proportioned and mixed as to have an efflux time of 9- 12 seconds when passed through the 0.75 inch (19 mm) orifice of the standard flow cone that is described in ASTM C 939. Pozzolan, fluidifier or pumping aid conforming to this Specification may be used at the option of the Contractor. The mix shall exhibit a compressive strength of 2,000 lb/in2 (13.8 MPa) at 28 days, when made and tested in accordance with ASTM C 31 and C 39.

1. Portland cement shall conform to ASTM C 150, Type I or Type II.

2. Fine aggregate shall conform to ASTM C 33, except as to grading. Aggregate grading shall be reasonably consistent and shall not exceed the maximum size which can be conveniently handled with available pumping equipment.
3. Water for mixing shall be clean and free from injurious amounts of oil, acid, salt, alkali, organic matter or other deleterious substances.

4. Pozzolan, if used, shall conform to ASTM C 618, Class C, F or N.

5. Plasticizing and air entraining admixtures, if used, shall conform to ASTM C 494 and ASTM C 260, respectively.

B. Fabric Forms:

The fabric forms shall be as specified, HYDROTEX™ Filter Point (see Note A) forms as manufactured by Synthetex LLC, 4151 Ashford Dunwoody Road, Suite 510, Atlanta, Georgia 30319, Tel: 800.253.0561 (770.399.5051); or approved equal. The fabric forms shall be composed of synthetic yarns formed into a woven fabric. Yarns used in the manufacture of the fabric shall be composed of nylon and/or polyester. Forms shall be woven with a minimum of 50% textured yarns (by weight) to improve adhesion to fine aggregate concrete and to improve filtration. Partially- oriented (POY), draw-textured, and/or staple yarns shall not be used in the manufacture of the fabric. Each layer of fabric shall conform to the physical, mechanical and hydraulic requirements referenced herein. The fabric forms shall be free of defects or flaws which significantly affect their physical, mechanical, or hydraulic properties.

1. Fabric forms shall consist of double-layer woven fabric joined together by spaced, interwoven filter points to form a concrete lining with a finished average thickness of (see Table 1.0) inches (mm), a nominal mass per unit area of (see Table 1.0) lb/ft2 (kg/m2), and a deeply cobbled surface appearance. After the form has been filled with fine aggregate concrete, the filter points shall be on approximately (see Table 1.0) inch (mm) spacing when measured along the diagonal. Filter points shall be formed by interweaving the double-layer fabric to form water permeable drains and attachment points for the control of concrete lining thickness. The interweaving of the fabric layers shall form an area of double density, high strength, single-layer fabric with an area of (see Table 1.0) in2 (cm2) and a perimeter of (see Table 1.0) inches (mm). All filter points shall be cross shaped and shall have twill weave centers designed to function as drains to relieve hydrostatic uplift pressure.

2. Mill widths of fabric shall be a minimum of 76 inches (1.92 m). Each selvage edge of the top and bottom layers of fabric shall be reinforced for a width of not less than 1.35 inches (35 mm) by adding a minimum of 6 warp yarns to each selvage construction. Mill width rolls shall be cut to the length required, and the double-layer fabric separately joined, bottom layer to bottom layer and top layer to top layer, by means of sewing thread, to form multiple mill width panels with sewn seams on not less than 72 inch (182 cm) centers.

3. All factory-sewn seams shall be downward facing as shown on the Drawings. All seams sewn in the factory shall be not less than 90 lbf/in (15.7 kN/m) when tested in accordance with ASTM D 4884. All sewn seams and zipper attachments shall be made using a double line of U.S. Federal Standard Type 401 stitch. All stitches shall be sewn simultaneously and be parallel to each other, spaced between 0.25 inches (6 mm) to 0.75 inches (19 mm) apart. Each row of stitching shall consist of 4 to 7 stitches per inch (per 25.4 mm). Thread used for seaming shall be nylon and/or polyester.

4. Baffles shall be installed at predetermined mill width intervals to regulate the distance of lateral flow of fine aggregate concrete. The baffle material shall be nonwoven filter fabric. The grab tensile strength of the filter fabric shall be not less than 90 lbf (400 N) when tested in accordance with ASTM D 4632.

5. The fabric forms shall be kept dry and wrapped such that they are protected from the elements during shipping and storage. If stored outdoors, they shall be elevated and protected with a waterproof cover that is opaque to ultraviolet light. The fabric forms shall be labeled as per ASTM D 4873, “Guide for Identification, Storage and Handling of Geosynthetic Rolls.”

6. The Contractor shall submit a manufacturer's certificate that the supplied fabric forms meet the criteria of these Specifications, as measured in full accordance with the test methods and standards referenced herein. The certificates shall include the following information about each fabric form delivered:

   Manufacturer's name and current address; full product name; style and product code number; form number(s); composition of yarns; and manufacturer's certification statement.

C. Filter Fabrics**:**

The filter fabrics shall be composed of synthetic fibers or yarns formed into a nonwoven or woven fabric. Fibers and yarns used in the manufacture of filter fabrics shall be composed of at least 85% by weight of polypropylene, polyester or polyethylene. They shall be formed into a network such that the filaments or yarns retain dimensional stability relative to each other, including selvages. These materials shall conform to the physical requirements shown below. The filter fabric shall be free of defects or flaws which significantly affect its mechanical or hydraulic properties.

PROPERTY REQUIREMENTS - FILTER FABRIC 1, 2			
Property	**Test Method**	**Units**	**Values**
Grab Tensile Strength	ASTM D 4632	lbf (N)	90 (400)
Elongation at Break	ASTM D 4632	%	15
Trapezoidal Tear Strength	ASTM D 4533	lbf (N)	30 (130)
Permittivity	ASTM D 4491	sec -1	0.5

Notes:
1. Conformance of filter fabrics to specification property requirements shall be based on ASTM D 4759, "Practice for Determining the Specification Conformance of Geotextiles."
2. All numerical values represent minimum average roll values (i.e., average of test results from any sample roll in a lot shall meet or exceed the minimum values). Lots shall be sampled according to ASTM D 4354, "Practice for Sampling of Geosynthetics for Testing."

W-524.04 Design Requirements

The average thickness, mass per unit area and hydraulic resistance of each concrete lining shall withstand the hydraulic loadings (velocity, depth, duration, shear stress, pressure, and frequency of immersion) for the design discharges along the structure(s). The stability analysis for each concrete lining shall be accomplished using a factor-of-safety methodology. A minimum factor of safety of 1.5 shall be required.

The Contractor shall provide to the Engineer calculations and design details, provided by the manufacturer or a professional engineer, attesting to the suitability of each fabric formed concrete lining for the purpose contemplated. Each concrete lining shall be accepted only when accompanied by the documented hydraulic performance characteristics derived from tests performed under controlled flow conditions. Test conditions shall conform to test protocol as documented in "Hydraulic Stability of Fabric Formed Concrete Lining and Mat Systems During Overtopping Flow."

W-524.05 Construction and Installation Requirements

A. Site Preparation:

1. Areas on which fabric forms are to be placed shall be constructed to the lines, grades, contours, and dimensions shown on the Drawings. All obstructions such as roots and projecting stones shall be removed. Where such areas are below the allowable grades, they shall be brought to grade by placing compacted layers of select material. The thickness of layers and the amount of compaction shall be as specified by the Engineer. Where required by the Contract Specifications, soft and otherwise unsuitable subgrade soils shall be identified, excavated and replaced with select materials in accordance with the Contract Specifications.

2. Excavation and preparation of aprons as well as anchor, terminal or toe trenches shall be done in accordance with the lines, grades, contours, and dimensions shown on the Drawings.

3. Immediately prior to placing the fabric forms, the prepared area shall be inspected by the Engineer, and no forms shall be placed thereon until the area has been approved.

B. Fabric Form Placement:

1. A filter fabric shall be placed on the graded surface approved by the Engineer.

2. Fabric forms shall be placed over the filter fabric and within the limits shown on the Drawings. Anchoring of the fabric forms shall be accomplished through the use of anchor, terminal and toe trenches.

3. Adjacent fabric forms shall be joined before filling with fine aggregate concrete by field sewing or zippering the two bottom layers of fabric together and the two top layers of fabric together. All field seams shall be made using two lines of U.S. Federal Standard Type 101 stitches. All sewn seams shall be downward facing, and all zipper seams shall be fastened as shown on the Drawings, except with the approval of the Engineer.

4. When conventional joining of fabric forms is impractical or where called for on the Drawings, adjacent forms may be overlapped a minimum of 3 ft (1 m) to form a lap joint, pending approval by the Engineer. Based on the predominant flow direction, the downstream edge of the form shall overlap the upstream edge of the next form. In no case shall simple butt joints between forms be permitted.

5. Expansion joints shall be provided as shown on the Drawings, or as specified by the Engineer.

6. Immediately prior to filling with fine aggregate concrete, the assembled fabric forms shall be inspected by the Engineer, and no fine aggregate concrete shall be pumped therein until the fabric seams have been approved. At no time shall the unfilled fabric forms be exposed to ultraviolet light (including direct sunlight) for a period exceeding five days.

C. Fine Aggregate Concrete Placement:

1. Following the placement of the fabric forms, small slits shall be cut in the top layer of the fabric form to allow the insertion of the filling pipe at the end of the fine aggregate concrete pump hose. These slits shall be of the minimum length to allow proper insertion of the filling pipe. Fine aggregate concrete shall be pumped between the top and bottom layers of fabric, filling the forms to the recommended thickness and configuration.

2. Fine aggregate concrete shall be pumped in such a way that excessive pressure on the fabric forms and cold joints are avoided. A cold joint is defined as one in which the pumping of the fine aggregate concrete into a given form is discontinued or interrupted for an interval of forty-five or more minutes.

3. Holes in the fabric forms left by the removal of the filling pipe shall be temporarily closed by inserting a piece of nonwoven fabric or similar material. The nonwoven fabric shall be removed when the concrete is no longer fluid and the concrete surface at the hole shall be cleaned and smoothed by hand. Foot traffic on the filled form shall be restricted to an absolute minimum for one hour after filling.

4. After the fine aggregate concrete has set, all anchor, terminal and toe trenches shall be backfilled and compacted, as specified by the Engineer.

5. The Filter Point Lining shall be measured by the number of square feet (square meters) computed from the payment lines shown on the Drawings or from payment lines established in writing by the Engineer. This includes Filter Point fabric forms, fine aggregate concrete, and filter fabric used in the aprons, overlaps, and anchor, terminal, or toe trenches. Slope preparation, excavation and backfilling, and bedding are separate pay items.

* * *

SECTION 530 -3- RUBBLE RIPRAP

The work specified in this section consists of the construction of riprap, composed of rubble, as shown on the Plans, specified, and directed by the Engineer. The riprap shall be placed against the embankment or other work to be protected, in accordance with these specifications and in conformity with the lines, grades, dimensions, and notes shown in the Plans.

Rubble shall consist of broken stone. Broken stone shall conform to the following requirements: The material shall be sound and durable, with specific gravity of at least 1.90. It shall be free of cracks, soft seams, and other structural defects. The rubble pieces shall be roughly angular and shall be reasonably free from thin, flat, elongated pieces; no bricks or broken concrete blocks shall be permitted.

Rubble for placement at the toe of the slope shall be a graded mixture, with individual pieces weighing, in general, from 50 to 300 pounds each with not more than 10% weighing less than 50 pounds. At least 50 percent of the total volume shall be composed of pieces weighing 100 pounds or more, and 25% weighing 200 pounds or more.

Rubble can be dumped in place and shall be arranged by hand to form a compact layer conforming to the neat lines called for and to the specified thickness, plus or minus 3 inches. It shall be placed in such manner that the small pieces are not segregated but are evenly distributed and placed so that they fill the voids between the larger pieces.

* * *

SECTION 530 –1 SAND-CEMENT RIPRAP

W-530-1.01 General

Construct riprap composed of sand-cement to the dimensions, slopes, and areas as indicated on the Drawings and specified herein.

Posts, braces, fabric, concrete for bases, and all other accessories shall conform to the requirements of the FDOT Design Standards, latest edition.

W-530-1.02 Materials

A. Portland Cement:

Provide cement from an approved source meeting the requirements of Section 921. Certify that cement meets the requirements of the Contract Documents.

B. Fine Aggregate:

Meet the requirements of FDOT Standard Specifications Section 902-3.3, latest edition.

C. Sacks:

Provide sacks made of jute, cotton, or scrim reinforced paper capable of holding the sand-cement mixture without leakage. Ensure that sack material is permeable and absorptive enough to permit passage of water to provide for hydration of the cement. Ensure that paper used in sacks is non-asphalt laminated with a polyester fiber scrim reinforcement in a three-way directional pattern, has an embossed finish, and is perforated approximately 3/32 inch in approximate 1 inch centers. Extend perforations continuously through the entire wall.

Provide sacks of uniform size and dimensions, in order to provide uniformity of lines in the completed work. Use sacks that are free from holes and strong enough to withstand handling without ripping or splitting. Use only one type and size of sack at any one structure.

D. Grout:

Provide sand from an approved source meeting the requirements of FDOT Standard Specifications Section 902-3.3, latest edition. Provide cement from an approved source meeting the requirements of Section 921.

E. Geotextile Fabric:

Meet the requirements of FDOT Standard Specifications Section 514 and FDOT Design Standards, Index 199.

W-530-1.03 Installation

A. Mixing Materials:

Proportion sand and cement in the ratio of 5 cubic feet of sand to 94 lbs. (1 bag) of cement. If proportioning the materials by mass, use a density of 85 lbs\ft3 (loose volume) for sand. The Contractor may batch sand at the moisture content occurring in the stockpile. Mix the sand and cement until the mixture is of uniform color.

B. Filling Sacks:

Accurately measure the mixed material into each sack, taking care to place the same amount of material in each sack; keep at least the top 6 inches of the sacks unfilled to allow for proper tying or folding and to ensure against breaking of the sack during placing.

C. Placing:

Place the filled sacks with their tied or folded ends all in the same direction. Lay the sacks with broken joints, in a regular pattern. Ram or pack the sacks against each other so as to form a close and molded contact after the sand and cement mixture has set up. Remove and replace sacks ripped or torn in placing with sound, unbroken sacks. Then, thoroughly saturate all sacks with water.

D. Grouting:

Immediately after watering, fill all openings between sacks with dry grout composed of one part Portland cement and five parts sand.

E. Toe Walls:

The Contractor may construct toe walls of riprap for fill slopes of poured in place concrete in lieu of sand cement in sacks. Meet the concrete requirements as specified in of FDOT Standard Specifications Section 347. If using sand cement in sacks for the toe walls, fill the entire trench excavated for the toe walls with sand cement in sacks.

* * *

SECTION 548- CONCRETE SEGMENTAL RETAINING WALL SYSTEM

W-548-01 General

This work shall include the furnishing of all labor, materials, equipment, services, and incidentals required for the placement of the concrete retaining wall, backfill, drainage aggregate, geotextile filter, tie-backs, and foundation soil as specified herein.

Materials furnished and installed under this section shall be provided and placed in full conformity with detailed drawings, specifications, engineering data, and instructions and recommendations of the manufacturer as approved by the Engineer.

The Contractor shall furnish records of past successful experience in performing this type of work.

W-548.02 Technical Services

The Contractor shall retain the services of a manufacturer's representative to provide technical assistance in the field. The representative shall be present prior to and during placement of the erosion control materials to instruct in their proper installation.

W-548.03 Materials

A. Segmental Retaining Wall units shall meet the following requirements:

1. Physical Requirements:

    a. Compression and Absorption: Concrete retaining wall units shall be tested in accordance with ASTM C140, Sections 6, 8 and 9. Concrete retaining wall units shall meet requirements of ASTM C1372, except the compressive strength requirements will be increased to a minimum of 3,500 psi and the maximum water absorption shall be limited to 7 percent, and unit height dimensions shall not vary more than plus or minus 1/16 inch from that specified in the ASTM reference, not including textured face. Test shall be performed within the past 6 months to be considered current and valid.
    b. Freeze-Thaw Durability: Shall be tested in accordance with ASTM C1262 when required. Test shall be performed within the past 12 months to be considered current and valid.

2. Per the Engineer:

    a. Color: Natural Grey
    b. Face Pattern Geometry: Straight
    c. Texture: Split Rock Face that exposes the natural aggregates.
    d. Batter: Include an integral batter control shear connector to provide a consistent setback for each wall course. Initial wall batter shall not exceed 7 degrees.

B. Approved Systems: Anchor Wall Systems or approved equal

C. Geosynthetic Reinforcement:

Geosynthetic Reinforcement shall be manufactured with high-tenacity polyester or HDPE in a grid or textile structure. The geosynthetic reinforcement must meet the long-term design strength, soil interaction, and connection capacity requirements as required by the design of the retaining wall.

2. Long-term Design Strength: As determined in accordance with Method A of the NCMA Design Manual for Segmental Retaining Walls, Second Edition, Second Printing, 1997.

    a. Ultimate Tensile Strength: The ultimate tensile strength of the geosynthetic reinforcement shall be determined in accordance with ASTM D4595 or ASTM D6637.
    b. Creep: Creep testing of the geosynthetic shall be performed in accordance with ASTM D5262. The creep reduction factor shall be determined in accordance with FHWA-NHI-00-043.
    c. Installation Damage: The installation damage reduction factor shall be determined in accordance with ASTM D5818 and FHWA-NHI-00-043.
    d. Durability: The durability reduction factor shall be determined in accordance with FHWA-NHI-00-044.

2. Soil Interaction: The soil interaction properties include the coefficient of direct sliding and coefficient of interaction as determined through direct shear and pullout testing, respectively.

    a. Pullout: Shall be determined in accordance with ASTM D6706.
    b. Direct Sliding: Shall be tested in accordance with ASTM D5321.

3. Connection Capacity: As determined in accordance with ASTM D6638.

D. Leveling Pad Base:

1. Aggregate Base: Crushed stone or granular fill meeting the following gradation as determined in accordance with ASTM D448:

Sieve Size	Percent Passing
1 inch	100
No. 4	35 to 70
No. 40	10 to 35
No. 200	3 to 10

    a. Base Thickness: 6 inches (minimum compacted thickness).

2. Concrete Base: Nonreinforced lean concrete base.

    a. Base Thickness: At least 2 inches
    b. Minimum Compressive strength of 1,500 psi

E. Drainage Aggregate: Clean crushed stone or granular fill meeting the following gradation as determined in accordance with ASTM D448:

Sieve Size	Percent Passing
1 inch	100
3/4 inch	75 to 100
No. 4	0 to 60
No. 40	0 to 50
No. 200	0 to 5

F. Reinforced Backfill: Suitable reinforced backfill soils shall be free of organics and debris and consisting of GP, GW, SP, SW, or SM type, classified in accordance with ASTM D2487 and the USCS classification system. Soils classified as SC, ML and CL are considered suitable soils for segmental retaining walls with a total height of less than 10 feet.

1. The Plasticity Index (PI) of the reinforced backfill soils shall not be greater than 20 as measured in accordance with ASTM D4318.
2. Unsuitable soils are organic soils and those soils classified as CH, OH, MH, OL, or PT.
3. The pH of the reinforced backfill shall be between 3 and 10 and be tested in accordance with ASTM G51.
4. Maximum particle size less than or equal to 4 inches.

G. Drainage Pipe: Perforated or slotted PVC or corrugated HDPE pipe manufactured in accordance with D3034 and/or ASTM F405. The pipe may be covered with a geotextile filter to prevent fines migration into the pipe.

H. Pre-fabricated Drainage Composite: The pre-fabricated drainage composite shall be Miradrain 5000, manufactured by Mirafi, or approved equal.

I. Geotextile Filter: The geotextile filter shall be in accordance with AASHTO M288 guidelines.

J. Impervious Material: Clay soil and/or low permeability geosynthetic shall have a coefficient of permeability of less than 10^{-6} cm/s as tested in accordance with ASTM D5084 or ASTM D4491, as applicable.

K. Construction Adhesive: Exterior grade adhesive as recommended by the retaining wall unit manufacturer.

W-548.04 Submittals

Due to the design-build nature of Segmental Retaining Wall Systems, contractors shall provide a system specific submittal package to the Engineer at least thirty (30) days prior to construction for approval. Incomplete submittal packages will not be reviewed.

A. Submit the following at least thirty (30) days prior to construction for approval

1. Product Data :
   a. Material description and installation instructions for each manufactured product specified including Segmental Retaining Wall Units (SRW) and Geosynthetic Reinforcement.
   b. Name and address of the production facility where the proposed SRW units will be manufactured. All units to be manufactured at the same facility.
   c. Notarized letter from the SRW manufacturer stating that the units supplied for this project are manufactured in complete compliance with Section 2.01 of this specification. The letter shall state that the SRW units shown in the attached test reports are representative samples of the plants normal mix design and regular production runs.

2. Samples:
   a. Furnish one unit demonstrating the color, face pattern, and texture of the SRW.
   b. Furnish 12-inch square or larger piece of the geosynthetic reinforcement specified.

3. Test Reports:
   a. Independent laboratory reports indicating compressive strength, moisture absorption and freeze-thaw durability of the concrete retaining wall units from the proposed production facility. Only test performed within the past 12 months will be considered current and valid.

b. Independent test reports verifying the long-term design strength properties (creep, installation damage, and durability) and soil interaction properties of the geosynthetic reinforcement.
c. Independent test reports verifying the connection capacity between the geosynthetic reinforcement and the concrete retaining wall units.

4. Wall Design Engineer Qualifications:
   a. Current insurance policy verifying professional liability and errors and omissions insurance coverage for an aggregate and per claim limit of at least two million dollars ($2,000,000).
   b. Notarized letter certifying the proposed SRW Design Engineer is a licensed professional engineer in the state of wall installation and has a minimum of 4 years and 500,000 square feet of SRW system design experience.

5. Retaining Wall Installer Qualifications:
   a. Notarized statement showing that the retaining wall installer has installed a minimum of 100,000 square feet of segmental retaining walls.
   b. The Retaining Wall Installer shall furnish five (5) project references of similar size and scope to this project including the wall(s) height and square footage. References shall include the contact information of Owner or General Contractor.

B. Submit the following at least thirty (30) days prior to start of construction for approval

1. Retaining Wall Final Design Submittals
   a. Shop Drawings: Four (4) sets of the retaining wall system design, including wall elevation views, geosynthetic reinforcement layout, pertinent details, and drainage provisions. A registered professional engineer licensed in the state of wall installation shall sign and certify that the shop drawings are designed in accordance with the project civil plans and specifications.
   b. Design Calculations: Four (4) sets of certified engineering design calculations prepared in accordance with the NCMA Design Manual for Segmental Retaining Walls, Second Edition, Second Printing, 1997. Analysis shall include Internal, External, Global Stability, and Bearing Capacity Calculations. Certification must be by a qualified Professional Engineer, currently registered in the State of Florida.

W-548.05 Design Requirements

A. Designs for SRW's using extensible (geosynthetic) reinforcement shall be prepared according to design methodology presented in the NCMA "Design Manual for Segmental Retaining Walls, 1997, second edition, second printing" and conform to the minimum safety factors as specified in this specification section. Design submittals not meeting this design criteria or technical/administrative criteria as specified will be rejected in their entirety until complete compliance is achieved. Owner reserves all rights in determining compliance for plan approval and may reject any submittals.

B. Design of the SRW shall be based on the following soil parameters as determined during the geotechnical investigation:

	Effective Friction Angle	Effective Cohesion	Unit Weight
Reinforced Backfill	_____	NA	_____
Retained Backfill	_____	NA	_____
Foundation	_____	_____	_____

The Design Engineer of Record shall be responsible for selecting and specifying reinforced fill material. The General Contractor is responsible for ensuring and documenting the reinforced fill meets

the specified parameters for both strength and compaction. Compacted retained soil shall meet the minimum requirements specified.

C. Design Criteria for Retaining Wall Systems:

Unless otherwise indicated below, SRW design shall be performed in strict accordance with the procedures presented in the NCMA Design Manual for Segmental Retaining Walls.

1. Internal Stability:
   a. Minimum Factor of Safety on Tensile Overstress 1.0
   b. Minimum Factor of Safety on Geogrid Pullout (peak load criterion) 1.5
   c. Minimum Factor of Safety on Facing Shear (peak load criterion) 1.5
   d. Minimum Factor of Safety on Facing Shear (serviceability criterion) 2% of height of SRW units 1.0
   e. Minimum Factor of Safety Connections (peak load criterion) 1.5
   f. Minimum Factor of Safety for Uncertainties 1.5

2. External Stability:
   a. Minimum Factor of Safety Against Base Sliding (static condition) 1.5
   b. Minimum Factor of Safety Against Overturning 2.0
   c. Minimum Factor of Safety for Global Stability 1.3
   d. Minimum Factor of Safety for Bearing Capacity 2.0

3. Seismic factors of safety shall be 75% of the static values

D. Design shall address hydrostatic loading, seismic loading, rapid drawdown, surcharge, and backslopes where appropriate. Minimum Design Live Load of 150 psf shall be used for all walls supporting parking areas. Minimum Design Live Load of 250 psf shall be used for walls supporting entrance drives, service drives and other areas subject to traffic.

E. Minimum reinforcement length shall be 60 percent of the wall height. Reinforcement coverage at each layer shall be 100 percent (no gaps).

F. The maximum vertical distance between layers of soil reinforcement shall be limited to a maximum of 25” (inches) for systems that derive their connection capacity from friction and 31” (inches) for systems using a mechanical connection to derive their connection capacity (per NHI 043 and AASHTO).

G. Drainage Aggregate shall be placed within, between, and a minimum of 12” (inches) behind the segmental concrete facing units.

W-548.06 Delivery, Storage and Handling

A. Concrete Retaining Wall Units and Accessories: Deliver, store, and handle materials in accordance with manufacturer's recommendations, in such a manner as to prevent damage. Check the materials upon delivery to assure that proper material has been received. Store above ground on wood pallets or blocking. Remove damaged or otherwise unsuitable material, when so determined, from the site.
   1. Exposed faces of concrete wall units shall be free of chips, cracks, stains, and other imperfections detracting from their appearance, when viewed from a distance of 10 feet.

2. Prevent mud, wet cement, adhesives and similar materials that may harm appearance of units, from coming in contact with system components.

B. Geosynthetics (including geosynthetic reinforcement, geotextile filter, pre-fabricated drainage composite) shall be delivered, stored, and handled in accordance with ASTM D4873.

W-548.07 Extra Materials

A. Furnish Owner with 10 replacement units identical to those installed on the Project.

W-548.08 Construction and Installation Requirements

A. Examination:

1. The Project Geotechnical Engineer shall examine the areas and conditions under which the retaining wall system is to be erected, and notify the Owner and Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.

2. Promptly notify the wall design engineer of site conditions that may affect wall performance, soil conditions observed other than those assumed, or other conditions that may require a reevaluation of the wall design.

3. Verify the location of existing structures and utilities prior to excavation.

B. Preparation:

1. Ensure surrounding structures and existing utilities are protected from the effects of wall excavation.
2. Excavation support, if required, is the responsibility of the Contractor, including the stability of the excavation and it's influence on adjacent properties and structures.

C. Excavation:

1. Excavate to the lines and grades shown on the Drawings. The General Contractor shall replace any unsuitable soils discovered during excavation. Use care in excavating to prevent disturbance of the base beyond the lines shown.

D. Foundation Preparation:

1. Excavate foundation soil as required for footing or base dimension shown on the Drawings, or as directed by the Project geotechnical engineer.
2. The Project geotechnical engineer will examine foundation soil to ensure that the actual foundation soil strength meets or exceeds that indicated on the Drawings. Remove soil not meeting the required strength. Oversize resulting space sufficiently from the front of the block to the back of the reinforcement, and backfill with suitable compacted backfill soils.
3. The Project geotechnical engineer will determine if the foundation soils will require special treatment or correction to control total and differential settlement.
4. Fill over-excavated areas with suitable compacted backfill, as recommended by the Project geotechnical engineer.

E. Base Course Preparation

1. Place base materials to the depths and widths shown on the Drawings, upon undisturbed soils, or foundation soils prepared in accordance with Article 3.04.

a. Extend the leveling pad laterally at least 6 inches in front and behind the lowermost concrete retaining wall unit.
b. Provide aggregate base compacted to 6 inches thick (minimum).
c. The Contractor may at their option, provide a concrete leveling pad as specified in Subparagraph 2.01.C.2, in lieu of the aggregate base.
d. Where a reinforced footing is required by local code official, place footing below frost depth.

2. Compact aggregate base material to provide a level, hard surface on which to place the first course of units. A thin, less than 1 inch, can be used to assist in leveling the base units
3. Prepare base materials to ensure complete contact with retaining wall units.

F. Erection

1. General: Erect units in accordance with manufacturer's instructions and recommendations, and as specified herein.

2. Place first course of concrete wall units on the prepared base material. Check units for level and alignment. Maintain the same elevation at the top of each unit within each section of the base course.

3. Ensure that foundation units are in full contact with natural or compacted soil base or lean concrete leveling pad.
4. Place concrete wall units side-by-side for full length of wall alignment. Alignment may be accomplished by using a string line measuring from the back of the block.

5. Place 12 inches (minimum) of drainage aggregate directly behind the concrete wall units. Fill voids in and between retaining wall units with drainage aggregate.

6. Provide a drainage zone behind the wall units to within 12 inches of the final grade. Cap the backfill and drainage aggregate zone with 12 inches of impervious material.

7. Install drainage pipe at the lowest elevation possible, to maintain gravity flow of water to outside of the reinforced zone. Slope the main collection drainage pipe, located just behind the concrete retaining wall units, 2 percent (minimum) to provide gravity flow to the daylighted areas. Daylight the main collection drainage pipe to an appropriate location away from the wall system at each low point and at 50-foot (maximum) intervals along the wall.

8. Remove excess fill from top of units and install next course. Ensure drainage aggregate and backfill are compacted before installation of next course.

9. Check each course for level and alignment. Adjust units as necessary to maintain level and alignment prior to proceeding with each additional course. Install alignment devices (pins, clips, bars etc.) if required.

10. Install each succeeding course. Backfill as each course is completed. Pull the units forward until the locating surface of the unit contacts the locating surface/device of the units in the preceding course. Interlock wall segments that meet at corners by overlapping successive courses. Attach concrete retaining wall units at exterior corners with adhesive specified.

11. Install geosynthetic reinforcement in accordance with geosynthetic manufacturer's recommendations and the shop drawings.

a. Orient geosynthetic reinforcement with the highest strength axis perpendicular to the wall face.

b. Prior to geosynthetic reinforcement placement, place the backfill and compact to the elevation of the top of the wall units at the elevation of the geosynthetic reinforcement.
c. Place geosynthetic reinforcement at the elevations and to the lengths shown on the Drawings.
d. Lay geosynthetic reinforcement horizontally on top of the concrete retaining wall units and the compacted backfill soils. Ensure that the geosynthetic reinforcement extends to within one inch of the face of the concrete retaining wall units. Place the next course of concrete retaining wall units on top of the geosynthetic reinforcement.
e. The geosynthetic reinforcement shall be laid horizontally, pulled taught and be free from wrinkles prior to placement of the backfill soils. The geosynthetic reinforcement may be secured in place with staples, stakes, soil fill or by hand tensioning until the geosynthetic reinforcement is covered by 6 inches of loose fill.
f. The geosynthetic reinforcements shall be continuous throughout its embedment length. Splices in the geosynthetic reinforcement strength direction are not allowed.
g. Do not operate tracked construction equipment directly on the geosynthetic reinforcement.
h. At least 6 inches of compacted backfill soil is required prior to operation of tracked vehicles over the geosynthetic reinforcement. Keep turning of tracked construction equipment to a minimum.
i. Rubber-tired equipment may pass over the geosynthetic reinforcement at speeds of less than 5 miles per hour. Turning of rubber-tired equipment is not allowed on the geosynthetic reinforcement.

G. Backfill placement

1. Place reinforced backfill, spread and compact in a manner that will minimize slack in the reinforcement.

2. Place fill within the reinforced zone and compact in lifts not exceeding 6 to 8 inches (loose thickness) where hand-operated compaction equipment is used, and not exceeding 12 inches (loose thickness) where heavy, self-propelled compaction equipment is used.

    a. Only lightweight hand-operated compaction equipment is allowed within 4 feet of the back of the retaining wall units. If the specified compaction cannot be achieved within 4 feet of the back of the retaining wall units, replace the reinforced soil in this zone with drainage aggregate material.

3. Compaction testing shall be done in accordance with ASTM D1556 or ASTM D2922.

4. Minimum Compaction Requirements for Fill Placed in the Reinforced Zone
    a. The minimum compaction requirement shall be determined by the project geotechnical engineer testing the compaction. At no time shall the soil compaction requirements be less than 95 percent of the soil's standard Proctor maximum dry density (ASTM D698) [modified Proctor maximum dry density (ASTM D1557)] for the entire wall height
    b. Utility Trench Backfill: Compact utility trench backfill in or below the reinforced soil zone to 98 percent of the soil's standard Proctor maximum dry density (ASTM D698) [modified Proctor maximum dry density (ASTM D1557)], or as recommended by the Project geotechnical engineer. If the height from the utility to finish grade is higher than 30 feet, increase compaction to 100 percent of the standard Proctor density [modified Proctor density].
        1. Utilities must be properly designed (by others) to withstand all forces from the retaining wall units, reinforced soil mass, and surcharge loads, if any.
    c. Moisture Content: Within 2 percentage points of the optimum moisture content for all wall heights.

d. These specifications may be changed based on recommendations by the Project geotechnical engineer.
    1. If changes are required, the Contract Sum will be adjusted by written Change Order.

5. At the end of each day's operation, the wall installer shall slope the last level of compacted backfill away from the interior (concealed) face of the wall to direct surface water runoff away from the wall face.
    a. The General Contractor is responsible for ensuring that the finished site drainage is directed away from the retaining wall system.
    b. In addition, the General Contractor is responsible for ensuring that surface water runoff from adjacent construction areas is not allowed to enter the retaining wall area of the construction site.

6. Refer to Article 3.10 for compaction testing.

H. Cap Unit Installation

1. Apply adhesive to the top surface of the unit below and place the cap unit into desired position.

2. Cut cap units as necessary to obtain the proper fit.

3. Backfill and compact to top of cap unit.

I. Site Construction Tolerances

1. Site Construction Tolerances
    a. Vertical Alignment: Plus or minus 1-1/2 inches over any 10-foot distance, with a maximum differential of 3 inches over the length of the wall.
    b. Horizontal Location Control From Grading Plan
        1. Straight Lines: Plus or minus 1-1/2 inches over any 10-foot distance.
        2. Corner and Radius Locations: Plus or minus 12 inches.
        3. Curves and Serpentine Radii: Plus or minus 2 feet.
    c. Immediate Post Construction Wall Batter: Within 2 degrees of the design batter of the concrete retaining wall units.
    d. Bulging: Plus or minus 1-1/4 inches over any 10-foot distance.

J. Field Quality Control

1. Installer is responsible for quality control of installation of system components.

2. The General Contractor or Owner, at their expense, shall retain a qualified independent testing agency to perform quality assurance checks, evaluation of foundation soils, and compaction testing of the installer's work.

3. Installer shall correct work that does not meet these specifications or the requirements shown on the Drawings at the installer's expense.

4. An independent testing agency, at the general contractors expense, shall be contracted to perform compaction testing of the reinforced backfill placed and compacted in the reinforced backfill zone.
    a. Testing Frequency
        1. One test for every 2 feet (vertical) of fill placed and compacted, for every 50 lineal feet of retaining wall.

2. Vary compaction test locations to cover the entire area of the reinforced soil zone, including the area compacted by the hand-operated compaction equipment.

K. Adjusting and Cleaning

1. Replace damaged units with new units as the work progresses.

2. Remove debris caused by wall construction and leave adjacent paved areas broom clean.

L. Measurement and Payment

1. Measurement of segmental retaining wall shall be on an installed square foot basis computed on the total face area of wall installed. Wall face area includes from the bottom of the embedded base wall unit to the top of the wall, including cap unit, and the entire length of the wall.
2. Payment for the wall will be made on a square foot basis at the agreed upon Contract Unit Price.
    a. Payment should be considered full compensation for labor, materials, and equipment required to install the wall in accordance with these specifications and the Drawings.
    b. Quantities may vary from that shown on the Drawings depending on existing topography. Change to the total quantity of wall face area will be paid or withheld at the agreed upon Contract Unit Price.

* * *

SECTION 550 – VINYL CLAD CHAIN LINK FENCING TYPE B

W-550.01 General

The work specified in this section consists of furnishing and erecting Type B vinyl clad metal fencing at the locations specified in each Work Order and as directed by the Engineer.

Posts, fabric, and all other accessories shall conform to the requirements of Specification 550 of the FDOT Standard Specifications for Road and Bridge Construction, latest edition, except that the color for vinyl coated fence members, when specified, shall be dark black.

The Contractor will use zinc-coated vinyl coated fence members at sites where complete fence is specified. In locations where only a portion of the fencing is to be replaced or repaired, the Contractor shall furnish and install fence members that match the predominate type and style of remaining fence members.

W-550.02 Installation

The fence installation shall be in accordance with FDOT Standard Drawing Index No. 802 FENCE TYPE B (two sheets), these specifications, and as directed by the Engineer.

The fence will generally be constructed in the same location as shown on the Contract Plans, unless directed otherwise by the Engineer. It is desired to construct the proposed fence on the property line, if not already located on the property line.

The Contractor shall be responsible for obtaining all necessary permits.

The Contractor shall also be responsible for obtaining permission from adjacent property owners for any encroachments required to perform the work, and for proper scheduling of the fence installation with the removal of existing fences where it is necessary to provide continuous security to adjacent areas already fenced. In order to meet this requirement, the Contractor may be required to erect and subsequently remove temporary fencing on the adjacent property owner's side of the property line, at no additional cost to the City.

W-550.03 Clearing and Grubbing and Fence Removal

Where vegetation hinders the removal of existing fencing or individual fence components, the Contractor shall clear and grub the vegetation away from the existing fence to a maximum of 2 feet on each side of the fence line.

Where the proposed fence location does not coincide with the existing fence, the Contractor shall clear and grub any hindering vegetation from the proposed fence line to a maximum of 2 feet on each side of the proposed fence line.

Such clearing and grubbing shall not extend beyond the property line onto adjacent private property. The Engineer may direct that any valuable tree be left in place.

W-550.04 Temporary Security Fencing

In locations where the existing fencing is removed, is damaged, or is missing, the Contractor shall install temporary security fencing. The temporary security fencing shall be installed to deny access by the public to the pumping station property during times when the City or the Contractor's personnel are not on site. The temporary security fencing shall be installed and removed to the satisfaction of the Engineer.

W-550.05 Spacing of Posts

Posts shall be spaced as shown on the FDOT Indices, within a tolerance of 12 inches, except where definite spotting of corner or gate posts is required. In any line of fence, however, the over-spacings and the under-spacings shall approximately compensate. Additional line posts shall be set at abrupt changes in grade.

W-550.06 Construction Over Irregular Terrain and Other Obstructions

The bottom of the fence shall, in general, follow the contour of the ground. The fence is detailed on the FDOT Indices at approximately 3 inches above ground line. Over irregular ground, however, a minimum clearance of 1 inch and a maximum of 6 inches will be permitted for a length not to exceed 8 feet. At locations where these clearances cannot be met, the Engineer may require that posts of additional length be set and that the opening at the bottom be closed by barbed wire, stretched taut between poles, with no vertical distance between wires greater that 3 inches.

W-550.07 Setting Posts

All posts shall be set in a concrete base as shown in the FDOT Indices or on a base plate if the post is to be mounted on an existing concrete endwall or retaining wall, or in grout.

If rock occurs within the required depth of the post hole, or pavement which is to remain exists at the location of a post, a hole a diameter slightly larger than the greatest dimension of the post shall be drilled and the post grouted in.

W-550.08 Top Rail

A top rail shall be required in lieu of a top tension wire for all fencing replacement occurrences.

W-550.09 Placing Fabric

Fence fabric shall not be placed until the posts have been permanently positioned and concrete foundations have attained adequate strength. The fabric shall be placed by securing one end and applying sufficient tension to remove all slack before making permanent attachments at intermediate points. The fabric shall be fastened to all end, corner, and pull posts by approved stretcher bar assemblies. Fastening shall be done by use of tools designed for the purpose, in accordance with the manufacturer's recommendations. The tension for stretching shall be applied by mechanical fence stretchers designed for the purpose.

All splices in the fabric shall be securely and neatly made.

W-550.10 Electrical Grounds

Whenever a power line passes over the fence, a ground shall be installed directly below the point of crossing. The ground rod shall consist of an aluminum or galvanized rod, with connection of similar metal if required, or of other appropriate material, 8 feet in length and at least 5/8 inch in diameter. The rod shall be driven vertically until the top of the rod is approximately 6 inches below the ground surface. A No. 6 conductor shall be used to connect the rod and all fence elements. The conductor shall be connected to each fence element and the ground rod by means of electrical-type clamps which will prevent corrosion.

W-550.11 Gates

All gates specified shall be 20-foot wide, double, swing gates. Each section of gate shall be constructed of three horizontal pipes, one each at the top, mid-height and bottom; two vertical pipes, one at each side; and an adjustable truss rod diagonally from the top corner on the hinge side to the bottom corner of the latch side. The size of all pipe shall, at the

minimum, equal the diameter of the line post option used for the adjacent fencing. All pipe joints and truss rod attachments shall be welded. The galvanizing of steel materials shall be done after fabrication. The welds of other materials shall be protected as per the applicable AASHTO standard, ASTM standard, or as directed by the Engineer. The fabric shall be stretched taut and fastened with either stretcher bars or ties at 12-inch centers to all pipes of the frame. Posts to which the gate hinges are attached shall be 6 inches in diameter and provided with an appropriate cap.

W-550.12 Extra Length Posts

Extra length posts may be ordered by the Engineer in locations where the fence crosses depressions where the specified ground clearance cannot be met or where it crosses muck or other areas of inadequate support for a post of standard length.

For all such posts, the concrete base shall be extended downward to the bottom of the extra length post.

* * *

SECTION 901 - COARSE AGGREGATE

W-901.01 General

Coarse aggregate shall consist of naturally occurring materials such as gravel, or resulting from the crushing of parent rock, to include natural rock, slags, expanded clays and shales (lightweight aggregates), and other approved inert materials with similar characteristics, having hard, strong, durable particles, conforming to the specific requirements of the section.

Coarse aggregate for use in a hot bituminous mixture may also consist of reclaimed portland cement concrete pavement meeting the requirements of 901.08. Washing of this material will not be required if the requirements of 901.02 for maximum percent of material passing the No. 200 sieve can be met without washing.

Materials substantially retained on the No. 4 (4.75 mm) sieve shall be classified as coarse aggregate.

Sources of supply shall be approved by the Engineer, and aggregates shall be produced under the requirements of the Standard Operating Procedure for Evaluation, Approval and Control of Mineral Aggregate Sources (Coarse Aggregates).

W-901.02 Deleterious Substances

All coarse aggregate shall be reasonably free of clay lumps, soft and friable particles, salt, alkali, organic matter, adherent coatings, and other substances not defined which may possess undesirable characteristics. The weight of deleterious substances shall not exceed the following percentages:

Coal and Lignite (AASHTO T-113)	1.00
Soft and friable particles (AASHTO T-112)	2.00*
Clay lumps (AASHTO T-112)	2.00*
Cinders and clinkers	0.50
Free shell	1.00**
Material passing the No. 200 Sieve (FM 1-T 011)	1.75***
Organic Matter (wet)	0.03
Chert (less than 2.40 Sp. Gr. SSD)(AASHTO T-113)	3.00****

The sum of the percentages of all deleterious substances shall not exceed ten.

* The maximum percent by weight of soft and friable particles and clay lumps together shall not exceed 3.00.

** Aggregates to be used in asphaltic concrete may contain up to five percent free shell. Free shell is defined as that portion of the coarse aggregate retained on the No. 4 sieve consisting of loose, whole, or broken shell, or the external skeletal remains of other marine life, having a ratio of the maximum length of the particle to the shell wall thickness exceeding five to one. Coral, molds, or casts of other shells, and crushed clam and oyster shell indigenous to the formation will not be considered as free shell.

*** The requirement for maximum percent of material passing the No. 200 sieve for a lot or stockpile of any coarse aggregate component shall be as follows:

(a) For any samples obtained by the City for acceptance purposes or assurances purposes at the source of production, the average percent of material passing the No. 200 sieve of two composite samples shall not exceed 1.75 percent. No individual test shall exceed 2.0 percent.

(b) For assurance samples or acceptance samples, as designated by the Engineer. Obtained at the point of use, the average percent of material passing the No. 200 sieve for two composite samples shall not exceed 3.75 percent. No individual test shall exceed 4.0 percent.

**** This limitation applies only to coarse aggregates in which chert appears as an impurity. It is not applicable to aggregates which are predominantly chert.

W-901.03 Physical Properties

Coarse aggregate shall meet the following physical property requirements, except as noted herein:

Los Angeles Abrasion (FM 1-T 096)	Maximum loss 45 percent
Soundness (Sodium Sulphate)(FM 1-T 104)	Maximum loss 12 percent*
Flat or elongated pieces	Maximum 10 percent**

* For source approval - Aggregates exceeding soundness loss limitations will be rejected unless performance history shows that the material will not be detrimental for Portland Cement Concrete or other intended usages.

** A flat or elongated particle is defined as one having a ratio between the maximum and the minimum dimensions of a circumscribing prism exceeding five to one.

W-901.04 Gradation

Coarse aggregates shall conform to the gradation requirements of Table 1 (see Pages W901-5 and 6), when the stone size is specified. However, Table 1 is waived for those aggregates intended for usage in bituminous mixtures, provided the material is graded on sieves specified in the Standard Operating Procedure, and meets uniformity and bituminous design requirements.

W-901.05 Natural Stones

Coarse aggregate may be processed from gravels, granites, limestones, dolomites, sandstones, or other naturally occurring hard, sound, durable materials meeting the requirements of this section.

Gravel shall be composed of naturally occurring quartz, free from injurious coatings of any kind. The Los Angeles Abrasion requirement of 901-1.3 is modified to permit a maximum loss up to 45 (FM 1-T 096). The minimum dry-rodded weight (FM 1-T 019) shall be 95 pounds per cubic foot.

Crushed gravel shall consist of 85 percent, by weight, of the material retained on the No. 4 sieve, having three crushed faces.

Coarse aggregate produced from the crushing of granites shall be sound and durable. For granites to be used in bituminous mixtures and surface treatments, the Los Angeles Abrasion requirement of 901-1.3 is modified to permit a maximum loss up to 50 (FM 1-T 096). Maximum amount of mica schist permitted is five percent (AASHTO T 189).

Limestones, Dolomites, and Sandstone

Coarse aggregates may be produced from limestone, dolomites, sandstones, or other naturally occurring hard, sound, durable materials meeting the requirements of this section.

Pre-Denozoic limestones and dolomites shall not be used as crushed stone aggregates either coarse or fine for Asphaltic Concrete Friction Courses, or any other asphaltic concrete mixture or surface treatment serving as the final wearing course. This specifically includes materials from the Ketona Dolomite (Cambrian) Newala Limestone (Mississippian) and Northern Alabama and Georgia.

As an exception to the above, up to 20 percent fine aggregate from these materials may be used in asphaltic concrete mixtures other than Friction Courses which serve as the final wearing course.

W-901.06 Manufactured Stones

Coarse aggregate may be produced from molten nonmetallic by-products consisting essentially of silicates and aluminosilicates of calcium and other bases, such as air-cooled blast-furnace slag or phosphate slag, provided it is reasonably uniform in density and quality, and reasonably free from deleterious substances as specified in 901.02. in addition, it must meet the following specific requirements:

Sulphur content	Not more than 1.5 percent
Dry rodded weight (FM 1-T 019)	Minimum 70 pounds per cubic foot
Glassy particles	Not more than 10 percent

Slag shall not be used as an aggregate for portland cement concrete.

W-901.07 Lightweight Aggregates

Lightweight coarse aggregate may be produced from naturally occurring materials such as pumice, scoria, and tuff or from expanded clay, shale, or slate fired in a rotary kiln. It shall be reasonably uniform in quality and density, and free of deleterious substances as specified in 901.02, except that the term cinders and clinkers shall apply to those particles clearly foreign to the extended aggregate in question.

In addition, it must meet the following specific requirements:

Material passing the No. 200 Sieve	Maximum 3.00 percent (FM 1-T 011)
Dry loose weight (FM 1-T 019)	33-55 pounds per cubic foot*
Los Angeles Abrasion (FM 1-T 096)	Maximum 35 percent
Ferric Oxide (ASTM C 641)	Maximum 1.5 milligrams (Option of Engineer)

* Source shall maintain dry-loose unit weight with $\pm$ 6 percent of Quality Control average. Point of use dry-loose unit weight shall be within $\pm$ 10 percent of Source Quality Control average.

W-901.08 Reclaimed Portland Cement Concrete Pavement

The reclaimed portland cement concrete pavement shall be crushed and processed to provide a clean, hard, durable aggregate having a uniform gradation free from adherent coatings, steel reinforcement, vegetable matter, base material, joint fillers, or bituminous materials. The processing shall be controlled in accordance with the Department's

Standard Operating Procedure for Evaluation Approval and Control of Mineral Aggregate Sources.

W-901.09 Exceptions, Additions, and Restrictions

Pertinent specifications modifications, based on material usage, will be found in other sections of the specifications package.

* * *

SECTION 902 - FINE AGGREGATE

W-902.01 General

Fine aggregate shall consist of natural silica sand, screening, local materials, or subject to approval, other inert materials with similar characteristics, or combination thereof, having hard, strong, durable particles, conforming to the specific requirements of this section.

Sources of supply shall be approved by the Engineer, with materials produced under the requirements of the Standard Operating Procedure for Evaluation, Approval and Control of Mineral Aggregate Sources (Silica Sand and Screenings), except as noted herein.

All fine aggregate shall be reasonably free of lumps of clay, soft or flaky particles, salt, alkali, organic matter, loam, or other extraneous substances. The weight of deleterious substances shall not exceed the following percentages:

Shale	1.0
Coal and lignite	1.0
Cinders and clinkers	0.5
Clay Lumps	1.0

W-902.02 Silica Sand

Silica sand shall be composed only of naturally occurring hard, strong, durable, uncoated grains of quartz, reasonably graded from coarse to fine, meeting the following requirements, in percent total weight.

Sieve	Percent Retained	Percent Passing
No. 4	0 to 5	95-100
No. 8	0 to 15	85-100
No. 16	3 to 35	65-97
No. 30	30 to 75	25-70
No. 50	65 to 95	5-35
No. 100	93 to 100	0-7
No. 200	Minimum 96	Maximum 4

Silica sand from any one source, having a variation in Fineness Modulus greater than 0.20 either way from the Fineness Modulus of target gradations established by the producer, may be rejected.

Silica sand shall be subject to the colorimetric test for organic impurities. If the color produced is darker than the standard solution, the aggregate shall be rejected unless it can be shown by appropriate tests that the impurities causing the color are not of a type that would be detrimental to Portland Cement Concrete. Such tests shall be in accordance with Florida Methods FM 1-T-21 and T-71. When tested for the effect of organic impurities on strength of mortar, the strength ratio at 7 and 28 days, calculated in accordance with Section 8 of FM 1-T-71, shall not be less than 95 percent.

W-902.03 Sands for Miscellaneous Uses

Sand for setting anchor bolts, pipe joints, or other similar uses shall meet the quality requirements of W-902.02 except that gradation requirements are waived.

Sand for brick masonry shall meet the quality requirements of W-902.02 except for gradation requirements. All the materials shall pass the no. 8 Sieve, and be uniformly graded from coarse to fine.

Sand for sand-cement riprap shall meet the quality requirements of W-902.02 except for gradation requirements. The material shall meet the following gradation limits:

Passing	Percent
No. 4 Sieve	Minimum 97
No. 100 Sieve	Maximum 20
No. 200 Sieve	Maximum 5

W902.04 Filter Material for Underdrains

Silica sand for use as filter material for Types I through IV Underdrains shall meet the requirements of W-902.02 except that the requirements regarding gradation and organic impurities shall not apply. The aggregate shall be reasonably free of organic matter and other deleterious materials. The gradation requirements of W-902.02 shall apply except no more than two percent shall pass the No. 200 Sieve.

Filter material for Type V Underdrains shall meet the above requirements except that there shall be no more than one percent of silt, clay, and organic matter, that the aggregate shall have a Uniformity Coefficient of 1.5 or greater, and that ten percent diameter shall be 0.212 (No. 70 Sieve) to 0.50 (No. 35 Sieve) millimeters. The Uniformity Coefficient shall be determined by the ratio D60 divided by D10, where D60 and D10 refer to the particle diameter corresponding to 60 and 10 percent of the material which is finer by dry weight.

W-902.05 Screenings

Screenings shall be composed of hard, durable particles, either naturally occurring, such as gravel screenings, or resulting from the crushing or processing of the parent rock, to include natural rock, slags, expended clays or shales (lightweight aggregates), or other approved inert materials with similar characteristics.

Aggregates classified as screening shall conform to the following gradation requirements:

Sieve Size	Passing Percent
3/8 inch	100
No. 4	85 to 100
No. 200	Maximum 15

When permitted by specifications, a screening component may contain up to 18 percent material passing the No. 200 Sieve.

W-902.06 Specific Requirements

Screenings from F.D.O.T. Approved Sources of Coarse Aggregate: Processed screenings from fully Approved Sources of Coarse Aggregate are subject to gradation and maximum percent passing the No. 200 Sieve tests. Should Coarse Aggregate Source Approval status change, or unsatisfactory in-service history develop, additional control requirements may be implemented.

Screenings for use in hot bituminous mixture may consist of screenings from the processing of reclaimed portland cement pavement to produce coarse aggregate.

* * *

SECTION 9600 – VIDEO RECORDING

W-9600.01 Video Recording

Prior to commencing work, the Contractor shall submit to the Engineer for approval, a DVD containing a continuous color video recording including complete coverage of pre-construction conditions of all surface features within the construction's zone of influence, (including detour routes) simultaneously produced audio commentary and electronic display of time and date. The video recording shall be sufficient to fulfill the technical and forensic requirements of the project and provide continuous unedited coverage, establishing locations and viewer orientation with clear, bright, steady and sharp video images with accurate colors free of distortion or other imperfections. The DVD must be accompanied by a detailed log of its contents including date, locations, video counter numbers and features. No work shall be allowed until the completed DVD and log are approved by the Engineer.

* * *

CONTRACT ITEMS

CONTRACT ITEM 0100-1 - CONTINGENCY

The work covered by this item consists of unforeseen items of work not included in other bid items but necessary for accomplishing the work and shall apply only to extra work or additional items over and above those specified or shown on the plans. The Contractor shall negotiate with the Owner regarding the construction cost of additional work. The cost of this additional work shall be agreed upon in writing and approved by the Owner or his authorized representative prior to starting this additional work.

CONTRACT ITEM 0101-1 – MOBILIZATION/DEMOBILIZATION

The Contractor shall furnish all equipment, labor, and materials necessary to mobilize his forces as necessary to perform all the work under this Contract.

Work under this section includes permits, bonding and insurance; construction stakeout and as-built documentation; transportation, and otherwise movement of all personnel, equipment, supplies, materials and incidentals to the project site; establishment of temporary offices, buildings, safety equipment and first aid supplies, sanitary and other facilities; providing a continuous color audio-video tape of existing conditions along the pipeline and stormwater inlet locations; providing a traffic control plan; and all other preconstruction expense necessary for the start of the work, excluding the cost of construction materials, to be constructed under this Contract as shown on the Plans and directed by the Engineer.

Payment for Mobilization will be made at the appropriate Contract Lump Sum Price.

Payment for mobilization will be made on an incremental basis. Payment of 75% of the applicable lump sum price shall be made for the preparatory work and operations in mobilizing for the beginning work on the project. Payment of the remaining 25% shall be made for finalization of this project, including demobilization, contract closeout documents, removal of field office, and final site clean-up. Retainage requirements as stated in the General Conditions shall apply to this pay item.

Payment for mobilization/demobilization will be made on an incremental basis in accordance with the following:

Percent of Original Contract Amount Earned	Allowable Percent of the Lump Sum Price for the Item
5	25
10	50
25	75
100	100

CONTRACT ITEM 0102-1 - MAINTENANCE OF TRAFFIC

The Contractor shall furnish all materials, equipment, and labor to establish and maintain all traffic maintenance devices and personnel as shown on the Plans, specified, and directed by the Engineer.

The work includes installation of all signs, barricades, lights and flagmen, additional earth excavation, selected fill, temporary wearing surfaces, temporary bridges, detour facilities, access to residences and businesses and all appurtenant work complete in place as necessary to control traffic and provide for safety

to the public, all in compliance with the Manual on Uniform Traffic Control Devices, "MUTCD", with subsequent revisions and additions, and to the satisfaction of the Engineer.

The Contractor will be required to have a licensed Professional Engineer sign and seal a M.O.T plan to be submitted to the City's Right-of-Way Department for permit.

Payment for Maintenance of Traffic will be made at the appropriate Contract Lump Sum Price.

Payment for Maintenance of Traffic will be made on an incremental basis in accordance with the following:

Percent of Original Contract Amount Earned	Allowable Percent of the Lump Sum Price for the Item
10	10
20	20
30	30
40	40
50	50
60	60
70	70
80	80
90	90
100	100

CONTRACT ITEM 0104-1 – EROSION CONTROL AND TREE PROTECTION

This bid item describes measurement and payment for construction of temporary and permanent erosion control features to protect the work areas and adjacent property.

The lump sum to be paid for under this item, furnished and installed where shown on the plans or where directed by the Project Representative shall include artificial coverings, mowing, sandbagging, slope drains, sediment basins, cleanouts, baled hay and straw, floating silt barrier, floating turbidity barrier, staked silt barrier, staked silt fence, and seeding. This item also includes tree protection barriers as shown on the plans. The lump sum price includes furnishing and installing material, routine maintenance, mowing, and removal of temporary erosion control and tree protection features upon completion of construction.

Payment for erosion control will be made on an incremental basis in accordance with the following:

Percent of Original Contract Amount Earned	Allowable Percent of the Lump Sum Price for the Item
10	10
20	20
30	30
40	40
50	50
60	60
70	70
80	80
90	90
100	100

CONTRACT ITEM 0105-1 – TREE AND ROOT PRUNING

The Contractor shall furnish and install all labor, materials, services, equipment and appurtenances to prune trees and tree roots within the limits of construction as shown in the Contract Drawings and properly dispose of material off site.

The work includes, but is not limited to, the following: removal of stumps and brush, pruning of trees and brush, prune the roots of trees and the removal of any undesirable material within the limits of construction as shown in the Contract Drawings. All pruning of trees and roots must be done under the direction of a Certified Arborist and in coordination with Planning and Development, Natural Resource Division.

Payment for the Tree and Root Pruning will be made at the appropriate Contract Lump Sum Price.

CONTRACT ITEM 0108-1 – DEWATERING AND BY-PASS PUMPING

The Contractor shall furnish and install all labor, materials, services, equipment and appurtenances to dewater the work site or bypass the stream flow, if necessary, to facilitate work activities and to maintain rain event flow in the ditch system within the limits of construction as shown in the Contract Drawings.

The work includes, but is not limited to, the following: pumps, piping, hoses, generators, erosion BMP, fuel, temporary diversion dams within the limits of construction as shown in the Contract Drawings.

Payment for the Dewatering will be made at the appropriate Contract Lump Sum Price.

CONTRACT ITEM 0110-1 – CLEARING AND GRUBBING

The Contractor shall furnish and install all labor, materials, services, equipment and appurtenances to grub and clear the area and to properly dispose of material off site within the limits of construction as shown in the Contract Drawings.

The work includes, but is not limited to, the following: root raking, removal of top layer of soil containing organic material, removal of stumps and brush, removal of any trash and debris, and the removal of any undesirable material, such as concrete headwalls, fabric formed concrete, sidewalks, asphalt, roadway base material, curbing, handrails, landscaping, etc. within the limits of construction as shown in the Contract Drawings. Removal of tree pruning, root pruning, and tree removal is covered under the Contract Item 0105-1 Tree Removal and Replacement

Payment for the Clearing and Grubbing will be made at the appropriate Contract Lump Sum Price.

CONTRACT ITEM 0112-1 – LANDSCAPE REPLACEMENT

The Contractor shall furnish and install all labor, materials, services, equipment and appurtenances to install all replacement shrubs and ground cover plants damaged during construction within the work site as depicted on the Contract Drawings.

The work includes, but is not limited to, the following: installation and maintenance of landscape plants damaged as a result of construction activities with in the work site as depicted on the Contract Drawings.

Contractor will be responsible for the maintenance of the replacement plants and will warrant them for a period of time as stated in Workmanship and Materials Section - 25

Payment for the landscape replacement will be made at the appropriate Contract Lump Sum Price

CONTRACT ITEM 0113-1 – IRRIGATION AND ELECTRIC REPAIRS

The Contractor shall furnish and install all labor, materials, services, equipment and appurtenances to repair and replace all lighting systems and irrigation systems damaged as a result of construction activities within the work site as depicted on the Contract Drawings.

The work includes, but is not limited to, the following: repair, installation, and maintenance of the existing irrigation system including pipes, valves, tubing, bubblers, sprinklers, controller and tie-in to potable water supply and existing lighting system including wires, connections and light fixtures within the work area as depicted on the Contract Drawings.

Payment for the irrigation and electric repairs will be made at the appropriate Contract Lump Sum Price

CONTRACT ITEM 0120 – EXCAVATION SERIES

0120-1 REGULAR EXCAVATION
0120-3 SLOPE GRADING
0120-4 SUBSOIL EXCAVATION (UNSUITABLES)
0120-6 EMBANKMENT

The Contractor shall furnish and install all labor, materials, services, equipment and appurtenances to excavate, shape, grade and construct the ditch banks as shown in the Contract Drawings.

The work includes, but is not limited to, the following: surveying stakeout; excavating, removing, and placement of all soil material within the ditch; rough and final grading of the side slopes and bottom; and placement and grading of imported fill material as shown in the Contract Drawings. Although the intent is to use all excavated material as fill with in the ditch, Item 120-4 Subsoil Excavation (unsuitable) will be used for the removal and off-site disposal any unsuitable material as determined by the Engineer.

Payment for the Excavation Series items will be made at the appropriate Contract Unit Price per cubic yard measured in place and compacted, except Item 0120-3 Slope Grading which will be per square yard of slope.

CONTRACT ITEM 0142-7 - ADDITIONAL SELECT SAND FILL MATERIAL

The Contractor shall furnish, from sources other than excavations made in the Contract, transport, place, and compact select sand as necessary and not specifically included under other Contract Items. Select sand shall be as defined under the Workmanship and Materials Section 2 - Backfilling.

The work does not include transporting, placing, and compacting approved surplus sand from excavations made in this Contract. The Contractor shall use all such approved surplus sand available from excavations made in this Contract prior to supplying select sand from other sources.

The quantities of Additional Select Sand Fill Material, obtained from sources other than excavations in this Contract, in cubic yards, to be measured for payment will be the actual compacted volume of select sand placed within the payment limits shown on the Plans or established by the Engineer.

Select sand used to fill voids resulting from unauthorized excavation, or where required for dewatering, will not be measured for payment even though their use is ordered by the Engineer. Select sand used for pipe bedding will not be measured for payment under this Contract Item. Such select sand is included in the various classified unit price Contract Items for pipelines.

Payment for Additional Select Sand Fill Material, ordered by the Engineer in writing, will be made at the Contract Item Unit Price per cubic yard of sand fill material placed and compacted.

No payment will be made under this Contract Item for approved surplus sand obtained from excavations made in this Contract.

CONTRACT ITEM 0150-1 – CELLULAR CONFINEMENT EROSION CONTROL SYSTEM

The Contractor shall furnish and install all labor, materials, services, equipment and appurtenances to install a cellular confinement erosion control system denoted on the Contract Plans.

The work includes, but is not limited to, the following: preparing, grading and tamping the ditch slope; installation of cellular confinement system material; filter fabric underlayment; connecting new system to the existing system; and placement of aggregate within the cells per manufacturer's specifications in areas denoted on the Contract Plans.

Payment for the cellular confinement erosion control system will be made at the appropriate Contract Unit Price per square yard.

CONTRACT ITEM 0160-5 - STABILIZED SUBBASE

The Contractor shall furnish all materials, equipment, and labor to install and maintain all stabilized subbase below roadway pavement and curbing as shown on the Contract Plans, or as specified and directed by the Engineer.

Stabilized subbase shall conform to the requirements of the Workmanship and Materials Section 2 - Backfilling.

The quantity of Stabilized Subbase, in square yards, to be measured for payment will be the actual compacted volume of stabilized subbase material installed within payment limits for surface restoration detailed on the Contract Plans, specified herein, and ordered by the Engineer.

All permanent pavement base material removed or damaged and requiring replacement outside payment limits will not be measured for payment and shall be replaced by the Contractor at his own expense.

Payment for Stabilized Subbase will be made at the Contract Item Unit Price per square yard of stabilized subbase installed.

CONTRACT ITEM 0285-7 - PERMANENT PAVEMENT BASE

The Contractor shall furnish all materials, equipment and labor to replace and maintain all permanent pavement base removed or damaged by installation of curbing, guard rails, fabric formed concrete and appurtenant work as shown on the Contract Plans, or as specified and directed by the Engineer.

Permanent pavement base replacement shall conform to the requirements of the Workmanship and Materials section headed "Restoration of Street Pavements."

The quantity of Permanent Pavement Base, in square yards, to be measured for payment will be the actual compacted volume of pavement base material within payment limits for surface restoration shown on the Plans, or specified and ordered by the Engineer.

Payment for permanent pavement base replacement along pipelines shall include removal and replacement of permanent pavement base incidental to construction of manholes and structures. All permanent pavement base removed or damaged and requiring replacement outside payment limits will not be measured for payment and shall be replaced by the Contractor at his own expense.

Where the existing pavement is nonpermanent type consisting of shell, gravel, limerock, crushed stone, or other similar material, or is specified to be temporary, no payment will be allowed for replacement of pavement base. Replacement of material for such nonpermanent or temporary pavement will be included in the various classified unit price Contract Items for pipelines and no separate payment will be made therefore.

Payment for Permanent Pavement Base Replacement will be made at the Contract Item Unit Price per square yard of pavement base replaced.

CONTRACT ITEM 0327-1 – MILLING 1 INCH ASPHALT

The Contractor shall furnish all labor, equipment, and materials to mill and maintain existing southbound lane of Jones Ave. from centerline to proposed curb between Station 10+55 and Station 16+80 and appurtenant work as shown on the Plans, or as specified and directed by the Engineer.

Milling shall conform to the requirements of the Workmanship and Materials Section 327 – Milling of Existing Asphalt Pavement.

The quantity of Milling to be measured for payment will be the actual area of pavement surface milled in the work area within payment limits for surface restoration shown on the Plans, or as specified and ordered by the Engineer.

Payment for milling of pavement surface shall include removal millings from the site. Permanent pavement surface removed or damaged and requiring replacement outside payment limits will not be measured for payment and shall be replaced by the Contractor at his own expense.

Replacement of permanent pavement surface will be included in Item 0334-1 Permanent Pavement Surface Replacement.

Payment of Permanent Pavement Surface Replacement will be made at the Contract Item Unit Price per square yard of asphalt surfaced milled.

CONTRACT ITEM - PERMANENT PAVEMENT

0334-1 – PERMANENT PAVEMENT SURFACE REPLACEMENT - 1" S-3
0334-4 – PERMANENT PAVEMENT REPLACEMENT - 1" S-1

The Contractor shall furnish all labor, equipment, and materials to replace and maintain all permanent pavement surface removed or damaged by pipeline construction and appurtenant work as shown on the Plans, or as specified and directed by the Engineer.

Permanent pavement surface replacement shall conform to the requirements of the Workmanship and Materials Section 16 – Restoration of Street Pavements.

The quantity of Permanent Pavement to be measured for payment will be the actual area of permanent pavement surface placed in the work within payment limits for surface restoration shown on the Plans, or as specified and ordered by the Engineer.

Payment for permanent pavement replacement along pipelines shall include removal and replacement of permanent pavement incidental to construction of manholes, inlets, and structures and portions of the roadway shown to be milled and resurfaced. All permanent pavement surface removed or damaged and requiring replacement outside payment limits will not be measured for payment and shall be replaced by the Contractor at his own expense.

Where the existing pavement surface is nonpermanent type consisting of shell, gravel, limerock, crushed stone, or other similar materials, or is specified to be a special temporary pavement surface, no payment will be allowed for replacement of permanent pavement surface. Replacement of surface for such nonpermanent or special temporary pavement will be included in the various classified unit price Contract Items for pipelines, and no separate payment will be made therefore.

Payment of Permanent Pavement will be made at the Contract Item Unit Price per ton of asphalt material installed.

CONTRACT ITEM 0350-1 - CONCRETE FLUME

The Contractor shall furnish all labor, equipment and materials to construct and maintain the concrete flume and appurtenant work as shown on the Contract Plans, specified, and directed by the Engineer.

The concrete flume shall conform to the requirements of the Workmanship and Materials Section 345 - Portland Cement Concrete.

The work includes all excavation, formwork, shoring, bracing, filling, shaping, grading, steel reinforcement, and all appurtenant work complete in place.

The quantity of Concrete Flume to be measured for payment will be the number of flumes placed in the work within payment limits as shown on the Contract Plans, or as specified and directed by the Engineer.

Payment for Concrete Flume will be made at the Contract Item Unit Price per each of the concrete flumes placed.

CONTRACT ITEM 0350-2 - CONCRETE RETAINING WALL PENETRATIONS

The Contractor shall furnish all labor, equipment and materials to construct and maintain the concrete retaining wall penetrations and appurtenant work as shown on the Contract Plans, specified, and directed by the Engineer.

The retaining wall penetrations shall conform to the requirements of the Workmanship and Materials Section 345 - Portland Cement Concrete and the details denoted on the Contract Plans.

The work includes all excavation, formwork, shoring, bracing, filling, shaping, grading, reinforcement, and all appurtenant work complete in place.

The quantity of Retaining Wall Penetrations to be measured for payment will be the actual area of penetrations placed in the work within payment limits as shown on the Contract Plans, or as specified and directed by the Engineer.

Payment for Concrete Retaining Wall Penetrations will be made at the Contract Item Unit Price per cubic yards of the retaining wall penetrations placed.

CONTRACT ITEM 0410-1– WOOD POST W-BEAM GUARDRAIL WITH IMPACT HEADS

The Contractor shall furnish all labor, equipment and materials to construct and maintain all Wood Post W-Beam Guardrail system and appurtenant work as shown on the Contract Plans, or as specified and directed by the Engineer.

Wood Post W-Beam Guardrail System shall conform to the requirements of the FDOT Standard Index 400 and associated specifications.

The work includes all excavation, assembly, steel beams, brackets, wood posts, shoring, bracing, filling, shaping, grading, hardware, impact heads, and all appurtenant work complete in place.

The quantity of Wood Post W-Beam Guardrail to be measured for payment will be the actual length of guardrail placed in the work within payment limits shown on the Contract Plans, specified, and directed by the Engineer.

Payment for Wood Post W-Beam Guardrail will be made at the Contract Item Unit Price per linear foot of guardrail placed.

CONTRACT ITEM 0430 - PIPE CULVERTS AND STORM SEWERS

0430-175-124 – 24 INCH RCP STORM DRAIN
0430-175-148 – 48 INCH RCP STORM DRAIN

The Contractor shall furnish all materials and equipment, construct, test, and maintain complete all pipe culverts and storm sewers as shown on the Contract Plans, or as specified and directed by the Engineer.

All pipe culverts and storm sewers, including fittings, shall be manufactured and installed in accordance with the requirements of the respective Workmanship and Materials sections.

The work includes all removal of existing storm sewer systems, excavation, short tunnels, backfill, sheeting, shoring, bracing, dewatering, pipe bedding, pipe fittings, pipe work, making all pipe connections, anchors, sealants, jackets and coupling bands, installation and removal of plugs and bulkheads, testing, protection, repair and replacement of utilities and house services, protection of existing structures, making joints between pipes and manholes or structures and all other work incidental to the installation of all pipe culverts and storm sewers complete in place.

The quantity of storm sewer pipe, in linear feet, to be measured for payment shall be the actual length of new pipelines placed in the work, as shown, specified and directed. Pipelines will be measured horizontally along the centerline of the pipe.

Deductions in the measured length of storm sewers will be made for the width of all structures, including manholes and inlets, measured from the inside wall to the inside wall of the structure.

Payment for Pipe Culverts and Storm Sewers will be made at the appropriate Contract Item Unit Price per linear foot of pipe installed.

CONTRACT ITEM 0440 - PVC DRAIN PIPES

0440-73-6 – 6 INCH PVC STORM DRAIN PIPE
0440-73-10 – 10 INCH PVC STORM DRAIN PIPE

The Contractor shall furnish all materials and equipment, construct, test, and maintain complete all drain pipe as shown on the Contract Plans, or as specified and directed by the Engineer.

All drain pipe, including fittings, shall be manufactured and installed in accordance with the requirements of the respective Workmanship and Materials sections.

The work includes all removal of existing storm sewer systems, excavation, short tunnels, backfill, sheeting, shoring, bracing, dewatering, pipe bedding, pipe fittings, pipe work, making all pipe connections, anchors, sealants, jackets and coupling bands, installation and removal of plugs and bulkheads, testing, protection, repair and replacement of utilities and house services, protection of existing structures, making joints between pipes and manholes or structures and all other work incidental to the installation of all pipe culverts and storm sewers complete in place.

The quantity of drain pipe, in linear feet, to be measured for payment shall be the actual length of new pipelines placed in the work, as shown, specified and directed. Pipelines will be measured horizontally along the centerline of the pipe.

Deductions in the measured length of drain pipes will be made for the width of all structures, including manholes and inlets, measured from the inside wall to the inside wall of the structure.

Payment for PVC Drain Pipes will be made at the appropriate Contract Item Unit Price per linear foot of pipe installed.

CONTRACT ITEM 0440-2 – WASTEWATER SERVICE PLUG AND REMOVAL

The Contractor shall furnish all materials and equipment, construct, test, and maintain complete all wastewater service laterals uncovered during construction as shown on the Contract Plans.

All wastewater service piping, including fittings, shall be manufactured and installed in accordance with the requirements of the respective Workmanship and Materials sections.

The work includes all removal of existing wastewater service pipe within the limits of construction, excavation, short tunnels, backfill, sheeting, shoring, bracing, dewatering, pipe bedding, pipe fittings, pipe work, making all pipe connections, grouting, sealants, jackets and coupling bands, installation and removal of plugs and bulkheads, testing, protection, protection of existing structures, and all other work incidental to the plugging and removal of wastewater service laterals complete in place.

Payment for plugging and removal of wastewater service laterals will be made at the appropriate Contract Item Unit Price per each service plugged and removed.

CONTRACT ITEM 0515-22-11 – PED/BICYCLE RAILING

The Contractor shall furnish and install all labor, materials, services, equipment and appurtenances to install the FDOT Type 1 Pedestrian/Bicycle Railing as shown in the Contract Plans.

The work includes all excavation, bracing, filling, grading, concrete footing, assembly, posts, hardware, and all appurtenant work complete in place in compliance with FDOT specifications and indices

The quantity of FDOT Type 1 Pedestrian/Bicycle Railing to be measured for payment will be the length of railing in the work within payment limits as shown on the Contract Plans, or as specified and directed by the Engineer.

Payment for FDOT Type 1 Pedestrian/Bicycle Railing will be made at the Contract Item Unit Price per lineal feet of railing installed.

CONTRACT ITEM 0520 – CURBING SERIES

CONTRACT ITEM 0520-1 CONCRETE CURB
CONTRACT ITEM 0520-2 CONCRETE CURB TRANSITION

The Contractor shall furnish all labor, equipment, and materials to install and maintain all permanent concrete curb, transitions, and appurtenant work as shown on the Contract Plans, or as specified and directed by the Engineer.

Permanent concrete curb shall conform to the requirements of the FDOT Index 300.

All concrete work under this series shall conform to Workmanship and Materials Section 345 - Portland Cement Concrete.

The work includes all excavation, filling, shaping, formwork, grading, base material, concrete, and other appurtenant work complete in place.

The length of Concrete Curb to be measured for payment will be the actual length of curbing placed in the work within payment limits for surface restoration shown on the Contract Plans, or ordered by the Engineer.

All curb and gutter removed or damaged and requiring replacement outside payment limits will not be measured for payment and shall be replaced by the Contractor at his own expense.

Payment of Concrete Curb will be made at the Contract Item Unit Price per linear foot of curb placed. Payment for Curb Transitions to concrete flumes, existing curb, and terminal ends will be made at the Contract Item Unit Price per each.

CONTRACT ITEM 0522-1 – CONCRETE PAVING UNDER GUARDRAIL

The Contractor shall furnish all labor, equipment, and materials to install and maintain all concrete paving and appurtenant work as shown on the Contract Plans, or as specified and directed by the Engineer.

All concrete work under this series shall conform to Workmanship and Materials Section 345 - Portland Cement Concrete.

The work includes all excavation, filling, shaping, grading, base material, concrete, and other appurtenant work complete in place.

The amount of Concrete Paving to be measured for payment will be the actual area of concrete placed under the guardrail in the work within shown on the Contract Plans, or ordered by the Engineer.

Payment of Concrete Pavement will be made at the Contract Item Unit Price per square yard of concrete paving placed.

CONTRACT ITEM 0524-1 – FILTER POINT FABRIC FORMED CONCRETE

The Contractor shall furnish all labor, equipment, and materials to install and maintain the Filter Point Fabric Formed Concrete system and all appurtenant work as shown on the Contract Plans, or as specified and

directed by the Engineer.

The Filter Point Fabric Formed Concrete erosion control system shall conform to the requirements of the Workmanship and Materials section headed "Filter Point Fabric Formed Concrete."

The work includes all excavation, filling, shaping, grading, compacting, concrete, sealant, grout, filter fabric, anchorage, and all other appurtenant work complete in place.

The quantity of Filter Point Fabric Formed Concrete to be measured for payment will be the actual amount of fabric formed concrete placed in the work as shown on the Contract Plans, or as specified and directed by the Engineer.

Payment for the Filter Point Fabric Formed Concrete will be made at the appropriate Contract Item Unit Price per square yard

CONTRACT ITEM 0530 - RIPRAP

CONTRACT ITEM 0530-1 - RIPRAP (SAND-CEMENT)
CONTRACT ITEM 0530-3 - RUBBLE RIPRAP

The Contractor shall furnish all labor, materials, and equipment to install riprap as shown on the Contract Plans, or as specified and directed by the Engineer.

The work includes all excavation, backfilling, compacting, restoration, select fill, dewatering, placement, filter fabric underlayment, crushed stone, shaping, disposal of surplus excavated material, and all incidentals, complete and in place.

Payment for Rubble Riprap shall be made at the appropriate Contract Item Unit Price per ton installed and payment for Riprap (Sand-Cement) shall be made at the appropriate Contract Item Unit Price per cubic yard of riprap installed.

CONTRACT ITEM 0548-12 - BLOCK RETAINING WALL

The Contractor shall furnish all labor, materials, and equipment necessary to install and maintain concrete block retaining wall, including footing, anchors, and drainage system as shown on the Contract Plans, or as specified and directed by the Engineer.

Construction of the concrete block retaining wall shall conform to the requirements of the Workmanship and Materials Section 548 “Retaining Wall.”

The work includes all testing, excavation, backfill, compacting, footing, bedding, bracing, formwork, scaffolding, reinforcing, ties, anchors, drains, filter fabric, cleaning compound, and all appurtenant work, complete in place.

Payment for concrete Block Retaining Wall shall be made at the appropriate Contract Item Unit Price per square foot.

CONTRACT ITEM 0550-21 – VINYL COATED CHAIN LINK FENCE

The Contractor shall furnish and install all labor, materials, services, equipment and appurtenances to install the Vinyl Coated Chain Link Fence all as shown in the Contract Plans.

The work includes all brush removal, excavation, bracing, filling, grading, concrete footing, bottom and top wire, cross bracing, locking assembles, posts wire fabric, and all appurtenant work complete in place.

The quantity of Vinyl Coated Chain Link Fence to be measured for payment will be the length of fencing in the work within payment limits as shown on the Plans, or as specified and directed by the Engineer.

Payment for Vinyl Coated Chain Link Fence will be made at the Contract Item Unit Price per lineal feet of fencing installed.

CONTRACT ITEM 570 – SOD AND HYDROSEED

0570-1 SOD
0570-2 HYDROSEED WITH MULCH

The Contractor shall furnish all labor, equipment, and materials to install and maintain all sod or hydroseed and appurtenant work as shown on the Contract Plans, or as specified and directed by the Engineer.

All sod or hydroseed work under this series shall conform to Workmanship and Materials Section 17 Lawn Replacement.

The work includes all excavation, filling, shaping, grading, mulch, fertilizer, soil amendments, water, mowing, and other appurtenant work complete in place.

The amount of sod or hydroseed to be measured for payment will be the actual area of sod or hydroseed placed within the work area as shown on the Contract Plans, or directed by the Engineer.

Payment of Sod or Hydroseed will be made at the Contract Item Unit Price per square yard of sod or hydroseed installed.

END OF SECTION