

The Enclosed Document Is Provided For Your Convenience.

Please Email ALL Questions:
[MailTo:ContractAdministration@TampaGov.net](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 17-C-00030

David L. Tippin Water Treatment Facility Lime Slaker Replacement

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

JUNE 2017

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

BID NOTICE MEMO

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

CONTRACT NO.: 17-C-00030; David L. Tippin Water Treatment Facility Lime Slaker Replacement
BID DATE: August 1, 2017 **ESTIMATE:** \$1,400,000 **SCOPE:** The project comprises furnishing all labor, materials, and equipment to install a new lime slaker system, lime feeder, slurry aging tank, fine grit classifier, slurry pumps and delivery system, electrical controls and instrumentation package, construction of a new prefabricated modular concrete building with all associated work required for a complete project in accordance with the Contract Documents. **PRE-BID CONFERENCE:** Tuesday, July 18, 2017, 10:00 a.m., at the David L. Tippin Water Treatment Facility Maintenance Building Conference Center located at 7125 N. 30th Street, Tampa, FL 33604. Please send an email referring to this pre-bid conference and listing the names and companies represented for all attendees a minimum of 24 hours in advance to Israel.Vigier@ci.tampa.fl.us to obtain security clearance. 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/contract-administration/programs/construction-project-bidding>. 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.

Contract 17-C-00030; David L. Tippin Water Treatment Facility
Lime Slaker Replacement

TABLE OF CONTENTS

BIDDING REQUIREMENTS

Notice to Bidders.....N-1
Instructions to Bidders.....I-1a thru I-4
Insurance Requirements.....INS-1 thru INS-2
MBD Form 701 Page
SLBE Goal Setting ListGS-1
Goal Contact List Instructions.....GCL-1
Sample Solicitation LetterSL-1

BID FORMS

ProposalP-1 thru P-3
Good Faith Efforts Compliance PlanGFCEP
SLBE SolicitedDMI – Solicited
SLBE Utilized.....DMI – Utilized
Bid Bond.....BB-1

CONTRACT FORMS

AgreementA-1 thru A-15
Public Construction Bond.....PB-1 thru PB-3

GENERAL PROVISIONS

General Provisions.....G-1 thru G-10
Supplementary General ProvisionsSGP-1 thru SGP-8
Specific ProvisionsSP-1- thru SP-7
Subcontractors Payment FormDMI – Payments
Project Sign.....Sign-1 thru Sign-2

DIVISION 1

Section 01020 – Allowance.....01020-1

SPECIFICATIONS

Section 014550 – Leakage Tests.....014550-1 thru 014550-2
Section 017823 – Operation and Maintenance Manuals017823-1 thru 017823-4
Section 024100 – Demolition.....024100-1 thru 024100-2
Section 036000 – Grout.....036000-1 thru 036000-3
Section 050513 – Galvanizing050513-1 thru 050513-3
Section 051200 – Structural Steel051200-1 thru 051200-7
Section 055000 – Metal Fabrications.....055000-1 thru 055000-4
Section 055300 – Metal Floor Grating and Plate.....055300-1 thru 055300-4
Section 099600 – High Performance Coatings099600-1 thru 099600-8
Section 100100 – Prefabricated Modular Building100100-1 thru 100100-7
Section 260500 – Electrical – General Provisions.....260500-1 thru 260500-9
Section 260510 – Motors260510-1 thru 260510-6
Section 260519 – Wires and Cables.....260519-1 thru 260519-3
Section 260520 – Fiber Optic System.....260520-1 thru 260520-4

Contract 17-C-00030; David L. Tippin Water Treatment Facility
Lime Slaker Replacement

Section 260526 – Grounding System.....	260526-1 thru 260526-2
Section 260533 – Raceways, Boxes and Fittings.....	260533-1 thru 260533-4
Section 260553 – Electrical Identification.....	260553-1 thru 260553-3
Section 262412 – Panelboards.....	262412-1 thru 262412-4
Section 262816 – Miscellaneous Equipment.....	262816-1 thru 262816-2
Section 312316 – Excavation – Earth and Rock.....	312316-1 thru 312316-3
Section 312323 – Backfilling.....	312323-1 thru 312323-7
Section 331300 – Disinfection.....	331300-1 thru 331300-2
Section 400501 – Support and Anchors.....	400501-1 thru 400501-5
Section 400503 – Mechanical Identification.....	400503-1 thru 400503-7
Section 400510 – Erecting and Jointing Interior and Exposed Exterior Piping.....	400510-1 thru 400510-8
Section 400517 – Steel Pipe and Fittings.....	400517-1 thru 400517-8
Section 400518 – Miscellaneous Pipe and Fittings.....	400518-1 thru 400518-6
Section 409000 – Instrumentation and Controls – General Provisions.....	409000-1 thru 409000-11
Section 463040 – Lime Slaking and Feed Equipment.....	463040-1 thru 463040-12

PLANS: 36 Sheets of Drawings

NOTICE TO BIDDERS
CITY OF TAMPA, FLORIDA

Contract 17-C-00030; David L. Tippin Water Treatment Facility Lime Slaker Replacement

Sealed Proposals will be received by the City of Tampa no later than 1:30 P.M., August 1, 2017, 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, furnishing all labor, materials, and equipment to install a new lime slaker system, lime feeder, slurry aging tank, fine grit classifier, slurry pumps and delivery system, electrical controls and instrumentation package, construction of a new prefabricated modular concrete building with 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/contract-administration/programs/construction-project-bidding>. 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 a Public Construction Bond within twenty (20) days after receipt of Notice of Award of Contract.

To be eligible to submit a proposal, a Bidder must hold the required and/or appropriate current license, certificate, or registration (e.g. DBPR license/certificate of authorization, etc.) in good standing at the time of receipt of Bids. **Per Section 489.131, Florida Statutes, Proposals submitted for the construction, improvement, remodeling, or repair of public projects must be accompanied by evidence that the Bidder holds the required and/or appropriate current certificate or registration, unless the work to be performed is exempt under Section 489.103, Florida Statutes.**

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.

Any Requests For Information must be submitted by email to 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 Statutes.

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

Pursuant to Section 287.087, Florida Statutes, under certain circumstances preference may be given to businesses with a drug-free workplace program that meets the requirements of said Section.

INSTRUCTIONS TO BIDDERS
SECTION 1 - SPECIAL INSTRUCTIONS

I-1.01 GENERAL:

The proposed work is the David L. Tippin Water Treatment Facility Lime Slaker Replacement 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.

To be eligible to submit a proposal, a Bidder must hold the required and/or appropriate current license, certificate, or registration (e.g. DBPR license/certificate of authorization, etc.) in good standing at the time of receipt of Bids. **Per Section 489.131, Florida Statutes, Proposals submitted for the construction, improvement, remodeling, or repair of public projects must be accompanied by evidence that the Bidder holds the required and/or appropriate current certificate or registration, unless the work to be performed is exempt under Section 489.103, Florida Statutes.**

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 INSTRUCTIONS TO BIDDERS

SECTION 2 – GENERAL INSTRUCTIONS. Section I-2.07 SIGNATURE AND QUALIFICATIONS OF BIDDERS 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 County where its principal place of business is. Failure to submit what is required is grounds to reject the bid of that bidder.

SECTION 2 – GENERAL INSTRUCTIONS. Section I-2.14 NONDISCRIMINATION IN EMPLOYMENT is changed to add the following to the end of the existing text:

The following provisions are hereby incorporated into any contract executed by or on behalf of the City. Contractor shall comply with the following Statement of Assurance: During the performance of the Contract, the Contractor assures the City, that the Contractor is in compliance with Title VII of the 1964 Civil Rights Act, as amended, the Florida Civil Rights Act of 1992, and the City of Tampa Code of Ordinances, Chapter 12, in that Firm/Contractor does not on the grounds of race, color, national origin, religion, sex, sexual orientation, gender identity or expression, age, disability, familial status, or marital status, discriminate in any form or manner against said Firm's/Contractor's employees or applicants for employment. Contractor understands and agrees that the Contract is conditioned upon the veracity of this Statement of Assurance, and that violation of this condition shall be considered a material breach of the Award/Contract. Furthermore, Contractor herein assures the City that said Contractor will comply with Title VI of the Civil Rights Act of 1964 when federal grant(s) is/are

INSTRUCTIONS TO BIDDERS
SECTION 1 - SPECIAL INSTRUCTIONS

involved. This Statement of Assurance shall be interpreted to include Vietnam-Era Veterans and Disabled Veterans within its protective range of applicability. Firm/Contractor further acknowledges and agrees to provide the City with all information and documentation that may be requested by the City from time to time regarding the solicitation, selection, treatment and payment of subcontractors, suppliers and vendors in connection with this Award/Contract. Firm/Contractor further acknowledges that it must comply with City of Tampa Code of Ordinances, Chapter 26.5, as enacted by Ordinance No. 2008-89.

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 330 consecutive calendar days. The period for performance shall start from the date indicated in the Notice To Proceed.

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.

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 the attached and incorporated Special Instructions pages beginning with page INS-1 entitled CITY OF TAMPA INSURANCE REQUIREMENTS, which among other things requires the Contractor to provide a Certificate of Insurance to the City prior to commencing work. The City may from time to time use a third party vendor to manage its insurance certificates and related documentation which vendor may periodically initiate contact, requests for information, etc. on the City's behalf.

I-1.10 EQUAL BUSINESS OPPORTUNITY PROGRAM / WMBE-SLBE / REQUIREMENTS

BIDDERS MUST SUBMIT COMPLETED FORMS MBD-10 AND MBD-20 WITH BIDS. BIDS SUBMITTED WITHOUT THE COMPLETED FORMS (INCLUDING SIGNATURES) WILL BE DEEMED NON-RESPONSIVE.

In accordance with the City of Tampa's Equal Business Opportunity Policies, the City has a statistically-based Annual Overall Program Goal of 15%; hence the contract requires the bidder/proposer to submit a WMBE/SLBE Participation Plan (MBD Form-50 GFECF) that endeavors to achieve the program goal. The annual goal is based upon the overall availability of firms.

BIDDERS MUST SOLICIT ALL FIRMS ON THE CONTACT LIST PROVIDED HEREIN, 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.

INSTRUCTIONS TO BIDDERS
SECTION 1 - SPECIAL INSTRUCTIONS

Bidders may explore other opportunities for subcontracting with WMBEs/SLBEs by consulting the current directory of all certified firms 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 GFECF contained herein. Additional documentation is required whenever a WMBE/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 web page at TampaGov.net for other information about the program, FAQ's, and the latest 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 KeyRating Guide Property/Casualty.

I-1.12 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 issued and executed by (a) surety company(ies) acceptable to the City and licensed to underwrite contracts in the State of Florida. After execution of the Agreement and before commencing work, the Contractor must provide the City a certified copy of the officially recorded Bond.

I-1.13 AGREEMENT

SECTION 2 – POWERS OF THE CITY'S REPRESENTATIVES, new Article 2.05:

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 Article 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 Contractor 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;

INSTRUCTIONS TO BIDDERS
SECTION 1 - SPECIAL INSTRUCTIONS

- (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.

SECTION 5 – SUBCONTRACTS AND ASSIGNMENTS, Article 5.01, Page A-7, last paragraph:
Change "...twenty-five (25) percent..." to "...fifty-one (51) percent..."

SECTION 8 – CONTRACTOR'S EMPLOYEES, Article 8.03, Page A-9, delete Article 8.03 in its entirety and Replace with the following new article:

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 and must not maintain, provide or permit facilities that are segregated.

SECTION 10 – PAYMENTS, Article 10.05, Page A-10, 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..."

SECTION 11 – MISCELLANEOUS PROVISIONS, Article 11.02, Page A-12, 1st Paragraph, 2nd Sentence:
Delete the 2nd Sentence in its entirety and replace it with the following new 2nd Sentence:

Without limiting application of Article 11.07, below, 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, defend, and hold harmless the City Indemnified Parties (as defined below) from any and all Claims (as defined below) 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 damages which may be incurred by reason of such infringement at any time during the prosecution or after completion of the work.

SECTION 11 – MISCELLANEOUS PROVISIONS, Article 11.03, Page A-12:

Delete Article 11.03 in its entirety and replace with the following new article:

ARTICLE 11.03 INTENTIONALLY OMITTED.

SECTION 11 – MISCELLANEOUS PROVISIONS, Article 11.07, Page A-12:

Delete Article 11.07 in its entirety and replace with the following new article:

ARTICLE 11.07 INDEMNIFICATION PROVISIONS

Whenever there appears in this Agreement, or in the other Contract 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.

Contractor releases and agrees to defend, indemnify and hold harmless the City, its officers, elected and appointed officials, employees, and/or agents (collectively, "City Indemnified Parties") from and against any and all losses, liabilities, damages, penalties, settlements, judgments, charges, or costs (including without limitation attorneys' fees, professional fees, or other expenses) of every kind and character arising out of any and all claims, liens, is entitled to indemnification hereunder. This obligation shall in no way be limited in any nature whatsoever by any limitation on the amount or type of Contractor's insurance coverage.

INSTRUCTIONS TO BIDDERS
SECTION 1 - SPECIAL INSTRUCTIONS

The parties agree that to the extent the written terms of this indemnification are deemed by a court of competent jurisdiction to be in conflict with any provisions of Florida law, in particular Sections 725.06 and 725.08, Florida Statutes, the written terms of this indemnification shall be deemed by any court of competent jurisdiction to be modified in such a manner as to be in fully and complete compliance with all such laws and to contain such limiting conditions or limitations of liability, or to not contain any unenforceable or prohibited term or terms, such that this indemnification shall be enforceable in accordance with and to the maximum extent permitted by Florida law.

The obligation of Contractor under this Article is absolute and unconditional; it is not conditioned in any way on any attempt by a City Indemnified Party to collect from an insurer any amount under a liability insurance policy, and is not subject to any set-off, defense, deduction, or counterclaim that the Contractor might have against the City Indemnified Party. The duty to defend hereunder is independent and separate from the duty to indemnify, and the duty to defend exists regardless of any ultimate liability of Contractor, the City, and any City Indemnified Party. The duty to defend arises immediately upon presentation of a Claim by any party and written notice of such Claim being provided to Contractor. Contractor's defense and indemnity obligations hereunder will survive the expiration or earlier termination of this Contract.

Contractor agrees and recognizes that the City Indemnified Parties shall not be held liable or responsible for any Claims which may result from any actions or omissions of Contractor in which the City Indemnified Parties participated either through providing data or advice and/or review or concurrence of Contractor's actions. In reviewing, approving or rejecting any submissions by Contractor or other acts of Contractor, the City in no way assumes or shares any responsibility or liability of Contractor or any tier of subcontractor/subconsultant/supplier, under this Contract.

In the event the law is construed to require a specific consideration for such indemnification, the parties agree that the sum of Ten Dollars and 00/100 (\$10.00), receipt of which is hereby acknowledged, is the specific consideration for such indemnification and the providing of such indemnification is deemed to be part of the specifications with respect to the services provided by Contractor.

SECTION 11 – MISCELLANEOUS PROVISIONS, Article 11.12, Page A-13:

Change Article 11.12 to add the following new language after existing text:

The City of Tampa is a public agency subject to Chapter 119, Florida Statutes. In accordance with Florida Statutes, 119.0701, Contractor agrees to comply with Florida's Public Records Law, including the following:

1. Contractor shall keep and maintain public records required by the City to perform the services under this Agreement;
2. Upon request by the City, provide the City with copies of the requested records, having redacted records in total on in part that are exempt from disclosure by law or allow the records to be inspected or copied within a reasonable time (with provision of a copy of such records to the City) on the same terms and conditions that the City would provide the records and at a cost that does not exceed that provided in Chapter 119, Florida Statutes, or as otherwise provided by law;
3. Ensure that records, in part or in total, that are exempt or that are confidential and exempt from disclosure requirements are not disclosed except as authorized by law for the duration of the Agreement term and following completion (or earlier termination) of the Agreement if Contractor does not transfer the records to the City;
4. Upon completion (or earlier termination) of the Agreement, Contractor shall within 30 days after such event either transfer to the City, at no cost, all public records in possession of the Contractor or keep and maintain the public records in compliance with Chapter 119, Florida Statutes. If Contractor transfers all public records to the City upon completion (or earlier termination) of the Agreement, Contractor shall destroy any duplicate records that

INSTRUCTIONS TO BIDDERS
SECTION 1 - SPECIAL INSTRUCTIONS

are exempt or confidential and exempt from public records disclosure requirements. If Contractor keeps and maintains public records upon completion (or earlier termination) of the Agreement, Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the City in a format that is compatible with the information technology systems of the agency.

The failure of Contractor to comply with Chapter 119, Florida Statutes, and/or the provisions set forth in this Article shall be grounds for immediate unilateral termination of the Agreement by the City; the City shall also have the option to withhold compensation due Contractor until records are received as provided herein.

IF CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS AGREEMENT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT 813-274-8598, JIM.GREINER@TAMPAGOV.NET, AND CONTRACT ADMINISTRATION DEPARTMENT, TAMPA MUNICIPAL OFFICE BUILDING, 4TH FLOOR, 306 E. JACKSON ST. TAMPA, FLORIDA 33602.

I-1.14 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 Contractor to perform work pursuant to the contract.

I-1.15 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, which may be downloaded from the City's web site, at www.tampagov.net/contract-administration

Bidder as part of the solicitation process (and as Contractor if Bidder is successful) may hold, come into possession of, and/or generate certain building plans, blueprints, schematic drawings, including draft, preliminary, and final formats, which depict the internal layout and structural elements of a building, facility, or other structure owned or operated by the City or an agency (singularly or collectively "Exempt Plans"), which pursuant to Section 119.071(3), Florida Statutes, are exempt from Section 119.07(1), Florida Statutes and Section 24(a), Art. I of the Florida State Constitution. Contractor certifies it has read and is familiar the exemptions and obligations of Section 119.071(3), Florida Statutes; further that Contractor is and shall remain in compliance with same, including without limitation maintaining the exempt status of such Exempt Plans, for so long as any Exempt Plans are held by or otherwise in its possession.

I-1.16 PAYMENT DISPUTE RESOLUTION

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

I-1.17 SCRUTINIZED COMPANIES.

Section 287.135, Florida Statutes, prohibits agencies or local governmental entities from contracting with companies for goods or services of \$1 million or more that are on either the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, created pursuant to Section 215.473, Florida Statutes, or is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, Florida Statutes, (effective October 1, 2016), or is engaged in a boycott of Israel (effective October 1, 2016), or is engaged in business operations in Cuba or Syria. A company that is on either the Scrutinized Companies with Activities in Sudan List or the

INSTRUCTIONS TO BIDDERS
SECTION 1 - SPECIAL INSTRUCTIONS

Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, created pursuant to Section 215.473, Florida Statutes, or is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, Florida Statutes, (effective October 1, 2016) or is engaged in a boycott of Israel (effective October 1, 2016) or is engaged in business operations in Cuba or Syria is ineligible to, and may not, bid on, submit a proposal for, or enter into or renew a contract with an agency or local governmental entity for goods or services of \$1 million or more. Contractor certifies that it is not in violation of Section 287.135, Florida Statutes. 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 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, or is on the Scrutinized Companies that Boycott Israel List, created pursuant to Section 215.4725, Florida Statutes, (effective October 1, 2016), or is engaged in a boycott of Israel (effective October 1, 2016), or been engaged in business operations in Cuba or Syria, the City shall either terminate the Agreement 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 Agreement if the conditions of Section 287.135(4) of the Florida Statutes are met.

I-1.18 FLORIDA'S PUBLIC RECORDS LAW; DATA COLLECTION

Pursuant to Section 119.071(5)(a)2a, Florida Statutes, social security numbers shall only be collected from Bidders and/or Contractor by the City should such number be needed for identification, verification, and/or tax reporting purposes. To the extent Bidder and/or Contractor collects an individual's social security number in the course of acting on behalf of the City pursuant to the terms and conditions of its Proposal or, if awarded, the Agreement, Bidder and/or Contractor shall follow the requirements of Florida's Public Records Law.

[REMAINDER OF PAGE INTENTIONALLY LEFT BLANK]

INSTRUCTIONS TO BIDDERS

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 item 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

Prior to commencing any work or services or taking occupancy under that certain written agreement or award (for purposes of this document, Agreement) between the City of Tampa, Florida (City) and Firm/Awardee/Contractor/Consultant/Lessee/non-City party, etc. (for purposes of this document, Firm) to which this document is attached and incorporated as an Exhibit or otherwise, and continuing during the term of said Agreement (or longer if the Agreement and/or this document so requires), Firm shall provide, pay for, and maintain insurance against claims for injuries to persons (including death) or damages to property which may arise from or in connection with the performance of the Agreement (including without limitation occupancy and/or use of certain property/premises) by Firm, its agents, representatives, employees, suppliers, subtenants, or subcontractors (which term includes sub-consultants, as applicable) of any tier subject to the terms and conditions of this document. Firm's maintenance of insurance coverage as required herein is a material element of the Agreement and the failure to maintain or renew coverage or provide evidence of same (defined to include without limitation Firm's affirmative duty to provide from time to time upon City's request certificates of insurance, complete and certified copies of Firm's insurance policies, forms, and endorsements, information on the amount of claims payments or reserves chargeable to the aggregate amount of coverage(s) whether during the term of the Agreement or after as may be requested by the City in response to an issue or potential claim arising out of or related to the Agreement to which Firm's insurance obligations hereunder may apply or possibly help mitigate) may be treated as a material breach of the Agreement. Should at any time Firm not maintain the insurance coverages required, City at its sole option (but without any obligation or waiver of its rights) may (i) terminate the Agreement or (ii) purchase such coverages as City deems necessary to protect the itself (charging Firm for same) and at City's option suspending Firm's performance until such coverage is in place. If Firm does not reimburse City for such costs within 10 days after demand, in addition to any other rights, City shall also have the right to offset such costs from amounts due Firm under any agreement with the City. All provisions intended to survive or to be performed subsequent to the expiration or termination of the Agreement shall survive, including without limitation Firm's obligation to maintain or renew coverage, provide evidence of coverage and certified copies of policies, etc. upon City's request and/or in response to a potential claim, litigation, etc.

The City reserves the right from time to time to modify or waive any or all of these insurance requirements (or to reject policies) based on the specific nature of goods/services to be provided, nature of the risk, prior experience, insurer, coverage, financial condition, failure to operate legally, or other special circumstances. If Firm maintains broader coverage and/or higher limits than the minimums shown herein, the City requires and shall be entitled to such broader coverage and/or higher limits maintained by Firm. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the City. No representation is made that the minimum insurance requirements are sufficient to cover Firm's interests, liabilities, or obligations. Required insurance shall not limit Firm's liability.

Firm acknowledges and agrees Firm and not the City is the party in the best position to determine applicability (e.g. "IF APPLICABLE"), confirm, and/or verify its insurance coverage. Acceptance by the City, or by any of its employees, representatives, agents, etc. of certificates or other documentation of insurance or policies pursuant to the terms of this document and the Agreement evidencing insurance coverages and limits does not constitute approval or agreement that the insurance requirements have been met or that coverages or policies are in compliance. Furthermore, receipt, acceptance, and/or approval of certificates or other documentation of insurance or policies or copies of policies by the City, or by any of its employees, representatives, agents, etc., which indicate less coverage than required does not constitute a waiver of Firm's obligation to fulfill these insurance requirements.

MINIMUM SCOPE AND LIMIT OF INSURANCE ¹

A. Commercial General Liability (CGL) Insurance on the most current Insurance Services Office (ISO) Form CG 00 01 or its equivalent on an "occurrence" basis (Modified Occurrence or Claims Made forms are not acceptable without prior written consent of the City). Coverage must be provided to cover liability contemplated by the Agreement including without limitation premises and operations, independent contractors, contractual liability, products and completed operations, property damage, bodily, personal and advertising injury, contractual liability, explosion, collapse, underground coverages, personal injury liability, death, employees-as-insureds. Products and completed operations liability coverage maintained for at least 3 years after completion of work. Limits shall not be less than \$1M per occurrence and \$2M general aggregate for Agreements valued at \$2M or less; if valued over \$2M, a general aggregate limit that equals or exceeds the Agreement's value. If a general aggregate limit applies, it shall apply separately to the project/location (ISO CG 25 03 or 25 04 or equivalent). **(ALWAYS APPLICABLE)**

B. Automobile Liability (AL) Insurance in accordance with Florida law, as to the ownership, maintenance, and use of all owned, non-owned, leased, or hired vehicles. AL insurance shall not be less than: (a) \$500,000 combined single limit each occurrence bodily injury and property damage for Agreements valued at \$100,000 or less or (b) \$1M combined single limit each occurrence bodily injury and property damage for Agreements valued over \$100,000. If transportation of hazardous material involved, the MCS-90 endorsement (or equivalent). **(ALWAYS APPLICABLE)**

C. Worker's Compensation (WC) & Employer's Liability Insurance for all employees engaged under the Agreement, Worker's Compensation as required by Florida law. Employer's Liability with minimum limits of (a) \$500,000 bodily injury by accident and each accident, bodily injury by disease policy limit, and bodily injury by disease each employee for Agreements valued at \$100,000 and under or (b) \$1M bodily injury by accident and each accident, bodily injury by disease policy limit, and bodily injury by disease each for all other Agreements. **(ALWAYS APPLICABLE)**

D. Excess (Umbrella) Liability Insurance for Agreements valued at \$2M or more, at least \$4M per occurrence in excess of underlying limits and no more restrictive than underlying coverage for all work performed by Firm. May also compensate for a deficiency in CGL, AL, or WC. **(ALWAYS APPLICABLE)**

E. Builder's Risk Insurance for property loss exposure associated with construction/renovation/additions to buildings or structures, including materials or fixtures to be incorporated. Must be "All Risk" form with limits of no less than the project's completed value, have no coinsurance penalties, eliminate the "occupancy clause", cover Firm (together with its contractors, subcontractors of every tier, and suppliers), and name City as a Loss Payee. **(IF APPLICABLE)**

F. Installation Floater coverage for property (usually highly valued equipment or materials such as compressors, generators, etc.) during its installation. Coverage must be "All Risk" including installation and transit for no less than 100% of the installed replacement cost value. **(IF APPLICABLE)**

G. Architects & Engineers Liability/ Professional Liability (E&O)/ Contractors Professional Liability (CPL)/ Medical Malpractice Insurance where Agreement involves Florida-regulated professional services (e.g. architect, engineer, design-builder, CM, accountant, appraiser, investment banker medical professional) at any tier, whether employed or independent, vicarious design liability exposure (e.g. construction means & methods, design supervision), value engineering, constructability assessments/reviews, BIM process, and/or performance specifications. Limits of at least \$1M per occurrence and \$2M aggregate; deletion of design/ build liability exclusions, as applicable, and maintained for at least 3 years after completion of work/services and City's acceptance of same. **(IF APPLICABLE)**

H. Railroad Protective Liability (RPL) Insurance for construction within 50ft of operated railroad track(s) or where affects any railroad bridge, trestle, tunnel, track(s) roadbed, or over/under pass. Subject to involved rail road's approval prior to commencement of work. **(IF APPLICABLE)**.

I. Pollution and/or Asbestos Legal Liability Insurance where Agreement involves asbestos and/or environmental hazards/contamination risks (defined broadly, e.g. lead, mold, bacteria, fuel storage, underground work, cleanup (owned or non-owned sites), pollutant generation/transportation, marine/natural resource damage, contamination claim, restitution, business interruption, mold, fungus, lead-based paint, 3rd party claims/removal, etc.), with limits of at least \$1M per occurrence and \$2M aggregate, maintained for at least 3 years after Agreement completion. **(IF APPLICABLE)**

J. Cyber Liability Insurance where Agreement involves portals allowing access to obtain, use, or store data; managed dedicated servers; cloud hosting services; software/hardware; programming; and/or other IT services

¹ "M" indicates million(s), for example \$1M is \$1,000,000

and products are involved. Limits of not less than \$2M per occurrence and \$2M aggregate. Coverage sufficiently broad to respond to duties and obligations undertaken by Firm, and shall include, but not be limited to, claims involving infringement of intellectual property/copyright, trademark, trade dress, invasion of privacy violations, damage to or destruction of electronic information, information theft, release of confidential and/or private information, alteration of electronic information, extortion, virus transmission, and network security. Coverage, as applicable and with sufficient limits to respond, for breach response costs, regulatory fines and penalties, credit monitoring expenses. **(IF APPLICABLE)**

K. Drone/UAV Liability Insurance where Agreements involves unmanned aerial vehicles/drones. Coverage to include products and completed operations, property damage, bodily injury with limits no less than \$1M per occurrence, and \$2M aggregate; may be provided by CGL endorsement subject to City's prior written approval. **(IF APPLICABLE)**

L. Longshore & Harbor Workers' Compensation Act/Jones Act for work being conducted near, above, or on "navigable waters" for not less than the above Employer's Liability Insurance limit. **(IF APPLICABLE)**

M. Garagekeeper/Hangerkeeper/Marina Operator Legal Liability Insurance and/or Hull/P&I Insurance where parking lot, valet, dealership, garage services, towing, etc. and/or operation of a hangar, marina, or air

plane/ship repairer, providing safe berth, air/watercraft storage/docking (on land/ in water), fueling, tours, charters, ferries, dredges, tugs, mooring, towing, boat/aircraft equipment/repair/alteration/maintenance, etc.; coverage against liability for damage to vehicles air/watercraft, their machinery in Firm's care, custody, or control both private & commercial. Limits at least equal to greater of \$1M, value of max number of vehicles that may be in Firm's custody, or of most costly object in Firm's custody. **(IF APPLICABLE)**

N. Property Insurance and Interruption of Business (IOB) Insurance where premises, building, structure, or improved real property is leased, licensed, or otherwise occupied by Firm. Property Insurance against all risks of loss to any occupant/tenant improvements at full replacement cost with no coinsurance penalty, including fire, water, leak damage, and flood, as applicable, vandalism and malicious mischief endorsements. IOB by which minimum monthly rent will be paid to City for up to 1 year if premises are destroyed, rendered inaccessible or untenable, including disruption of utilities, water, or telecommunications. **(IF APPLICABLE)**

O. Liquor Liability/Host Liquor Liability where Firm directly or indirectly provides alcoholic beverages, limits of at least \$1M per occurrence and \$1M aggregate. **(IF APPLICABLE)**

P. Educators Legal Liability Insurance where day care, after school program, recreational activities, etc. limits per G above. **(IF APPLICABLE)**

ADDITIONAL REQUIREMENTS

ACCEPTABILITY OF INSURERS - Insurance is to be placed with insurers admitted in the State of Florida and who have a current A.M. Best rating of no less than **A-:VII** or, if not rated by A.M. Best, as otherwise approved by the City in advance and in writing.

ADDITIONAL INSURED - **City, its elected officials, departments, officers, officials, employees, and volunteers together with, as applicable, any associated lender of the City shall be covered as additional insureds on all liability coverage** (e.g. CGL, AL, and Excess (Umbrella) Liability) as to liability arising out of work or operations performed by or on behalf of Firm including materials, parts, or equipment furnished in connection with such work or operations and automobiles owned, leased, hired, or borrowed by or on behalf of Firm. Coverage can be provided in the form of an endorsement to Firm's insurance (at least as broad as ISO Form CG 20 10 11 85 or **both** CG 10 20, CG 20 26, CG 20 33, or CG 20 38 **and** CG 20 37 if later revisions used).

CANCELLATION/NON-RENEWAL - Each insurance policy shall provide that at least 30 days written notice must be given to City of any cancellation, intent to non-renew, or material reduction in coverage (except aggregate liability limits) and at least 10 days' notice for non-payment of premium. Firm shall also have an independent duty to notify City in like manner, within 5 business days of Firm's receipt from its insurer of any notices of same. If any policy's aggregate limit is reduced, Firm shall directly take steps to have it reinstated. Notice and proof of renewal/continued coverage/certifications, etc. shall be sent to the City's notice (or Award contact) address as stated in the Agreement with a copy to the following:

- Contract Administration Department, 306 E Jackson St, Tampa, FL 33602 Purchasing Department, 306 E Jackson Street, Tampa, FL 33602
 Other: _____

CERTIFICATE OF INSURANCE (COI) - to be provided to City by insurance carrier prior to Firm beginning any work/services or taking occupancy and, if the insurance expires prior to completion of the work or services or Agreement term (as may be extended), a renewal COI at least 30 days before expiration to the above address(es). COIs shall specifically identify the Agreement and its subject (project, lease, etc.), shall be sufficiently comprehensive to insure City (named as additional insured) and Firm and to certify that coverage extends to subcontractors' acts or omissions, and as to permit the City to determine the required coverages are in place without the responsibility of examining individual policies. **Certificate Holder must be The City of Tampa, Florida.**

CLAIMS MADE - If any liability insurance is issued on a claims made form, Firm agrees to maintain such coverage uninterrupted for at least 3 years following completion and acceptance of the work either through purchase of an extended reporting provision or purchase of successive renewals. The Retroactive Date must be shown and be a date not later than the earlier of the Agreement date or the date performance/occupancy began thereunder.

DEDUCTIBLES/ SELF-INSURED RETENTIONS (SIR) - must be disclosed to City and, if over \$500,000, approved by the City in advance and in writing, including at City's option being guaranteed, reduced, or eliminated (additionally if a SIR provides a financial guarantee guaranteeing payment of losses and related investigations, claim administration, and defense expenses). Firm shall be fully responsible for any deductible or SIR (without limiting the foregoing a policy with a SIR shall provide or be endorsed to provide that the SIR may be satisfied by either the City or named insured). In the event of loss which would have been covered but for a deductible or SIR, City may withhold from any payment due Firm, under any agreement with the City, an amount equal to same to cover such loss should full recovery not be obtained under the policy.

PERFORMANCE - All insurance policies shall be fully performable in Hillsborough County, Florida (the County), and construed in accordance with Florida law. Further, all insurance policies must expressly state that the insurance company will accept service of process in the County and that the exclusive venue for any action concerning any matter under those policies shall be in the appropriate state court of the County.

PRIMARY POLICIES - Firm's insurance coverage shall be primary insurance coverage at least as broad as ISO CG 20 01 04 13 as to the City, its elected officials, departments, officers, employees, and volunteers. Any insurance or self-insurance maintained by the City, its elected officials, departments, officers, employees, and volunteers shall be excess of the Firm's insurance and shall not contribute with it.

SUBCONTRACTORS/INDEPENDENT ASSOCIATES/CONSULTANTS/SUBTENANTS/SUBLICENSEE - **Firm shall require and verify that all such entities maintain insurance meeting all requirements stated herein with the City as an additional insured** by endorsement (ISO FORM CG 20 38, or broader) or otherwise include such entities within Firm's insurance policies. Upon City's request, Firm shall furnish complete and certified copies of copies of such entities' insurance policies, forms, and endorsements.

SUBCONTRACTOR DEFAULT INSURANCE, CONTROLLED INSURANCE PROGRAM, WRAP-UP. Use requires express prior written consent of City Risk Manager.

UNAVAILABILITY - To the fullest extent permitted by law, if Firm is out of business or otherwise unavailable at the time a claim is presented to City, Firm hereby assigns to the City all of its right, title and interest (but not any liabilities or obligations) under any applicable policies of insurance.

WAIVER OF SUBROGATION - With regard to any policy of insurance that would pay third party losses, Firm hereby grants City a waiver of any right to subrogation which any insurer of Firm may acquire against the City by virtue of the payment of any loss under such insurance. Firm agrees to obtain any endorsement that may be necessary to affect such waiver, but this provision shall apply to such policies regardless.

WAIVER/RELEASE AGREEMENT - Where Firm has a defined group of persons who might be exposed to harm (e.g. participants in an athletic event/program, volunteers) any waiver or release agreement used by Firm whereby such persons (and their parent/guardian as applicable) discharge Firm from claims and liabilities, shall include the City, its elected officials, departments, officers, officials, employees, and volunteers to the same extent as Firm.

Procurement Guidelines To Implement Minority & Small Business Participation

Underutilized WMBE Primes by Industry Category

FORMAL PROCUREMENT	Construction	Construction-Related	Professional	Non-Professional	Goods
	Black	Asian	Black	Black	Black
	Hispanic	Native Am.	Hispanic	Asian	Hispanic
	Native Am.	Woman	Asian	Native Am.	Asian
	Woman		Native Am.		Native Am.
			Woman		Woman

Underutilized WMBE Sub-Contractors / Sub-Consultants

SUB WORK	Construction	Construction-Related	Professional	Non-Professional	Goods
	Black	Black	Black	Black	Black
		Asian	Hispanic	Asian	Asian
		Native Am.	Asian	Native Am.	Native Am.
		Woman	Native Am.		Woman
			Woman		

Policy

The Guidelines apply to formal procurements and solicitations. WMBE participation will be narrowly-tailored.

Index

- Black = Black/African-American Business Enterprise
- Hispanic = Hispanic Business Enterprise
- Asian = Asian Business Enterprise
- Native Am. = Native American Business Enterprise
- Woman = Woman Business Enterprise (Caucasian)

Industry Categories

Construction is defined as: new construction, renovation, restoration, maintenance of public improvements and underground utilities.

Construction-Related Services are defined as: architecture, professional engineering, landscape architecture, design build, construction management services, or registered surveying and mapping.

Professional Services are defined as: attorney, accountant, medical doctor, veterinarian, miscellaneous consultant, etc.

Non-Professional Services are defined as: lawn maintenance, painting, janitorial, printing, hauling, security guard, etc.

Goods are defined as: all supplies, materials, pipes, equipment, machinery, appliances, and other commodities.

MBD Form-70

Instructions Regarding Use of the SLBE Goal Contact List

Bidders must solicit a subcontracting bid from ALL of the firms listed on the SLBEs list provided within the Specifications, and provide documentation of emails, faxes, phone calls, letters, or other communication with the firms as 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 contact 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)

PROPOSAL

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

Legal Name of Bidder: _____

Bidder's Fictitious Name, if applicable: _____

Bidder is a/an: Individual Partnership* Joint Venture* LLC Corp. Other:

Bidder is organized under the laws of: State of Florida Other:

Bidder Mailing Address: _____

Bidder's Federal Employee Identification No. (FEI/EIN): _____

Bidder's License No.: _____ Bidder's FDOS (SUNBIZ) Doc. No.: _____
(See Ch. 489. FS; use entity's, individual's only if applicable)

Bidder Contact Name**: _____ Email: _____ Phone: (____) _____

Bidder's own initial application for employment has criminal history screening practices similar in nature to the practices contained in Chapter 12, Article VI, City of Tampa Code (*Responses, whether "Yes" or "No", are for informational purposes only and will not be used as a basis of award or denial, nor as a basis for any protest*): Yes No

The below named person, appearing before the undersigned authority and after being first duly sworn, for him/herself and on behalf of the entity submitting this Proposal does hereby affirm and declare as follows:

- (1) He/She is of lawful age and is authorized to act on behalf of Bidder (the individual, partnership, corporation, entity, etc. submitting this Proposal) and that all statements made in this document are true and correct to the best of my knowledge.
- (2) If Bidder is operating under a fictitious name, Bidder has currently complied with any and all laws and procedures governing the operation of businesses under fictitious names in the State of Florida
- (3) No person or entity other than Bidder has any interest in this Proposal or in the Contract proposed to be entered into.
- (4) This Proposal is made without any understanding, agreement, or connection with any person or entity making Proposal for the same purposes, and is in all respects fair and without collusion or fraud.
- (5) 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.
- (6) 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.
- (7) Bidder has carefully examined and fully understands the Solicitation and has full knowledge of the scope, nature, and quality of the work to be performed; furthermore, 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.
- (8) Bidder (including its principals) has | has NOT been debarred or suspended from contracting with a public entity.
- (9) Bidder has | has NOT implemented a drug-free workplace program that meets the requirements of Section 287.087, Florida Statutes.
- (10) Bidder has carefully examined and fully understands all the component parts of the Contract Documents and agrees Bidder will execute the Contract, provide the required Public Construction Bond, and will fully perform the work in strict accordance with the terms of the Contract and Contract Documents therein referred to for the following prices, to wit:

* If a Partnership or Joint Venture, attach Partnership or Joint Venture Agreement.

** Someone the City may contact with questions/correspondence regarding this Solicitation and/or permits.

Contract Item No.	Estimated Quantity	Description and Price in Words	Computed Total Price for Item in Figures
BASE BID	LS	The work includes the furnishing of all labor, equipment, and material for installing a new lime slaker system, lime feeder, slurry aging tank, fine grit classifier, slurry pumps and delivery system, electrical controls and instrumentation package and construction of a new prefabricated modular concrete building, any allowances that may be listed in Section 01020, and with all associated work required for a complete project in accordance with the Contract Documents.	
		<hr/> _____ dollars and _____ cents (BASE BID) LS \$ _____	

Contract 17-C-00030; David L. Tippin Water Treatment Facility Lime Slaker Replacement

Computed Total Price in Words: _____
 _____ dollars and _____ cents.

Computed Total Price in Figures: \$ _____

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 ____ #6 ____ #7 ____ #8 ____.

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

Bidder acknowledges that it is aware of Florida's Trench Safety Act (Sections 553.60-553.64, Florida Statutes), and agrees that Bidder together with any involved subcontractors will comply with all applicable trench safety standards. Bidder further acknowledges that included in the various items of this Proposal and the total bid price (as applicable) are costs for complying with the Trench Safety Act. Bidder further identifies the costs and methods summarized below:

	Trench Safety Measure (Description)	Unit of Measure (LF, SY)	Unit Quantity	Unit Cost	Extended Cost
A.	_____	_____	_____	_____	_____
B.	_____	_____	_____	_____	_____
C.	_____	_____	_____	_____	_____
Total Cost: \$				_____	

Accompanying this Proposal is a certified check, cashier's check or Tampa Bid Bond (form included herein must be used) for at least five percent (5%) of the total amount of the Proposal which check shall become the property of the City, or which bond shall become forthwith due and payable to the City, if this Proposal shall be accepted by the City and the Bidder shall fail to enter into a legally binding contract with and to furnish the required Public Construction Bond to the City within twenty (20) days after the date of its receipt of written Notice of Award by the City so to do.

FAILURE TO COMPLETE THE ABOVE MAY RESULT IN THE PROPOSAL BEING DECLARED NON-RESPONSIVE.

[SEAL] Name of Bidder: _____
 Authorized Signature: _____
 Signer's Printed Name: _____
 Signer's Title: _____

STATE OF _____
 COUNTY OF _____

For an entity: The forgoing instrument was sworn (or affirmed) before me this ____ day of _____, 20____ by _____ as _____ of _____, a/n Partnership Joint Venture LLC Corp Other: _____, on behalf of such entity. Such individual is personally known to me or produced a/n _____ state driver's license as identification.

For an individual: The forgoing instrument was sworn (or affirmed) before me this ____ day of _____, 20____ by _____, who is personally known to me or produced a/n _____ state driver's license as identification.

[NOTARY SEAL] _____
 Notary Public, State of _____
 Notary Printed Name: _____
 Commission No.: _____
 My Commission Expires: _____



Good Faith Effort Compliance Plan Guidelines

for Women/Minority Business Enterprise/Small Local Business Enterprise Participation
City of Tampa - Equal Business Opportunity Program
(MBD Form 50 – detailed instructions on page 2 of 2)

Contract Name _____ Bid Date _____

Bidder/Proposer _____

Signature _____ Date _____

Name _____ Title _____

The Compliance Plan with attachments is a true account of Good Faith Efforts (GFE) made to achieve the participation goals as specified for Women/Minority Business Enterprises/Small Local Business Enterprises (WMBE/SLBE) on the referenced contract:

The WMBE/SLBE participation **Goal is Met or Exceeded**. See DMI Forms 10 and 20 which accurately report all subcontractors solicited and all subcontractors to-be-utilized.

The WMBE/SLBE participation Goal is **Not Achieved**. The following list is an overview of the baseline GFE action steps already performed. Furthermore, it is understood that these GFE requirements are weighted in the compliance evaluation based on the veracity and demonstrable degree of documentation provided with the bid/proposal:

(Check applicable boxes below. Must enclose supporting documents accordingly with remarks)

- (1) Solicited through reasonable and available means the interest of WMBE/SLBEs that have the capability to perform the work of the contract. The Bidder or Proposer must solicit this interest within sufficient time to allow the WMBE/SLBEs to respond. The Bidder or Proposer 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. Qualifying Remarks:
- (2) Provided interested WMBE/SLBEs with adequate, specific scope information about the plans, specifications, and requirements of the contract, including addenda, in a timely manner to assist them in responding to the requested-scope identified by bidder/proposer for the solicitation. See enclosed actual solicitations used. Qualifying Remarks:
- (3) Negotiated in good faith with interested WMBE/SLBEs that have submitted bids (e.g. adjusted quantities or scale). 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. Additional costs involved in soliciting and using subcontractors is not a sufficient reason for a bidder/proposer's failure to meet goals or achieve participation, as long as such costs are reasonable. Bidders are not required to accept excessive quotes in order to meet the goal. DMI Utilized Forms for sub-(contractor/consultant) reflect genuine negotiations This project is an RFO/RFP in nature and negotiations are limited to clarifications of scope/specifications and qualifications. See enclosed documentation. Qualifying Remarks:
- (4) Not rejecting WMBE/SLBEs as being unqualified without justification based on a thorough investigation of their capabilities. The WMBE/SLBEs standing within its industry, membership in specific groups, organizations / associations and political or social affiliations are not legitimate causes for rejecting or not soliciting bids to meet the goals. Not applicable. See attached justification for rejection of a subcontractor's bid or proposal. Qualifying Remarks:
- (5) Made scope(s) of work available to WMBE/SLBE subcontractors and suppliers; and, segmented 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. Qualifying Remarks:
- (6) Made good faith efforts, despite the ability or desire of Bidder/Proposer to perform the work of a contract with its own forces/organization. A Bidder/Proposer who desires to self-perform the work of a contract must demonstrate good faith efforts if the goal has not been met. Sub-Contractors were not prohibited from submitting bids/proposals and were solicited on work typically self-performed by the prime. Qualifying Remarks:
- (7) Segmented 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 (quantities/scale) to facilitate WMBE/SLBE participation, even when the Bidder/Proposer 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/proposals and were solicited on work typically self-performed by the prime. See enclosed comments. Qualifying Remarks:
- (8) Made efforts to assist interested WMBE/SLBEs in obtaining bonding, lines of credit, or insurance as required by the city or contractor. See enclosed documentation on initiatives undertaken and methods to accomplish. Qualifying Remarks:
- (9) Made efforts to assist interested WMBE/SLBEs in obtaining necessary equipment, supplies, materials, or related assistance or services, including participation in an acceptable mentor-protégé program. See enclosed documentation of initiatives and/or agreements. Qualifying Remarks:
- (10) Effectively used the services of the City and other organizations that provide assistance in the recruitment and placement of WMBE/SLBEs. See enclosed documentation. The following services were used:

Note: Provide any unsolicited information that will support the Bid/RFP Compliance Evaluation. Named Documents Are:



Participation Plan: Guidance for Complying with Good Faith Efforts Outreach
(page 2 of 2)

1. All firms on the WMBE/SLBE Goal Setting List must be solicited and documentation provided for email, fax, letters, phone calls, and other methods of outreach/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 MBD Office and/or researching the on-line Diversity Management Business System Directory for Tampa certified WMBE/SLBE firms.
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 sent a minimum of a week (i.e. 5 business days or more) before the bid/proposal date. Actual copies of the bidder's solicitation containing their scope specific instructions should be provided.
3. With any quotes received, a follow-up should be made when needed to confirm detail scope of work. For any WMBE/SLBE low quotes rejected, an explanation shall 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 shall break down portions of work into economical feasible opportunities for subcontracting. The WMBE/SLBE directory may be useful in identifying additional subcontracting opportunities and firms not listed in the "WMBE/SLBE Goal Setting Firms List."
6. Contractor shall not preclude WMBE/SLBEs from bidding on any part of work, even if the Contractor may desire to self-perform the work.
7. Contractor shall avoid relying solely on subcontracting out work-scope where WMBE/SLBE availability is not sufficient to attain the pre-determined subcontract goal set for the Bid or when targeted sub-consultant participation is stated within the RFP/RFQ.
8. In its solicitations, the Bidder should offer assistance to WMBE/SLBEs in obtaining bonding, insurance, et cetera, 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 City of Tampa Minority and Small Business Development Office, Hillsborough County Entrepreneur Collaborative Center, Hillsborough County Economic Development Department's MBE/SBE Program and the NAACP Empowerment Center to name a few for the recruitment and placement of WMBEs/SLBEs.



Failure to Complete, Sign and Submit Both Forms 10 & 20 SHALL render the Bid or Proposal Non-Responsive

**Page 1 of 4 – DMI Solicited/Utilized Schedules
 City of Tampa – Schedule of **All Solicited** Sub-(Contractors/Consultants/Suppliers)
 (FORM MBD-10)**

Contract No.: _____ Contract Name: _____
 Company Name: _____ Address: _____
 Federal ID: _____ Phone: _____ Fax: _____ Email: _____

Check applicable box(es). Detailed Instructions for completing this form are on page 2 of 4.

- No Firms were contacted or solicited for this contract.
- No Firms were contacted because: _____
- See attached list of additional Firms solicited and all supplemental information (List must comply to this form)
Note: Form MBD-10 must list ALL subcontractors solicited including Non-minority/small businesses

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

S = SLBE W=WMBE O = Neither	Company Name Address Phone, Fax, Email	Type of Ownership (F=Female M=Male) BF BM = African Am. HF HM = Hispanic 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 Response Received Y/N

Failure to Complete, Sign and Submit
 this form with your Bid or Proposal
 Shall render the Bid N -

It is hereby certified that the information provided is an accurate and true account of contacts and solicitations for sub-contracting opportunities on this contract.

Signed: _____ Name/Title: _____ Date: _____

**Failure to Complete, Sign and Submit Both Forms 10 & 20 SHALL render the Bid or Proposal Non-Responsive
 Forms must be included with Bid / Proposal**



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 to achieve participation.

- **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 and/or doing business as (dba) if applicable.
- **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 or solicited for this contract.** Checking the box indicates that a pre-determined Subcontract Goal or Participation Plan Requirement 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 (MBD Form-30) must be submitted with every pay application and invoice. **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 or solicited.
- **See attached documents.** Check box, if after you have completed the DMI Form in its entirety, you need more space to list additional firms and/or if you have supplemental information/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 either Women/Minority Business Enterprise; **“O” = Non-certified others.**
- **Federal ID.** FIN. A number assigned to a business for tax reporting purposes. This information is critical in proper identification and payment of the contractor/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 materials provided by the subcontractor. NIGP codes aka “National Institute of Governmental Purchasing” are listed at top section of document.
- **Contact Method L=letter, F=fax, E=Email, P=Phone.** Indicate with letter the method(s) 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. Must keep records: log, ledger, documentation, etc. that can validate/verify.

If additional information is required or you have questions, please contact the Equal Business Opportunity Program - Minority and Small Business Development Office at (813) 274-5522.



Failure to Complete, Sign and Submit Both Forms 10 & 20 SHALL render the Bid or Proposal Non-Responsive

Page 3 of 4 – DMI Solicited/Utilized Schedules
City of Tampa – Schedule of All To-Be-Utilized Sub-(Contractors/Consultants/Suppliers)
(FORM MBD-20)

Contract No.: _____ Contract Name: _____
Company Name: _____ Address: _____
Federal ID: _____ Phone: _____ Fax: _____ Email: _____

Check applicable box(es). Detailed Instructions for completing this form are on page 4 of 4.

See attached list of additional Firms Utilized and all supplemental information (List must comply to this form)

Note: Form MBD-20 must list ALL subcontractors To-Be-Utilized including Non-minority/small businesses

No Subcontracting/consulting (of any kind) will be performed on this contract.

No Firms are listed to be utilized because: _____

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

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

S = SLBE W=WMBE O =Neither	Company Name Address Phone, Fax, Email	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 (LOI) if available	Percent of Scope or Contract %

Failure to Complete, Sign and Submit
this form with your Bid or Proposal
Shall render the Bid Non-Responsive

Total ALL 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.

Signed: _____ Name/Title: _____ Date: _____

Failure to Complete, Sign and Submit Both Forms 10 & 20 SHALL render the Bid or Proposal Non-Responsive
Forms must be included with Bid / Proposal



Page 4 of 4 DMI – Solicited/**Utilized**

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 (regardless of ownership or size) projected to be utilized must be included on this form. Note: Ability or desire to self-perform all work shall not exempt the prime from Good Faith Efforts to achieve participation.

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 and/or doing business as (dba) if applicable.
- **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/consulting (of any kind) will be performed on this contract.** Checking box indicates your business will not use subcontractors when no Subcontract Goal or Participation Plan Requirement was 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 (MBD Form-30) must be submitted with every pay application and invoice. Note: certified **SLBE or WMBE firms** bidding as Primes **are not exempt** from outreach and solicitation of subcontractors, including completion and submitting Form-10 and Form-20.
- **No Firms listed To-Be-Utilized.** Check box; provide brief explanation why no firms were retained when a goal or participation plan requirement was set on the contract. Note: mandatory compliance with Good Faith Effort outreach (GFECF) requirements applies (MBD Form-50) and supporting documentation must accompany the bid.
- **See attached documents.** Check box, if after completing the DMI Form in its entirety, you need more space to list additional firms and/or if you have supplemental information/documentation relating to the scope/value/percent utilization of subcontractors. Reproduce copies of MBD-20 and attach. All data not submitted on duplicate forms must be in the same format and content as specified in these instructions.

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; **“O” = Non-certified others.**
- **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. Abbreviated list of NIGP is available at <http://www.tampagov.net/mbd> “Information Resources”.
- **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. For CCNA only (i.e. Consultant A/E Services) you must indicate subcontracts as percent of total scope/contract.
- **Total Subcontract/Supplier Utilization.** – Provide total dollar amount of all subcontractors/suppliers projected to be used for the contract. (Dollar amounts may be optional in CCNA depending on solicitation format).
- **Total SLBE Utilization.** Provide total dollar amount for all projected SLBE subcontractors/Suppliers used for this contract. (Dollar amounts may be optional in CCNA proposals depending on the solicitation format).
- **Total WMBE Utilization.** Provide total dollar amount for all projected WMBE subcontractors/Suppliers used for this contract. (Dollar amounts may be optional in CCNA proposals depending on the solicitation format).
- **Percent SLBE Utilization.** Total amount allocated to SLBEs divided by the total bid/proposal amount.
- **Percent WMBE Utilization.** Total amount allocated to WMBEs divided by the total bid/proposal amount.

If additional information is required or you have questions, please contact the Equal Business Opportunity Program - Minority and Small Business Development Office at (813) 274-5522.

TAMPA BID BOND
Contract 17-C-00030; David L. Tippin Water Treatment Facility Lime Slaker Replacement

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 17-C-00030, David L. Tippin Water Treatment Facility Lime Slaker Replacement.

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 Public Construction 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 _____, 20__.

Principal

BY _____

TITLE _____

BY _____

TITLE _____

(SEAL)

_____ Producing Agent

_____ Producing Agent's Address

_____ Name of 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 17-C-00030 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, between the City of Tampa, Florida, hereinafter called the City, and _____ hereinafter called the Contractor, as of the _____ day of _____, 20__ when the City Council of the City of Tampa, Florida adopted a Resolution authorizing, among other things, the Mayor's execution of this Agreement.

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 17-C-00030; David L. Tippin Water Treatment Facility Lime Slaker Replacement, shall include, but not be limited to, furnishing labor, materials, and equipment installing a new lime slaker system, lime feeder, slurry aging tank, fine grit classifier, slurry pumps and delivery system, electrical controls and instrumentation package and construction of a new prefabricated modular concrete building 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 Contract.

(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 condition(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 or 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 Contract 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 or 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 or 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 indemnify 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 Contract 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. _____

Rachel S. Peterkin, Assistant City Attorney

Contractor

By: _____
(SEAL)

Title:

ATTEST:

Witness

TAMPA AGREEMENT (ACKNOWLEDGMENT OF PRINCIPAL)

STATE OF _____)
) SS:
COUNTY OF _____)

For a Corporation:

STATE OF _____
COUNTY OF _____

The foregoing instrument was acknowledged before me this ____ of _____, 20__ 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 _____, 20__ 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 _____, 20__ 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)

(Name of Surety)

(Principal Business Address)

(Surety Address)

By _____

By _____
(As Attorney in Fact)*

Title _____

Telephone Number of Surety

Telephone Number of Principal

Approved as to legal sufficiency:

Countersignature:

By _____
Assistant City Attorney

(Name of Local Agency)

(Address of Resident Agent)

By _____

Title _____

Telephone Number of Local Agency

*(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 the 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.

TEMPORARY STRUCTURES

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 constructed in accordance with the requirements of the Contract Documents.

SECTION 6

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.

**SECTION 13
CLEANING**

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.

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.

SUPPLEMENTARY GENERAL PROVISIONS

1.0 GENERAL:

- 1.1 This Section sets forth modifications to the "General Provisions" of the Contract Documents which are referred to as Specifications, General Provisions.
- 1.2 Paragraph numbers and titles used herein refer to similarly numbered and titled articles in the General Provisions.
- 1.3 Only those paragraphs contained herein shall be assumed to be modified. Paragraphs not appearing herein shall apply as written in the General Provisions.
- 1.4 Any portion of the General Provisions, whether or not modified herein, may be further modified in Special Conditions and in the Instructions to Bidders of these Specifications.
- 1.5 Where the Supplementary General Provisions, Special Conditions and Instructions to Bidders conflict with the General Provisions, the Supplementary General Provisions, Special Conditions and the Instructions to Bidders shall take precedence.

2.0 MODIFICATIONS TO THE GENERAL PROVISIONS AS FOLLOWS:

2.1 SECTION 1 SCOPE AND INTENT

G-1.02 WORK INCLUDED

The first paragraph shall be deleted in its entirety and replaced by the following paragraph:

"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 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 incidental thereto. He shall repair or restore all during performance of the work."

2.2 SECTION 3 WORKING DRAWINGS

- a. Change to read as follows:

SECTION 3 SHOP DRAWINGS

- b. Replace the existing paragraphs in their entirety with the following paragraphs:

G-3.01 SCOPE

Shop drawings, schedules, etc., shall be submitted to the Engineer and/or Architect in quadruplet, accompanied by a letter of transmittal. Subcontractors and suppliers shall submit shop drawings and make requests for approvals through their respective prime Contractors.

The drawings shall be numbered consecutively and shall accurately and distinctly present the following:

- (1) Names of equipment or materials, and the locations at which the equipment or materials are to be installed in the work.
- (2) All working and erection dimensions.
- (3) Arrangement and sectional views.
- (4) Necessary details, including complete information for making connections between work under this contract and work under other contracts.
- (5) Kinds of materials and finishes.
- (6) Parts list and description thereof.

The Engineer and/or Architect may decline to consider any shop drawing that does not contain complete data on the work and full information of related matters.

Fax submittals will not be reviewed.

G-3.02 APPROVAL:

Shop drawings shall be examined by the Contractor prior to his transmitting them to the Engineer and/or Architect. Shop drawings submitted to the Engineer and/or Architect shall bear the Contractor's stamp of approval evidencing that he has examined and checked each drawing and that he has found said drawings to be in accordance with the Contract requirements. Any drawings submitted without this stamp will not be considered by the Engineer and/or Architect and will be returned to the Contractor for re- submission.

If the shop drawings show departures from the Contract requirements, the Contractor shall make specific mention thereof in his letter of submittal and the following shall be submitted:

- (1) Each request shall include a complete description of the proposed substitute and the name of the material or equipment for which it is to be substituted.
- (2) Furnish drawings, cut, manufacturer's printed specifications, performance and test data and any other data or information necessary for a complete evaluation of both the item specified and the proposed substitute item.

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.

Approval of the drawings shall be general and shall not relieve the Contractor of responsibility for the accuracy of such drawings, nor for the quantities of materials and equipment, nor for the proper fitting and construction of the work, nor for the furnishing of materials, tools, equipment, etc., required by this contract and not indicated on the drawings.

No work called for by Shop Drawings shall be done until the said drawings have been approved by the Engineer and/or Architect.

The Contractor shall revise and resubmit the shop drawings as required by the Engineer and/or Architect until approval thereof is obtained.

The City shall retain four (4) copies of all submittals unless the Engineers and/or Architect makes a specific request for additional copies.

<u>Items</u>	<u>Submittals</u>	<u>*Approval</u>
All trade	Fourteen (14) Days	Fourteen (14) Days

*From date of receipt of submittal.

Delays on account of tardy or untimely submittals will not be considered as causes of extension of time of the Contract or increases to the Contract Sum.

G-3.03 JOB SITE:

One (1) copy of all approved submittals SHALL BE available at the Contractor's Office at the job site.

2.3 SECTION 4 MATERIALS AND EQUIPMENT

G-4.01 GENERAL REQUIREMENTS

In the first paragraph, second line, delete the word "specifications" and substitute the words "Contract Documents".

G4.03 REFERENCE TO STANDARDS

The following paragraph shall be added in its entirety:

"Compliance with the Standard Building Code, latest edition, and all local electrical and plumbing codes shall be required. In the event of a conflict in code requirements, the most stringent code or standard shall apply."

G-4.05 EQUIVALENT QUALITY

Add the following sentence to paragraph two: "Any professional fees associated with shop drawing review of materials or equipment submitted for approval as equivalent to that specified shall be borne by the Contractor.

2.4 SECTION 5 INSPECTION AND TESTING

G-5.06 PRELIMINARY FIELD TESTS

G-5.07 FINAL FIELD TEST

A. Add the following sentence to BOTH of the above paragraphs:

The Contractor shall provide, at NO EXTRA COST to the City, ALL labor, tools, equipment, materials, etc., for the Engineer and/or Architect to make any field test that may be required in the judgment of the Engineer and/or Architect.

2.5 SECTION 6 TEMPORARY STRUCTURES

G-6.03 CONTRACTOR'S FIELD OFFICE

- a. In the last sentence of this paragraph, add the following words: "...and Shop Drawings".

G-6.03 CONTRACTOR'S FIELD OFFICE

- A. Delete this paragraph G-6.03 in its entirety.

2.6 SECTION 7 TEMPORARY SERVICES

G-7.01 WATER, G-7.02 LIGHT AND POWER, AND G-7.03 SANITARY REGULATIONS

The City of Tampa shall provide, at no cost to the Contractor, water, electricity and washroom/toilet facilities for installation of this project. All water and electricity shall be applied and/or connected by the Contractor.

G-7.07 TELEPHONE

The Contractor shall furnish the Engineer with a telephone number(s) by which the Engineer may contact the site.

2.7 SECTION 14 MISCELLANEOUS

G-14.04 USE OF EXPLOSIVES:

Explosives will not be used on the work except when authorized by the Engineer and/or Architect. 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.

G-14.05 OWNERSHIP OF MATERIALS:

The removal of any underground and surface structures as required shall be performed in a careful manner to permit salvaging of as much material, such as pipe and brick, also broken section of sidewalk, as practical for use in repair and maintenance of City-owned facilities.

Such acceptable salvaged material remains the property of the City and shall be placed in stock piles so as not to interfere with new construction work but accessible for loading and hauling by the City or by the Contractor within the free haul limit of six (6) miles. The Engineer and/or Architect shall direct the Contractor as to the location of stockpile.

The paving material, such as vitrified brick, asphalt block and other paving materials removed from the excavated areas and suitable for reuse but not reused in the work, shall also be considered the property of the City. The handling of such materials shall be as set forth elsewhere in the Specifications or Special Provisions.

G-14.06 NOTICE OR SERVICE THEREOF:

All notices, which shall include demands, instructions, requests, approvals and claims, shall be in writing.

Any notice to or demand upon the Contractor shall be sufficiently given if delivered to the office of the Contractor specified in the bid (or to such other office as the Contractor may, from time to time, designate to the City in writing), or if deposited in the United States mail in a sealed, postage-prepaid envelope, or delivered, with charges case addressed to such office.

All notices required to be delivered to the City shall, unless otherwise specified in writing to the Contractor, be delivered to Contract Administration Department – Construction Management Division, 3808 East 26th Avenue, Tampa, Florida 33605, and any notice to or demand upon the City shall be sufficiently given if delivered to the office of the said Engineer and/or Architect, or if deposited in the United States mail in a sealed, postage- prepaid envelope, or delivered with charges prepaid to any telegraph company for transmission, in each case addressed to said Engineer and/or Architect or to such other representative of the City or to such other address as the City may subsequently specify in writing to the Contractor or to its representative at the construction site for such purposes.

Any such notice or demand shall be deemed to have been given or made as of the time of actual delivery or (in the case of mailing) when the same should have been received in due course of post or (in the case of telegram) at the time of actual receipt, as the case may be.

G-14.07 REQUIREMENTS FOR CONTROL OF THE WORK:

Prior to the start of the work included in this contract, a Preconstruction Conference will be held by the Engineer and/or Architect to be attended by the Contractor and representatives of the various utilities and others for the purpose of establishing a schedule of operations which will coordinate the work to be done under this contract with all related work to be done by others within the limits of the project. The Contractor shall be prepared for this meeting and shall present a comprehensive construction schedule for all items of work to be accomplished by him, which will be used as the basis for the development of an overall operational schedule and a list of subcontractors to be used on this work.

All items of work on this contract shall be coordinated so that progress on each related work item will be continuous from week to week. The progress of the work will be reviewed by the Engineer and/or Architect at the end of each week, and if the progress on any item of work during that week is found to be unsatisfactory, the Contractor shall be required to adjust the rate of progress on that item or other items as directed by the Engineer and/or Architect.

The Contractor shall conduct his operations in such a manner as will result in a minimum of inconvenience to occupants of adjacent homes and business establishments and shall provide temporary access as directed or as conditions in any particular location may require.

G-14.08 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 a Work Directive Change 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."

DELETE AS REQUIRED BELOW

G-14.09 RESERVED PARKING SIGNS IN PARKING METER AREAS

The Contractor shall reimburse the Department of Public Works, Parking Division, located at 107 N. Franklin Street, Tampa, Florida 33602, for any and all metered parking spaces occupied or made unusable or unavailable as a result of, or because of, construction activity by the Contractor. Private automobiles may not be parked in any reserved space, unless clearly marked as associated with the project.

In order to receive temporary or permanent reserved signs in parking areas which are required by parking meters, there shall first be paid to the Parking Revenue Fund for the elimination of each such meter a charge based on the following schedules:

1. Meter Removal: The charge for removing a meter is ten (10) times the hourly meter fee, with a minimum charge of \$12.50. Such charge will be assessed for each day a meter is removed, excluding Saturdays, Sundays, and City holidays.
2. Reservation of Parking Metered Spaces During Hours of City Parking Division Operation: The charge for reservation of a metered space is ten (10) times the hourly meter fee. Such charge will be assessed for each day a meter is reserved. The minimum total charge per rental agreement is \$12.50.
3. Reservation of Parking Metered Spaces During Hours of City Parking Division Non- Operation: The charge for reservation of a metered space during hours of non-operation shall be \$2.00. Such charge will be assessed for each day a meter is reserved. The minimum charge per rental agreement is \$12.50.
4. Reservation of Parking Metered Spaces During Hours of City of Tampa Parking Division Operation and Non-Operation: Meter reservation periods, which include both operation and non-operational hours, shall be charged the operational rate.

In the event that an entire block or area of parking meters are reserved for a period of 90 days or longer, the Contractor may arrange a payment schedule with the Department of Public Works, Parking Division. Said payment schedule will be paid on a monthly basis after a deposit equivalent to the first and last month rental charges has been received by the Parking Division prior to commencement of construction.

Any meter or meters which may sustain damage due to construction activities in the immediate area must be removed. The meter removal/installation charge is \$7.50 per meter. Failure to have a meter(s) removed will result in the Contractor being held liable for damage occurring to said meter(s) and further, the Contractor will be required to reimburse the Department of Public Works, Parking Division for meter(s) repaired or replaced.

G-14.10 EROSION AND SEDIMENT CONTROL:

During construction, the Contractor shall provide adequate erosion and sediment controls to prevent adverse effects to the environment and public and private property. He shall construct and maintain control structures necessary to prevent erosion and sediment. He shall conduct and schedule construction operations to avoid, prevent, and minimize erosion and sediment. He shall comply with City, County, State, and Federal codes, laws, and regulations and the plans and specifications for this project pertaining to erosion and sediment prevention and control.

At the Preconstruction Conference, the Contractor shall present a plan for erosion and sediment prevention and control. This plan shall include the operations methods, also temporary and permanent control measures and structures to be used on this project.

G-14.11 ENGINEER'S FIELD OFFICE:

The Contractor shall provide and maintain an adequate field office, which shall be a structure completely separated from the Contractor's field office, for the exclusive use of the Construction Engineer and/or Architect and engineering technicians within the project limits. No additional payment shall be made for this item. Location of said field office shall be as directed by the Engineer and/or Architect.

Contractor shall provide one (1) desk with chair, one (1) four-drawer metal file cabinet with lock, plan rack to hold a minimum of eight (8) separate sets of plans and one (1) plan table, top shall be minimum of 3'-0" wide x 6'-8" long; also adequate heating, air conditioning, lighting and one (1) window, 36"x36" minimum size, in each of four (4) walls.

G-14.12 PROJECT SIGNS:

The Contractor shall furnish and install, as directed by the Engineer and/or Architect, a project sign of design, size, color, etc., as per drawing page SIGN-1.

G-15.0 NOTIFICATION TO CONTRACTORS:

All Contractors working in City of Tampa buildings and facilities that contain ACM will be provided with a written notice, including contract custodial firms. The notice when applicable will advise Contractors about the possibility of encountering ACM while working for the City and will require Contractors to become familiar with locations of ACM within their work areas. The Contractor Notice shall include the name and phone number of the designated Building Asbestos Contact Person assigned to that building/facility. This notice is provided in Appendix C.

Appendix C

Contractor Notification Requirements

Asbestos-Containing Material (ACM) may be present in the facility. The presence of ACM does not necessarily mean that a hazard exists; however, a hazard may be created when ACM is disturbed and asbestos fibers become airborne. The best way to maintain a safe environment is to avoid the disturbance of ACM.

It is possible that you may encounter ACM while working in the facility. On the bulletin board, there is a summary of known locations of ACM in that building. The summary may or may not be all inclusive. Therefore, workers must exercise caution and be watchful for materials that might contain asbestos. Avoid disturbing ACM or suspected ACM as you carry out your work.

If your work necessitates the disturbance of ACM you shall take whatever precautions that are necessary to protect human health and the environment from asbestos fibers. At minimum, you will comply with all Federal, State, and Local responsible for assuring that you are medically certified, trained, and equipped with the proper personal protective devices for safe handling of ACM. You must notify the designated Building Asbestos Contact Person before disturbing any asbestos-containing materials in City-Owned buildings. The designated Building Asbestos Contact Person is listed on the bulletin board with the asbestos location summary.

If you need additional information regarding ACM in a particular building or would like to see a copy of the Operations and Maintenance Plan, contact the Building Asbestos Contact Person responsible for the building for which you will be working.

Comply with all regulatory requirements for removal and disposal.

SPECIFIC PROVISIONS

SP-1 Scope

The work included under these Contract Documents includes, but is not limited to the following: Furnishing of all labor, materials, equipment, services and incidentals for the installation of new lime slaking system and modifications to the existing lime slaking system which includes new lime feeder, new lime slaker, new fine grit classifier, new slurry aging tank, new slurry transfer pumps, new slurry loop pumps, new slurry dosing assemblies, all the new piping, valves and fittings, modifications to existing slaker outlet, new prefabricated electrical building, new concrete slabs for new slurry aging tank and the new electrical building, new control panel, new electrical cables and wires, instrumentation implementation, along with demolition of the existing old slaker and associated piping, electrical conduits and other ancillary equipment.

All work shall be constructed, installed and maintained complete in place as specifically described in these Specifications, as shown on the Plans, as required for a complete functional installation, and as described and directed by the ENGINEER in accordance with the obvious or expressed intent of the Contract.

This work also includes general cleanup, start-up and testing of all installed equipment to ensure satisfactory operation and all other work required by the Contract Documents necessary to make the improvements complete and functional.

SP-2 Permits

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 building permit fees will be paid by the CITY.

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 CITY all required inspections and tests for all phases of work to obtain final approval thereof.

There is no Florida Department of Environmental Protection (FDEP) permit required for this work. The CITY will notify FDEP prior to construction.

SP-3 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. Refer also to Tampa Agreement Article 3.09.

SP-4 Construction Start

Construction shall not begin prior to receipt by the CITY of the required permits. 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. Refer also to Tampa Agreement Article 4.01.

SP-5 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-6 Discrepancy Between Drawings and Specifications

In case of any discrepancy between the drawings and specifications, the more stringent requirement shall apply. The Contractor will not be held responsible for the discovery of such discrepancy, but any work done on the item involved after such discovery, and prior to authorization by the Engineer, will be done at the Contractor's risk and expense.

SP-7 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. After the CONTRACTOR has received approval of the ENGINEER, equipment procurement shall commence.

SP-8 Working Hours

Normal working hours for this project will be from 7:00am to 3:30pm, Monday through Friday. If certain phases of the project require work outside of the normal hours, a minimum of 7-days notice must be provided to allow scheduling of CITY inspectors.

SP-9 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-10 Salvage

All existing pipe, appurtenances and equipment removed by the CONTRACTOR 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.

SP-11 Sequence of Operations

The CONTRACTOR shall be responsible for scheduling his work in an orderly fashion to meet the project goals described herein. The CONTRACTOR shall sequence his operations to keep one slaker in service at all times. Follow the general sequence of operation as described below:

1. Modify existing Tekkem Slaker and provide new outlet.
2. Demolish existing Wallace and Tiernan slaker while keeping the Tekkem slaker in service.
3. Install new slaking system.

A detailed construction sequence and schedule shall be submitted to the ENGINEER for approval.

SP-12 Cleaning and 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. Refer also to General Provisions Section 13.

SP-13 Surface Restoration

Where construction activities are conducted in existing grassed areas, the grassed areas shall be restored as specified or directed by sodding to match existing conditions. Surface restoration in paved areas, where applicable, shall be as shown on the Plans.

SP-14 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 herein, and in accordance with the requirements of the Agreement. All excavations for pipelines or conduits shall be hand dug with care to avoid damaging underground structures or utilities that may not be shown on the Plans. Refer also to General Provisions Section 1.03.

SP-15 Water and Electric Services

The CITY will provide potable water service from existing connection or fixtures at the Lime Building. The quantity of water available is limited to that which might be available from a hose connection. Any other water required by the CONTRACTOR for the Work shall be the responsibility of the CONTRACTOR and shall be supplied from his own source of supply (tanker trucks or the like). Construction and removal of piping from existing connections and/or use of a separate construction water service shall be the responsibility of the CONTRACTOR, and such cost shall be included in the Lump Sum Price and no separate payment will be made therefore. This provision supersedes General Provisions Section G-7.01 and Supplementary General Provisions Section 2.6 pertaining to General Provisions Section G-7.01.

The CONTRACTOR may utilize power that is available at existing 120V electrical outlets located in the vicinity of the Work. Additional power, if necessary, will be the responsibility of the Contractor.

SP-16 Protection of Trees and Shrubs

Not applicable this project. There are no trees or landscaping in the project area.

SP-17 Facility Operations During Construction

The CONTRACTOR shall perform all work in recognition of, and coordination with, on-going building activities.

After the Contract is awarded plant staff will conduct a safety training session with the CONTRACTOR's designated supervisor(s). The supervisor(s) will then be responsible for informing their employees of plant safety procedures.

Company vehicles will be allowed on the premises provided they are properly marked.

Individual workers will be required to park their personal cars outside the plant's security fencing and walk to the Security Guard House. For their first entry, they will be required to present a photo ID. They will then be issued a badge. At the end of the work day the workers will turn in their badge at the Guard House; the guard at the security gate will re-issue the badge when they come to work the next day. The procedure will be followed every day.

The CONTRACTOR will not be allowed to use the plant's break room or any other areas not a part of the limited construction area.

The CONTRACTOR shall coordinate with plant staff as required, to isolate work zones during dust generating activities that might activate the fire alarm system.

Provide and install barricades, signage, etc. as needed to designate work areas, as well as protection for persons and existing materials to remain, in and adjacent to work areas. Maintain protections as needed throughout the course of the Work.

The CONTRACTOR shall perform work in a manner to minimize noise, vibration, dust and debris.

The CONTRACTOR shall coordinate with the plant staff in advance of operations producing excessive noise and/or vibration and the use of non-designated areas to avoid disruption or interference with plant operations.

Deliveries or other use of non-designated areas around the perimeter of the plant shall be coordinated in advance with plant staff.

Use of the plant's dumpster will not be allowed. Trash and debris shall be removed from the site by the CONTRACTOR on a regular basis.

Following each and every work session, leave site in clean and orderly fashion with site protections in place.

Failure to adhere to approved sequencing/layout plan and/or failure to have supervisory personnel present and/or failure to maintain appropriate site conditions will be cause for work stoppage without additional Contract time.

Staging areas shall be as designated, unless adjustments requested by the Contractor are pre-approved by the CITY.

The CONTRACTOR shall have a supervisor on site with Contract related personnel at all times.

SP-18 Testing

The cost of all testing required shall be borne by the CONTRACTOR.

SP-19 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. Procurement status
2. Demolition
3. Existing Lime Slaking System modifications
4. New lime slurry piping installation
5. New Lime Slaking System installation
6. New electrical building installation
7. Equipment testing and acceptance
8. Final Restoration

SP-20 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. Refer also to Supplementary General Provisions Section G-14.08.

SP-21 Services of Manufacturers' Representatives

The services of manufacturers' representatives shall be provided on the site as required for the supervision of installation, the adjustment and placing in satisfactory trouble-free operation of the equipment and for providing training to CITY personnel in the operation and maintenance of such equipment.

Such manufacturers' services shall be of sufficient time and shall meet the requirements of the Specifications. Additional time shall be provided if necessary.

The cost of all services of manufacturers' representatives shall be included in the total Lump Sum Price, and no separate payment will be made therefore. Refer also to General Provisions Section G-4.11.

SP-22 Storage of Materials

The CONTRACTOR may use a small area near the Lime Building for storage of material and equipment at the specific location identified by the CITY. Payment for use and restoration of storage areas will be included in the lump sum price and no separate payment will be made therefore.

SP-23 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 and to allow ingress and egress by local plant 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, 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.

SP-24 Substantial Completion

The work, or any separable parts thereof, identified herein shall be deemed Substantially Completed as such time that all incidental requirements necessary to enable the City to continuously and successfully utilize the work or separable part thereof, for the purposes of which it is intended are completed.

SP-25 Final completion

Project shall be deemed fully completed when the City Inspector and the Engineer agree that all work required by this specification has been completed satisfactorily to the intent of these documents.

SP-26 Project Photographs

Before construction, the CONTRACTOR will be required to furnish color photographs of the project site and surrounding area. The CONTRACTOR shall not perform any construction work until the pre-construction photographs are taken.

The CONTRACTOR shall submit pre-construction photographs in digital form (JPEG or PDF) to the CITY prior to the start of construction.

SP-27 Record Drawings

During the course of the Work, the CONTRACTOR shall maintain, at the site, a clean undamaged set of the Contract Documents. The CONTRACTOR shall mark the set, on a daily basis, with location and progress of all contract work.

Drawings shall be on site at all times and available for review by the CITY. Failure of the CONTRACTOR to have drawings on site and/or up to date may result in suspension of work until the situation is corrected. Extension of Contract will not be granted for such condition.

At conclusion of Work, the CONTRACTOR shall provide the CITY with one complete set of Electronic Record Drawings incorporating changes described above. The record drawings shall be in AutoCAD DWG and Adobe PDF latest versions. Additionally, the CONTRACTOR shall provide marked hard copy set of as-built drawings clean and damage free at the same time. Electronic files will be issued to the Contractor by the CITY for his use.

SP-28 Not Used

SP-29 Safety

The CONTRACTOR is solely responsible for the safety of its workers, and shall comply with all OSHA requirements pertaining to safety at the site of the Work. All costs associated with safety measures shall be included in the total lump sum contract price, and no separate payment shall be made therefore. Refer also to the Tampa Agreement Article 3.07.

SP-30 Disposal of Debris

The CONTRACTOR shall be solely responsible for removal and proper disposal of debris to locations off of the project site.

SP-31 Pavement Restoration

Restoration shall conform to standard requirements of CITY and as shown on the Plans.

END OF SECTION



Page 1 of 2 –DMI Payment
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	Federal ID	Total Sub Contract Or PO Amount	Amount Paid To Date	Amount To Be Paid For This Period
[] Sub [] Supplier				Amount Pending Previously Reported	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: _____



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 if 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.

0 1 2 3 4 5 6 7 8

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.

Improvement Project

City of Tampa Florida
 Mayor Bob Buckhorn

Project Contact:
 Don Cermeno
 Contract Administration
 City of Tampa
 Don.Cermeno@tampagov.net

For information call:
 (813) 635-3400



Building a Better Tampa

David L. Tippin Water Treatment Facility Caustic Soda Piping Improvements

Project provides for improvements at the David L. Tippin Water Treatment Facility to improve the reliability and safety of the Sodium Hydroxide System of the water distribution system within the facility.

\$TBD investment
 Scheduled for completion in TBD 2014

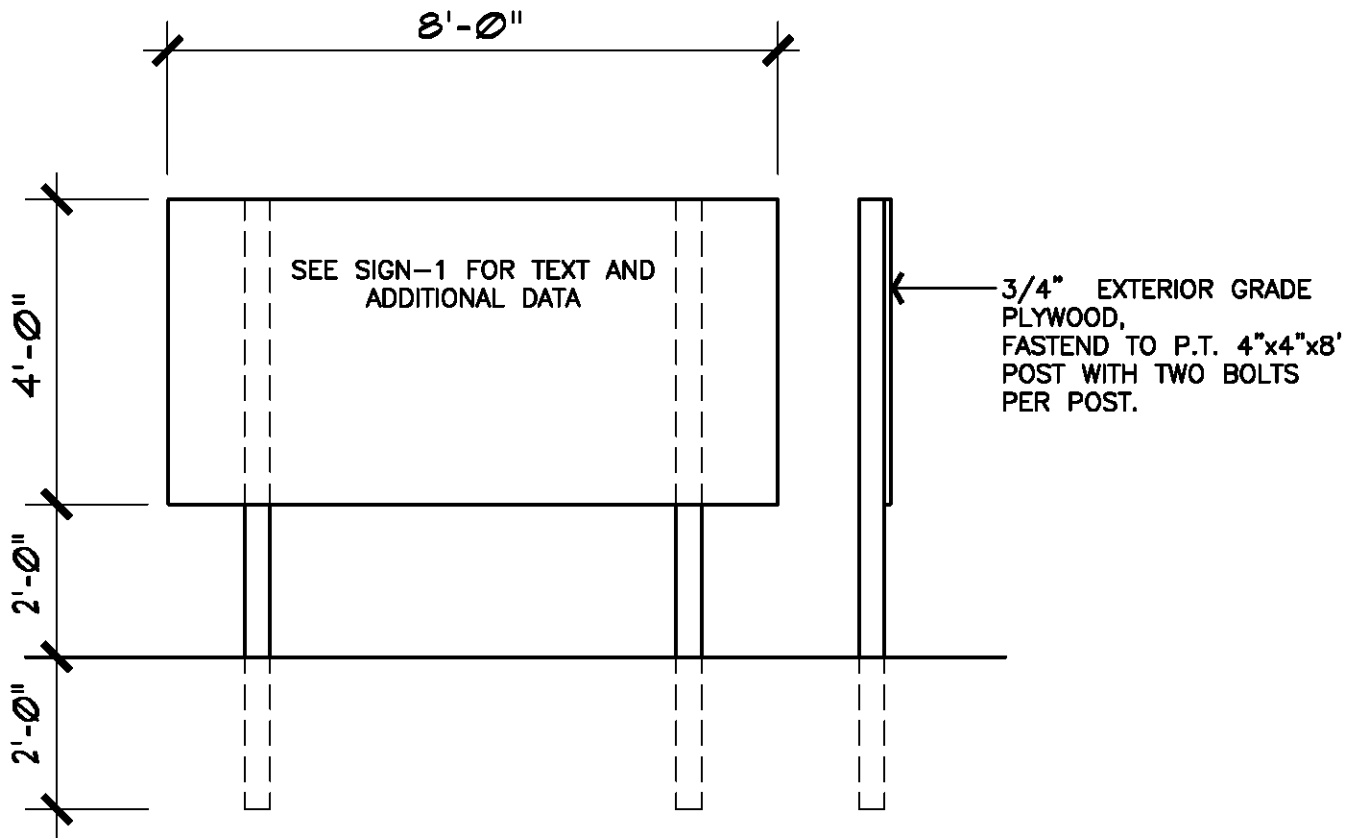
TBD

Colors
 Blue: Sherwin Williams Naval SW6244
 Green: Sherwin Williams Center Stage SW6920
 White: Sherwin Williams Pure White SW7005

SIGN EXAMPLE ONLY GRAPHIC TO BE DEVELOPED BY CONTRACTOR

scale: 3" 3"

Font
 Franklin Gothic



SECTION 01020 - ALLOWANCE

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

SUMMARY

This Section includes administrative and procedural requirements governing allowances.

Types of allowances include the following:

Contingency allowances.

SELECTION AND PURCHASE

SUBMITTALS

Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

CONTINGENCY ALLOWANCES

Use the contingency allowance only as directed by the City.

The Contractor's related costs for services, products and equipment ordered by the City under the contingency allowance include delivery, installation, taxes, insurance, equipment rental, and similar costs.

Work Directive Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit margins.

At Project closeout, credit unused amounts remaining in the contingency allowance to the City by Change Order.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

EXAMINATION

Examine products covered by an allowance promptly upon delivery for damage or defects.

PREPARATION

Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

SCHEDULE OF ALLOWANCES

Allowance No. 1: Include a contingency allowance of \$118,000 for use according to the City's instructions. The allowance shall be included in the Base Bid.

END OF SECTION 01020

SECTION 01 45 50

LEAKAGE TESTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Testing for any signs of leakage in all pipelines and structures required to be watertight.
 - 1. Test air and gas lines with compressed air.
 - 2. Test all other pipelines with water under the specified pressures.
- B. Operation of Existing Facilities: Conduct all tests in a manner to minimize as much as possible any interference with the day-to-day operations of existing facilities or other contractors working on the site.

1.2 PERFORMANCE REQUIREMENTS

- A. Written Notification of Testing: Provide written notice when the work is ready for testing, and make the tests as soon thereafter as possible.
 - 1. Personnel for reading meters, gauges, or other measuring devices, will be furnished by the ENGINEER.
 - 2. Furnish all other labor, equipment, air, water and materials, including meters, gauges, blower, pumps, compressors, fuel, water, bulkheads and accessory equipment.

1.3 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. ACI 350.1R-93 - Manual of Concrete Practice, Part 4
 - 2. AWWA C 600 - Installation of Ductile-Iron Water Mains and Their Appurtenances

1.4 SUBMITTALS

- A. General: Provide all submittals, including the following, as specified in Division 1.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PRESSURE TESTS OF EXPOSED PLANT PIPING

- A. Testing: Pressure test exposed pipelines for leakage by maintaining the fluid in the pipe at the specified pressure for a period of 60 minutes. Examine all accessible joints during the test. Stop all visible leakage.
- B. Test Pressures: Test the various pipelines at the test pressures specified in Section 40 05 10.

3.2 VALVE TESTING

- A. Testing: Operate valves in the section under test through several complete cycles of closing and opening. In addition, have the test pressure for each valve, when in the closed position, applied to one side of the valve only. Test each end of the valve in this manner.
- B. Test Pressure: Test each valve at the same test pressure as that specified for the pipe in which the valve is installed.
- C. Leakage: Stop all external and internal leakage through the valves.
- D. Movement: Stop all valve movement or structural distress.

3.3 REPAIR OF PIPING LEAKS

- A. Procedures: Repair leaks as follows:
 - 1. Replace broken pipe or joint assemblies found to leak.
 - 2. When leakage occurs in excess of the specified amount, locate and repair defective valves, pipe, cleanouts or joints.
 - 3. If the excess leakage is determined to be caused by defective materials furnished, improper workmanship, or damage to the materials, make the necessary repairs or replacements at no addition to the Contract Price.
 - 4. If defective portions cannot be located, remove and reconstruct as much of the original work as necessary to obtain piping that meets the leakage requirements specified herein and retest, all at no addition to the Contract Price.

3.4 LEAKAGE TESTS FOR STEEL TANKS

- A. Steel tanks shall show no visible leakage. Examine the tank during the test. Stop all visible leakage.

END OF SECTION

SECTION 01 78 23

OPERATION AND MAINTENANCE MANUALS

PART 1 GENERAL

1.1 DESCRIPTION

- A. Scope: Furnish to the ENGINEER one (1) paper copy and one electronic copy (PDF FORMAT) on a CD of an Operation and Maintenance Manual for all equipment and associated control systems furnished and installed.

1.2 QUALITY ASSURANCE

- A. Reference Codes and Specifications: No current government or commercial specifications or documents apply.

1.3 SUBMITTALS

- A. Prior to the Work Reaching 50 Percent Completion, submit to the ENGINEER for approval one paper copy and one electronic copy on a CD of the manual with all specified material. Submit the approval copies with the partial payment request for the specified completion. Within 30 days after the ENGINEER's approval of the submittal, furnish to the ENGINEER the remaining 1 copy of the manual. Provide space in the manual for additional material. Submit any missing material for the manual prior to requesting certification of substantial completion.

1.4 FORMAT AND CONTENTS

- A. Prepare and arrange each copy of the manual as follows:
 1. One copy of an equipment data summary (see sample form) for each item of equipment.
 2. One copy of an equipment preventive maintenance data summary (see sample form) for each item of equipment.
 3. One copy of the manufacturer's operating and maintenance instructions. Operating instructions include equipment start-up, normal operation, shutdown, emergency operation and troubleshooting. Maintenance instructions include equipment installation, calibration and adjustment, preventive and repair maintenance, lubrication, troubleshooting, parts list and recommended spare parts.
 4. List of electrical relay settings and control and alarm contact settings.

5. Electrical interconnection wiring diagram for equipment furnished including all control and lighting systems.
 6. Furnish all O&M Manual material on 8-1/2 by 11 commercially printed or typed forms or an acceptable alternative format.
- B. Organize each manual into sections paralleling the equipment specifications. Identify each section using heavy section dividers with reinforced holes and numbered plastic index tabs. Use 3-ring, slant ring, hard-back binders Type No. AVE-VS11 as manufactured by Avery Company, or equal. Binder size shall be 3-inch maximum. Punch all loose data for binding. Arrange composition and printing so that punching does not obliterate any data. Print on the cover and binding edge of each manual the project title, and manual title, as furnished and approved by the CONSULTANT.
- C. Leave all operating and maintenance material that comes bound by the equipment manufacturer in its original bound state. Cross-reference the appropriate sections of the CONTRACTOR's O&M manual to the manufacturers' bound manuals.
- D. Label binders Volume 1, 2, and so on, where more than one binder is required. Include the table of contents for the entire set, identified by volume number, in each binder.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

CITY OF TAMPA
WATER DEPARTMENT

DAVID L. TIPPIN WATER TREATMENT FACILITY
LIME SLAKER REPLACEMENT PROJECT

Equipment Data Summary

Equipment Name: Specification Reference:

Manufacturer:

Name:

Address:

Telephone:

Number Supplied: Location/Service:

Model No: Serial No:

Type:

Size/Speed/Capacity/Range (as applicable):

Power Requirement (Phase/Volts/Hertz):

Local Representative:

Name:

Address:

Telephone:

NOTES:

CITY OF TAMPA
WATER DEPARTMENT

DAVID L. TIPPIN WATER TREATMENT FACILITY
LIME SLAKER REPLACEMENT PROJECT

Preventive Maintenance Summary

Equipment Name:

Location:

Manufacturer:

Name:

Address:

Telephone:

Model No:

Serial No:

Maintenance Task	Lubricant/Part	D W M Q SA A	O&M Manual Reference
------------------	----------------	--------------	-------------------------

NOTES:

*D-Daily W-Weekly M-Monthly Q-Quarterly SA-Semi-Annual A-Annual

SECTION 02 41 00

DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: All work necessary for the removal and disposal of buildings, structures, piping, equipment, or any part thereof including masonry, steel, reinforced concrete, plain concrete, electrical facilities, and any other material or equipment shown or specified to be removed.
- B. Basic Procedures and Schedule: Carry out demolition so that adjacent structures, equipment and piping, which are to remain, are not endangered. Schedule the work so as not to interfere with the day to day operation of the existing facilities. Do not block doorways or passageways in the Lime Building.
- C. Additional Requirements: Provide dust control and make provisions for safety.

1.2 SUBMITTALS

- A. Provide all submittals, including the following, as specified in Division 1.
- B. Site Inspection: Visit the site and inspect all existing structures. Observe and record any defects which may exist in buildings or structures adjacent to but not directly affected by the demolition work. Provide the ENGINEER with a copy of this inspection record and obtain the ENGINEER's approval prior to commencing the demolition.

1.3 QUALITY ASSURANCE

- A. Limits: Exercise care to break concrete well for removal in reasonably small masses. Where only parts of a structure are to be removed, cut the concrete along limiting lines with a suitable saw so that damage to the remaining structure is held to a minimum.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROTECTION

- A. General Safety: Provide warning signs, protective barriers, and warning lights as necessary adjacent to the work as approved or required. Maintain these items during the demolition period.
- B. Existing Services: Undertake no demolition work until all mechanical and electrical services affected by the work have been properly disconnected. Cap, reroute or reconnect interconnecting piping or electrical services that are to remain in service either permanently or temporarily in a manner that will not interfere with the operation of the remaining facilities.
- C. Hazards: Perform testing and air purging where the presence of hazardous chemicals, gases, flammable materials or other dangerous substances is apparent or suspected, and eliminate the hazard before demolition is started.

3.2 DEMOLITION REQUIREMENTS

- A. Explosives: The use of explosives will not be permitted.
- B. Protection: Carefully protect all mechanical and electrical equipment against dust and debris.
- C. Removal: Remove all debris from the structures during demolition and do not allow debris to accumulate in piles.
- D. Access: Provide safe access to and egress from all working areas at all times with adequate protection from falling material.
- E. Protection: Provide adequate scaffolding, shoring, bracing railings, toe boards and protective covering during demolition to protect personnel and equipment against injury or damage.

3.3 DISPOSAL OF MATERIALS

- A. Final Removal: Remove all debris, rubbish, scrap pieces, equipment, and materials resulting from the demolition unless otherwise indicated. Take title to all demolished materials and remove such items from the site.

END OF SECTION

SECTION 03 60 00

GROUT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Furnishing non-shrink grout under column and beam bearings and under equipment bases.
2. Furnishing non-shrink grout around handrail posts and base plates of handrail posts.

1.2 REFERENCES

A. Codes and Standards Referred to in this Section:

1. ASTM C 33 - Specifications for Concrete Aggregates
2. ASTM C 109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 in. [or 50 mm] Cube Specimens).
3. CRD C-619 - Specification for Grout Fluidifier.
4. CRD C-621 - Specification for Non-Shrink Grout.

1.3 SUBMITTALS

A. Provide all submittals, including the following, as specified in Division 1:

1. Submit notarized certificate of manufacturer as evidence that pre-packaged non-shrink grout conforms to specified requirements. Include manufacturer's literature.

1.4 QUALITY ASSURANCE

A. Testing Requirements: Testing laboratory provided by ENGINEER is responsible for conducting tests required in Division 1.

- B. Testing Assistance: Cooperate with the laboratory personnel, provide access to Work, and manufacturer's operations. Provide and deliver to the laboratory adequate quantities of representative samples of materials proposed to be used which require testing.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle all products and materials as specified in Division 1, and as follows:

- 1. Pre-packaged, Non-shrink Grout:

Deliver in unopened packages. Store in a dry place protected from moisture.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Non-Shrink Grout:

- 1. Furnish a flowable, pre-packaged non-shrink grout without dependence on gas expansion forces or enlargement of metal particles for its non-shrinkage characteristics and conforming to CRD C-621.
- 2. Furnish one of the following:
 - a. Masterflow 928, as manufactured by MasterBuilders, Incorporated.
 - b. Multipurpose, as manufactured by Symons Corporation.
 - c. Sika grout 212, as manufactured by Sika Corporation.
 - d. Or equal.

2.2 GROUT MIXES

- A. Non-Shrink Grout:

- 1. Add water to pre-packaged grout material and mix, as recommended by the manufacturer, to produce a flowable, non-shrink grout having a minimum compressive strength of 3000 psi in 24 hours.
- 2. Provide grout which when exposed to weather will be free of discoloration, without the necessity of special surface treatments.

PART 3 EXECUTION

3.1 INSPECTION

A. Substrate Condition:

Examine the substrate and conditions under which grout is to be placed and notify the ENGINEER, in writing, of unsatisfactory conditions. Do not proceed with the Work until unsatisfactory conditions have been corrected in a manner acceptable to the ENGINEER.

3.2 INSTALLATION

A. General:

1. Place grout as shown and in accordance with the manufacturer's instructions. Notify the ENGINEER if manufacturer's instructions conflict with the Specifications. Do not proceed with installation until directed by the ENGINEER.
2. Dry packing will not be permitted.
3. Have manufacturers of proprietary products make available upon 72 hours notification the services of a qualified, full time employee to aid in assuring proper use of the product under job conditions. The cost of this service, if any, shall be borne by the CONTRACTOR.
4. Conform grout placement to temperature and weather limitations shown on the structural plans.

B. Columns, Beams and Equipment Bases:

1. After shimming columns, beams and equipment to proper grade, securely tighten anchor bolts. Properly form around the base plates allowing sufficient room around the edges for placing the grout. Adequate depth between the bottom of the base plate and the top of concrete base must be provided to assure that the void is completely filled with the non-shrink grout.

C. Handrails and Railings

1. After posts have been properly inserted into the holes or sleeves, fill the annular space between posts and sleeve with the non-shrink grout. Bevel grout at juncture with post so that moisture flows away from post.

END OF SECTION

SECTION 05 05 13

GALVANIZING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: All galvanizing of metals when such coating is specified, except as otherwise shown, specified or required.

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
1. ASTM A 123 - Specification for Zinc-Coated (Hot-Dip Galvanized) Coatings on Iron and Steel Products
 2. ASTM A 153 - Specification for Zinc Coating (Hot-Dip) On Iron and Steel Hardware
 3. ASTM A 924 - Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
 4. ASTM A 385 - Practice for Providing High-Quality Zinc-Coatings (Hot-Dip)
 5. ASTM A 392 - Specification for Zinc-Coated Steel Chain-Link Fence Fabric
 6. ASTM A 53 - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless
 7. ASTM A 121 - Specification for Zinc-Coated (Galvanized) Steel Barbed Wire
 8. ASTM A 143 - Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
 9. ASTM A 384 - Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanization of Steel Assemblies
 10. ASTM B 6 - Specification for Zinc (Slab Zinc)
 11. MIL-P-21035B - Paint High Zinc Dust Content, Galvanizing Repair

12. MIL-P-26915C - Primer Coating Zinc Dust Pigmented for Steel Surfaces

PART 2 PRODUCTS

2.1 MATERIALS

- A. Standard: Meet the requirements of ASTM B 6 and "Prime Western" grade, or equal, for zinc for galvanizing, zinc coating or plating.

PART 3 EXECUTION

3.1 PREPARATION

- A. General: Blast clean or grind smooth wrought metals and castings. Tumble and grind flush all high spots when a smooth coat is required for castings. Normalize castings to prevent cracking.
- B. Base Metal Cleaning: Thoroughly clean base metal. Remove all welding slag and burrs. Remove surface contaminants and coatings which would not be removable by the normal chemical cleaning process in the galvanizing operation, by blast cleaning, by immersion in a caustic bath, acid pickle and flux or other approved method.
- C. Product Preparation: Fabricate structural steel products and assemblies to be galvanized in accordance with ASTM A 143, A 384, A385 and Class I guidelines as shown in "Recommended Details of Galvanized Structures" as published by American Hot-Dip Galvanizers Association, Inc.

3.2 APPLICATION

- A. Hot Dip: Use the hot-dip process for galvanizing as required by the appropriate ASTM and American Hot-Dip Galvanizers Association, Inc. specifications.
 - 1. Do not allow the dipping to come in contact with or rest upon the dross during the operation.
 - 2. Do not use procedures tending to agitate the dross.
- B. Required Facilities: Perform the galvanizing and coating in a plant having the required facilities to produce the quality of coatings specified and with ample capacity for the volume of work required. Handle and ship galvanized material in a manner which will avoid damage to the zinc coating.
- C. Requirements: Perform galvanizing in accordance with the requirements of the following specifications:

	<u>Item</u>	<u>ASTM</u>
1.	Iron and steel products	A 123
2.	Iron and steel hardware	A 153
3.	Chain for chainwheel operators	A 153
4.	Chainwheels and Guides	A 123
5.	Steel sheets	A 924
6.	Assembled products	A 385 & A 123
7.	Steel chain link fence fabric	A 392 Class II
8.	Steel pipe	A 53
9.	Steel barbed wire	A 121

3.3 INSTALLATION

- A. Field Coating for Touch-Up: Coat all field welds, abraided areas where damage is more than 3/16-inch wide or uncoated cut edges in material more than 1/10-inch thick with an organic zinc-rich paint complying with MIL-P-21035B or MIL-P-26915C in multiple coats to dry film thickness of 8 mils.

END OF SECTION

SECTION 05 12 00
STRUCTURAL STEEL

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Columns, girders, beams, pipe supports and hangers, inserts, pins bolts, nuts and washers and similar work.
- B. Related Work Specified in Other Sections Includes, But is Not Limited to, the Following:
 - 1. Section 05 50 00 - Metal Fabrications
 - 2. Section 09 96 00 - High Performance Coatings

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. ASTM A 325 - High-Strength Bolts for Structural Steel Joints
 - 2. ASTM A 490 - Heat-Treated, Steel Structural Bolts
 - 3. ASTM A 6/A6M - General Requirements for Rolled Steel Plates, Shapes, Sheet Piling, and Bars for Structural Use
 - 4. AWS D1.1 - Structural Welding Code - Steel
 - 5. AISC M 016 - Manual of Steel Construction - "Allowable Stress Design"
 - 6. AISC S 335 - Specifications for Structural Steel Buildings
 - 7. AISC S 303 - Code of Standard Practice for Steel Buildings and Bridges
 - 8. SSPC SP1 - Solvent Cleaning
 - 9. SSPC SP2 - Hand Tool Cleaning
 - 10. SSPC SP3 - Power Tool Cleaning

1.3 SUBMITTALS

- A. General: Provide all submittals, including the following, as specified in Division 1.
- B. CONTRACTOR's Drawings: Provide complete fabrication and erection details and schedules. Conform the numbering of columns, beams, and the like, as shown on detail drawings to the numbering on erection drawings.
- C. Placement Listings: Submit erector's complete placement list of all field bolts - including grip, bolt length, and location.
- D. Mill Reports: Submit certified mill reports for ASTM A 36 steels as requested. Submit certified mill reports for all steels other than ASTM A 36.
- E. Setting Plans: Submit complete setting plans for use by others to set anchor bolts, setting plates, weir anchors and the like.
- F. Welding Certifications: Submit reports that confirm that all welders have been certified within the last year by a nationally recognized laboratory to make groove and fillet welds in all positions.
- G. Weld Inspection Reports: Submit reports of visual inspections of all structural steel welds for size, length and defects.
- H. Tension Test Reports: Submit direct tension test reports of high strength bolted connections designated on the plans as slip critical connections or direct tension connections.

1.4 TESTING SERVICE

- A. General: Provide a testing laboratory responsible for inspecting, conducting and interpreting tests as required in Division 1 and for performance of at least the following inspections and tests:
 - 1. Ascertain that all welders have been certified within the last year by a nationally recognized laboratory to make groove and fillet welds in all positions.
 - 2. Visually inspect all structural steel welds for minimum size and length and for defects. Where specified, shown or required, radiographic, magnetic particle, or ultrasonic inspection of welds will be performed. Inspection will conform to the inspection requirements of the AWS Structural Welding Code (D1.1).

3. Mechanically test the high-tensile bolted connections selected at random by checking for minimum tension and torque in 10 percent of all bolts or 2 bolts per connection, whichever is greater.
- B. Cooperation: Cooperate with the laboratory personnel, provide access to work and manufacturer's operations, and provide and deliver to the laboratory adequate quantities of representative samples of materials proposed to be used which require testing.
- C. Additional Testing: Assume sole responsibility for expense of additional testing where work does not comply with the Contract Documents.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle all products and materials as specified in Division 1 (and as follows:)
1. Handle all steel with a crane or derrick. Do not drop or dump material from truck. Return bent or damaged sections to the fabrication shop.
 2. Store and cover materials in areas set aside for such use. Store materials on skids or platforms above the ground and protected from corrosion and deterioration.
 3. Store materials so that they are not distorted or otherwise damaged in any way.
 4. Assume full responsibility for replacement of damaged or unsatisfactory materials.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Structural Steel: Provide structural steel as follows:
1. Provide shapes, plates and anchor bolts ASTM A 36
 2. Provide mild steel plate ASTM A 283, Grade C or D
- B. Bolts: Provide bolts as follows:
1. Provide high-strength bolts ASTM A 325

2. Provide standard bolts ASTM A 307
 3. Stainless steel anchor bolts ASTM A 276 Type 316
 4. Provide miscellaneous bolts of steel, bronze, aluminum, stainless steel with hexagonal nuts and standard flat plate washers with threads that are clean cut, unified standard series meeting the requirements of ANSI B1.1.
- C. Direct Tension Indicators: ASTM F 959, type as required
- D. Headed Stud-Type Shear Connectors: ASTM A 108, Grade 1015 or 1020, cold-finished carbon steel with dimensions complying with A15C specifications
- E. Welding Electrodes: Conform welding electrodes to requirements in AWS A5.1 or A5.5, 7000 series.
- F. Expansion Anchors: Use Hilti Kwik Bolts by Hilti, Inc., or approved equal, for expansion anchors.
- G. Adhesive Anchors: Use Hilti HVA Adhesive Anchors, by Hilti, Inc., or approved equal, for adhesive type anchors.
- H. Bearing Surfaces: Manufacture TFE (polytetrafluoroethylene) bearing surfaces from a filled TFE sheet bonded to a stainless steel substrate conforming to the requirements of Section 27, Division 2 of the AASHTO Standard Specifications for highway bridges.

2.2 FABRICATION

- A. General: Conform fabrication to AISC "Code of Standard Practice for Steel Buildings and Bridges".
1. Properly mark and match-mark materials where field assembly so requires. Expedite the sequence of shipments to minimize the field handling of material.
 2. Mill or saw cut columns at bearing ends and protect all such surfaces from corrosion.
 3. Make allowances for draw in all tension bracing.
 4. Camber beams, girders and trusses as indicated.
 5. Drill or punch holes for connection bolts 1/16-inch larger than the nominal diameter of the bolts. Make holes for anchor bolts in column base and

setting plates 5/16-inch larger than bolt size. Make holes for bolts in weir plates and the like as shown.

6. Provide all holes required in members to permit the connection of work of other trades who will furnish the necessary templates or such information as may be required.
7. Provide built-up sections assembled by welding free of warpage, and with all axes having true alignment.
8. Be responsible for any errors of fabrication and for the correct fitting of the various members. Errors in fabrication will cause the piece to be rejected. Supply a new and properly fabricated piece at no additional expense.

B. Connections: Provide connections with a minimum of two bolts. Use two-sided connections unless otherwise shown. Where the reactions are indicated, size and detail connections for those reactions. Unless otherwise shown, provide bolts with 3/4-inch diameter in slip critical connections.

1. Provide connections for noncomposite beams with uniform loads having a capacity not less than half the AISC total tabulated uniform load capacity for the given shape and span, and steel specification for the particular beam tabulated in the "Allowable Uniform Load Tables" with the AISC "Manual of Steel Construction" (Ninth Edition), nor less than the reaction noted, if any. Consider the effect of concentrated loads and make an analysis of loading and end reactions if necessary.
2. Shop connections may be welded or bolted. If bolted, use ASTM A 325 bolts in slip critical connections.
3. Provide bolt, field connections using ASTM A 325 bolts in slip critical connections, unless otherwise shown. Use welding only where indicated.
4. For bolted connections, provide one hardened washer under either head or nut, whichever is turned to tighten. Use the turn-of-the-nut method for tightening. The substitution of direct tension indicators or calibrated impact wrenches for the turn-of-the-nut method is permitted only with previous approval. Determine proper bolt length for each field connection determined from the "Erector's Placement List".

C. Welded Connections: Use welded connections only where shown or as approved. Substitution of welded connections for shown bolted connections will not be permitted without written approval.

1. Furnish certificate issued by an approved testing laboratory, for all welders, to make groove and fillet welds in all positions. Provide documentation

showing that all welders have practiced welding continuously since certification. Submit certification prior to any welding operations.

2. Unless otherwise shown, provide welded connections equal in strength to bolted shear connections. Provide minimum welds when not indicated, 1/4-inch fillet all around.
- D. Miscellaneous bolts and nuts: Provide bolts and nuts of steel, bronze, aluminum, stainless steel or other materials as shown for uses other than those specified above for structural framing connections.
1. Assume the expense of drilled and grouted anchor bolts which are installed after concrete is placed.
 2. Provide all bolts and nuts which are submerged or subject to periodic wetting of stainless steel, unless shown or specified otherwise.
- E. Expansion Anchors: Provide expansion anchors of the size indicated and of the type specified. Lead expansion anchors will not be permitted.
- F. Adhesive Anchors: Provide adhesive anchors of the size indicated and of the type specified.
- G. TFE Surfaces: Install TFE (polytetrafluoroethylene) bearing surfaces to the dimensions and at the locations shown.

PART 3 EXECUTION

3.1 ERECTION

- A. Field Verification: Verify all dimensions for connections to existing structures or to new structures already in place in the field. Assume sole responsibility for the correctness of all shop and field fabrication fits.
- B. Bracing: Provide temporary bracing and guy lines to properly protect all persons and property and to ensure proper alignment. Comply with all federal, state and local laws which govern safety requirements for steel erection. Provide all necessary additional bracing, beams, temporary struts, ties, guys, clip angles, and the like, as required to take care of all loads to which the structure may be subjected before it is in finished condition. Remove all such erection aids after completion of steel erection, unless otherwise directed.
- C. Coordination: Coordinate the location of supports for derricks, hoists, rigging and the like.

- D. Templates: Furnish templates where shown, specified or required. Furnish shim plates, or developed fills where necessary to transfer load, where required, to obtain proper fit and alignment. Accurately set anchor bolts using a steel or wood template as necessary to maintain elevation and location.
- E. Reaming: Unfair holes mismatched less than one-half fastener diameter may be reamed, and a proper size fastener installed with hardened washer under both head and nut, as directed. Mismatched holes greater than one-half fastener diameter will be considered as a fabrication error. Replace the piece affected as specified.
- F. Leveling: Unless otherwise noted, level and plumb individual steel members to an accuracy of 1 to 500. Do all leveling and plumbing based on the mean operating temperature of the structure. Make allowances for the differences in temperature at the time of erection and the mean temperature at which the structure will be when completed and in service.
- G. Stiffening of Structure: Do no welding or bolt tightening until as much of the structure as will be stiffened by the welding or bolting has been properly aligned.
- H. Burn Holes: Burning of holes is permitted only with written approval. Any burning of holes without such written approval will be cause for the rejection of all parts involved.
- I. Variations: Report immediately any variation from the Contract Documents which may occur during erection. Do not continue work affected by such variation without written approval.
- J. Protection: Protect anchor bolt threads during placement of concrete.

3.2 INSPECTION AND TESTS

- A. Rejection of Work: Work which does not comply with the Contract Documents will not be accepted. Take sole responsibility and assume the expense of all corrective measures, including additional and more extensive testing related to such work.

3.3 PAINTING

- A. For surface preparation and painting of structural steel not encased in concrete see Section 09 96 00.
- B. Structural steel encased in concrete shall be cleaned by removing all rust, loose mill scale, oil, grease and dirt in accordance with Steel Structures Painting Council SSPC-SPI, SP2 or SP3.

SECTION 05 50 00

METAL FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Ornamental light iron, steel, aluminum and stainless steel items, including anchors, bolts and accessories required for the attachment of items specified herein, and other items shown, to complete the Work in accordance with the Contract Documents.
- B. Related Work Specified In Other Sections Includes, But is Not Limited to, the Following:
 - 1. Section 05 05 13 - Galvanizing
 - 2. Section 05 12 00 - Structural Steel
 - 3. Section 09 96 00 - High Performance Coatings

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. ASTM A 36/A36 - Structural Steel
 - 2. ASTM A 193/A193M
Grade MT316 - Stainless Steel Bolts
 - 3. ASTM A 283/A283M - Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes and Bars
 - 4. ASTM A 554 - Welded Stainless Steel Mechanical Tubing
 - 5. ASTM B 137 - Method for Measurement of Mass of Coating on Anodically Coated Aluminum
 - 6. ASTM B 244 - Method for Measurement of Thickness of Anodic Coatings on Aluminum and Other Nonconductive Coatings on Nonmagnetic Basic Metals with Eddy-Current Instruments
 - 7. FS FF-S-325 - Expansion Shields for Masonry Anchorage

- 8. FS FF-B-588 - Toggle Bolts
- 9. ANSI A14.3 - Safety Requirements for Fixed Ladders

1.3 SUBMITTALS

- A. General: Provide all submittals, including the following, as specified in Division 1.
- B. Certification: Submit certificates in triplicate for anodic treatment of aluminum. Certificates shall be properly attested by the aluminum fabricator stating that the aluminum has been treated as herein specified.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Standards: Provide metal items meeting the requirements of the following standards:

- | | | |
|-----|--|---|
| 1. | Structural steel, shapes and plates, except plates to be bent or cold-formed | ASTM A 36/A36M |
| 2. | Steel plates, bent or cold-formed | ASTM A 283/A283M, Grade C |
| 3. | Steel bars and bar size shapes | ASTM A 36/A36M |
| 4. | Sheet aluminum and extrusions | As required for color (3003 Alloy with mill finish) |
| 5. | Aluminum castings thresholds and the like ornamental | Alloy 356-T6
Alloy 214-F |
| 6. | Aluminum screw machine parts | Alloy 2024-T4 |
| 7. | Structural aluminum | Alloy 6061-T6 |
| 8. | Aluminum bar | Alloy 6061-T6511 |
| 9. | Stainless steel sheet | U.S. Steel 16-10, Grade MT316 |
| 10. | Pipe, stainless steel | ASTM A 554 Grade MT304 |
| 11. | Bolts: stainless steel | ASTM A 193/A193M, Grade MT316 85 percent copper, 5 percent lead, tin and zinc, unless otherwise specified |

12. Provide steel which is to be hot-dip galvanized after fabrication, that has a silicone content in the range of 0 to 0.04 percent or 0.15 percent to 0.25 percent unless otherwise approved.
 13. Provide lead expansion anchors for concrete meeting the requirements of FS FF-S-325, wedge type, Group II, Type 4, Class 1 or 2; self-drilling type, Group III, Type I or nondrilling type, Group VIII, Type 1 or 2.
 14. Provide bolt anchor expansion shields for masonry meeting the requirements of FS FF-S-325, lag shield type, Group II, Type I, or split shield type, Group II, Type 3, Class 3.
 15. Provide expansion bolts of Grade 316MT stainless steel.
 16. Provide gauges specified to refer to U.S. Standard gauge for sheet steel, plate iron and steel, and to Brown & Sharp Gauge for wire and sheet aluminum.
 17. Provide stainless steel screws, bolts, nuts and similar items used in connection with galvanized exterior Work.
 18. Anodically treat aluminum to meet the test requirements of ASTM B 137 for weight and ASTM B 244 for thickness.
- B. Aluminum Finishes: Provide aluminum finishes specified below in strict compliance with the National Association of Architectural Metal Manufacturers (NAAMM) aluminum finish designations, unless otherwise indicated or specified.
1. Provide miscellaneous aluminum angles and cover moldings which are indicated to be painted with a mill finish.
 2. Provide aluminum finishes as follows:
 - a. Exterior aluminum items, unless otherwise specified: NAAMM Architectural Class 1, AA-A41 clear coating
 - b. Interior aluminum items, unless otherwise specified: NAAMM Architectural Class 2, AA-A31 clear coating
- C. Stainless Steel Finish: Provide stainless steel with a No. 4 satin finish unless otherwise shown.
- D. Galvanizing: Galvanize in accordance with Section 05 05 13.
- E. Painting: Metal fabrications shall be shop painted in accordance with Section 09 96 00.

2.2 FABRICATION

- A. General: Form all Work true to detail, with clean, straight, sharply defined profiles and smooth surfaces of uniform color and texture, and free from defects impairing strength or durability. Precision fitting and jointings are required for all Work. Perform all welding in a way to prevent pitting or discoloration.
- B. Welding: Weld joints of such character and assemble so that they will be as strong and rigid as the adjoining section. Select wire for welding to prevent discoloration and to insure sound structural welds. Continuously weld exposed joints their entire length unless otherwise shown or specified. Provide all exposed welded face joints dressed flush and smooth.
- C. Surface Flaws: Remove surface flaws on aluminum before the anodic coating is applied.
- D. Structural Steel: Provide structural steel plates, shapes, bars, sheets and other metal items meeting the requirements of Section 05 12 00.
- E. Miscellaneous: Perform all drilling, tapping, cutouts, and reinforcement required to attach, insert or fit thereto, fixtures and fittings in accordance with the drawings templates or instruction for the fixtures and fittings. Do not begin fabrication of metalwork until all drawings, templates or instructions are available.

PART 3 EXECUTION

3.1 INSTALLATION

- A. General: Install metal fabrications in accordance with the manufacturer's recommendations and approved shop drawings and as specified in Division 1.
- B. Alignment: Install all items and set plumb, square, level and true at their proper elevation and plane, and located in true alignment with all Work.
- C. Fastening: Securely anchor, ready for operation in every respect. Unless indicated otherwise, fasten metalwork to solid masonry and concrete with expansion bolts and to void areas of unit masonry with toggle bolts.
- D. Examine metal Work after installation, painting and glazing have been completed as required. Adjust, repair and replace metalwork as required. Clean and retouch exposed surfaces of metal Work where necessary to bring the color of the finished surfaces reasonably uniform and free from scratches and other surface blemishes.

END OF SECTION

SECTION 05 53 00

METAL FLOOR GRATING AND PLATE

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Metal floor grating and plate, supporting angles, and appurtenances.
- B. Related Work Specified in Other Sections Includes, But is Not Limited to, the Following:
 - 1. Section 05 05 13 - Galvanizing
 - 2. Section 05 12 00 - Structural Steel
 - 3. Section 09 96 00 - High Performance Coatings

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. ASTM A 36/A36M - Specification for Carbon Structural Steel

1.3 SYSTEM DESCRIPTION

- A. Design Requirements: Fabricate grating and plate in accordance with the details shown, designed for a live load of not less than 150 pounds per square foot with deflection not exceeding 1/360 of the span.

1.4 SUBMITTALS

- A. General: Provide all submittals, including the following, as specified in Division 1.
- B. CONTRACTOR's Drawings: Submit completely detailed working drawings of all grating and plate for approval before any fabrication is started.
- C. Literature: Submit manufacturer's literature, including load, span and deflection tables for floor grating and plate.
- D. Samples: Submit samples of each type of floor grating and plate to be used.

- E. Welder Certification: Submit reports that confirm that all welders have been certified within the last year by a nationally recognized laboratory, to make groove and filet welds in all positions.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle all products and materials as specified in Division 1 (and as follows:)
 - 1. Dumping or dropping from trucks is not permitted. Return all bent or damaged sections to the fabrication shop and supply new pieces.
 - 2. Store and cover materials on skids or platforms, above ground in areas set aside for such use.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Use grating or plate of the same type which is the product of the same manufacturer.
 - 1. IKG Border
 - 2. Klemp Corporation
 - 3. Approved equal

2.2 MATERIALS

- A. Metal Grating and Plate: Provide metal grating and plate as shown and specified.
 - 1. Construct aluminum grating and plate of Aluminum Alloy 6061-T6, and supporting angles and appurtenances of Aluminum Alloy 6063-T6.
 - 2. Construct steel grating and plate of ASTM A 36 steel along with appurtenances. All steel shall be galvanized in accordance with Section 05 05 13.
 - 3. Supply supporting angles and appurtenances for steel grating and plate of galvanized, ASTM A 36 steel in accordance with Section 05 12 00.
- B. Metal Plate: Provide plate of the raised lug, diamond pattern type. Use a minimum thickness of 3/8-inch and reinforce as shown or required.

2.3 FABRICATION

- A. General: Accurately fabricate grating and plate free from warps, twists or other defects which affect appearance and serviceability.
1. Provide grating and plate having a permanent, nonskid pattern on the upper surface.
 2. Provide holes where required for passage of pipes, gate stems, or for other purposes. Reinforce all openings to preserve strength.
 3. Design grating and plate as individual sections and install for ready removal and replacement. Provide clearance at the ends or between sections of grating of a maximum of 1/4-inch.
- B. Parallel Bar Grating:
1. Use grating of the pressure locked parallel bar type.
 2. Use grating comprised of parallel bearing bars, at least 3/16- inch thick and 1-1/2 inches deep, with clear spacing of not more than 1-inch, tied securely with transverse bars not less than 1/8-inch thick and 5/8-inch in depth, spaced not more than 2 inches on center or other approved equivalent rectangular pattern fabricated from separate straight bearing bars and tying cross members.
 3. At the ends of grating, provide transverse bars not more than 1-1/4 inches from the ends of the bearing bars.
 4. Band openings in, and ends of all grating with bars 3/16-inch thick. At the ends of all grating keep the bottom of the band 1/4-inch above the bottom of the grating. Elsewhere provide the bands the same depth as the grating. Weld bands to all intersecting members.

PART 3 EXECUTION

3.1 PREPARATION

- A. Field Check: Check all dimensions in the field after all concrete, piping, and equipment are in place to determine the exact dimensions and locations of openings and cutouts. Verify that opening sizes and dimensional tolerances are acceptable and that supports and anchors are correctly positioned.

3.2 ERECTION

- A. Grating: Neatly fit adjacent units together and form their transverse members into an uninterrupted straight line. Provide fasteners for each section of grating, anchoring the grating to the supporting angles. Do not extend fasteners above the top plane of the grating.
- B. Plate: Provide fasteners or hinges, as required and neatly fit adjacent units together. Do not extend fasteners above the top plane of the plate.
- C. Supports: Erect grating in place on supporting angles, as shown, and provide a full and uniform bearing on the supports, precluding any rocking movement. Fit adjacent and transverse units to neatly form an uninterrupted straight line. Do not use wedges or similar shimming devices. Lock securely in place with approved clamps or devices all individual grating panels and plate.

3.3 PAINTING

- A. Aluminum Surfaces: Paint aluminum surfaces in which will be in contact with concrete as specified in Section 09 96 00.

END OF SECTION

SECTION 09 96 00

HIGH PERFORMANCE COATINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Preparation of surfaces, shop painting of items furnished, field painting of structures, piping, conduit, and equipment.

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
1. SSPC - Steel Structures Painting Manual
 2. SSPC SP 1 - Solvent Cleaning
 3. SSPC SP 3 - Power Tool Cleaning
 4. SSPC SP 6 - Commercial Blast Cleaning
 5. SSPC SP 10 - Near-White Blast Cleaning
 6. FS-TT-V-51F - Asphalt Varnish
 7. NSF 61 - Drinking Water System Components - Health Effects

1.3 SUBMITTALS

- A. Provide all submittals, including the following, as specified in Division 1.
1. Submit manufacturer's standard color chart for color selection.
 2. Where equipment is customarily shipped with a standard finish, submit samples of the proposed color and finish for approval prior to shipping.
 3. Furnish affidavits from the manufacturer certifying that materials furnished conform to the requirements specified and that paint products have been checked for compatibility.
 4. Submit a supplementary schedule of paint products with mil thickness, and solids by volume, including all paint applied in the shop and in the field. Provide a schedule that is in accordance with the recommendations of the paint manufacturer.

5. Furnish affidavits from the manufacturer certifying that coatings in immersion service contain no water soluble solvents or corrosion inhibitive (active) pigments with slight water solubility.

1.4 PAINTING REQUIREMENTS

- A. Shop Primed and Finished Items: Furnish the following items with the manufacturer's standard prime and finish coats applied in the shop: pumps, motors, gears, gear housings, conveyors, temperature control and instrument panels, motor control centers.
- B. Shop Primed and Field Painted Items: Furnish the following items shop primed and field painted: pipelines, hangers and supports, valves, valve operators and stands.
- C. Field Primed and Finished Items: Field prime and finish, where exposed to view, all items not shop primed or shop finished. This Work generally includes, but is not limited to, the following: exterior PVC piping valves, and fittings.
- D. Unpainted Items: Do not paint the following items, unless otherwise specified: interior structural steel not exposed to view, name and identification plates, floor gratings, stainless steel, wood, cast-iron piping installed underground, steel to be embedded or in contact with cast-in-place concrete.

1.5 DELIVERY, STORAGE AND HANDLING

- A. General: Deliver, store and handle all products and materials as specified in Division 1 (and as follows:)
- B. Delivery and Storage: Deliver and store paint at the site from the approved manufacturer only.
- C. Packaging and Labeling: Prepare, pack and label paints, stains, varnish or ingredients of paints to be used on the job. Deliver all material to the site in original unbroken containers.
- D. Storage: Store the painting materials at the site in accordance with applicable codes and regulations and in accordance with manufacturer's instructions. Keep the storage space clean at all times. Take every precaution to eliminate fire hazards.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted.
 1. Paint - General:
 - a. Tnemec Co., Inc.

2.2 MATERIALS

- A. General: Furnish paint and other materials of the type and quality of the manufacturer on which the painting schedule specified herein is based.
1. Provide compatible shop and field coats.
 2. Provide all coats of paint for any particular surface from the same manufacturer.
 3. Provide coatings, including paints, primers and materials in contact with potable water listed by NSF International under Standard 61 for materials and products in contact with potable water.
 4. Provide paint of approved color as selected from the manufacturer's standard range of colors.
- B. Paint Schedule: Provide all painting in accordance with the following schedule with the number of coats not less than the number shown on the schedule.

MATERIAL PAINTING SCHEDULE				
Class of Work	Primer	Field Coats		
	Shop Coat	1st	2nd	3rd
Nonferrous Metal and Galvanized Steel:				
Interior		A	A	A
Exterior		A	A	C
Steel and Iron:				
Interior	B	B*	A	A
Interior not Exposed to View	B	B*		
Exterior	B	B*	A	C
Submerged, Buried or Constantly Wetted	B	B*	D	D
Concealed in Masonry	B	B*		
Air Main Pipe,				
Submerged, Interior and Buried	E	E*	A	A
Exposed to Sunlight	E	E*	A	C
Exposed to Potable Water	B	B*	B	F
Wrapped in Insulation	B	B*		
Exterior, Exposed to Process				
Wetting and Drying	B	B*	D	D
Concrete Masonry:				
Interior		G	D	D
Concrete:				
Interior		D	D	

MATERIAL PAINTING SCHEDULE

Class of Work	Primer Shop Coat	Field Coats		
		1st	2nd	3rd
Pipe and Duct Insulation: Exposed		I	I	
PVC: Interior	A	A		
Exterior	A	A	C	

*Touch-up bare metal with primer

- C. Schedule of Paints: Alphabetical designations in the following list are given solely for the purpose of indicating the type and quality of materials desired. Equivalent material from other approved manufacturers may be submitted for approval.

<u>Symbol</u>	<u>Product Name and Number</u>	<u>Volume Solids %</u>	<u>Dry Film Thickness Mils Per Coat</u>
A	Tnemec Series 69 Hi-Build Epoxoline II	69	2.0-3.0
B	Tnemec Series 140-Pota-Pox Plus	69	4.0-6.0
C	Tnemec Series 74 Endura-Shield	68	2.0-3.0
D	Tnemec Series 69 Hi-Build Epoxoline II	69	4.0-5.0
E	Tnemec Series 90-97 Tneme-Zinc	63	2.5-3.5
F	Tnemec Series 140-WHO2 Tank White Pota-Pox Plus	69	4.0-6.0
G	Tnemec Series 130 Envirofill Masonry Filler	68	
I	Tnemec Series 6 (flat) 7 (gloss) Tneme-Cryl	43	2.0-3.0
J	Tnemec Series 180 Tneme-Crete	42	4.0-8.0

PART 3 EXECUTION

3.1 PREPARATION

A. Inspection: Prior to surface preparation perform the following:

1. Verify that surface substrate conditions are ready to receive Work as instructed by the product manufacturer.
2. Examine specifications for all Work and become thoroughly familiar with all provisions regarding painting.

B. Surface Preparation: After inspection and prior to painting, perform the following:

1. Inspect all Work prior to application of any paint or finishing material.
2. Prepare the surface to be painted in accordance with the instructions of the manufacturer.
3. Brush and wash concrete surfaces and concrete masonry. Remove all loose dirt, free lime, form oil, curing compounds and other foreign matter by approved methods. Patch concrete surfaces requiring repair and spackle and repair surfaces to receive paint. Acid etch concrete surfaces to be painted as recommended by the manufacturer of the coating to be applied, to produce a slightly granular surface required for adherence of the paint to the concrete unless otherwise indicated. Determine that concrete and concrete masonry is thoroughly dry prior to painting.
4. Thoroughly clean surfaces to be given protective coatings.
5. Refinish shop-coated equipment that has scratches and abrasions.
6. Do not begin field painting prior to approval of the surface preparation.
7. Thoroughly clean wood surfaces to remove all foreign matter. Properly fill and smooth cracks and nail holes. Finish exposed wood with sandpaper to a fine finish and wipe clean of dust.
8. Prepare and clean all surfaces prior to painting, as specified and required. Verify that surfaces are dry before any paint is applied. Perform special surface preparation work as directed by the manufacturer of the paint specified to be applied to the surface.
9. Clean the surface of structural steel, exterior and interior dry surfaces of water storage tanks and steel encased in concrete, masonry or spray-on fireproofing by removing all rust, mill scale, oil, grease or dirt in accordance with Steel Structures Painting Council SSPC-SP6.
10. Prior to painting steel and interior wet surfaces of water storage tanks, grind smooth all welds, beads, blisters or protuberances, other than identification markings and remove

other imperfections. Remove all rust, mill scale, oil, grease and dirt by sandblasting in accordance with Steel Structures Painting Council Near White SSPC-SP-10 unless otherwise indicated.

11. Prior to painting metals other than steel, grind smooth all welds, beads, blisters of protuberances, other than identification markings, and remove other imperfections. Solvent clean all nonferrous metals, galvanized steel and stainless steel whether shop primed or field primed, in accordance with SSPC-SP-1 prior to the application of the primer.
12. Prime cleaned metal the same day immediately after sandblasting to prevent rusting.
13. Remove all adhering debris on pipe and duct covering and smooth out indentations or unsightly spots and brush clean.
14. Remove all bituminous or asphaltic coating from cast iron drain and soil pipe prior to painting.
15. Prepare gypsum wallboard as recommended by the wallboard manufacturer.
16. Remove all adhering debris on PVC, roughen surface with sandpaper and brush clean.

3.2 INSTALLATION

- A. General: Install all painting and coatings in accordance with the manufacturer's recommendations and approved shop drawings and as specified in Division 1.
 1. Apply products in accordance with the manufacturer's instructions.
 2. Apply paint that is at a minimum temperature of 60 degrees F.
 3. Paint or finish all surfaces that are left unfinished by the requirements of other specifications and specified herein to be painted or finished.
 4. Paint surfaces in accordance with the material painting schedule included in this Section.
 5. Completely cover all surfaces to be painted. Cover by additional coats when color on undercoats shows through the final coat of paint, until paint is of uniform color and appearance and coverage is complete.
 6. Do not apply exterior coatings during rain, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
 7. Provide sufficient temporary ventilation during painting operations in enclosed areas to remove moisture and solvents, and to keep the atmosphere safe from harmful or dangerous fumes and dust levels for personnel.

- B. Touch-Up Shop-Primed and Finished Items: Touch-up all damaged portions and imperfections in shop-primed and finished items. Use the same paint as used for the shop prime and finish. Prepare the surface prior to touch-up by wire brushing and sanding to remove rust, scale and loose paint.
- C. Aluminum and Incompatible Surfaces: Where aluminum surfaces come in contact with incompatible metals, lime, mortar, concrete or other masonry materials, apply one field coat of Tnemec Series 69 Hi-Build Epoxoline II, or approved equal, or two coats of asphalt varnish conforming to FS-TT-V-51F.
- D. Steel Pipe: Applicable to insulated and uninsulated steel pipe. Immediately after installation, prime pipe not available with a shop coat.
- E. Shop Prime: Apply one shop coat of primer, before exposure to weather, to all structural steel, wrought metals, metal castings, mechanical equipment and electrical equipment, and all piping specified to be field painted before exposure to the weather. Apply this shop coat as the first coat as specified in the Material Painting Schedule.
- F. Field Painting: Perform field painting at the job site as follows:
 - 1. Mix all paints and similar materials in galvanized iron pans or pails or other approved containers of adequate capacity.
 - 2. Mix all paint thoroughly before being taken from the containers. Keep mixed while painting. Apply all ready-mixed paint exactly as received from the manufacturer without addition of any kind of drier or thinner, except as specified, to mix colors to conform to approved color schedule. Tint successive coats of paint to make various coats easily distinguishable. Tint undercoats of paint to the approximate shade of the final coat of paint.
 - 3. Use only skilled painters on the Work, and employ specialists where required. Apply paint by brush or roller in accordance with the manufacturer's recommendation. Spray painting is not allowed.
 - 4. Paint top and bottom edges of doors. Thoroughly and uniformly sand undercoats on hollow metal Work with No. 00 sandpaper or equal abrasive to remove all surface defects and provide a smooth, even surface. Do not allow brush marks or other irregularities on finished surfaces.
 - 5. Perform painting as a continuous and orderly operation to facilitate adequate inspection. Prime coat and paint materials subject to weathering or corrosion before erection. Perform all paint application methods in accordance with the instructions of the paint manufacturer and as approved. Do not field paint equipment, such as electrical control cabinets, motors, unit heaters and similar items which are shipped with a final baked enamel finish and having received prior approval unless the finish is damaged in transit or installation. Paint access panels, pipe, pipe covering, ducts and other building appurtenances built into adjoining walls the same color as adjacent walls, unless color

coding applies. Remove or protect hardware and accessories, fixtures and similar items placed prior to painting during painting and replace them upon completion of painting.

6. Paint piping up to and including the flanges attached to mechanical equipment. Paint electrical conduit up to and including the flexible conduit connected to equipment.
7. Paint all wall surfaces which will be concealed by equipment before equipment installation.
8. Fully protect areas under and adjacent to painted Work at all times and promptly remove dripped or spattered paint.
9. Repair refinish and repaint any adjacent surfaces that have been damaged or discolored.
10. Do not paint when the air or surface temperature is below that recommended by the manufacturer, or in dust-laden air, or until moisture on the surface has completely disappeared. If necessary, provide sufficient heating and ventilation to keep the atmosphere and all surfaces to be painted dry and warm until each coat of paint has hardened.
11. Remove any painting found defective. Touch-up and provide remedial painting as directed and as required until completion and acceptance of final Work.

3.3 CLEANING AND PAINTING

- A. Touch up and restore any finish damaged. Remove paint or other finishes spilled, splashed or splattered from all surfaces taking care not to mar any surface or item being cleaned.

END OF SECTION

SECTION 10 01 00

PREFABRICATED MODULAR BUILDING

PART 1 GENERAL

1.01. SUMMARY

- A. One prefabricated building system shall be supplied and installed for this project. The prefabricated building systems shall be factory assembled, pre-tested, shipped to the site.

1.02. GENERAL.

- A. The building shall be manufactured by Concrete Modular Systems, Inc. (727-945-1864) or approved equal. The building design and construction shall conform to all applicable federal, state, and local building codes and standards including the latest Florida Building Code, D1.1 Structural Welding Code, ACI-318-05, ACI-318R-05, and AISC 360-05. Electrical shall comply with NFPA 70.
- B. The building shall be guaranteed to be completely weather-tight under all weather conditions for a period equal to or greater than the correction period. Leaks which occur during the period, whether through roofs, walls, doors, accessory equipment, or materials shall be repaired to the satisfaction of the ENGINEER at no additional cost.
- C. All openings and penetrations shall be verified by CONTRACTOR prior to casting.

1.03. SUBMITTALS

- A. Complete shop drawings for the building shall be furnished showing sizes, and projections (if required); details of sidewall, end wall, and roof framing; transverse cross-sections; locations of all openings; details of louver; flashing details; and erection instructions. Color samples of manufacturer's standard finishes shall be submitted.
- B. Complete shop drawings for the FRP door and a complete hardware schedule shall be submitted, including elevation of the door, details of construction, assembly and erection details, profiles and thickness of materials, anchors, reinforcements, hardware coordination, and finish. Shop drawings shall include the manufacturer's installation manual, indicating standard recommendations and details of erection. The hardware schedule shall indicate each item of hardware required, manufacturer's name, manufacturer's number or symbol, and finish.
- C. A letter of certification signed and sealed by a Professional Engineer registered in the state of Florida shall be submitted for the structural framing, anchorage and covering panels of the building system.

PART 2 – PRODUCTS

2.01. STRUCTURAL DESIGN

- A. The applicable building code is the 2014 Florida Building Code 5th Edition with latest updates. The building shall be designed for the criteria shown on structural drawings.

2.02. BUILDING CONSTRUCTION.

- A. The building shall be constructed of solid, one-piece concrete panels. Panels shall be bolted or welded together and joints caulked inside and out to make the building weatherproof. The wall panels shall be minimum 4" thick solid panels of concrete with primary structural reinforcement of steel bars and welded wire fabric.
- B. The interior finish on the walls of the building shall be 3/4" plywood panels with plastic laminate facing suitable for equipment mounting; metal wall studs; wall panels that are continuous from base to leave with no horizontal joints; and insulated to R-14. Wall panel assembly shall develop strength to resist the design wind loads. The exterior finish on the walls of the building shall be "Split Face Block Finish"; paint color to be selected by the CITY.
- C. The ceiling for the building shall be 5/8" gypsum and insulated to R-21.
- D. All welding shall be in accordance with AWS D1.1 Structural Welding Code.
- E. All necessary erection hardware, fasteners, trim, flashing, closures and other accessories necessary for a complete building shall be furnished.
- F. The building roof shall be a minimum 4" thick concrete panels which shall extend 2" over the walls to act as a drip edge. The roof shall contain primary reinforcement of steel bars and welded wire fabric as well as secondary reinforcement of polypropylene fibers.
- G. Caulking shall be provided at all bases, corners, eaves, doors, and other openings to provide a completely weather-tight installation. Exterior flashing shall be finished in a complementing color as the section to which it is attached.

2.03. DOOR MATERIALS.

- A. Materials used in the manufacture and installation of FRP doors and frames shall be as follows:

Doors	Fiberglass reinforced plastic face sheets, 0.125 inch minimum thickness, with manufacturer's standard 10 year warranty.
Internal Reinforcing	Manufacturer's standard
Urethane Core	1 1/2" thick rigid block laminated to exterior panels.

Balsa Wood Core	1 ½” thick rigid end grain balsa wood bonded to exterior panels.
Frame	Solid, all fiberglass frame with molded-in color.
Resin	Premium grade polyester for extreme corrosion resistance, minimum 40 percent fiberglass by weight.
Anchoring Devices	Stainless steel.
Expansion Anchors	As per manufacturer’s instructions.

2.04. DOOR CONSTRUCTION

- A. Doors shall be rigid, neat in appearance and free from defects. All welded joints on exposed surfaces shall be dressed smooth so that they are invisible after finishing. Door frames and framing members shall be erected plumb and in accordance with the manufacturer’s recommendations and standard installation manuals, subject to the following modifications.
- B. Framing members shall be anchored to steel by machine screws. Anchors for head, jamb, and sill members shall be spaced not more than 24 inches apart. Weather-stripping and other accessories shall be secured with countersunk machine screws.
- C. Hardware shall be carefully and properly installed, doors hung, and each item of hardware lubricated and adjusted for perfect operation. Doors and frames shall be protected during fabrication, shipment, and erection of the building to prevent damage to materials or finished work.
- D. Doors shall be Fiberglass Reinforced Plastic (FRP) type with polyurethane core. FRP doors with rigid block polyurethane core shall be equivalent to Corrim Company "Fiberglass Doors", Chem-Pruf, or equivalent product. Doors and hardware shall comply with the latest Florida Product Approval system requirements.
- E. The building shall be equipped with one (1) 3-foot wide by 7-foot tall passage door.
- F. Shop Finish: A color impregnated gel coat finish of 25 mils minimum thickness shall be applied to all door and frame surfaces. The finish surfaces shall be smooth and free from irregularities. Color will be selected from the manufacturer’s standard color chart. A minimum of 8 colors shall be available for selection.
- G. Frames: Frames for doors shall be formed fiberglass reinforced plastic shapes with molded-in color shall be a minimum 3/16” in thickness. Frame face shall be sized according to the actual size and width of the opening provided. Resins for frames shall match those used for doors.

- H. Workmanship: The finish work shall be strong and rigid, neat in appearance, and free from defects. Molded members shall be fabricated straight and true, with corner joints well formed, and with fastenings concealed where practicable. All joints on exposed surfaces shall be smooth so they are invisible after finishing.
- I. Joints: Joints for frames shall be mitered or butted and continuously sealed on the reverse side to produce rigid joints which are invisible on the face of the frame. Frame bottoms shall be held rigidly in position by spreader bars to maintain proper alignment during shipment and erection. Fiberglass reinforced plastic frames shall have concealed reinforcements for hardware according to manufacturer's standards.
- J. Sizes and Clearances: Doors shall be 1-3/4 inches thick, full flush type, of the sizes and design indicated. Clearances for doors shall be 1/8 inch at heads and jambs, 1/4" at meeting stiles of pair doors, and 3/4" at bottom unless otherwise indicated or specified.
- K. Construction: Doors shall be constructed with at least 0.125 inch fiberglass reinforced plastic outer sheets. Side edges of doors shall be flush and closed watertight. All seams shall be continuously sealed. Doors shall be prepared at the factory for hardware as specified. Door edges shall be beveled or rounded.
 - 1. Internally reinforced doors shall have solid polymer reinforcement at all joints and all hardware locations.
 - 2. Solid polyurethane core or balsa wood core shall be laminated to the exterior panels. Balsa wood core shall have a minimum density of 8.5 lbs per cubic foot.
 - 3. Out-swinging exterior doors shall be finish flush at the top, with all seams and joints closed watertight as specified for side edges.
- L. Installation: Frames shall be set in position, plumbed, aligned and braced securely until permanent anchors are set or as required by manufacturer.
- M. Frames: Frames for doors and transoms shall be formed of FRP to the sizes and shapes required.
- N. Mullions and Transom Bars. Mullions and transom bars shall be reinforced construction, connecting neatly with heads and jambs and secured in place by concealed joints. Removable transom bars shall be connected to frames at jambs by concealed fasteners. Cutouts or removable plates shall be provided for access to fasteners.
- O. CONTRACTOR shall verify equipment fits through doors provided.
- P. Door colors shall be as selected by the CITY.

2.05. DOOR HARDWARE

- A. Doors shall be mortised, reinforced, drilled, and tapped for mortised hardware. Reinforcing units shall be provided for locksets. Reinforcing plates shall be provided for mortised and surface-applied hardware according to manufacturer's standards.
- B. Hinges shall be heavy duty with a security stud. Unless otherwise required, a security stud will be supplied.
- C. Locksets shall match CITY standard. Coordinate with CITY for cylinder type, keying, and key code.
- D. Hardware shall be furnished and installed by the door manufacturer in accordance with the schedule listed herein. Hardware shall be furnished complete with machine screws, bolts, and other attachments as required, finished to match the hardware.
- E. Hardware shall be stainless steel.
- F. The location of hardware items shall be in accordance with DHI "Recommended Locations for Builders' Hardware". Two keys shall be furnished with the lock.

G. The following hardware shall be provided for the Building:

Item	Quantity	Remarks
Butt Hinges	3	Stanley, FBB 199-630 4-1/2" x 4-1/2" NRP, or equal
Lockset	1	M9-953-L-LT-H-630-TX Dorma or equal.
Cylinder	1	best lock core meeting CITY standards
Closer	1	LCN 4041 HAL-CUSH Hold Open, or equal
Latch Guard	1	Ives, LG1-630
Threshold, cast abrasive	1	Wooster, 115 Alumogrit 4" x 1/2", or equal
Drip Cap, Frame	1	Reese, R199-A, or equal
Weather Stripping, Head and Jambs	1 Set	Reese D70S, or equal
Weather Stripping, Sill	1	Reese 323, or equal
Exit hardware	1	LBR Cal-royal 9800 series with vertical rod or equal

2.06. PAINTING AND FINISHES

- A. All surfaces to receive paint shall be cleaned of any grease, dust, or dirt. Pre-finished surfaces shall be masked or otherwise protected to avoid damage from spilled paint, overspray, or spatter.
- B. Factory finished surfaces which have become damaged during shipping, assembly, or erection shall be touchup painted with materials supplied by the building manufacturer. No other finish will be accepted. All touchup painting shall produce a final finish satisfactory to the ENGINEER.
- C. Finish of the exterior surfaces of the wall panels shall be split face block (color selected by CITY). Finish of metal surfaces shall be an epoxy or marine-grade enamel. Colors of panels, trim, and flashing shall be complimentary and match the existing adjacent building(s) and approved by the ENGINEER.
- D. Refer to Section 09 96 00 High Performance Coatings.

2.07. ELECTRICAL

- A. The applicable electrical code is the latest edition adopted by the state of Florida, National Electrical Code. All electrical components are to be UL labeled.
- B. Building Power. The building power shall be provided by the CONTRACTOR in close coordination with the building manufacturer. The building manufacturer shall provide a panelboard, interior and exterior led lighting fixtures, interior and exterior associated conduit, wiring, receptacles, light switches and occupancy sensor. See the electrical drawings and specifications for material requirements, details and additional requirements.
- C. Additional electrical equipment and panels will be installed on site within this building as shown on the electrical drawings. Coordinate and provide openings in the floor suitable for the installation of the conduits as installed through the foundation slab.

2.08. HVAC

- A. Provide the building with a wall-mounted air conditioning unit with 1 Ton cooling capacity.
 - 1. Casing: Slope top with Galvanized 20 Gauge, Zinc coated, steel cabinet with polyurethane primer and baked textured enamel finish capable of withstanding 1000 hours of salt spray tests per ASTM B117-03.
 - 2. Fans: Twins blowers
 - 3. Compressor: R-410 refrigerant.
 - 4. Condenser and Evaporator Coils: Aluminum finned copper coils.
 - 5. Automatic Condensate Disposal System
 - 6. Filter: Provide washable filter mounted in a retaining frame.
 - 7. Controls: Provide unit mounted safety and timing controls for compressor and evaporator functions. Provide wall mounted adjustable thermostat for temperature control. Economizer shall be enthalpy based.
 - 8. Provide air conditioning unit manufactured by Bard Manufacturing Company, Inc., Model W12A2-K0ZEWXX2X, or approved equal, with corrosion coating on condenser. 120V/60Hz/single phase with economizer.

PART 3 - EXECUTION

- A. The building shall be assembled in accordance with the building manufacturer's instructions.
- B. All members shall be carefully leveled. Sill angles and door frames shall be caulked in place and sealed.

END OF SECTION

SECTION 26 05 00

ELECTRICAL - GENERAL PROVISIONS

PART 1 -- GENERAL

1.01 SCOPE OF WORK

- A. Furnish all labor, materials, equipment and incidentals required for a complete electrical system as hereinafter specified and shown on the Drawings.
- B. The work, apparatus and materials which shall be furnished under these Specifications and accompanying Drawings shall include all items listed hereinafter and/or shown on the Drawings. Certain equipment will be furnished as specified in other sections of these Specifications which will require wiring thereto and/or complete installation as indicated. All materials necessary for the complete installation shall be furnished and installed by the CONTRACTOR to provide complete power, lighting, communication systems, instrumentation, wiring and control systems as indicated on the Drawings and/or as specified herein.
- C. The CONTRACTOR shall furnish and install the necessary switchgear, cables, transformers, motor control centers, generators, protective devices, conductors, exterior electrical system, etc., to serve motor loads, lighting loads and miscellaneous electrical loads as indicated on the Drawings and/or as specified hereinafter.
- D. The work shall include complete testing of all equipment and wiring at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment. All workmanship shall be of the highest quality; sub-standard work will be rejected.
- E. All work outlined in Division 26 specifications shall be the responsibility of the CONTRACTOR. It is the intent of the Contract Documents that the CONTRACTOR will have the ultimate responsibility for the coordination of Division 26 systems.
- F. Mount and wire speed indicators and process instruments furnished under other Divisions of these Specifications.
- G. Mount and wire isolation transformers, operator's stations, and power conversion equipment for all variable speed drive systems furnished under other Divisions of these specifications.
- H. Make all field connections to process instrument panels and other control panels furnished under other Divisions of these Specifications.
- I. For process instrumentation, furnish and install all conduit, wire and interconnections between primary elements, transmitters, local indicators and receivers.
- J. Furnish necessary devices and make connections to provide power to drinking fountains and other equipment. This will require appropriate receptacles in some cases and direct wiring in

other cases, depending upon equipment furnished.

- K. Install and wire all thermostats, aquastats and other devices furnished under other Divisions of this Specification directly controlling heating equipment or fan motors.
- L. Mount and wire electric heaters furnished under other Divisions of this Specification.
- M. Wire all ventilation equipment furnished under other Divisions of this Specification.
- N. Each bidder or his authorized representatives shall, before preparing his proposal, visit all areas of the site in which work under this division is to be performed and inspect carefully the present installation. The submission of the proposal by this bidder shall be considered evidence that he or his representative has visited the proposed site and noted the locations and conditions under which the work will be performed and that he takes full responsibility for a complete knowledge of all factors governing his work.
- O. Several areas of construction under this contract must be coordinated with the CITY and accomplished in a logical order to maintain the operations and to allow construction to be completed within the time allowed by Contract Documents. CONTRACTOR will also coordinate his/her activities with the other CONTRACTORS, if any, to allow orderly and timely completion of all the work.
- P. Various equipment removal and connections at the facility may require temporary or partial power shutdowns. Make every effort necessary to minimize the shutdown time and coordinate with ENGINEER prior to attempting any such power interruptions. At no time shall all power to the facilities be out (full shutdown). Furthermore, provide any corrective measure or temporary facilities necessary to perform the work at no additional cost to the CITY and without interrupting operations. All power shutdowns and switchovers shall be requested in writing to the ENGINEER for approval. No shutdown shall compromise operations. Partial shutdowns shall be limited to the constraints specified herein and as indicated on the drawings. When required by the CITY, the CONTRACTOR shall restore power and operations during any shutdown in order to maintain operations
- Q. When the work requires a portion of a facility to be taken out of operation, temporarily or permanently, notify the ENGINEER and CITY a minimum of 14 calendar days in advance. Mandatory shutdown and switchover meetings between the CONTRACTOR, CITY and ENGINEER shall be held to review each outage request prior to approval of any outage.
- R. During shutdowns, switchovers, testing, start-up, etc., the CONTRACTOR shall have the manpower, equipment and manufacturer's representatives required to make any necessary adjustments, repairs, restoration of power, training, etc. in order to keep the facility operational as specified herein.
- S. All power interruptions shall be at the CITY's convenience. Each interruption shall have prior approval.
- T. It is the intent of these Specifications that the electrical system shall be suitable in every way for the service required. All material and all work which may be reasonably implied as being incidental to the work of this Section shall be furnished at no extra cost.

1.02 SERVICE & METERING

- A. Permanent electrical power is existing at the voltages as indicated on the drawings.

1.03 CODES, INSPECTIONS & FEES

- A. All material and installation shall be in accordance with the latest edition of the National Electrical Code and all applicable national, local and state codes.
- B. Pay all fees required for permits and inspections including any charges associated with the service modifications.

1.04 TESTS

- A. Test all systems and repair or replace all defective work. Make all necessary adjustments to the systems and instruct the CITY's personnel in the proper operation of the systems.
- B. The following minimum tests and checks shall be made prior to the energizing of electrical equipment. Test shall be by an independent NETA certified testing firm, and a certified test report shall be submitted stating that the equipment meets and operates in accordance with the Manufacturer's and job specifications, and that equipment and installation conforms to all applicable Standards and Specifications:
 - 1. Testing and setting of protective relays for calibration and proper operation.
 - 2. Mechanical inspection of all circuit breakers 100 amps and larger to assure proper operation.
 - 3. Motors: Megger to ground each motor winding. Record date, motor temperature, terminal, reading and operator and have CITY representative sign off on each reading.
 - 4. Conductors: Megger to ground prior to termination all 600 volt conductors not used for service conductors. Record the date, conductor, reading and operator and have CITY representative sign off on each reading.
 - 5. Service Conductors: Megger to ground prior to termination in the presence of the ENGINEER or his representative all 600 volt service conductors. Record date, conductor, reading, operator, and have the CITY representative sign off on each reading.
 - 6. Power Panel: After installing, with circuit breakers closed, but prior to terminating any conductors or bus to the motor control center, megger each phase to phase and phase to ground. Record the date, test (i.e. A/B or A/G), reading and operator and have CITY representative sign off on each reading.
 - 7. Connections & Terminations:
 - a. Power Panel: Torque to Manufacturer's values in the presence of the ENGINEER or his representative. Record the date, conductor, torque, operator

and have the ENGINEER sign off on each reading.

8. Data Base: After equipment suppliers test, calibrations, and inspection, megger all circuits leaving all switchgear and motor control centers. Record the date, conductor, circuit condition (i.e. load connected or unconnected), reading and operator and have CITY representative sign off on each reading.
9. Hot Spot Testing: Perform infrared hot spot inspection of the Power Panel and associated equipment as soon as determined by the ENGINEER that representative loads are present. Record the date, gear conditions found, operator and have the CITY's representative who must be present for the inspection sign off in each instance.
10. Miscellaneous:
 - a. Meggering must be done at 1000 VDC for one minute. The ground plane used must be the one established at the main source of energy for conductors, switchboards and control centers. The motor frame may be used for the ground plane for motors.
 - b. In the course of construction, it will become necessary to temporarily energize some systems for testing. Confirm that any motor has been meggered prior to connection and testing. Do not leave any motor or system unattended and energized without written authorization.
 - c. An unsuccessful test will be one in which any one of the three megger readings differs from another by more than 25%. ENGINEER shall determine if cables and/or equipment bussing shall be replaced.

1.05 RELATED WORK

- A. Completion, Start-up and Closeout: Division 01
- B. Demolition and Alterations: Division 01
- C. Structural Plans: Concrete

1.06 SLEEVES AND FORMS FOR OPERATING

- A. Provide and place all sleeves for conduits penetrating floors, walls, partitions, etc. Locate all necessary slots for electrical work and form before concrete is poured.

1.07 CUTTING AND PATCHING

- A. All cutting and patching shall be done in a thoroughly workmanlike manner.

1.08 INTERPRETATION OF DRAWINGS

- A. The Drawings are not intended to show exact locations of conduit runs.
- B. All three-phase circuits shall be run in separate conduits unless otherwise shown on the Drawings.

- C. Unless otherwise approved by the ENGINEER conduit shown exposed shall be installed exposed; conduit shown concealed shall be installed concealed.
- D. Where circuits are shown as "home-runs" all necessary fittings and boxes shall be provided for a complete raceway installation.
- E. The CONTRACTOR shall harmonize the work of the different trades so that interferences between conduits, piping, equipment, architectural and structural work will be avoided. All necessary offsets shall be furnished so as to take up a minimum space and all such offsets, fittings, etc., required to accomplish this shall be furnished and installed by the CONTRACTOR without additional expense to the CITY. In case interference develops, the CITY's authorized representative is to decide which equipment, piping, etc., must be relocated, regardless which was installed first.
- F. Verify with the ENGINEER the exact locations and mounting heights of lighting fixtures, switches and receptacles prior to installation.
- G. The locations of equipment, fixtures, outlets, and similar devices shown on the Drawings are approximate only. Exact locations shall be as approved by the ENGINEER during construction. Obtain in the field all information relevant to the placing of electrical work and in case of any interference with other work, proceed as directed by the ENGINEER and furnish all labor and materials necessary to complete the work in an approved manner.
- H. Surface mounted panel boxes, junction boxes, conduit, etc., shall be supported by spacers to provide a clearance between wall and equipment.
- I. Circuit layouts shown are not intended to show the number of fittings, or other installation details. Furnish all labor and materials necessary to install and place in satisfactory operation all power, lighting, and other electrical systems shown. Additional circuits shall be installed wherever needed to conform to the specific requirements of the equipment.
- J. The ratings of motors and other electrically operated devices together with the size shown for their branch circuit conductors and conduits are approximate only and are indicative of the probable power requirements insofar as they can determine in advance of the purchase of equipment.
- K. All connections to equipment shall be made as shown, specified, and directed and in accordance with the Manufacturer's approved shop drawings, regardless of the number of conductors shown on the Drawings.

1.09 SIZE OF EQUIPMENT

- A. Investigate each space in the building where equipment must pass to reach its final location. If necessary, the Manufacturer shall be required to ship his material in sections, sized to permit passing through such restricted areas in the building.
- B. The equipment shall be kept upright at all times. When equipment has to be tilted for ease of passage through restricted areas during transportation, the Manufacturer shall be required to brace the equipment suitably, to insure that the tilting does not impair the functional integrity of the equipment.

1.10 RECORD DRAWINGS

- A. Requirements for record drawings are specified in the Specific Provisions.

1.11 COMPONENT INTERCONNECTIONS

- A. Component equipment furnished under this Specification will not be furnished as integrated systems. CONTRACTOR shall field install and wire completely all components.
- B. CONTRACTOR shall analyze all systems components and their shop drawings, identify all terminals and prepare drawings and wiring tables necessary for component interconnection. CONTRACTOR shall provide crimp on wire numbers on both ends of all control wiring installed between all panels furnished under this contract. These numbers shall directly relate to the interconnect wiring drawing furnished by the CONTRACTOR and be reflected in the record drawings submitted.

1.12 SHOP DRAWINGS

- A. As specified under other sections shop drawings shall be submitted for approval of all materials, equipment, apparatus, and other items as required by the ENGINEER.
- B. Shop drawings shall be submitted for the following equipment:
 - 1. Automatic Transfer Switch
 - 2. Panelboards
 - 3. Disconnect Switches
 - 4. Combination Motor Starter
 - 5. Power Monitor
 - 6. Instruments
 - 7. Wire and Cable
 - 8. Conduit Drawings
 - 9. Circuit Breakers
 - 10. Motors
- C. The Manufacturer name and product designation and catalog data sheet shall be submitted for the following material:
 - 1. Conduit
 - 2. Boxes and fittings

3. Switches
 4. Lamps
 5. Control Relays
- D. Prior to submittal by the CONTRACTOR, all shop drawings shall be checked for accuracy and contract requirements. Shop drawings shall bear the date checked and shall be accompanied by a statement that the shop drawings have been examined for conformity to Specifications and Drawings. This statement shall also list all discrepancies with the Specifications and Drawings. Shop drawings not so checked and noted shall be returned.
- E. The ENGINEER's check shall be only for conformance with the design concept of the project and compliance with the Specifications and Drawings. The responsibility of, or the necessity of, furnishing materials and workmanship required by the Specifications and Drawings which may not be indicated on the shop drawings is included under the work of this Section.
- F. The responsibility for all dimensions to be confirmed and correlated at the job site and for coordination of this work with the work of all other trades is also included under the work of this Section.
- G. No material shall be ordered or shop work started until the ENGINEER's approval of shop drawings has been given.

1.13 DEMOLITION

- A. Remove all electrical work associated with equipment shown to be removed (TBR) except those portions indicated to remain or be reused. Remove all unused exposed conduit and wiring back to point of concealment. Remove unused wiring in concealed conduits back to source (or nearest point of usage). Electrical work to be removed corresponds to the associated mechanical equipment to be removed.
- B. Where electrical systems pass through the demolition areas to serve other portions of the premises, they shall remain or shall be suitably relocated and the system restored to normal operation. Coordinate outages in systems with the CITY. Where duration of proposed outage cannot be allowed by the CITY, provide temporary connections as required to maintain service.
- C. All removals and relocations of existing installations cannot be completely detailed on the Drawings. Survey the site before submitting bid proposal.
- D. Continuous service is required on all circuits and outlets affected by these changes, except where the CITY will permit outage for a specific time. Obtain CITY's written consent before removing any circuit from continuous service.
- E. Where required to disconnect and/or remove any part of an existing circuit, reconnect that circuit to reestablish service in the remaining portion.
- F. Remove exposed conduits, wireways, outlet boxes, pull boxes and hangers made obsolete by the alternations, unless specifically designated to remain. Exposed conduits shall be

removed back to point of concealment, where they shall be cut and threaded for a cap. A threaded cap shall then be installed. Conduits may be removed back to first coupling if within 3-inches of point of concealment. Cut back in traffic areas to the floor level and patch.

- G. Repair all walls to “Like new” condition and paint to match existing wall color.

1.14 DISPOSITION OF REVOKED MATERIALS AND EQUIPMENT

- A. In general, it is intended that all materials and equipment indicated to be removed and disposed of by the CONTRACTOR shall, upon removal, become the CONTRACTOR's property and shall be disposed of off the site by the CONTRACTOR, unless otherwise directed by the CITY.
- B. Reuse of wire will not be permitted. An exception is the reuse or relocation when wire is part of an existing lighting branch circuit and reuse or relocation is specifically designated and can be accomplished without removing and re-pulling the wire.
- C. All reusable and salvageable disconnect switches, starters, control devices, control panels and instruments, receptacles, light fixtures, etc. shall be sorted and returned to the CITY.
- D. All electrical equipment to be salvaged shall be removed and shall be moved by the CONTRACTOR to a location on the site for storage as directed by the CITY.

1.15 MATERIALS

- A. The materials used in all systems shall be new, unused and as hereinafter specified. All materials where not specified shall be of the very best of their respective kinds. Samples of materials or Manufacturer's specifications shall be submitted for approval as required by the ENGINEER.
- B. Materials and equipment used shall be Underwriters Laboratories, Inc. listed.
- C. Electrical equipment shall at all times during construction be adequately protected against mechanical injury or damage by water. Electrical equipment shall not be stored out-of-doors. Electrical equipment shall be stored in dry permanent shelters. If any apparatus has been damaged, such damage shall be repaired by the CONTRACTOR at his own cost and expense. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried out and put through such special tests as directed by the ENGINEER, at the expense of the CONTRACTOR, or shall be replaced by the CONTRACTOR at his own expense.

1.16 CONDUIT DRAWINGS

- A. In addition to the manufacturer's equipment shop drawings, the CONTRACTOR shall submit for the approval, electrical installation working drawings for the overall site work and the Lime House Building, new Electrical Building, and equipment slab located outside the Lime House Building containing the following:

1. Concealed and buried conduit layouts shown on floor plans drawn at not less than 1/4-inch = 1-foot-0-inch scale. The layouts shall include locations of process equipment, motor control centers, transformers, panelboards, control panels and equipment, motors, switches, motor starters, large junction or pull boxes, instruments, and any other electrical devices connected to concealed or buried conduits.
2. Plans shall be drawn with AutoCAD 2015, size 36-inch x 24-inch, and shall be presented in a neat, professional manner. Drawing files shall be provided for review.
3. Concrete floors and/or walls containing concealed conduits shall not be poured until conduit layouts are approved.
4. Site plan conduit layout drawings shall be at 1" = 20'-0".

Note: ACAD drawing files are available from the ENGINEER.

1.17 OPERATION & MAINTENANCE DATA

- A. Submit complete operations and maintenance data for all equipment furnished under this Division in accordance with Section 01 78 23. The manuals shall be prepared specifically for this installation and shall include all required cuts, Drawings, equipment lists, descriptions, complete part lists, etc. that are required to instruct operating and maintenance personnel unfamiliar with such equipment.

1.18 WARRANTY

- A. Provide a warranty for all the electrical equipment in accordance with the requirements of other sections, but in no case less than 1 year from date of CITY acceptance.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 26 05 10

MOTORS

PART 1 -- GENERAL

1.01 SCOPE OF WORK

- A. Furnish and install the motors as hereinafter specified and as called for in other sections of these Specifications.

1.02 QUALIFICATIONS

- A. Motor shall be sufficient size for the duty to be performed and shall not exceed their full-rated load when the driven equipment is operating at specified capacity. Unless otherwise noted, motors driving pumps shall not be overloaded at any head or discharge condition of the pump.

1.03 SUBMITTALS

- A. The motor manufacturer shall submit to the ENGINEER certified dimension prints showing nameplate data and outline dimensions within three weeks of the date they receive the order.
- B. Guarantee: All equipment furnished and installed under this Section shall be guaranteed against defects of workmanship, materials and improper installation for a period of one year from date of acceptance. All such equipment or parts proven defective, due to the above noted causes, shall be replaced in the machines by the CONTRACTOR at no expense to the CITY.

PART 2 -- PRODUCTS

2.01 RATING

- A. Unless otherwise noted, all motors shall be of the low voltage type. All motors 1/2 through 100 horsepower shall be rated 230 volt, 3 phase, 60 Hertz A.C., and motors below 1/2 horsepower shall be rated 115/230 volt, 1 phase, 60 Hertz A.C.

2.02 THREE PHASE INDUCTION MOTORS

- A. Motors 15 HP and larger shall have a 120-volt space heater for moisture control.
- B. Unless specifically noted in other sections of these Specifications, all motors shall have a minimum as indicated in the table below. All motors shall be "premium efficiency" type.
- C. Motors operating with variable frequency drives shall state that they are suitable for their intended applications. Motor nameplate shall read "Inverter Duty Rated".

In addition, Motors operating with Variable Frequency Drives (VFDs) shall meet the requirements of NEMA MG1 Part 31.

TABLE 26 05 10-1

Motor HP	Min. Eff.	Max. dba	Motor HP	Min. Eff.	Max. dba
1-2	84.0%	74	25-30	92.0%	92
3-5	86.5%	79	40-50	93.0%	97
7.5-10	90.2%	84	60-75	94.0%	100
15-20	91.0%	89	100	94.1%	102

- D. Motors larger than 10 Hp and operating with a VFD shall have imbedded a winding temperature switch.
- E. Motors 200 Hp and larger shall have vibration protection and a bearing temperature switch.

2.03 CONSTRUCTION

A. General:

1. All drip-proof and weather protected Type I motors shall have epoxy encapsulated windings. Totally enclosed motors shall not be encapsulated. Motors not readily available with encapsulated windings may be standard type. Motors exposed to the outside atmosphere shall be totally enclosed fan cooled (TEFC) unless otherwise specified.
2. Squirrel-cage rotors shall be made from high-grade steel laminations adequately fastened together and to the shaft, or shall be cast aluminum or bar-type construction with brazed end rings.

B. Low Voltage, Three Phase Motors:

1. Motors shall be of the squirrel-cage or wound rotor induction type as noted. Horizontal, vertical solid shaft, vertical hollow shaft, normal thrust and high thrust types shall be furnished as specified herein. All motors shall be built in accordance with current NEMA, IEEE, ANSI and AFBMA standards where applicable. Motors shall be of the type and quality described by these Specifications, fully capable of performing in accordance with manufacturer's nameplate rating, and free from defective material and workmanship.
2. Motors shall have normal or high starting torque (as required), low starting current (not to exceed 600 percent full load current), and low slip.

3. Motors shall be totally enclosed fan-cooled construction with 1.15 service factor unless otherwise noted.
4. Motors shall be suitable for operation in moist air with hydrogen sulphide gas present.
5. The output shaft shall be suitable for direct connection or belt drive as required.
6. Motors shall have a Class B nonhygroscopic insulation system. Class F insulation may be used but shall be limited to Class B temperature rise.
7. All motors shall have a final coating of chemical resistant corrosion and fungus protective epoxy fortified enamel finish sprayed over red primer over all interior and exterior surfaces. Stator bore and rotor of all motors shall be epoxy coated.
8. All fittings, bolts, nuts, and screws shall be 316 stainless steel. Bolts and nuts shall have hex heads.
9. All machine surfaces shall be coated with rust inhibitor for easy disassembly.
10. Conduit boxes shall be gasketed. Lead wires between motor frame and conduit box shall be gasketed.
11. Totally enclosed motors shall be provided with condensate drain hole and epoxy coated motor windings to protect against moisture.
12. Nameplates shall be stainless steel. Lifting lugs or "O" type bolts shall be supplied on all frames 254T and larger. Enclosures will have stainless steel screen and motors shall be protected for corrosion, fungus and insects.
13. Low voltage, three phase motors shall be manufactured by General Electric, U.S. Motors, Westinghouse or approved equal.
14. Fractional Horsepower:
 - a. Fractional horsepower motors shall be rigid, welded-steel, designed to maintain accurate alignment of motor components and provide adequate protection. End shields shall be reinforced, lightweight die-cast aluminum. Windings shall be of varnish-insulated wire with slot insulation of polyester film, baked-on bonding treatment to make the stator winding strongly resistant to heat, aging, moisture, electrical stresses and other hazards.
 - b. Motor shaft shall be made from high-grade, cold-rolled shaft steel with drive-shaft extensions carefully machined to standard NEMA dimensions for the particular drive connection.

- c. For light to moderate loading, bearings shall be quiet all-angle sleeve type with large oil reservoir that prevents leakage and permits motor operation in any position.
- d. For heavy loading, bearings shall be carefully selected precision ball bearings with extra quality, long-life grease, and large reservoir providing 10 years' normal operation without relubrication.

15. Integral Horsepower:

- a. Motor frames and end shields shall be cast iron or heavy fabricated steel of such design and proportions as to hold all motor components rigidly in proper position and provide adequate protection for the type of enclosure employed.
- b. Windings shall be adequately insulated and securely braced to resist failure due to electrical stresses and vibrations.
- c. The shaft shall be made of high-grade machine steel or steel forging of size and design adequate to withstand the load stresses normally encountered in motors of the particular rating. Bearing journals shall be ground and polished.
- d. Rotors shall be made from high-grade steel laminations adequately fastened together, and to the shaft. Rotor squirrel-cage windings may be cast-aluminum or bar-type construction with brazed end rings.
- e. Motors shall be equipped with vacuum-degassed antifriction bearings made to AFBMA Standards, and be of ample capacity for the motor rating. The bearing housing shall be large enough to hold sufficient lubricant to minimize the need for frequent lubrication, but facilities shall be provided for adding new lubricant and draining out old lubricant without motor disassembly. The bearing housing shall have long, tight, running fits or rotating seals to protect against the entrance of foreign matter into the bearings, or leakage of lubricant out of the bearing cavity.
- f. Bearings of high thrust motors will be locked for momentary upthrust of 30% downthrust. All bearings shall have a minimum B10 life rating of 100,000 hours in accordance with AFBMA life and thrust values.
- g. Vertical hollow-shaft motors will have nonreverse ratchets to prevent backspin.

C. Low Voltage, Single Phase Motors:

- 1. Single phase motors shall be split-phase and capacitor-start induction types rated for continuous horsepower at the rpm called for on the Drawings.

Motors shall be rated 115/230 volts, 60 Hertz, single phase, open drip-proof, or totally enclosed fan cooled as called for on the Drawings, with temperature rise in accordance with NEMA Standards for Class B insulation.

2. Totally enclosed fan cooled motors shall be designed for severe-duty.
3. Motors shall have corrosion and fungus protective finish on internal and external surfaces. All fittings shall have a corrosion protective plating.
4. Mechanical characteristics shall be the same as specified for polyphase fractional horsepower motors.

PART 3 -- EXECUTION

3.01 INSTALLATION

- A. Motor Connections: All motors shall be connected to the conduit system by means of a short section 18-inch minimum of flexible conduit unless otherwise indicated. For all motor connections, the CONTRACTOR shall install a grounding conductor in the conduit and terminate at the motor control center with an approved grounding clamp.

3.02 TESTS AND CHECKS

- A. The following tests shall be performed on all motors after installation but before putting motors into service.
 1. The CONTRACTOR shall megger each motor winding before energizing the motor, and, if insulation resistance is found to be low, shall notify the ENGINEER and shall not energize the motor. The following table gives minimum acceptable insulation resistance in megohms at various temperatures and for various voltages with readings being taken after one minute of megger test run.

TABLE 26 05 10-2

Degree Winding Temperature		Voltage	
F	C	115V	230V
37	3.9	60	108
50	10	32	60
68	20	13	26
86	30	5.6	11
104	45	2.4	4.5
122	50	1	2
140	60	.5	.85

2. The CONTRACTOR shall check all motors for correct clearances and alignment and for correct lubrication, and shall lubricate if required in accordance with manufacturer's instructions. The CONTRACTOR shall check direction of rotation of all motors and reverse connections if necessary.
3. All motors shall be given the standard short commercial test prior to shipment. This shall consist of no load current, check current balance, winding resistance, air gap measurement, high potential tests, and bearing inspection. Six (6) copies of the certified short commercial test shall be mailed to the ENGINEER prior to shipment.

END OF SECTION

SECTION 26 05 19

WIRES AND CABLES

PART 1 -- GENERAL

1.01 SCOPE

- A. Furnish, install and test all wire, cable, and appurtenances as shown on the Drawings and as hereinafter specified.

1.02 SUBMITTALS

- A. Installed, unapproved wire shall be removed and replaced at no additional cost to the CITY.

1.03 APPLICATIONS

- A. Wire for lighting and receptacle circuits above grade shall be type THWN/THWN.
- B. Wire for all power motor circuits and below grade lighting and receptacle circuits shall be type XHHW, stranded.
- C. Single conductor wire for control, indication and metering shall be type MTW No. 14 AWG, 19 strand or type XHHW No. 14 AWG stranded.
- D. Multi-conductor control cable shall be No. 14 AWG, 19 strand.
- E. Wire for process instrumentation or shielded control cable shall be No. 16 AWG, shielded and stranded.
- F. Ethernet shielded cable shall be Cat-6e, yellow, ABA Elite EL-TSP2404N70 or approved equal.

1.04 MINIMUM SIZES

- A. Except for control and signal leads, no conductor smaller than No. 12 AWG shall be used.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. All wires and cables shall be of annealed, 98 percent conductivity, soft drawn stranded copper conductors.

2.02 600 VOLT WIRE AND CABLE

- A. Type XHHW shall be cross-linked polyethylene (XLP); as manufactured by the Southwire Co., Collyer Insulated Wire Co., Rome Cable or approved equal.
- B. Type THWN shall be as manufactured by the Southwire Co., Collyer Insulated Wire Co., Rome Cable or approved equal.

2.03 INSTRUMENTATION AND CONTROL CABLE

- A. Process instrumentation wire shall be twisted pair, 600V, cross-linked polyethylene insulated, aluminum tape shielded, polyvinyl chloride jacketed, type "XLP" as manufactured by the American Insulated Wire Co., Eaton Corp. "Polyset," or approved equal. Multi-conductor cables shall be supplied with individually shielded twisted pairs.
- B. Multi-conductor control cable shall be stranded, 600V, cross-linked polyethylene insulated with PVC jacket, type "XLP" as manufactured by the American Insulated Wire Co., Eaton Corp. "Polyset," or approved equal.

2.04 TERMINATION AND SPLICES

- A. Power Conductors: Terminations shall be die type or set screw type pressure connectors as specified. Splices (where allowed) shall be die type compression connector and waterproof with heat shrink boot or epoxy filling.
- B. Control Conductors: Termination on saddle-type terminals shall be wired directly with a maximum of two conductors per termination. Termination on screw type terminals shall be made with a maximum of two spade connectors. Splices (where allowed) shall be made with insulated compression type connectors. Heat shrink boots shall be utilized for all outdoor splices.
- C. Instrumentation Signal Conductors (including graphic panel, alarm, low and high level signals): Terminations permitted shall be typical of control conductors. Splices are allowed at instrumentation terminal boxes only.
- D. Except where otherwise approved by the Engineer no splices will be allowed in manholes, hand-holes or other below grade located boxes.
- E. Splices shall not be made in push button control stations, control devices (i.e., pressure switches, flow switches, etc.), conduit bodies, etc.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. All conductors shall be carefully handled to avoid kinks or damage to insulation.

- B. Lubrications shall be used to facilitate wire pulling. Lubricants shall be U.L. listed for use with the insulation specified.
- C. Shielded instrumentation wire shall be installed from terminal to terminal with no splicing at any intermediate point.
- D. Shielded instrumentation wire shall be installed in rigid steel conduit and pull boxes that contain only shielded instrumentation wire. Instrumentation cables shall be separated from control cables in manholes.
- E. Shielding on instrumentation wire shall be grounded at one end only, as directed by supplier of the instrumentation equipment.
- F. Wire and cable connections to terminals and taps shall be made with compression connectors. Connections of insulated conductors shall be insulated and covered. All connections shall be made using materials and installation methods in accordance with instructions and recommendations of the manufacturer of the particular item of wire and cable. The conductivity of all completed connections shall be not less than that of the uncut conductor. The insulation resistance of all completed connections of insulated conductors shall be not less than that of the uncut conductor.
- G. All wire and cable shall be continuous and without splices between points of connection to equipment terminals, except a splice will be permitted by the ENGINEER if the length required between the points of connection exceeds the greatest standard shipping length available from the manufacturer specified or approved by the ENGINEER as the manufacturer of the particular item of wire and cable.
- H. Steel fish tapes and/or steel pulling cables shall not be used in PVC conduit runs.
- I. All control and instrumentation circuits and wiring shall be clearly and permanently numbered and labeled at each end so as to identify the location of the opposite end and the function of the circuit. Individual wires in a multi-wire circuit shall be identified with wire numbers. Labeling shall be in place prior to turnover of any equipment, system or sub-system to CITY.

3.02 TESTS

- A. All 600-volt wire insulation shall be tested with a meg-ohmmeter after installation. Tests shall be made at not less than 1,000 VDC. See 26 05 00 for additional testing requirements.
- B. All service conductors shall be tested as in paragraph A above. These tests shall be witnessed by the ENGINEER. A written report shall be submitted to the ENGINEER for review.

- END OF SECTION -

SECTION 26 05 20

FIBER OPTIC SYSTEM

PART 1 GENERAL

1.01 Scope of Work

- A. Work includes furnishing, installing, and testing, an extension of the fiber optic system as shown in the Contract Drawings and defined herein.
- B. All work covered by this specification shall be performed by a sub-contractor experienced in fiber optic cable installation and using direct employees who have satisfactorily completed installation classes.
- C. The sub-contractor shall furnish all labor, materials, equipment, programming, services and incidentals required to install the fiber optic network.
- D. The sub-contractor shall meet all of the requirements of these specifications, and, unless specifically stated otherwise, no prior acceptance of any subsystem, equipment, or materials has been made.
- E. It is the ultimate responsibility of the CONTRACTOR to furnish a complete and fully operable system that supports the required functions specified elsewhere. The CONTRACTOR is to assume full responsibility for additional costs which may result from unauthorized deviations from the specifications.
- F. Equipment found to be defective prior to system acceptance shall be replaced and installed at no additional cost to the CITY.

1.02 Submittals

- A. The shop Drawings shall fully demonstrate that the equipment and services to be furnished will comply with the provisions of these specifications and shall provide a true and complete record of the equipment as manufactured and delivered. Submittals shall be bound in separate three-ring binders, with an index and sectional dividers, with all Drawings reduced to a maximum size of 11-in by 17-in for inclusion within the binder.
- B. Submit complete, neat, orderly, and indexed submittal packages. Handwritten diagrams are not acceptable and all documentation submittals shall be made using CADD generated utilities as specified herein.
- C. Partial submittals or submittals that do not contain sufficient information for complete review or are unclear will not be reviewed and will be returned by the ENGINEER as not approved.

- D. Shop Drawings: Submit, in a single package, catalog information, descriptive literature and drawings for all components of the fiber optic system.
- E. Test Procedure: Submit the procedure proposed to be followed during cable pulls. The procedure shall include data sheets to be used to record cable pull lengths and the attenuation readings before and after installation as defined in Part 3 herein.

1.03 Final Documentation

- A. Provide a complete wiring diagram of the entire fiber optic system including:
 - 1. Termination numbers at all fiber patch panels.
 - 2. Routing details, including man-holes and/or pull boxes for each cable.
- B. Distances and installed attenuation of all fiber runs within the system.
- C. Provide a hard copy of all final documentation and also in electronic PDF format.

1.04 Standards

- A. The design, testing, assembly, and methods of installation of the fiber optic system shall conform to the National Electrical Code and to applicable state and local requirements.
- B. Any additional work needed resulting from any deviation from codes or local requirements shall be at no additional cost to the CITY.

PART 2 PRODUCTS

2.01 Network Components

- A. Provide fiber optic cable for implementing the fiber links required within the system. The cable shall meet the following requirements:
 - 1. 62.5/125 micron multimode fiber.
 - 2. Duct-bank rated.
 - 3. Number of fibers: Six (6).
 - 4. Manufacturer: Corning or approved equal.
- B. Fiber patch panels (FPP) shall be provided at all locations where fiber optic cable enters a building. FPP shall meet the following requirements:
 - 1. Outdoor locations shall be NEMA 4X 316 Stainless Steel enclosures.
 - 2. Indoor locations shall be NEMA 12 Steel enclosures.
 - 3. All enclosures shall be lockable and keyed alike.

- C. Each FPP shall include one or more housings with sufficient quantities of ST compatible adaptor panels to accommodate all fibers terminating within the FPP as defined in Table 26 05 20-1. This requirement includes all dark fibers.
- D. The housings shall be equipped with strain relief for the cables and shall have a lockable access door. Provide Siecor WCH housing with CCH connector panels or approved equal.

Table 26 05 20-1: Fiber Termination Quantities		
FPP No.	Pairs Qty	Pairs Active
1	24	5
2	6	2
Others	6	1

PART 3 EXECUTION

3.01 Installation

- A. Install materials and equipment in a workmanlike manner utilizing craftsmen skilled in the particular trade. Provide work which has a neat and finished appearance. Coordinate the work with the CITY and work of other trades to avoid conflicts, errors, delays, and unnecessary interference with operation of the existing plant during construction.
- B. All cables entering fiber patch panels shall be clearly labeled with their source location.
- C. Install all fiber cable runs in accordance with the manufacturers recommendations and including:
 - 1. Use manufacturer approved cable lubricant.
 - 2. Use a pulling winch that continuously monitors and records the pull tension.
 - 3. Note from the distance markers on the cable the exact length of each installed run and record the information.
- D. All pulling equipment and hardware that will contact the cable shall be sized to maintain the cable's minimum bend radius.
- E. Do not utilize a figure-of-eight machine for installation without prior written confirmation of compatibility from both the machine and cable manufacturer.
- F. Terminate all fibers entering the enclosure.

3.02 Testing

- A. Provide all special testing materials and equipment.

- B. Coordinate all testing with the CONTRACTOR, ENGINEER, and all affected suppliers.
- C. Measure the attenuation of the fiber optic cable prior to installation and determine the average attenuation per foot.
- D. Following installation and termination at the patch panels, measure and record the attenuation of each run and both termination ends using an Optical Time Domain Reflectometer (OTDR). Compare the attenuation per foot readings of each fiber run with those taken prior to installation. Replace any runs whose attenuation per foot reading is more than 10% higher than the pre-installation value. Remake any connections that have an attenuation of less than 2 dBm.
- E. The ENGINEER reserves the right to test or retest any and all specified functions whether or not explicitly stated in the approved test procedures. The ENGINEER's decision shall be final regarding the acceptability and completeness of all testing.

END OF SECTION

SECTION 26 05 26

GROUNDING SYSTEM

PART 1 – GENERAL

1.01 SCOPE

- A. Furnish and install a complete grounding system in strict accordance with Article 250 of the National Electrical Code and as hereinafter specified and shown on the Drawings.

1.02 RELATED WORK

- A. Wire shall be as specified under Section 26 05 19.
- B. Conduit shall be as specified under Section 26 05 33.

PART 2 -- PRODUCTS

2.01 MATERIALS

- A. Ground rods: Ground rods shall be copperclad steel 5/8-inch x 20 foot. Ground rods shall be Copperweld or be an approved equal product.

PART 3 -- EXECUTION

3.01 GENERAL

- A. Tie the new Electrical Building into the existing grounding system. Contractor shall field locate the existing grounding system.
- B. Ground bus in all panelboards shall be connected to the service entrance equipment ground bus with a No. 4/0 conductor.
- C. All steel building columns shall be bonded together and connected to the building ground grid and to the service entrance ground with a No. 4/0 copper conductor. The bond wire for all well pumps shall be connected to the well pump casing via Cadweld.
- D. Conduits stubbed-up below a motor control center shall be fitted with insulated grounding bushings and connected to the motor control center ground bus. Boxes mounted below motor control centers shall be bonded to the motor control center ground bus. The grounding wire shall, unless otherwise indicated on the drawings, be sized in accordance with Table 250-95 of the National Electrical Code, except that a minimum No. 12 AWG shall be used.
- E. Step down Transformer neutrals shall be grounded to a grounding electrode and the service entrance ground.

- F. Grounding electrodes shall be driven as required. Where rock is encountered, grounding plates may be used in lieu of grounding rods.
- G. All equipment enclosures, motor and transformer frames, conduits systems, cable armor, exposed structural steel and similar items shall be grounded.
- H. Exposed connections shall be made by means of approved grounding clamps. Exposed connections between different metals shall be sealed with No-Oxide Paint Grade A or approved equal. All buried connections shall be made by welding process equal to Cadweld.
- I. For reasons of mechanical strength, grounding conductors extending from the plant grounding grid to the ground buses of control centers and unit substations shall be No. 4/0 AWG.
- J. The plant grounding grid conductors shall be embedded in backfill material around the structures.
- K. All underground conductors shall be laid slack and where exposed to mechanical injury shall be protected by pipes or other substantial guards. If guards are iron pipe or other magnetic material, conductors shall be electrically connected to both ends of the guard.
- L. The CONTRACTOR shall exercise care to insure good ground continuity, in particular between the conduit system and equipment frames and enclosures. Where necessary, jumper wires shall be installed.

3.02 TESTS

- A. The CONTRACTOR shall test the ground resistance of the system. All test equipment shall be provided by the CONTRACTOR and approved by the Engineer. Dry season resistance of the system shall not exceed 5 ohms. If such resistance cannot be obtained with the system as shown, the CONTRACTOR shall provide additional grounding as directed by the ENGINEER, without additional payment. The CONTRACTOR shall submit all grounding system test results to the ENGINEER for review.

- END OF SECTION -

SECTION 26 05 33

RACEWAYS, BOXES AND FITTINGS

PART 1 – GENERAL

1.01 SCOPE

- A. Furnish and install complete raceway systems as shown on the Drawings and as specified herein.

1.02 APPLICATIONS

- A. Except where otherwise shown on the Drawings, or hereinafter specified. The following describes the conduit requirements of the project:
 - 1. All exposed raceways shall be in aluminum conduit unless otherwise noted below.
 - 2. All underground power conductors shall be installed in schedule 80 PVC conduit.
 - 3. Conduit installed in "Corrosive" areas shall be PVC schedule 80; all hardware to be non-metallic.
 - 4. All instrumentation conduits (4 – 20 mA signal wire) and VFD power circuits shall be installed in PVC coated Galvanized Rigid Steel (GRS) conduits.
- B. Where Schedule 80 PVC is used, all below grade elbows and risers to above grade shall be PVC coated GRS. All elbows above grade shall be suitably grounded. Conduit spaces shall be provided for underground conduit installation.
- C. All conduits shall be tagged/labelled at the point of supply, where exposed and at the equipment.
- D. All conduit of a given type shall be the product of one manufacturer.
- E. All switch, outlet and control station boxes and fittings shall be cast aluminum FS boxes with aluminum covers.
- F. Concealed switch, outlet and control station boxes in NEMA 1 areas shall be aluminum.
- G. Terminal boxes, junction boxes, pull boxes, etc.; installed outdoors shall be NEMA 4X stainless steel. All boxes installed indoors (except in corrosive areas) may be aluminum. Boxes in corrosive areas shall be PVC.
- H. Combination expansion-deflection fittings shall be used where exposed or embedded conduits cross structure expansion joints.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Rigid Metal Conduit

1. Rigid metal conduit shall be for use under the provisions of NEC Article 346.
2. Rigid aluminum conduit shall be 6063 alloy and shall be as manufactured by New Jersey Aluminum Corp., AFC Co., VAW of America, Inc., or approved equal.
3. PVC coated GRS conduit shall have a 1/50-in thick, polyvinyl chloride coating permanently bonded to the aluminum conduit and an internal phenolic coating, and shall be plasti-bond 2" as manufactured by Robroy Industries, Triangle PWC Inc., Perma-Cote Industries, or approved equal.

B. Rigid Nonmetallic Conduit

1. Rigid nonmetallic conduit shall be for use under the provisions of NEC Article 347.
2. PVC conduit shall be rigid polyvinyl chloride schedule 80 as manufactured by Carlon, An Indian Head Co., Kraloy Products Co., Inc., Highland Plastics Inc., or approved equal.

C. Liquidtight Flexible Conduit, Couplings and Fittings

1. Liquidtight flexible conduit shall be for use under the provisions of NEC Article 351A.
2. Liquidtight flexible conduit shall be Carflex by Carlon, or approved equal.
3. Fittings used with liquidtight flexible conduit shall be nylon.
4. Fittings installed on tanks, filter area, chemical rooms and other outdoor process areas shall be aluminum.

D. Flexible Couplings, Non-metallic

1. Flexible non-metallic couplings shall be as manufactured by the Crouse-Hinds Co., Appleton Electric Co., Killark Electric Manufacturing Co., or approved equal.

E. Boxes and Fittings:

1. PVC, aluminum and stainless steel switch and outlet boxes shall be manufactured by Carlon, Appleton, or approved equal.
2. Nema 1 terminal boxes, junction boxes, pull boxes etc., may be fiberglass (FRP) or stainless steel. Boxes shall be as manufactured by Hoffman Engineering Co., Stahlin, or approved equal. NEMA 4 boxes located outdoors shall be 316 stainless steel.
3. Cast aluminum boxes and fittings shall be copper-free aluminum with cast aluminum covers and corrosion-proof screws as manufactured by the Killark Electric Co., Crouse-Hinds Co., Appleton Electric Co., or approved equal.
4. Conduit hubs shall be as manufactured by Meyers Electric Products, Inc., Raco Div.,

Appleton Electric Co., or approved equal. Conduit hubs shall be provided for all outdoor conduit terminations.

5. Conduit wall seals shall be Type WSK as manufactured by the O.Z. Electrical Mfg. Co., or approved equal.
6. Combination expansion-deflection fittings shall be Type XD as manufactured by the Crouse-Hinds Co., or approved equal.
7. Conduit wall seals for new concrete walls below grade shall be O.Z./Gedney Co., Type WSK, Spring CITY Electrical Manufacturing Co., Type WDP, or approved equal.
8. Conduit wall seals for cored holes shall be Type CSML as manufactured by the O.Z./Gedney Co., or approved equal.
9. Conduit wall and floor seals for sleeved openings shall be Type CSMI as manufactured by the O.Z./Gedney Co., or approved equal.
10. Conduit sealing bushings shall be O.Z./Gedney Type CSB or approved equal.

F. Conduit Mounting Equipment:

1. Stainless steel channel and stainless steel hardware shall be used in all areas indoors or outdoors unless otherwise noted.
2. In “Corrosive” areas all mounting equipment shall be “non-metallic.”

PART 3 – EXECUTION

3.01 INSTALLATION

- A. No conduit smaller than 3/4-inch electrical trade size shall be used, nor shall any have more than four 90 degree bends in any one run. Pull boxes shall be provided as required or directed. Minimum size in floor slabs shall be 3/4-inch.
- B. No wire shall be pulled until the conduit system is complete in all details; in the case of concealed work, until all rough plastering or masonry has been completed; in the case of exposed work, until the conduit system has been completed in every detail.
- C. The ends of all conduits shall be tightly plugged to exclude dust and moisture while the buildings are under construction.
- D. Conduit supports shall be spaced at intervals as required to obtain rigid construction, but in no case more than as required by the NEC.
- E. Single conduits shall be supported by means of one-hole pipe clamps in combination with one-screw back plates, to raise conduits from the surface. Multiple runs of conduits shall be supported on trapeze type hangers with steel horizontal members and threaded hanger rods. The rods shall be not less than 3/8-inch diameter. Material type shall be as specified in Section 2.

- F. Conduit hangers shall be attached to structural steel by means of beam or channel clamps. Where attached to concrete surfaces, concrete inserts of the spot type shall be provided.
- G. All conduits on exposed work shall be run at right angles to and parallel with the surrounding walls and shall conform to the form of the ceiling. No diagonal runs will be allowed. Bends in parallel conduit runs shall be concentric. All conduit shall be run perfectly straight and true. Conduits not installed in this fashion shall be replaced.
- H. No unbroken run shall exceed 300 feet in length. This length shall be reduced by 75 feet for each 90 degree elbow.
- I. Conduit terminating in pressed steel boxes shall have double locknuts and insulated bushings.
- J. Conduit terminating in gasketed enclosures shall be terminated with conduit hubs.
- K. Conduit wall seals shall be used for all conduits penetrating walls below grade or other locations shown on the Drawings.
- L. Liquidtight flexible PVC conduit shall be used for all motor and transformer terminations and other equipment where vibration is present.
- M. Flexible couplings shall be used in hazardous locations for all motor and transformer terminations and other equipment where vibration is present.
- N. Conduit stub outs for future construction shall be provided with threaded PVC end caps at each end.
- O. Galvanized steel conduit entering manholes and below grade pull boxes shall be terminated with grounding type bushings and connected to a 5/8" x 20" rod with a #6 bare copper wire.
- P. Underground 120 volt circuits (GRS or Schedule 80 PVC) shall be installed directly to the respective distribution panelboard, lighting panels, etc. Stainless steel pull boxes shall be wall mounted on structures to eliminate excessive bends. With prior approval, below grade pull boxes, equal to Brooks #2424 (minimum), with hot dip galvanized covers and frames, may be used. Splices shall not be made in above or below grade pull boxes without prior approval.
- Q. All field cut threads on galvanized steel conduit shall be cleaned and painted with zinc-rich paint before installing.
- R. A 4-inch concrete conduit housekeeping pad shall be required for all exposed conduit stub-ups. This applies to ALL exposed conduits installed indoors or outdoors. Provide couplings within 12" of any slab penetration.

- END OF SECTION -

SECTION 26 05 53

ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.01 WORK INCLUDED

- A. Nameplates and tape labels.
- B. Wire and cable markers.
- C. Color coding.

1.02 SCOPE

- A. Provide engraved nameplates for the following equipment as indicated on the drawings:
 - 1. Label all compartments.
 - 2. Label all outdoor junction boxes.
 - 3. Label control system panels.
- B. All wires shall be marked and color-coded.
- C. All control wiring shall have wire numbers on each end.
- D. All exposed conduits to be painted to match color of back wall.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Nameplates: Engraved three-layer laminated plastic, black letters on a white background.
- B. Wire and Cable Markers: Pre-printed self-sticking type.
- C. Color Coding Tape: Vinyl plastic insulating tape, colors as specified in Part 3.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Degrease and clean surfaces to receive nameplates and tape labels.
- B. Install nameplates and tape labels parallel to equipment lines.
- C. Secure nameplates to equipment fronts using screws, rivets, or adhesive. Secure nameplate to

inside face of recessed panelboard doors in finished locations.

- D. Provide warning labels for automatic equipment indicating “Warning: Automated Machinery. This unit may start at any time. Stay clear. Lock-out / tagout before servicing.”

3.02 WIRE IDENTIFICATION

- A. Provide wire markers on each conductor in panelboard gutters, pull boxes, outlet and junction boxes, and at load connection. Identify with branch circuit or feeder number for power and lighting circuits, and with control wire number as indicated on schematic and interconnection diagrams or equipment manufacturer's shop drawings for control wiring.
- B. Any color coding schemes used in existing work shall be maintained in new work.
- C. Conductor Color Coding: Provide color coding for feeder, and branch circuit conductors throughout the project secondary electrical system as follows:

<u>240/120 Volts</u> <u>(w/ High Leg)</u>	<u>120/208 Volts</u>	<u>Phase</u>	<u>480/277 Volts</u>
Black	Black	A	Brown
Orange *	Blue	B	Orange
Blue	Red	C	Yellow
White	White	Neutral	White
Green	Green	Ground	Green

* Orange for high leg

3.03 NAMEPLATE ENGRAVING

- A. Provide nameplates to identify all electrical distribution and control equipment and loads served. Letter Height: 1/8 inch for individual switches and loads served for distribution and control equipment identification.
- B. Panelboards: 1/4 inch; identify equipment designation. 1/8 inch; identify voltage rating and source.
- C. Individual Circuit Breakers, Switches, and Motor Starters in Panelboards, Switchboards, and Motor Control Centers: 1/8 inch; identify circuit and load served, including location.
- D. Individual Circuit Breakers, Switches, and in Panelboards: 1/8 inch; identify circuit and load served, including location.

3.04 CONDUIT IDENTIFICATION

- A. Exposed conduits shall be identified at the source, load, and all intermediate components of the raceway system. Examples of intermediate components include but are not limited to junction

boxes, pull boxes, condulets, and disconnect switches. Identification shall be by means of an adhesive label with the following requirements:

1. Labels shall consist of an orange background with black text. Text for the label shall be the conduit number as indicated in the conduit and wire schedules.
 2. In addition, at the source end of the conduit, a second line of text shall be included to indicate the load equipment name. This second line shall consist of the word "TO:" and the text in the 'TO' column of the conduit and wire schedule (e.g. TO: Panel PD). At the load end of the conduit, a second line of text shall be included to indicate the source equipment name. This second line shall consist of the word "FROM:" and the text in the 'FROM' column of the conduit and wire schedule (e.g. FROM: MCC-A). This requirement applies only to the source and load ends of the conduit, and not anywhere in between.
 3. For conduits ¾" through 1½" in size, the text shall be a minimum 18 point font. For conduits 2" and larger, the text shall be a minimum 24 point font.
 4. Label height shall be ¾" minimum, and length shall be as required to fit required text. The label shall be installed such that the text is parallel with the axis of the conduit. The label shall be oriented such that the text can be read without the use of any special tools or removal of equipment.
 5. Labels shall be installed after each conduit is installed and, if applicable, after painting. Labels shall be printed in the field via the use of a portable label printing system. Handwritten labels are not acceptable.
 6. Labels shall be made of permanent vinyl with adhesive backing as manufactured by Brady, Seton equivalent, Panduit equivalent, or equal. Labels made of any other material are not acceptable.
- B. Conduits that are not exposed but installed beneath free standing equipment enclosures shall be identified by means of a plastic tag with the following requirements:
1. The tag shall be made of white Tyvek material, and have an orange label with black text, as described above, adhered to it. Text for the label shall be the conduit number as indicated in the conduit and wire schedules.
 2. The tag shall be affixed to the conduit by means of a nylon cable tie. The tag shall be of suitable dimensions to achieve a minimum text size of 18 points.
 3. Tags shall be White Tyvek as manufactured by Brady, Seton equivalent, Panduit equivalent, or equal.

END OF SECTION

SECTION 26 24 12

PANELBOARDS

PART 1 – GENERAL

1.01 SCOPE

- A. Furnish all labor materials, equipment and incidentals required and install all panelboards as hereinafter specified and as shown on the Drawings.

PART 2 – PRODUCTS

2.01 RATING

- A. Panelboard ratings shall be as shown on the Drawings. All panelboards shall be rated for the intended voltage.

2.02 STANDARDS

- A. Panelboards shall be in accordance with the Underwriter Laboratories, Inc. "Standard for Panelboards" and "Standard for Cabinets and Boxes" and shall be so labeled where procedures exist. Panelboards shall also comply with NEMA Standard for Panelboards and the National Electrical Code.

2.03 CONSTRUCTION (NEMA 4X, 316 Stainless Steel)

A. Interiors:

1. All interiors shall be completely factory assembled with circuit breakers, wire connectors, etc. All wire connectors, except screw terminals, shall be of the antiturn solderless type and all shall be suitable for copper wire of the sizes indicated.
2. Interiors shall be so designed that circuit breakers can be replaced without disturbing adjacent units and without removing the main bus connectors and shall be so designed that circuits may be changed without machining, drilling or tapping.
3. Branch circuits shall be arranged using double row construction except when narrow column panels are indicated. Branch circuits shall be numbered by the manufacturer.
4. A nameplate shall be provided listing panel type, number of circuit breakers and ratings.

B. Buses:

1. Bus bars for the mains shall be of copper. Full size neutral bars shall be included. Bus bar taps for panels with single pole branches shall be arranged for sequence

phasing of the branch circuit devices. Bussing shall be braced throughout to conform to industry standard practice governing short circuit stresses in panelboards. Phase bussing shall be full height without reduction. Cross connectors shall be copper.

2. Neutral bussing shall have a suitable lug for each outgoing feeder requiring a neutral connection.
3. Spaces for future circuit breakers shall be bussed for the maximum device that can be fitted into them.
4. Buses for 480V panelboards shall be rated for 65,000 amperes RMS symmetrical. Buses for 240V panelboards shall be rated for 65,000 amperes RMS symmetrical. Buses for 120/208V lighting panels shall be rated 10,000 amperes RMS symmetrical.

C. Boxes:

1. Recessed and surface mounted boxes shall be made from stainless steel (natural finish) without multiple knockouts. Boxes shall be of sufficient size to provide a minimum gutter space of 4-inches on all sides.
2. Surface mounted boxes shall have an internal and external finish as hereinafter specified in paragraph D4.
3. At least four (4) interior mounting studs shall be provided.
4. All conduit entrances shall be field punched.
5. Boxes and covers shall be bolted together and gasketed.
6. Conduit openings shall be tapped.

D. Trim:

1. Hinged doors covering all circuit breaker handles shall be included in all panel trims.
2. Doors shall have semi flush type cylinder lock and catch, except that doors over 48-inches in height shall have a vault handle and 3-point catch, complete with lock, arranged to fasten door at top, bottom and center. Door hinges shall be concealed. Two keys shall be supplied for each lock. All locks shall be keyed alike; directory frame and card having a transparent cover shall be furnished on each door.
3. The trims shall be fabricated from stainless steel.
4. All exterior and interior steel surfaces of the panelboard shall be properly cleaned and finished with ANSI Z55.1, No. 61 light gray paint over a rust-inhibiting phosphatized coating. The finish paint shall be of a type to which field applied paint will adhere.
5. Trims for flush panels shall overlap the box by at least 3/4-inch all around. Surface

trims shall have the same width and height as the box. Trims shall be fastened with quarter turn clamps.

E. Manufacturer:

1. 120/240V, single phase, 3-wire, and 120/208V 3-phase, 4-wire panelboards shall be type NLAB as manufactured by the General Electric Company, Square D Co., Type NQOB, or approved equal.
2. 240V, 3-phase, 4-wire or 480V, 3-phase, 3-wire panelboards shall be type CCB as manufactured by the General Electric Company, Square D Co., I-Line, or approved equal.

2.04 CIRCUIT BREAKERS

- A. Panelboards shall be equipped with circuit breakers with frame size and trip settings as shown on the Drawings.
- B. Circuit breakers shall be molded case, bolt-in type.
- C. Circuit breakers used in 120/240 and 120/208V single phase panelboards shall have an interrupting capacity of not less than 10,000 - amperes, RMS symmetrical.
- D. Three pole breakers used in 240V or 480V panelboards shall have an interrupting capacity of not less than 65,000 - amperes RMS symmetrical.
- E. GFCI (ground fault circuit interrupter) shall be provided for circuits where indicated on the Drawings. GFCI units shall be 1 pole, 120 volt, molded case, bolt-on breakers, incorporating a solid state ground fault interrupter circuit insulated and isolated from the breaker mechanism. The unit shall be U.L. listed Class A Group I device (5 milliamp sensitivity, 25 millisecond trip time), and an interrupting capacity of 10,000 amperes RMS.

2.05 SURGE SUPPRESSORS

- A. All panelboards shall be equipped with surge suppressors.
- B. Surge suppressors used in 240V or 480V panelboards shall be APT XT series or approved equal.

2.06 POWER MONITOR

- A. The 240V or 480V, 3-phase distribution panelboard shall be equipped with a digital-metering device capable of communication on the network of choice. Meters shall be Square D POWERLOGIC 8000 series Circuit Monitor, with PM8ECC Ethernet Communications Card, or approved equal. The meter shall have an embedded webpage and have communications to Modbus and Ethernet Modbus TCP/IP.

- B. The meter shall have capability for measuring all three phases of Volts-Amps, KW, KWH, PF, for all three phases. The meter shall have wave form capture for 16 to 512 cycles of data at 512 samples/cycle and providing harmonic content up to the 255th harmonic for voltage and current on all three phases. The circuit monitor shall be accurate to .04% of readings +/- .025% of full scale for voltage and current metering and .08% of rating plus .025% for power.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Boxes for surface mounted panelboards shall be mounted so there is at least 1/2-inch air space between the box and the wall.
- B. Unless otherwise noted on the Drawings, top of cabinets shall be mounted 6-feet 0-inch above the floor, properly aligned and adequately supported independently of the connecting raceways.
- C. All wiring in panelboards shall be neatly formed, grouped, laced, and identified to provide a neat and orderly appearance. A typewritten directory card identifying all circuits shall be placed in the card holder inside the front cover.

- END OF SECTION -

SECTION 26 28 16

MISCELLANEOUS EQUIPMENT

PART 1 – GENERAL

1.01 SCOPE OF WORK

- A. Furnish and install all miscellaneous equipment as hereinafter specified and as shown on the Drawings.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Disconnect Switches:

1. Fusible and non-fusible disconnect switches shall be heavy-duty, NEMA type H, quick-make, quick-break, visible blades, 600 volt, 3 pole with full cover interlock. All current carrying parts shall be copper.
2. Enclosure type shall be NEMA 4X, stainless steel with copper lugs except as otherwise shown on the Drawings.
3. Switches shall be horsepower rated as manufactured by the Square D Co., or approved equal.
4. Control wiring shall not pass through any disconnect enclosure. A junction box shall be provided, constructed of the same material as the disconnect and utilized to separate power and control wiring prior to the disconnect enclosure.
5. Each disconnect shall be provided with a plastic nameplate, affixed to the enclosure without screws, identifying the equipment served.

B. Combination Magnetic Motor Starters:

1. Motor starters shall be a combination motor circuit protector and 3-pole, 60 Hz, 600 volt, magnetically operated, full voltage non-reversing contactor except as otherwise shown on the Drawings. NEMA sizes shall be as required for the horsepowers shown on the Drawings.
2. Two speed starters shall be for single or two winding motors as shown on the Drawings.
3. Each motor starter shall have a 120 volt operating coil and control power transformer. Three phase starters shall have 3 overload relays. Auxiliary contacts shall be provided as shown on the Drawings or required.
4. Overload relays shall be non-adjustable, ambient compensated and manually reset.

5. Built-in control stations and indicating lights shall be furnished where shown on the Drawings.
6. Enclosure type shall be NEMA Type 4X enclosures stainless steel.
7. Motor circuit protectors shall be molded case with adjustable magnetic trip only. They shall be specifically designed for use with magnetic motor starters. Motor circuit protectors shall be furnished with bolt-on current limiting fuses.
8. Combination magnetic motor starters shall be as manufactured by Square D, or approved equal.

C. Control Stations:

1. Control stations shall be NEMA 4X stainless steel heavy-duty type, with full size operators when located outdoors, in "NEMA 4" locations or in "Corrosive" areas.
2. Control stations shall be Class 9001, manufactured by the Square D Company or approved equal.
3. Pilot lights shall be complete with full voltage LED.

D. Control Relays:

1. Control relays shall be heavy duty machine tool type, with 10 ampere, 600 volt, convertible contacts. Time delay relays shall be pneumatic, adjustable 1/5 to 180 seconds.
2. Relays shall be CR2810 and CR2820 as manufactured by the General Electric Co. or approved equal.

E. Unless otherwise noted, all NEMA 4 enclosures shall be stainless steel. NEMA 4X push buttons and pilot lights shall be provided in all weatherproof control panels.

F. All Enclosures installed in "Corrosive" areas shall be non-metallic.

PART 3 – EXECUTION

(NOT USED)

- END OF SECTION -

SECTION 31 23 16

EXCAVATION - EARTH AND ROCK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Requirements for performing opencut excavations to the widths and depths necessary for constructing structures, pipelines and conduits including excavation of any material necessary for any purpose pertinent to the construction of the Work.
- B. Related Work Specified In Other Sections Includes, But is Not Limited to, the Following:
 - 1. Section 31 23 23 - Backfilling

1.2 DEFINITIONS

- A. Earth: "Earth" includes all materials which, in the opinion of the ENGINEER, do not require blasting, barring, or wedging for their removal from their original beds. Specifically excluded are all ledge and bedrock and boulders or pieces of masonry larger than one cubic yard in volume.
- B. Rock: "Rock" includes all materials which, in the opinion of the ENGINEER, require blasting, barring or wedging for removal from their original beds and which have compressive strengths in their natural undisturbed state in excess of 300 psi. Boulders or masonry larger than one cubic yard in volume are classed as rock excavation.

1.3 SUBMITTALS

- A. General: Provide all submittals, including the following, as specified in Division 1.

1.4 SITE CONDITIONS

- A. Underground Utilities: Locate and identify all existing underground utilities prior to the commencement of Work. Hand dig all excavations.
- B. Quality and Quantity: Make any other investigations and determinations necessary to determine the quality and quantities of earth and rock and the methods to be used to excavate these materials.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 TRENCH EXCAVATION

- A. Preparation: Properly brace and protect trees, shrubs, poles and other structures which are to be preserved. Unless shown or specified otherwise, preserve all trees and large shrubs. Hold damage to the root structure to a minimum. Small shrubs may be preserved or replaced with equivalent specimens.
- B. Adequate Space: Keep the width of trenches to a minimum, however provide adequate space for workers to place, joint and backfill the pipe properly.
 - 1. Do not allow the clear width of the trench at the level of the top of the pipe to exceed the sum of the outside diameter of the pipe barrel plus 20 inches for pipe 4 through 24 inches in diameter nor the outside diameter of the pipe barrel plus 2 feet for pipe more than 24 inches in diameter, unless otherwise approved.
 - 2. In sheeted trenches, measure the clear width of the trench at the level of the top of the pipe to the inside of the sheeting.
 - 3. Should the maximum trench widths specified above be exceeded without written approval, provide concrete cradle or encasement for the pipe as directed. No separate payment will be made for such concrete cradle or encasement.
- C. Depth: Excavate trenches to a minimum depth of 6 inches below the bottom of the pipe or the bottom of encasement for electrical ducts, unless otherwise shown, specified or directed, so that bedding material can be placed in the bottom of the trench and shaped to provide a continuous, firm bearing for duct encasement, pipe barrels and bells.
- D. Unstable Materials: If unstable material is exposed at the level of the bottom of the trench excavation, excavate the material in accordance with the subsection headed "Authorized Additional Excavation".
 - 1. When in the judgment of the ENGINEER the unstable material extends to an excessive depth, the ENGINEER may advise, in writing, the need for stabilization of the trench bottom with additional select fill material or a crushed stone or gravel mat or the need to provide firm support for the pipe or electrical duct by other suitable methods.
 - 2. Payment for such trench stabilization will be made under the appropriate Contract Items or where no such items exist, as a change in the Work.

- E. Length of Excavation: Keep the open excavated trench preceding the pipe or electrical duct laying operation and the unfilled trench, with pipe or duct in place, to a minimum length which causes the least disturbance. Provide ladders for a means of exit from the trench as required by applicable safety and health regulations.
- F. Water: Allow no water to rise in the trench excavation until sufficient backfill has been placed to prevent pipe or duct flotation.

3.2 FINISHED EXCAVATION

- A. Finish: Provide a reasonably smooth finished surface for all excavations, which is uniformly compacted and free from irregular surface changes.
- B. Finish Methods: Provide a degree of finish which is ordinarily obtainable from blade-grade operations, except as otherwise specified in Section 31 23 23.

3.3 REMOVAL OF WATER

- A. Water Removal: At all times during the excavation period and until completion and acceptance of the Work at final inspection, provide ample means and equipment with which to remove promptly and dispose of properly all water entering any excavation or other parts of the Work.
- B. Dry Excavations: Keep the excavation dry.
- C. Water Contact: Allow no water to rise over or come in contact with masonry and concrete until the concrete and mortar have attained a set and, in any event, not sooner than 12 hours after placing the masonry or concrete.
- D. Discharge of Water: Dispose of water pumped or drained from the Work in a safe and suitable manner without damage to adjacent property or streets or to other work under construction.
- E. Sanitary Sewers: Discharge no water into sanitary sewers.
- F. Storm Sewers: Discharge no water containing settleable solids into storm sewers.
- G. Repair: Promptly repair any and all damage caused by dewatering the Work.

END OF SECTION

SECTION 31 23 23

BACKFILLING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Backfill all excavation to the original surface of the ground or to such other grades as may be shown or required. For areas to be covered by topsoil, leave or stop backfill 12 inches below the finished grade or as shown. Obtain approval before backfilling against masonry structures. Remove from all backfill, any compressible, putrescible, or destructible rubbish and refuse and all lumber and braces from the excavated space before backfilling is started. Leave sheeting and bracing in place or remove as the work progresses.
- B. Equipment Limitations: Do not permit construction equipment used to backfill to travel against and over cast-in-place concrete structures until the specified concrete strength has been obtained, as verified by concrete test cylinders. In special cases where conditions warrant, the above restriction may be modified providing 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.
- C. Related Work Specified In Other Sections Includes, But is Not Limited to, the Following:
 - 1. Section 31 23 16 – Excavation – Earth and Rock

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. ASTM D 1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN-m/m³))

1.3 SUBMITTALS

- A. Provide all submittals, including the following in accordance with Division 1.
 - 1. Certified laboratory reports of all proposed backfill material.

PART 2 PRODUCTS

2.1 BACKFILL MATERIAL - GENERAL

- A. General: Backfill with sound materials, free from waste, organic matter, rubbish, boggy or other unsuitable materials.
- B. General Materials Requirements: Conform materials used for backfilling to the requirements specified. Follow common fill requirements whenever drainage or select fill is not specified. Determine and obtain the approval of the appropriate test method where more than one compaction test method is specified.

2.2 SELECT FILL

- A. Materials for Select Fill: Use gravel, crushed stone, limestone screenings or other granular or similar material as approved which can be readily and thoroughly compacted to 95 percent of the maximum dry density obtainable by ASTM D 1557.

- 1. Grade select fill between the following limits:

U.S. Standard Sieve	Percent Passing by Weight
2 inch	100
1-1/2 inch	90-100
1 inch	75-95
1/2 inch	45-70
#4	25-50
#10	15-40
#200	5-15

- 2. Very fine sand, uniformly graded sands and gravels, or other materials that have a tendency to flow under pressure when wet are unacceptable as select fill.

2.3 COMMON FILL

- A. Materials for Common Fill: Material from on-site excavation may be used as common fill provided that it can be readily compacted to 90 percent of the maximum dry density obtainable by ASTM D 1557, and does not contain unsuitable material. Select fill may be used as common fill at no change in the Contract Price.

- B. Granular Materials On-Site: Granular on-site material, which is fairly well graded between the following limits may be used as granular common fill:

U.S. Standard Sieve	Percent Passing by Weight
3 inch	100
#10	50-100
#60	20-90
#200	0-20

- C. Cohesive Materials On-Site: Cohesive site material may be used as common fill.
1. The gradation requirements do not apply to cohesive common fill.
 2. Use material having a liquid limit less than or equal to 40 and a plasticity index less than or equal to 20.
- D. Material Approval: All material used as common fill is subject to approval. If there is insufficient on-site material, import whatever additional off-site material is required which conforms to the specifications and at no additional cost.

2.4 PIPE BEDDING

- A. Gradation for Small Piping: For pipe 18 inches or less in diameter, comprise pipe bedding of material 90 percent of which will be retained on a No. 8 sieve and 100 percent of which will pass a 1/2-inch sieve and be well graded between those limits.
- B. Gradation for Large Piping: For pipe larger than 18 inches in diameter, use the same pipe bedding material as specified for smaller pipe or use a similar well graded material 90 percent of which will be retained on a No. 8 sieve and 100 percent of which will pass a 1-inch sieve.

PART 3 EXECUTION

3.1 ELECTRICAL DUCT AND PRECAST MANHOLE BEDDING

- A. Bedding Compaction: Bed all electrical ducts and precast manholes in well graded, compacted, select fill conforming to the requirements except as otherwise shown, specified, or required. Extend electrical duct bedding a minimum of 6 inches below the bottom of the duct encasement for the full trench width. Compact bedding thickness no less than 6 inches for precast concrete manhole bases.

- B. Concrete Work Mats: Cast cast-in-place manhole bases and other foundations for structures against a Class D concrete work mat in clean and dry excavations, unless otherwise shown, specified or required.
- C. Bedding Placement: Place select fill used for bedding beneath electrical ducts and precast manhole bases, in uniform layers not greater than 9 inches in loose thickness. Thoroughly compact in place with suitable mechanical or pneumatic tools to not less than 95 percent of the maximum dry density as determined by ASTM D 1557.
- D. Use of Select Fill: Bed existing underground structures, tunnels, conduits and pipes crossing the excavation with compacted select fill material. Place bedding material under and around each existing underground structure, tunnel, conduit or pipe and extend underneath and on each side to a distance equal to the depth of the trench below the structure, tunnel, conduit or pipe.

3.2 PIPE BEDDING

- A. Hand Placement: Place select fill pipe bedding by hand from the bottom of the excavation to 1 foot over the top of the pipe in uniform layers not greater than 6 inches in loose thickness. Tamp under pipe haunches and thoroughly compact pipe bedding in place with suitable mechanical or pneumatic tools to not less than 95 percent of the maximum dry density as determined by ASTM D 1557 (Modified Proctor).
- B. Stone Placement: Do not place large stone fragments in the pipe bedding or backfill to 1 foot over the top of pipes, nor nearer than 2 feet at any point from any pipe, conduit or concrete wall.
- C. Unallowed Materials: Pipe bedding containing very fine sand, uniformly graded sands and gravels, or other materials that have a tendency to flow under pressure when wet is unacceptable.

3.3 BEDDING PLACEMENT AND BACKFILL FOR PIPE IN SHORT TUNNEL

- A. Bed pipelines or electrical ducts placed in short tunnels in select fill or Class D concrete. Completely fill the remainder of the annular space between the outside of the pipe wall and the tunnel wall with select fill, suitable job-excavated material, or Class D concrete, as approved. Suitably support pipelines or ducts in short tunnels to permit placing of backfill suitably tamped in place.

3.4 TRENCH BACKFILL

- A. General: Backfill trenches from 1 foot over the top of the pipe, from the top of electrical duct bedding or as shown to the bottom of pavement base course, subgrade for lawns or lawn replacement, to the top of the existing ground surface or to such other grades as may be shown or required.

- B. Materials: Provide select fill, suitable job-excavated material or other material, as specified and as approved for trench backfill.
- C. Depth of Placement - General: Except under pavements, walkways, railroad tracks, and street or highway appurtenances, or as otherwise specified, place trench backfill in uniform layers not greater than 9 inches in loose thickness and thoroughly compact in place using suitable mechanical or pneumatic equipment. Compact backfill to not less than 90 percent of the maximum dry density as determined by ASTM D 1557.
- D. Depth of Placement - Traffic Areas and Under Utilities: Where pavements, walkways, railroad tracks and street or highway appurtenances are to be placed over trenches and under utilities or utility services crossing the trench, provide trench backfill using select fill placed in uniform layers not greater than 9 inches in loose thickness and thoroughly compacted in place with equipment as specified above. Compact backfill to not less than 95 percent of the maximum dry density as determined by ASTM D 1557.
- E. Depth of Placement - Undeveloped Areas: In nondeveloped areas and where select fill material or hand-placed backfill are not specified or required, place suitable job-excavated material or other approved backfill in lifts not exceeding 12 inches in loose thickness. When the trench is full, consolidate the backfill by jetting, spading, tamping or puddling to ensure complete filling of the excavation. Mound the top of the trench approximately 12 inches to allow for consolidation of backfill.
- F. Dropping of Material on Work: Do trench backfilling work in such a way as to prevent dropping material directly on top of any conduit or pipe through any great vertical distance. Do not allow backfilling material from a bucket to fall directly on a structure or pipe and, in all cases, lower the bucket so that the shock of falling earth will not cause damage.
- G. Distribution of Large Materials: Break lumps up and distribute any stones, pieces of crushed rock or lumps which cannot be readily broken up, throughout the mass so that all interstices are solidly filled with fine material.

3.5 STRUCTURE BACKFILL

- A. Use of Select Fill: Use select fill underneath all structures, and adjacent to structures where pipes, connections, electrical ducts and structural foundations are to be located within this fill. Use select fill beneath all pavements, walkways, and railroad tracks, and extend to the bottom of pavement base course or ballast.
 - 1. Place backfill in uniform layers not greater than 8 inches in loose thickness and thoroughly compact in place with suitable approved mechanical or pneumatic equipment.

2. Compact backfill to not less than 95 percent of the maximum dry density as determined by ASTM D 1557.
- B. Use of Common Fill: Use common granular fill adjacent to structures in all areas not specified above, unless otherwise shown or specified. Select fill may be used in place of common granular fill at no additional cost.
1. Extend such backfill from the bottom of the excavation or top of bedding to the bottom of subgrade for lawns or lawn replacement, the top of previously existing ground surface or to such other grades as may be shown or required.
 2. Place backfill in uniform layers not greater than 8 inches in loose thickness and thoroughly compact in place with suitable equipment, as specified above.
 3. Compact backfill to not less than 90 percent of the maximum dry density as determined by ASTM D 1557.
- C. Use of Clay: In unpaved areas adjacent to structures for the top 1 foot of fill directly under lawn subgrades use clay backfill placed in 6-inch lifts. Compact clay backfill to not less than 90 percent of the maximum dry density as determined by ASTM D 1557.
1. Use clay having a liquid limit less than or equal to 40 and a plasticity index less than or equal to 20.

3.6 COMPACTION EQUIPMENT

- A. Equipment and Methods: Carry out all compaction with suitable approved equipment and methods.
1. Compact clay and other cohesive material with sheep's-foot rollers or similar equipment where practicable. Use hand held pneumatic tampers elsewhere for compaction of cohesive fill material.
 2. Compact low cohesive soils with pneumatic-tire rollers or large vibratory equipment where practicable. Use small vibratory equipment elsewhere for compaction of cohesionless fill material.
 3. Do not use heavy compaction equipment over pipelines or other structures, unless the depth of fill is sufficient to adequately distribute the load.

3.7 FINISH GRADING

- A. Final Contours: Perform finish grading in accordance with the completed contour elevations and grades shown and blend into conformation with remaining natural ground surfaces.

1. Leave all finished grading surfaces smooth and firm to drain.
 2. Bring finish grades to elevations within plus or minus 0.10 foot of elevations or contours shown.
- B. Surface Drainage: Perform grading outside of building or structure lines in a manner to prevent accumulation of water within the area. Where necessary or where shown, extend finish grading to ensure that water will be carried to drainage ditches, and the site area left smooth and free from depressions holding water.

3.8 RESPONSIBILITY FOR AFTERSETTLEMENT

- A. Aftersettlement Responsibility: Take responsibility for correcting any depression which may develop in backfilled areas from settlement within one year after the work is fully completed. Provide as needed, backfill material, pavement base replacement, permanent pavement, sidewalk, curb and driveway repair or replacement, and lawn replacement, and perform the necessary reconditioning and restoration work to bring such depressed areas to proper grade as approved.

3.9 INSPECTION AND TESTING OF BACKFILLING

- A. Sampling and Testing: Sampling and testing of all in-place backfill will be provided by the CITY as specified in Division 1. If initial testing reveals non-compliance with Contract requirements, all additional testing will be made at the CONTRACTOR's expense.
- B. Correction of Work: Correct any areas of unsatisfactory compaction by removal and replacement, or by scarifying, aerating or sprinkling as needed and recompaction in place prior to placement of a new lift.

END OF SECTION

SECTION 33 13 00

DISINFECTION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Disinfection of all pipelines, tanks, structures, conduits and equipment which are to store, handle or carry potable water. Furnish all labor, water, chemicals and equipment, including taps, corporation stops, temporary pumps and other items necessary to perform the Work, except as otherwise specified.

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. AWWA C651 - Disinfecting Water Mains
 - 2. AWWA C652 - Disinfection of Water-Storage Facilities

1.3 QUALITY ASSURANCE

- A. Disinfection Standards: Disinfect in accordance with AWWA C651 for water mains and AWWA C652 for water storage facilities and equipment.
- B. Local Requirements: Conform disinfection procedures to local health department requirements for new water mains and structures.
- C. Chlorinated Water Disposal: Dispose of old highly chlorinated water in accordance with applicable regulations.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 APPLICATION

- A. Disinfection Procedures for Piping: Flush pipelines with clean water before disinfecting. Disinfect by the continuous feed method, as specified in AWWA C651, using sodium hypochlorite solution. Then add chlorinated water containing

not less than 50 mg/l free available chlorine followed by clean water at one end of the section being disinfected and discharged at the far end.

1. Add the chlorinated water until the water coming from each downstream blowoff has a residual of not less than 25 mg/l of chlorine.
2. Close the pipelines and allow the solution to remain in the lines for at least 24 hours. Recheck the chlorine residual in the pipeline. If the free chlorine residual is less than 10 mg/l after 24 hours, disinfect the pipelines again with more concentrated chlorinated water.
3. After meeting the previous requirements in this subsection and after a 24-hour holding period, thoroughly flush out the pipelines and equipment and fill with clean water. Do not permit flushing water to discharge into existing water mains. The water for this filling will be furnished by the CITY.

3.2 VERIFICATION OF DISINFECTION

- A. Final Samples: Bacteriological samples will be taken and tested by the CITY on two successive days. If the samples are not satisfactory, repeat the entire disinfection procedure.
 1. Assume the expense of taking and testing additional samples until satisfactory samples are obtained.
 2. Assume the expense of all water for subsequent fillings of the pipelines, tanks and equipment.

END OF SECTION

SECTION 40 05 01

SUPPORTS AND ANCHORS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Requirements for providing all hanging and supporting devices of construction shown, specified, or required for pipelines, apparatus, and equipment other than electrical equipment.
- B. Related Work Specified in Other Sections Includes, But is Not Limited to, the Following:
 - 1. Section 05 05 13 - Galvanizing
 - 2. Section 05 12 00 - Structural Steel
 - 3. Section 09 96 00 - High Performance Coatings
 - 4. Section 40 05 10 - Erecting and Jointing Interior Piping
 - 5. Section 40 05 17 - Steel Pipe and Fittings

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. ASME B16.1 - Cast Iron Pipe Flanges and Flanged Fittings, Class 25, 125, 250, 800
 - 2. ASME B31.1 - Power Piping (Includes Revision Service)
 - 3. ASTM A 307 - Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength
 - 4. MSS SP-58 - Pipe Hangers and Supports - Materials, Design and Manufacture
 - 5. MSS SP-69 - Pipe Hangers and Supports - Selection and Application
 - 6. MSS SP-89 - Pipe Hangers and Supports - Fabrication and Installation Practices
 - 7. MSS SP-90 - Guidelines on Terminology for Pipe Hangers and Supports

1.3 SUBMITTALS

- A. General: Provide all submittals, including the following, as specified in Division 1.
- B. Shop Drawings: Submit shop drawings to show the quantity, type, design and location of all supports, hangers and anchors required.
- C. Submit a CERTIFICATE (ONLY), signed and sealed by a Licensed Professional Engineer experienced in structural Engineering and registered in the State of Florida, that certifies that the Licensed Professional Engineer has evaluated and approved the CONTRACTOR's supports and anchors as detailed on the submittal drawings and has prepared complete design calculations confirming the adequacy of all supports, hangers, anchors and expansion compensating devices used. Provide a separate CERTIFICATE for each piping system before starting the installation.

1.4 SYSTEM DESCRIPTION

- A. General: System includes supporting devices adequate to maintain the pipelines, apparatus, and equipment in proper position and alignment under all operating and testing conditions with due allowance for expansion and contraction.
- B. Design Requirements: Design supporting devices in accordance with the best practice and provide supporting devices that are not unnecessarily heavy. Design supporting devices to accommodate loads imposed during leakage tests for the test pressures specified. Base the required strength of supporting devices on the combined weight of the piping and connected equipment, the weight of the denser of the fluids used in operations or testing and the weight of insulation where applicable. Install supports with a working safety factor of not less than 5, and conform installation to requirements of Section 05 12 00.
- C. Provide springs where necessary. Make hangers and supports of standard design where possible and best suited for the service required. Include proper pipe protection saddles for hangers and supports on pipes which are covered with insulation. Where required, make supports screw adjustable after installation unless approved otherwise.
- D. Interference: Design all supporting devices so as to minimize interference with access and movement. Eliminate the potential for injuries due to protruding supporting devices.
- E. Sizing: Provide base piping support, hanger rod size, brackets and spacing meeting the requirements of ASME B31.1, MSS SP-58, SP-69, SP-89 and SP-90 except as modified herein.
 - 1. Modify hangers for plastic pipes to increase the bearing area by inserting a protective sleeve of medium-gauge aluminum sheet metal between the pipe and the hanger.

- a. Align hangers such that no sharp edges come in contact with the pipe.
- b. Provide a wooden or thermoplastic pad between the plastic pipe and any concrete or masonry surface.
- c. Use supports for vertical lines of a type which do not exert a compressive strain on the pipe. Riser-type clamps that squeeze the pipe will not be permitted.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle all products and materials as specified in Division 1.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted.
 - 1. Pipe hangers and supports
 - a. Grinnell Corporation, Cranston, RI
 - b. Globe Pipe Hanger Products, Inc., Cleveland, OH
 - 2. Sheet metal shield
 - a. "Thermal-Hanger Shields" by Pipe Shields Incorporated, Vacaville, CA

2.2 MATERIALS

- A. Provide pipe support unistrut, fittings and hardware with Type 316 stainless steel.
- B. Support overhead hangers using threaded rods properly fastened in place by suitable screws, clamps, inserts, or bolts, or by welding. Subject hangers to tensile loading only. Where lateral or axial movement may occur, provide suitable linkage to permit sway.
- C. Suspended Piping: Support suspended piping by adjustable ring or clevis hangers and threaded rods from heavy duty concrete inserts or other fastening devices, except as otherwise specified or noted.
- D. Brackets: Make brackets of welded steel and designed for the following load classifications.

Load Classification	Maximum Load per Bracket
---------------------	--------------------------

Light	750 pounds
Medium	1,500 pounds
Heavy	3,000 pounds

1. When medium or heavy brackets are bolted to vertical surfaces, furnish and install backplates of adequate size and thickness to distribute the load against the vertical surfaces.
 2. When the use of backplates is not practicable, fasten the brackets to the vertical surfaces in such a manner that the safe bearing strength of the vertical surfaces will not be exceeded.
- E. Chairs and Pipe Rolls: Use cast-iron pipe rolls or chairs. Provide pipe rolls with threaded nuts or with sockets to take threaded rods.
- F. Saddle Stands: Use adjustable saddle stands.
1. Provide each stand with a length of steel pipe fitted at the base with standard threaded cast-iron flange or steel base plate and at the top with an adjustable saddle or roll. Bolt the base flange or plate to the floor, foundation or concrete base.
 2. Use stanchions of construction similar to the saddle stand, except fit them at the top with cast-iron pipe saddle supports or with pipe stanchion saddles with yokes and nuts.
- G. Insulation Support Requirements: At support points, protect insulated pipes by a 360 degree insert of high density, 100 psi, waterproofed calcium silicate encased in a 360 degree sheet metal shield.
1. Make inserts of the same thickness as the adjoining pipe insulation.
 2. Provide the shield length, minimum galvanized sheet metal gauge and installation procedure in accordance with the manufacturer's recommendations.
 3. Extend insulation inserts one inch beyond the sheet metal shields on cold water lines, and jacket and vapor seal as required when the abutting insulation is installed.
- H. Expansion: Connect, support and guide piping to permit and control pipe expansion and contraction and to accommodate building expansion, contraction and settling without damage to the piping or support system.
1. Furnish and install anchors when specified, shown, or required for holding the pipelines and equipment in position or alignment. Design anchors for rigid fastening to the structures, either directly or through brackets.

2. Provide cast-iron chair type anchors for piping with steel straps, except where anchors form an integral part of pipe fittings or where an anchor of special design is required.
3. Inserts: Provide galvanized concrete inserts.
 - a. Design inserts to permit the rods to be adjusted horizontally in one plane and to lock the rod nut or head automatically.
 - b. Recess inserts near the upper flange to receive reinforcing rods.
 - c. Design inserts so that they may be held in position during concrete placing operations. Design inserts to carry safely the maximum load that can be imposed by the rod which they engage.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install hanger and supports in accordance with the manufacturer's recommendations and approved shop drawings and as specified in Division 01 and Section 40 05 10.

3.2 GALVANIZING AND PAINTING

- A. Galvanizing: When specified, galvanize hangers and supports as specified in Section 05 05 13.
- B. Painting: Paint hangers, supports, anchors, and similar devices as specified in Section 09 96 00.
- C. Touch-Up Painting: Clean and touch-up painting of field welds, bolted connections and abraded areas as specified in Section 09 96 00.

END OF SECTION

SECTION 40 05 03

MECHANICAL IDENTIFICATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Requirements for furnishing and installing identification materials and devices for the mechanical systems.
- B. Related Work Specified in Other Sections Includes, But is Not Limited to, the Following:
 - 1. Section 09 96 00 - High Performance Coatings

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. ASME A13.1 - Scheme for the Identification of Piping Systems.

1.3 SUBMITTALS

- A. General: Provide all submittals, including the following, as specified in Division 1.
- B. Product Data: Submit the manufacturer's technical product data and installation instructions for each identification material and device required.
- C. Maintenance Data: Include product data and schedules in the appropriate operation and maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Provide the specified items from firms regularly engaged in the manufacture of identification devices of types and sizes required, whose products have been in satisfactory use in similar service for not less than 5 years.

1.5 SPARE PARTS

- A. Spares: Furnish a minimum of 5% extra stock of each mechanical identification material required, including additional numbered valve tags (not less than 3) for each piping system, additional piping system identification markers, and additional plastic laminate engraving blanks of assorted sizes.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted.
 - 1. Identification Materials
 - a. Allen Systems, Inc.
 - b. Brady (W.H.) Co.; Signmark Div.
 - c. Industrial Safety Supply Co., Inc.
 - d. Seton Name Plate Corp.

2.2 MATERIALS

- A. Provide the manufacturer's standard products of categories and types required for each application as referenced in other Division 40 sections. Where more than a single type is specified for an application, selection is at the CONTRACTOR's option, but provide a single selection for each product category. Comply with ASME A13.1 for lettering size, length of color fields, colors and viewing angles of identification devices.
- B. Lettering: Comply with the piping system lettering nomenclature as specified, scheduled or shown, and abbreviate only as necessary for each application length.
 - 1. Arrows: Print each pipe marker with arrows indicating the direction of flow, either integrally with the piping system service lettering (to accommodate both directions), or as a separate unit of plastic.

2.3 PLASTIC TAPE

- A. General: Provide the manufacturer's standard color-coded pressure-sensitive (self-adhesive) vinyl tape, not less than 3 mils thick.

- B. Width: Provide 1-1/2 inch wide tape markers on pipes with outside diameters (including insulation, if any) of less than 6 inches, 2-1/2 inches wide tape for larger pipes.
- C. Color: Except where another color selection is indicated comply with ASME A13.1.

2.4 VALVE TAGS

- A. Brass Valve Tags: Provide 19-gauge polished brass valve tags with stamp-engraved piping system abbreviations in 1/4-inch high letters and sequenced valve numbers 1/2-inch high. Provide a 5/32-inch hole for the fastener.
 - 1. Provide 1-1/2-inch diameter tags, except as otherwise indicated.
 - 2. Fill tag engraving with black enamel.
- B. Valve Tag Fasteners: Provide the manufacturer's standard solid brass chain (wire link or beaded type), or solid brass S-hooks of the sizes required for proper attachment of the tags to valves, and manufactured specifically for that purpose.
- C. Access Panel Markers: Provide the manufacturer's standard 1/16 inch thick engraved plastic laminate access panel markers, with abbreviations and numbers corresponding to the concealed valve. Include a 1/8-inch center hole to allow for attachment.
- D. Other Descriptions: Provide manual and automatic balancing valve tags with the valve model number, rated flow in GPM, differential pressure range and zone or unit identification for each valve.

2.5 PLASTIC EQUIPMENT MARKERS

- A. General: Provide the manufacturer's standard laminated plastic, color coded equipment markers conforming to the following color code:
 - 1. Green: Cooling equipment and components.
 - 2. Yellow: Heating equipment and components.
 - 3. Yellow/Green: Combination cooling and heating equipment and components.
 - 4. Blue: Equipment and components that do not meet any of the above criteria.

5. For hazardous equipment, use colors and designs recommended by ASME A13.1.
- B. Nomenclature: Include the following, matching terminology on schedules as closely as possible:
1. Name and drawing number
 2. Equipment service
 3. Design capacity
 4. Other design parameters such as pressure drop, entering and leaving conditions, rpm, etc.
- C. Size: Provide approximate 2-1/2-inch x 4-inch markers for control devices, dampers, and valves; and 4-1/2-inch x 6-inch for equipment.

2.6 PLASTICIZED TAGS

- A. Provide the manufacturer's standard pre-printed or partially preprinted accident-prevention tags, of plasticized card stock with a matte finish suitable for writing, which are approximately 3-1/4-inch x 5-5/8-inch, with brass grommets and wire fasteners, and with appropriate pre-printed wording including large-size primary wording (as examples; DANGER, CAUTION, DO NOT OPERATE).

2.7 LETTERING AND GRAPHICS

- A. General: Coordinate names, abbreviations and other designations used in mechanical identification Work, with corresponding designations shown, specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by the manufacturers or as required for proper identification, operation and maintenance of mechanical systems and equipment.
- B. Multiple Systems: Where multiple systems of the same generic name are shown and specified, provide identification which indicates the individual system number as well as the service (as examples; Boiler No. 3, Air Supply No. 1H, Standpipe F12).

PART 3 EXECUTION

3.1 PREPARATION

- A. Surface Preparation: Degrease and clean surfaces to receive adhesive for identification materials.
 - 1. Prepare surfaces in accordance with Section 09 96 00 for stencil painting.

3.2 INSTALLATION

- A. General: Install markers in accordance with the manufacturer's recommendations and approved shop drawings and as specified in Division 1.
- B. Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install the identification after completion of the covering and painting. Install the identification prior to installation of acoustical ceilings and similar removable concealment.

3.3 PIPING SYSTEM IDENTIFICATION

- A. General: Install pipe markers of one of the following types on each system and include arrows to show normal direction of flow:
 - 1. Stenciled markers, including color-coded background band or rectangle, and contrasting lettering of black or white. Extend the color band or rectangle 2 inches beyond ends of lettering.
 - 2. Plastic pipe markers, with application system as indicated under "Materials" in this section. Install on pipe insulation segment where required for hot noninsulated pipes.
 - 3. Stenciled markers, black or white for best contrast, wherever continuous color-coded painting of piping is provided.
- B. Color Coding: Continuously paint and color code all exposed piping to allow for quick identification. Paint each piping system a different color as selected and approved.
- C. Identifier Location: Locate pipe markers and color bands as follows wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) and exterior nonconcealed locations.
 - 1. Near each valve and control device

2. Near each branch, excluding short take-offs for fixtures and terminal units; mark each pipe at branch, where there could be a question of the flow pattern
3. Near locations where pipes pass through walls or floors/ceilings, or enter nonaccessible enclosures
4. At access doors, manholes and similar access points which permit view of the concealed piping
5. Near major equipment items and other points of origin and termination
6. Spaced intermediately at a maximum spacing of 50 feet along each piping run, except reduce spacing to 25 feet in congested areas of piping and equipment
7. On piping above removable acoustical ceilings, except omit intermediately spaced markers

3.4 UNDERGROUND PIPING IDENTIFICATION

- A. During back-filling and placing of top-soil over each exterior underground piping system, install a continuous underground-type plastic line marker, located directly over the buried line at 6 to 8 inches below the finished grade. Where multiple small lines are buried in a common trench and do not exceed an overall width of 16 inches, install a single line marker. For tile fields and similar installations, mark only the edge pipe lines within the field.

3.5 VALVE IDENTIFICATION

- A. General: Provide a valve tag on every valve, cock and control device in each piping system. Exclude check valves, valves within factory-fabricated equipment units, plumbing fixture faucets, convenience and lawn-watering hose bibs, and shut-off valves at plumbing fixtures, HVAC terminal devices and similar rough-in connections of end-use fixtures and units. List each tagged valve in the valve schedule for each piping system.
- B. Location: Mount the valve schedule frames and schedules in machine rooms where indicated or, if not otherwise indicated, where directed. Where more than one major machine room is shown for the Project, install a mounted valve schedule in each major machine room, and repeat on the schedule only main valves which are to be operated in conjunction with operations of more than single machine room.

3.6 MECHANICAL EQUIPMENT IDENTIFICATION

- A. General: Install engraved plastic laminate signs on or near each major item of mechanical equipment and each operational device, as specified if not otherwise specified for each item or device. Provide signs for the following general categories of equipment and operational devices:
1. Main control and operating valves, including safety devices and hazardous units such as gas outlets
 2. Meters, gauges, thermometers and similar units
 3. Pumps, compressors, chillers, condensers and similar motor-driven units
 4. Fans, blowers, primary balancing dampers and mixing boxes
 5. Tanks and pressure vessels
 6. Strainers, filters, humidifiers, water treatment systems and similar equipment
- B. Lettering Size: Use a minimum 1/4 inch high lettering for name of unit where viewing distance is less than 2 feet 0 inches, 1/2-inch high for distances up to 6 feet 0 inches, and proportionately larger lettering for greater distances. Provide secondary lettering of 2/3 to 3/4 of the size of the principal lettering.
- C. Text of Signs: In addition to the name of the identified unit, provide lettering to distinguish between multiple units, inform the operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.

3.7 ADJUSTING AND CLEANING

- A. Adjusting: Relocate any mechanical identification device which has become visually blocked by the Work of this division or other divisions.
- B. Cleaning: Clean the face of identification devices, and glass frames of valve charts.

END OF SECTION

SECTION 40 05 10

ERECTING AND JOINTING INTERIOR AND EXPOSED EXTERIOR PIPING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Furnishing of supports and hangers and installation of all interior and exposed exterior piping and supports.
 - 1. Furnish, support, hang and install piping of the materials, coatings and linings shown or specified at locations as specified or where shown.
- B. Related Work Specified In Other Sections Includes, But is Not Limited to, the Following:
 - 1. Section 01 45 50 - Leakage Tests
 - 2. Section 05 05 13 - Galvanizing
 - 3. Section 09 96 00 - High Performance Coatings
 - 4. Section 33 13 00 - Disinfection
 - 5. Section 40 05 01 - Supports and Anchors

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. ASME B1.20.1 - Pipe Threads, General Purpose, Inch
 - 2. ASME B31.1 - Power Piping with Addenda
 - 3. AWWA C600 - Installation of Ductile-Iron Water Mains and Their Appurtenances

1.3 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle all products and materials as specified in Division 1 (and as follows:)
 - 1. Take extreme care in loading and unloading the pipe and fittings. Do the work slowly using skids or suitable power equipment, and keep the pipe under control at all times.

2. Handling Procedures: Under no condition is the pipe to be dropped, bumped, dragged, pushed or moved in any way which will cause damage to the pipe, lining or coating.
3. Use of Slings: When handling the pipe with a crane, use a suitable pipe hook or sling around the pipe. Under no condition is the sling to be allowed to pass through the pipe unless adequate measures are taken to prevent damage to the pipe ends, lining and coating.
4. Damage: If any piping or fittings are damaged in the process of delivery, storing, handling, or laying, replace or repair such piping or fittings as approved.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted.
 1. Pipe Dope for Threaded Joints
 - a. Masters Metallic Compound by Harbinseal Corporation

2.2 MATERIALS

- A. Provide hangers and supports and all necessary appurtenances as specified in Section 40 05 01.

2.3 FABRICATION

- A. Coating: Provide all threads coated with a suitable pipe dope, Masters Metallic Compound, graphite and engine oil, or equal, before jointing.

PART 3 EXECUTION

3.1 PREPARATION

- A. Galvanizing and Painting: Galvanize as specified, in accordance with Section 05 05 13.
 1. Paint hangers, supports, anchors, and similar devices as specified in Section 09 96 00.

3.2 INSTALLATION

- A. General: Install all piping in accordance with the manufacturer's recommendations and approved shop drawings and as specified in Division 1.
1. Install exposed piping at right angles or parallel to building walls. Diagonal runs are not permitted, unless expressly indicated.
 2. Install piping free of sags or bends and with ample space between piping to permit proper insulation applications, with 1-inch clearance outside the insulation.
 3. Place pipe runs to minimize obstruction to other work.
 4. Install piping to allow for expansion and contraction without stressing pipe, joints or connected equipment.
 5. Slope piping as shown and arrange systems to drain at low points.
 6. Do not penetrate building structural members unless shown.
 7. Locate groups of piping parallel to each other and at common elevations whenever practical, spaced to permit applying insulation and servicing of valves.
 8. Arrange miscellaneous pipelines, which are shown in diagram form on the Plans, clear of other pipelines and equipment.
 9. Fit and install pipelines in a neat and workmanlike manner in accordance with approved shop drawings.
 10. Provide an adequate number of unions in main pipe and branch pipe runs to facilitate dismantling or removal of pipeline sections without disturbing adjacent branch or connecting lines.
 11. Install suitable sleeves at all points where pipes pass through walls or floors of structures and where wall castings are not provided.
 12. Include proper pipe protection saddles on pipes which are covered with insulation.
- B. Flanged Joints: Make flanged joints with bolts or bolt studs with a nut on each end.

1. Field Flanges: Shop screw threaded flanges to pipe unless threading in the field is permitted with prior approval.
 2. Flange to Pipe Assembly: Assemble pipe to be fitted with threaded flanges as follows:
 - a. Accurately thread pipe and flanges to the appropriate gauge, screw flanges on by heavy machinery until the end of the pipe projects beyond the face of the flange and a tight metal-to-metal joint is produced without evidence of heat in the threaded portion.
 - b. Cut the projecting end of the pipe off flush with the face of the flange.
 - c. Make a light refacing cut across both the end of the pipe and the face of the flange at right angles to the center line of the pipe and then ream the pipe.
 - d. Flanged to Flange Assembly: Align flange surfaces parallel. Assemble joints by sequencing bolt tightening to make initial contact of flanges and gaskets as flat and parallel as possible. Use suitable lubricants on bolt threads. Tighten bolts gradually and uniformly to appropriate torque specified by bolt manufacturer.
- C. Threaded Joints: Conform threaded joints to ASME B1.20.1, tapered pipe threads for field cut threads unless otherwise specified. Join pipe, fittings, and valves as follows:
1. Note internal length of threads in fittings or valve ends, and proximity of internal seat or wall, to determine how far pipe should be threaded into joint.
 2. Align threads at point of assembly.
 3. Apply appropriate tape or thread compound to the external pipe threads.
 4. Assemble joint to appropriate thread depth. Assemble joint to produce a tight joint without evidence of heat in the threaded portion. When using a pipe wrench on valves, place wrench on valve end into which pipe is being threaded.
 5. Damaged Threads: Do not use pipe with threads which are corroded, or damaged. If weld opens during cutting or threading operations, do not use that portion of pipe.

6. Retightening: Once a threaded joint has been assembled, it is not to be backed off unless the threads are recleaned and new compound or tape applied before rejoining.
- D. Mechanical Joints: In making up mechanical joints, center the spigot in the bell.
1. Thoroughly brush the surfaces with which the rubber gasket comes in contact, with a wire brush just prior to assembly of the joint.
 2. Brush pipe manufacturers recommended lubricant over the gasket just prior to installation.
 3. Place the gasket and gland in position, insert bolts, and fingertighten nuts.
 4. Tighten the nuts with a torque wrench to bring the gland up toward the pipe evenly.
 5. Torques: Apply bolt torques complying with AWWA C600.
 6. Effective Sealing: If effective sealing is not obtained at the maximum torque listed, disassemble and reassemble the joint after thorough cleaning.
- E. Sleeve Type Couplings: For sleeve type couplings, equally tighten diametrically opposite bolts on the coupling to bring the gaskets up evenly all around the pipe.
1. Torque Wrenches: Do final tightening with torque wrenches set for the torque recommended by the coupling manufacturer.
- F. Welding: Comply welding of pipe joints with the requirements of ASME B31.1 unless otherwise specified. Do all off site welding of steel pipe conforming to the appropriate requirements.
1. Procedures: Confirm that pipe and fittings with wall thickness of 3/16-inch and larger have ends beveled for welding, and that the parts to be welded are securely held in place and are in proper alignment during welding.
 - a. Separate the abutting pipe ends before welding to permit complete fusion to the inside wall of the pipe without overlapping.
 - b. Provide welding continuous around the joint and completed without interruption.
 - c. Provide welds of the single vee butt type, of sound weld metal thoroughly fused into the ends of the pipe and into the bottom of the vee.

- d. Provide welds free from cold shuts, pinholes, oxide inclusions or other defects.
- G. Anchors and Stands: Furnish and install anchors and stands when specified, shown, or required for holding the pipelines and equipment in position or alignment.
1. Small Piping Supports: Where adjustable supporting devices are not required, support pipelines 3 inches in diameter and smaller on cast-iron, malleable iron, or steel hooks, hook plates, rings or ring plates.
- H. Hangers and Supports
1. Direction Changes: Provide pipe hangers at each change in pipe direction, on both sides of pipe mounted valves and equipment and on both sides of pipe loops and expansion absorbing devices.
 2. Brackets: Use brackets for the support of piping from vertical surfaces.
 3. Anchors: Furnish and install anchors when specified, shown, or required for holding the pipelines and equipment in position or alignment.
 4. Inserts: Install galvanized inserts in concrete structures where required for fastening supporting devices.
 5. Fire Protection System Piping: Support fire protection system piping independently from other piping systems.
 6. Controlled Movements: Install hangers and supports to allow controlled movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.
 7. Load Distribution: Adjust hangers to distribute loads equally on the attachment and to achieve any indicated slope of the pipe.

3.3 FIELD QUALITY CONTROL

- A. Tests: After installation of the interior and exposed exterior piping and supports, control equipment and all appurtenances, subject the units to a field running test, as specified in Division 1, under actual operating conditions. Where field welding of pipe joints shown, specified, permitted, or required meet the requirements of

ASME B31.1 -Power Piping, Chapter VI (Section 136.4.2 Visual Examination) (Section 137.4 Hydrostatic Testing) or (Section 137.5 Pneumatic Testing).

1. Perform testing of pipelines in accordance with the requirements of Section 01 45 50.

3.4 CLEANING

- A. General: Clean the interior of pipelines of all dirt and superfluous material of every description in an approved manner.
- B. Thoroughly clean threads for threaded joints after reaming.
- C. Disinfection: Disinfect pipelines carrying potable water in accordance with requirements of Section 33 13 00.

3.5 SCHEDULE

- A. Definitions: Abbreviations used in the schedule are as follows:

1. Pipe Materials:

- | | | |
|----|------|--------------------------------|
| a. | CPVC | Chlorinated Polyvinyl Chloride |
| b. | CU | Copper |
| c. | PVC | Polyvinyl Chloride |
| d. | SS | Stainless Steel |
| e. | St | Steel |
| f. | XL | XLPE Tubing |

2. Joints:

- | | | |
|----|----|------------------|
| a. | SW | Solvent Welded |
| b. | W | Welded |
| c. | Sc | Screwed/Threaded |
| d. | Sd | Soldered |

3. Coatings and Linings:

- | | | |
|----|---|------------|
| a. | G | Galvanized |
| b. | P | Painted |

- B. Schedule: Provide products as listed in the following schedule.

INTERIOR AND EXPOSED EXTERIOR PIPING SCHEDULE

Service	Size (Inches)	Pipe Material	Protective Coatings		Joints	Test Pressure (psig) ¹	Remarks
			Int.	Ext. ²			
Lime Slurry Pipe	3	XLPE	-	-	-	100	Cross Linked Polyethylene (XLPE) Hose pipe with Type 316 stainless steel cam-lock coupling fittings.
Water	1-2	PVC	-	-	SW	100	Sch 80, Coordinate sizes for water main connections with the lime slaker manufacturer. Water main connections are required for the new slaker, new slaker flushing water, and new slurry transfer pumps seal water.
Compressed Air	3/4	CU	-	-	Sd	100	

¹ Measure the test pressures shown in the schedule at the centerline of the pipeline's low point. Adjust test pressures measured at other locations accordingly.

² Do not insulate sections of pipe that pass through or are within structures containing water.

SECTION 40 05 17

STEEL PIPE AND FITTINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Requirements for providing steel pipe and fittings, except for steel pipe in buried applications, as follows:
1. Steel pipe and fittings include all fabricated and wrought steel pipe fittings. Use steel pipe only where specifically shown or specified. Provide pipe of the flanged, screwed, welded, grooved-type coupling joint or plain end type of the sizes and thicknesses as shown or specified.
- B. Related Work Specified in Other Sections Includes, But is Not Limited to, the Following:
1. Section 01 45 50 - Leakage Test
 2. Section 09 96 00 - High Performance Coatings
 3. Section 33 13 00 - Disinfection
 4. Section 40 05 10 - Erecting and Jointing Interior Piping
 5. Section 40 05 18 - Miscellaneous Pipe and Fittings

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
1. AWWA C205 - Cement-Mortar Protective Lining and Coating for Steel Water Pipe - 4 In. and Larger - Shop Applied
 2. AWWA C207 - Steel Pipe Flanges for Waterworks Service - Sizes 4 In. Through 144 In.
 3. AWWA C208 - Dimensions for Fabricated Steel Water Pipe Fittings
 4. AWWA C210 - Liquid Epoxy Coating Systems for Interior and Exterior of Steel Water Pipelines
 5. AWWA M11 - Steel Water Pipe: A Guide for Design and Installation

6. ASTM A 47 - Specification for Ferritic Malleable Iron Castings
7. ASTM A 53 - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
8. ASTM A 197 - Specification for Cupola Malleable Iron
9. ASTM A 283/A283M - Specification for Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes and Bars
10. ASTM A 307 - Specification for Carbon Steel Bolts and Studs, 50,000 psi Tensile
11. ASME B16.5 - Steel Pipe Flanges and Flanged Fittings: NPS 1/2 through 24 with Appendixes
12. ASME B36.10 - Welded and Seamless Wrought Steel Pipe

1.3 SYSTEM DESCRIPTION

- A. Design Standards: Use dimensions for steel pipe in accordance with ASME B36.10, unless specified otherwise.
 1. Provide pipe of 6-inch diameter and smaller not less than Schedule 40.
 2. Provide pipe of 8- through 16-inch diameter not less than Schedule 30.
 3. Provide pipe 18- through 30-inch diameter with a wall thickness of not less than 3/8 inch.
 4. Provide pipe 36 inches in diameter and larger with a wall thickness of not less than 1/2 inch.
- B. Small Steel Pipe: Provide steel pipe less than 30 inches in diameter meeting the requirements of ASTM A 53.

1.4 SUBMITTALS

- A. General: Provide all submittals, including the following, as specified in Division 1.
- B. Submit the following shop drawings:
 1. Flanged, screwed, welding and mechanical coupling fittings and pipe, couplings, harnessing and special fittings. When special designs or fittings

are required, show the Work in large detail and completely describe and dimension the special or fitting.

2. Catalog data for pipe, couplings, harnessing and fittings.

C. Quality Control: Submit the following certifications:

1. Certificate of compliance for pipe, fittings, couplings, sleeves, cleanouts and harnessing.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle pipe, fittings and couplings as specified in Division 01 and Section 40 05 10.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted.

1. Steel pipe and fittings

- a. U.S. Steel
- b. L.B. Foster
- c. Northwest Pipe Company

2. Coatings

- a. Kop-Coat
- b. Tnemec

2.2 MATERIALS

A. Fittings

1. Manufacture fittings for steel pipe to standard dimensions, suitable for the pressures specified. Provide steel fittings of the same or heavier wall thickness as the pipe of which they are a part.

- a. Provide fittings used in pipelines 2-inch diameter or smaller of the screwed pattern.

- b. Provide fittings used in pipelines 2.5-inch diameter or larger of the seamless steel welded type or flanged type, except as shown or specified otherwise.
2. Unions: Use screwed unions on all steel pipelines 2-inch diameter and smaller and flanged unions on pipelines 2.5-inch diameter and larger.
 - a. Provide an adequate number of unions of the screwed or flanged type in each main pipeline and each branch to facilitate the dismantling or removal of any branch line or any part thereof or the section of the main pipe to which it connects, without disturbing adjacent branch lines or their related main pipeline.
3. Screwed Fittings: Provide malleable iron ASME B16.3 screwed fittings where shown or specified for steel pipelines meeting the requirements of ASTM A 197. Provide unions with brass or iron seats.
4. Welding Fittings: Provide butt welding fittings meeting the requirements of ASME B16.9.
 - a. Provide outlets for welded connections that are made with Weldolets of the butt welding type.
 - b. Provide outlets for threaded connections that are made with Threadolets.
5. Fabricated Steel Fittings: Unless otherwise shown, provide steel flange fittings meeting the requirements of ASME B16.5 for 150-pound standard, except provide flanges that are plain faced.
 - a. Fabricate steel fittings from the same plates as the pipeline of which they are a part and meet the requirements of AWWA C208, unless otherwise shown or specified.
 - b. Provide fittings and elbows that are made of pipe segments or preformed plates.
 - c. Provide reducers and increasers with the same laying length as American Standard Class 125.
 - d. Provide fabricated steel fittings with plain ends or welded flanges.
 - e. Provide tees, wyes, laterals and outlets reinforced in accordance with AWWA M11.

B. Flanges and Flanged Joints

1. Flanges: Unless otherwise shown, provide all flanges for steel pipe, except blind flanges, of the slip-on welding type with hubs meeting the requirements of AWWA C207 Class D and made of metal meeting the requirements of ASTM A 181 Class 60
 - a. Attach the flanges to the barrel of the pipe with two continuous fillet welds.
 - b. Provide plain faced blind flanges in accordance with ASME B16.5 Class 150.
2. Flanged Joints: Make flanged joints with bolts or bolt studs with a nut on each end.
 - a. Provide bolts, stud bolts, and nuts meeting the requirements of ASTM A 307 Grade B and ASME B16.1.
 - b. Provide bolts which have a 1/4-inch projection beyond the nut when joint with gasket is assembled.
3. Gaskets: Provide rubber gaskets for flanged joints meeting the requirements of AWWA C207 as modified and supplemented herein. Provide 1/8-inch thick gaskets. Provide full face gaskets for pipe sizes 12 inches in diameter and smaller. Provide ring type gaskets for pipe larger than 12 inches in diameter.

C. Expansion

1. General: Make ample provisions for flexibility in all pipelines to compensate for expansion.
2. Expansion Device: Provide adequate expansion devices to allow the lines to expand and contract freely without damage to any part of the piping system.
 - a. Provide expansion devices in the form of expansion joints, expansion couplings, swivel or swing joints or pipe bends, and include such anchors as may be shown, specified or required to make the devices effective.
 - b. If expansion devices are not required, fabricate all runs of pipe subject to expansion shorter than their theoretical length to the extent that

there is freedom to expand without increasing the stresses imposed when cold.

3. Expansion Joints: Provide expansion joints that are of the single short type and are designed for the specified test pressures. Provide expansion joints with adequate tie rods to limit the axial movement at the specified test pressures, except where noted or specified otherwise.

D. Wall Pipes and Sleeves

1. Wall Pipes

- a. Where wall pipes are shown or specified, provide ductile iron wall pipes that meet the requirements of AWWA C110/A21.10 with end connections that are 1) of the type shown and 2) flush with the surfaces of the walls or floors. Unless otherwise shown or specified, provide wall pipes with intermediate collars located at the centers of the walls or floors.

2. Sleeves

- a. Where pipes pass through exterior walls or floors or wetted interior walls or floors of structures and where wall pipes are not to be provided, provide ductile-iron sleeves meeting the requirements of AWWA C110/A21.10 with ends that are flush with the wall or floor surfaces and with intermediate collars located at the centers of the walls or floors.
- b. Where pipes pass through non-wetted interior walls or floors and where wall pipes are not to be provided, provide ductile-iron sleeves meeting the requirements of AWWA C110/A21.10; steel pipe sleeves meeting the requirements of this Section or as shown or specified otherwise. Provide sleeves with ends that are flush with the wall or floor surfaces. Where shown or specified, provide intermediate collars located at the centers of the walls or floors.
- c. Provide sleeves having large enough diameters to accommodate the passage of pipe joints, if required.
- d. Provide steel sleeves 12 inches in diameter and larger with a minimum wall thickness of 0.375 inch. For steel sleeves that are smaller than 12 inches in diameter provide Schedule 40 or thicker sleeves. Where shown or specified, provide steel sleeves with intermediate collars located at the centers of the walls or floors. Provide collars having outside diameters four inches greater than the outside diameters of the sleeves, fabricated from steel plates having

minimum thickness equal to the sleeve thickness and double welded to the sleeves.

- e. Where shown or specified, provide modular, mechanical sleeve seals, meeting the requirements in Section 40 05 18, in the annular spaces between pipes and sleeves. In all other locations, caulk the annular spaces between pipes and sleeve with caulk meeting the requirements of ASTM C 920, Type S, Grade NS, Class 25. Match the color of the sealant to that of the adjacent surface..

E. Coatings and Linings

1. General: Line and coat steel pipelines in accordance with the piping schedule.
 - a. Coat all bolts, nuts, couplings and the like after the joint has been made.
 - b. Paint in accordance with Section 09 96 00.
 - c. Do not paint the outside of pipe and fittings that are to be concrete encased.
2. Cement-Mortar Lining: Provide cement and mortar lining in accordance with the requirements of AWWA C205 where shown or specified.
3. Galvanizing: Provide galvanizing in accordance with ASTM A 53 where shown or specified.
4. Sleeve-type Couplings: Shop coat all surfaces with Dresser Red D, Smith-Blair Standard Blue Shop-coat, or equal nontoxic material compatible with the finish coatings specified. Give the inside coating of the middle ring an additional shop coat of Kop-Coat Hi-Guard epoxy or Tnemec Pota-pox. Finish coat as specified in Section 09 96 00 for the pipeline of which it is a part.
5. Groove-type Couplings: Shop coat couplings as specified in Section 09 96 00 for the pipelines of which the coupling is a part.

PART 3 EXECUTION

3.1 INSTALLATION

- A. General: Install all steel pipe and fittings in accordance with the manufacturer's recommendations and approved shop drawings and as specified in Division 01 and Section 40 05 10.
- B. Reducing Fittings: Use ample fittings for all changes in pipe size. Do not use bushings.
- C. Drip Pans: Provide drip pans under all steel pipelines installed over electrical equipment and motors and properly connect to the drainage system with 3/4-inch red brass pipe. Make leak tight connection between the drip pan and the drain pipe. Pitch pans uniformly toward the drain pipe not less than 1/8-inch per lineal foot.

3.2 LEAKAGE TESTING

- A. Cleaning: Flush clean and test all pipes after installation.
- B. Testing: Test pipes for leaks and repair or tighten as required.
- C. Procedures: Conduct tests in accordance with Section 01 45 50.

3.3 DISINFECTION

- A. Disinfect all pipelines that are to carry potable water before they are placed into service as specified in Section 33 13 00.

3.4 SCHEDULES

- A. Refer to the Schedule contained in Section 40 05 10 Erecting and Jointing Interior Pipe for information on the piping that is to be constructed using the pipe materials and methods specified herein.

END OF SECTION

SECTION 40 05 18

MISCELLANEOUS PIPE AND FITTINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Requirements for providing miscellaneous pipe and fittings as indicated. Miscellaneous pipe and fittings include all aluminum, copper, brass, plastic, cast-iron soil and fittings.
- B. Related Work Specified In Other Sections Includes, But is Not Limited to, the Following:
 - 1. Section 09 96 00 - High Performance Coatings
 - 2. Section 33 13 00 - Disinfection
 - 3. Section 40 05 10 - Erecting and Jointing Interior Piping
 - 4. Section 40 05 17 - Steel Pipe and Fittings

1.2 REFERENCES

- A. Codes and standards referred to in this Section are:
 - 1. ASTM B 42 - Specification for Seamless Copper Pipe, Standard Sizes
 - 2. ASTM B 43 - Specification for Seamless Red Brass Pipe, Standard Sizes
 - 3. ASTM B 108 - Specification for Aluminum Alloy Permanent Mold Castings
 - 4. ASTM B 241 - Specification for Aluminum and Aluminum Alloy Seamless Pipe and Seamless Extruded Tube
 - 5. ASTM C 564 - Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings

- | | | |
|-----|--------------|--|
| 6. | ASTM D 1784 | - Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds |
| 7. | ASTM D 1785 | - Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120 |
| 8. | ASTM D 2464 | - Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80 |
| 9. | ASTM D 2564 | - Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems |
| 10. | ASTM D 2855 | - Recommended Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings |
| 11. | ASTM F 491 | - Specification for Poly (Vinylidene Fluoride) (PVDF) Plastic-Lined Ferrous Metal Pipe and Fittings |
| 12. | ASTM F 492 | - Specification for Propylene and Polypropylene (PP) Plastic-Lined Ferrous Metal Pipe and Fittings |
| 13. | ASME B1.20.1 | - Screw Threads - Pipe Threads, General Purpose (Inch) |
| 14. | ASME B16.15 | - Cast Bronze Threaded Fittings, Classes 125 and 250 (Includes Revisions Service) |

1.3 SUBMITTALS

- A. General: Provide all submittals, including the following, as specified in Division 1.
 - B. Shop Drawings: Submit the following Shop Drawings.
 - 1. Submit complete detailed shop drawings in conformance with the specified requirements.

2. Include drawings that show the piping layouts and schedules of all pipe, fittings, valves, expansion joints, flexible couplings, hangers, supports and other appurtenances.
3. When any work is of special design show in large detail and completely describe and dimension.
4. Welders Certificate: Include welders' certification with ASME/Section IX.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle all products and materials as specified in Division 1 (and as follows:)

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable manufacturers are listed below. Other manufacturers of equivalent products may be submitted.

1. Pipe and Fittings:

- a. Copper pipe and Fittings

- (1) Mueller Industries, Inc., Wichita, KS
- (2) Nibco, Elkhart, IN

- b. PVC and CPVC Pipe and Fittings

- (1) United States Plastic Corp., Lima, Ohio
- (2) Harvel Plastics Inc., Easton, Pennsylvania

- c. Wall Sleeve Annular Seals

- (1) Thunderline Corp. (Link-Seal), Belleville, MI

- d. Lime Slurry Hose

- (1) Eaton, Model EHC005 Corrugated UHMW-PE Suction and Discharge Hose

2.2 MATERIALS

A. Polyvinyl Chloride (PVC) and Chlorinated Polyvinyl Chloride (CPVC) Pipe and Fittings

1. Pipe and Fittings: Provide PVC pipe and fittings that are Schedule 80 and meet the requirements of ASTM D 1784 Class 12454-B and ASTM D 1785 unless otherwise shown or specified. Provide CPVC pipe and fittings that are Schedule 80 and meet the requirements of ASTM D 1784 Class 23447-B and ASTM D 1785, unless otherwise shown.
2. Joints: Provide ASTM D 2855 solvent welded joints utilizing ASTM D 2564 solvent cement or ASTM D 2464 threaded joints, as indicated in the piping schedules.

B. Lime Slurry Hose

1. Hose and Fittings: Provide 3-inch I.D. corrugated UHMW suction and discharge hose with high-tensile synthetic textile, steel helical wire and anti-static copper wire, with corrugated EPDM cover. Provide hose rated for 150 psi operating pressure at 68 degrees F with 600 psi burst pressure. Provide food grade rated hose or with NSF 61 certification. Provide certification that hose is resistant to calcium hydroxide (lime) slurry. Hose fittings shall be Type 316 stainless steel quick connect couplings as shown on the plans or as required. Where required for connecting to equipment, provide Type 316 stainless steel pipe and fittings.

C. Wall Pipes and Sleeves for Miscellaneous Pipe and Fittings

1. Wall Pipes

- a. Where wall pipes are shown or specified, provide ductile iron wall pipes that meet the requirements of AWWA C110/A21.10 with end connections that are 1) of the types shown and 2) flush with the surfaces of the walls or floors. Unless otherwise shown or specified, provide wall pipes with intermediate collars located at the centers of the walls or floors.

2. Sleeves

- a. Where pipes pass through exterior walls or floors or wetted interior walls or floors of structures and where wall pipes are not to be provided, provide ductile-iron sleeves meeting the requirements of AWWA C110/A21.10 with ends that are flush with the wall or floor surfaces and with intermediate collars located at the centers of the walls or floors.

- b. Where pipes pass through non-wetted interior walls or floors and where wall pipes are not to be provided, provide ductile-iron sleeves meeting the requirements of AWWA C110/A21.10; steel pipe sleeves meeting the requirements of Section 40 05 17 or as shown or specified otherwise. Provide sleeves with ends flush with the wall or floor surfaces. Where shown or specified, provide intermediate collars located at the centers of the walls or floors.
 - c. Provide sleeves having large enough diameters to accommodate the passage of pipe joints, if required.
 - d. Where shown or specified, provide modular, mechanical sleeve seals, meeting the requirements of this Section, in the annular spaces between pipes and sleeves. In all other locations, caulk the annular spaces between pipes and sleeves with caulk meeting the requirements of ASTM C 920, Type S, Grade NS, Class 25. Match the color of the sealant to that of the adjacent surface.
- D. Modular, Mechanical Sleeve Seals: Provide modular, mechanical type seals consisting of interlocking, synthetic-rubber links shaped to continuously fill the annular space between the pipe and the sleeve. Provide an elastomeric sealing element that is of the size, quantity, type and material that the manufacturer recommends for the intended service and that will provide an effective hydraulic seal. Provide stainless steel bolts and nuts.
- E. Supports and Anchors: Provide all pipelines with supporting and anchoring devices as specified in Section 40 05 01.
- F. Drip Pans: Provide drip pans constructed of 16-gauge Type 316 stainless steel.

PART 3 EXECUTION

3.1 INSTALLATION

- A. General: Install all miscellaneous pipe and fittings in accordance with the specifications contained herein and in Section 40 05 10 and in accordance with the manufacturer's recommendations and approved shop drawings and as specified in Division 1.
- B. Connections Between Dissimilar Metals: Where connections are to be made between pipelines or equipment of corrosion causing dissimilar metals make the connections using dielectric insulating couplings, unions or other approved dielectric insulating devices.

- C. Couplings: Only use couplings to join standard lengths of pipe and as required to complete a straight run of pipe. Do not use couplings to join random lengths of pipe and cuttings from standard lengths.
- D. Reducing Fittings: Use reducing fittings for all changes in pipe size. Do not use bushings.
- E. Pipe Flexibility: Make ample provisions for flexibility in all pipelines in accordance with Section 40 05 10.
- F. Drip Pans: Provide drip pans under all metallic pipelines installed over electrical equipment and motors and properly connect to the drainage system with 3/4-inch red brass pipe. Make leaktight connection between the drip pan and the drain pipe. Pitch pans uniformly toward the drain pipe not less than 1/8-inch per lineal foot.

3.2 CLEANING AND PAINTING

- A. Cleaning: Flush all process and potable water pipelines with clean water.
- B. Leakage: Test pipes at the pressures specified in the piping schedules located in Section 40 05 10.
- C. Paint in accordance with Section 09 96 00, unless otherwise specified.

3.3 DISINFECTION

- A. Disinfect all potable water pipelines in accordance with Section 33 13 00.

3.4 SCHEDULES

- A. Refer to the schedules contained in Section 40 05 10 Erecting and Jointing Interior Piping for information on the piping that is to be constructed using the pipe materials and methods specified herein.

END OF SECTION

SECTION 40 90 00
INSTRUMENTATION AND CONTROLS – GENERAL PROVISIONS

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Work includes engineering, furnishing, installing, testing, documenting and placing in operation a replacement Slaker No.1 Control Panel (SSCP-1) and modifications to SSCP-2 at City of Tampa Florida Water Department's (CITY) David L. Tippin Water Treatment Facility (WTF) Lime Slaker Replacement Project WO#103.
- B. The Work involves integrating the SSCP-1, designed and furnished by the EQUIPMENT SUPPLIER, and the modified SSCP-2 to monitor and control lime slaker processes associated with the Lime Slaker Replacement Project.
- C. The Programmable Logic Controller N1 (PLC-N1) contained within SSCP-1 shall be interconnected to the existing Process and Instrumentation Control System (PICS) via a new 3 pair fiber optic cable as shown on the Contract Drawings.
- D. The existing Human Machine Interface (HMI) Citect graphics shall be modified to represent the additions and modifications to the PICS. New screens shall be designed to conform with the existing screens design and function, and shall at a minimum include the following:
 - 1. Lime System Overview
 - 2. Lime Slaker No. 1
 - a. Slaker Controls
 - b. Slaker Data
 - c. Lime Totals
 - 3. Lime Slaker No. 2
 - a. Slaker Controls
 - b. Slaker Data
 - c. Lime Totals
- E. It is the ultimate responsibility of the CONTRACTOR to furnish a functionally operable SSCP-1 and SSCP-2 that fully meets the requirements set forth herein and as shown on the Contract Drawings. A single entity henceforth referred to as the PROCESS CONTROL SYSTEM SUPPLIER (PCSS) shall be retained by the CONTRACTOR to have overall responsibility for interfacing, adjusting, testing and documenting the SSCP-1 and SSCP-2 equipment described in the Contract Documents.

- F. The work defined in this Specification Section shall be performed by one of the following listed below and henceforth referred to as the PCSS. The PCSS shall have personnel certified for Citect HMI.
1. Curry Controls Company
 2. Revere Control Systems
 3. Automated Controls of Tampa
- G. The CONTRACTOR shall be responsible for:
1. Equipment storage and protection until installed following the storage and handling instructions recommended by the PCSS. Anti-static and winterization requirements shall be per the PCSS's instructions and the PCSS shall periodically verify that these instructions are followed.
 2. Including within the electrical subcontractors scope the provision, installation and termination of field and power wiring to the control system components. Termination shall be made in accordance with final accepted interconnection diagrams developed by the PCSS. The electrical subcontractor shall mark on the interconnect diagram the field wire numbers used for each termination point. The PCSS shall finalize the interconnect diagrams by including these field wire numbers in the final as built version.
 3. Physical installation of the control system. The CONTRACTOR shall require the PCSS and EQUIPMENT SUPPLIER to observe and advise on the installation of the control system to the extent required to certify, with the operational check-out tests, that the equipment will perform as required.
- H. All engineering development required by the PCSS and EQUIPMENT SUPPLIER shall be in accordance with the Conditions of this Contract.
- I. Equipment found to be defective prior to system acceptance shall be replaced and installed at no additional cost to the CITY.
- J. The PCSS shall coordinate with services of authorized field personnel from the manufacturers of components or systems provided under other sections but not manufactured by the PCSS. Should these personnel be required during installation and checkout of SSCP-1 and SSCP-2, such services shall be provided at no additional cost to the CITY.

1.02 RELATED WORK

- A. Specification Section 46 30 40 defines requirements for the Lime Equipment.
- B. Specification Section 26 05 20 defines requirements for Fiber Optic System.
- C. Division 26 covers the Electrical Requirements.

1.03 SYSTEM DESCRIPTION

- A. The lime slaker equipment and processes are monitored and controlled by PLCs contained within SSCP-1 and SSCP-2 via plant SCADA HMI.
- B. The new SSCP-1 provided by the EQUIPMENT SUPPLIER shall contain the following new elements:
 - 1. A new PLC-N1.
 - 2. A mixed media Ethernet switch to interconnect the new SSCP-1 PLC with the existing SCADA.
 - 3. A 24VDC power supply.
 - 4. A fiber optic patch panel.
 - 5. Refer to the Instrumentation Drawings for interconnection of new SSCP-1 and existing PICS.
- C. SSCP-2 shall be modified as laid out in Section 46 30 40, 2.09.
- D. A new 3 pair fiber optic cable shall be furnished and installed between the fiber patch panel located in the existing SSCP-2 in the Lime House and routed to the fiber patch panel located in SSCP-1 in the New Electrical Building. Refer to Specification Section 26 05 20.

1.04 SUBMITTALS

- A. Furnish, as prescribed under the General Requirements, all required submittals covering the items included under this section and its associated sections of the work.
- B. Submit complete, neat, orderly, and indexed submittal packages. Handwritten diagrams are not acceptable and all documentation submittals shall be made using CADD generated utilities.
- C. Partial submittals or submittals that do not contain sufficient information for complete review or are unclear will not be reviewed and will be returned by the ENGINEER as not approved.
- D. Provide all shop drawing submittals on disk in PDF format.
- E. Submit an HMI programming package. The submittal shall include the following:
 - 1. A listing of all process graphic screens to be provided.
 - 2. A written documentation of how the operator will interface with the process graphic screens to effect control actions or process parameter modifications. Support the description with samples of the graphics or pop-up windows to be used.
 - 3. An example screen illustrating the proposed operator interface with the historical database.
 - 4. An example screen illustrating the proposed operator interface with the alarm/event database.
 - 5. An example screen illustrating the proposed trending displays.

6. A list of proposed trends and associated parameters.
 7. Examples of proposed reports and associated parameters.
- F. Changeover Plan. This shall provide a descriptive sequence of work and tests proposed for the new equipment installation and removal of the replaced equipment.
- G. Test Procedures: Submit the procedures proposed to be followed during all system testing. Procedures shall include test descriptions, forms, and check lists to be used to control and document the required tests.
- H. Test Reports: Upon completion of operational check-out tests, document the testing by submitting a copy of the signed off test procedures to the ENGINEER.

1.05 FINAL DOCUMENTATION

- A. After the operational check-out tests have been completed and as a part of the final acceptance requirements, submit the SSCP-1 record drawings. Record drawings shall include, corrected for any changes that may have been made up through Substantial Completion:
1. instrument loop wiring diagrams
 2. panel wiring diagrams
 3. panel elevations
 4. interconnection diagrams showing terminal numbers at each wiring termination
- B. Record drawings shall be developed in AutoCAD 2015. Provide copies of all AutoCAD files and PDF versions on USB drive.
- C. Operating and Maintenance (O&M) Manuals: Provide the specified number of complete sets of three-ring bound O&M manuals in accordance with Specification Section 01 78 23. Include descriptive material, drawings, and figures bound in appropriate places. Include:
1. Cross references to any 3rd party O&M manuals.
 2. Additional operating and maintenance instructions in sufficient detail to facilitate the operation, removal, installation, adjustment, calibration and maintenance of each component provided with the SSCP-1 and SSCP-2.
 3. All the submittal data for each component from the approved shop drawing submittals with corrections made on approved as noted items.
 4. An USB Drive containing the shop drawing data in PDF format in the binder sleeve.

1.06 QUALITY CONTROL

- A. The PCSS shall be subcontracted by and paid by the CONTRACTOR.

- B. The PCSS and EQUIPMENT SUPPLIER shall meet all of the requirements of these specifications, and, unless specifically stated otherwise, no prior acceptance of any subsystem, equipment, or materials has been made.
- C. All equipment furnished by the EQUIPMENT SUPPLIER shall be of the latest and most recent design and shall have overall accuracy as guaranteed by the manufacturer.
- D. Materials and equipment used shall be U.L. approved wherever such approved equipment and materials are available.
- E. Component equipment shall be as supplied by EQUIPMENT SUPPLIER.
- F. To facilitate the CITY's operation and maintenance, products shall be of the same major MANUFACTURER, with panel mounted devices of the same type and model as far as possible.
- G. In order to insure the interchangeability of parts and the maintenance of quality, strict compliance with the above requirements shall be maintained.
- H. The PCSS and EQUIPMENT SUPPLIER shall designate a single point of contact for interface with the ENGINEER on this project. The ENGINEER reserves the sole right to approve or reject this point of contact.
- I. The PCSS and EQUIPMENT SUPPLIER shall provide experienced personnel on-site to coordinate and/or perform:
 - 1. Installation, termination, and adjustment.
 - 2. On-site testing.
 - 3. CITY personnel training.
 - 4. Startup assistance for the SSCP-1 and SSCP-2.

1.07 STANDARDS

- A. The design, testing, assembly, and methods of installation of the wiring materials, electrical equipment and accessories proposed under this Contract shall conform to the National Electrical Code and to applicable state and local requirements. UL listing and labeling shall be adhered to under this Contract.
- B. International Society of Automation (ISA) and National Electrical Manufacturers Association (NEMA) standards shall be used where applicable in the design of the SSCP-1 and SCCP-2.
- C. Any equipment that does not have a UL, FM CSA, or other approved testing laboratory label shall be furnished with a notarized letter signed by the supplier stating that the equipment furnished has been manufactured in accordance with the National Electric Code and OSHA requirements.
- D. Any additional work needed resulting from any deviation from codes or local requirements shall be at no additional cost to the CITY.

1.08 WARRANTY AND GUARANTEES

- A. In accordance with Division 1, the PCSS and EQUIPMENT SUPPLIER shall furnish to the CITY a written two year guarantee commencing with substantial completion, that all equipment and parts thereof, material and/or workmanship are of top quality and free from defects.
- B. The PCSS and EQUIPMENT SUPPLIER shall guarantee all equipment whether or not of his own manufacture.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. Equipment to be installed in a hazardous area shall meet Class, Group, and Division classification as shown on the Contract Electrical Drawings, or comply with the local or National Electrical Code, whichever is the most stringent requirement.
- B. All electronic instrumentation shall be of the solid-state type and shall utilize linear transmission signals of 4 to 20 mA DC (milliampere direct current); however, signals between instruments within the same panel or cabinet may be 1-5 volts DC (direct current). Outputs of equipment that are not of the standard signals as outlined, shall have the output immediately raised and/or converted to compatible standard signals for remote transmission. No zero based signals will be allowed.
- C. Electronic equipment shall utilize printed circuitry suitably coated to prevent contamination by dust, moisture and fungus. Solid-state components shall be conservatively rated for their purpose, to assure optimum long-term performance and dependability over ambient atmosphere fluctuations and 0 to 100 percent relative humidity. The field mounted equipment and system components shall be designed for installation in dusty, humid, and slightly corrosive service conditions.
- D. All equipment shall be designed to operate on a 60-Hertz alternating current power source at a normal 120 volts, plus or minus 10 percent, except where specifically noted. All regulators and power supplies required for compliance with the above shall be provided between power supply and interconnected instrument loop. Where equipment requires voltage regulation, constant voltage transformers shall be supplied.
- E. All equipment, cabinets and devices furnished hereunder shall be heavy-duty type, designed for continuous industrial service. The system shall contain products of a single MANUFACTURER, insofar as possible, and shall consist of equipment models which are currently in production. All equipment provided shall be of modular construction and shall be capable of field expansion through the installation of plug-in circuit cards or additional cabinets.
- F. The equipment furnished shall be designed to operate satisfactorily between 0 degrees C and 40 degrees C at up to 95 percent Relative Humidity (non condensing).
- G. All switches shall have double-pole, double-throw contacts rated at a minimum of 600 volts-amperes (VA), unless specifically noted otherwise.

- H. All equipment shall be designed and constructed so that in the event of a power interruption, the equipment specified hereunder shall resume normal operation without manual resetting when power is restored.

2.02 CONTROL EQUIPMENT

- A. Control and data acquisition associated with site equipment shall be performed by Programmable Logic Controllers (PLC). The PLC modules shall be Allen Bradley CompactLogix series, no equal, DIN-rail mounted within the Process Control Panel. Modules shall be selected from the following list:
 - 1. CPU Module. Module shall meet the following requirements:
 - a. Built-in dual Ethernet/IP ports and USB port for programming.
 - b. 1 GB memory card.
 - c. 1 MB user memory.
 - d. Provide Allen Bradley 1769-L30ER.
 - 2. Power Supply Module. Module shall meet the following requirements:
 - a. Power requirement: 85-265 VAC.
 - b. Provide Allen Bradley 1769-PA2 or 1769-PA4 as necessary based on load requirements.
 - 3. Input/Output Modules. Furnish input/output modules sufficient to accommodate the inputs/outputs shown on the Contract Drawings plus an additional 50% spare capacity. All I/O modules shall be provided with the associated Allen Bradley termination blocks with attached wiring.
 - 4. Discrete Input Module. Module shall meet the following requirements:
 - a. Sixteen 24 VDC sink/source inputs.
 - b. Provide Allen Bradley 1769-IQ16.
 - 5. Discrete Output Module. Module shall meet the following requirements:
 - a. Eight individually isolated contact outputs.
 - b. Operating AC voltage: 5-265 VAC.
 - c. Operating DC voltage: 5-125 VDC.
 - d. Provide Allen Bradley 1769-OA8I.
 - 6. Analog Input Module. Module shall meet the following requirements:
 - a. Eight single-ended or differential 4-20 mA inputs.

- b. Provide Allen Bradley 1769-IF8.
 - 7. Analog Output Module. Module shall meet the following requirements:
 - a. Four individually isolated differential 4-20 mA outputs.
 - b. Provide Allen Bradley 1769-OF4CI.
- B. PLC Software. The latest revision of the programming software shall be installed as of substantial completion. Provide Rockwell Automation RSLogix 5000 Version 20.
- C. Ethernet Switch. The switch shall be an industrialized, aluminum DIN-rail mountable enclosure meeting the following requirements:
 - 1. Four RJ-45 10/100 Base TX copper ports.
 - 2. One ST 100 Base FX fiber ports.
 - 3. Operating Temperature: Up to 60 degrees C.
 - 4. Power Supply – Phoenix Contact, MINI POWER 24V DC.
 - 5. Manufacturer/model:
 - a. Phoenix Contact, FL SWITCH SFN 4TX/FX ST - 2891453.
 - b. No equal.

2.03 SPARES AND EXPENDABLES

- A. Provide the following spare parts:
 - 1. One spare PLC module of each type provided.

PART 3 - EXECUTION

3.01 GENERAL

- A. Prerequisite Activities and Lead Times: Do not start the following key project activities until the listed prerequisite activities have been completed and lead times have been satisfied:
 - 1. Hardware Purchasing, Fabrication, and Assembly: Associated design related submittals completed (no exceptions, or approved as noted).
 - 2. Shipment: Completion and approval of all design related submittals.

3.02 PRODUCT HANDLING

- A. Adequately pack manufactured material to prevent damage during shipping, handling, storage and erection. Pack all material shipped to the project site in a container properly marked for identification. Use blocks and padding to prevent movement.

- B. Ship materials that must be handled with the aid of mechanical tools in wood-framed crates.
- C. Ship all materials to the project site with at least one layer of plastic wrapping or other approved means to make it weatherproof. Anti-stat protection shall be provided for all sensitive equipment.
- D. Inspect the material prior to removing it from the carrier. Do not unwrap equipment until it is ready to be installed. If any damage is observed, immediately notify the carrier so that a claim can be made. If no such notice is given, the material shall be assumed to be in undamaged condition, and any subsequent damage that is discovered shall be repaired and replaced at no additional expense to the CITY.
- E. Store and protect equipment until installation following the storage and handling instructions recommended by the equipment manufacturers. Place special emphasis on proper anti-static protection of sensitive equipment.
- F. Protection During Construction: Throughout this Contract, provide protection for materials and equipment against loss or damage and from the effects of weather. Prior to installation, store items in indoor, dry locations. Provide heating in storage areas for items subject to corrosion under damp conditions. Provide covers for panels and other elements that may be exposed to dusty construction environments. Specific storage requirements shall be in accordance with the PCSS and EQUIPMENT SUPPLIER's recommendations.
- G. The CONTRACTOR shall be responsible for any damage charges resulting from the handling of the materials.

3.03 INSTALLATION

- A. Install the equipment in the location indicated on the Drawings and follow manufacturers' installation instructions explicitly, unless otherwise indicated. Wherever any conflict arises between manufacturers' instruction, and these Contract Documents, follow ENGINEER's decision, at no additional cost. Keep a copy of manufacturers' instructions on the jobsite available for review at all times
- B. Install materials and equipment in a workmanlike manner utilizing craftsmen skilled in the particular trade. Provide work which has a neat and finished appearance. Coordinate I&C work with the CITY and work of other trades to avoid conflicts, errors, delays, and unnecessary interference with operation of the existing plant during construction.
- C. Keep the premises free from accumulation of waste material or rubbish. Upon completion of work, remove materials, scraps, and debris from premises and from interior and exterior of all devices and equipment. Touch-up scratches, scrapes, or chips in interior and exterior surfaces of devices and equipment with finishes matching as nearly as possible the type, color, consistency, and type of surface of the original finish. Clean and polish the exterior of all panels and enclosures upon the completion of the demonstration tests.

3.04 TRAINING

- A. The cost of training programs to be conducted with CITY's personnel shall be included in the Contract price.

- B. All training schedules shall be coordinated with, and at the convenience of the CITY. Shift training may be required to correspond to the CITY's working schedule.
- C. Provide a minimum of one day training for up to three of the CITY's personnel in the maintenance of the PLC-N1 which shall include:
 - 1. Training in standard hardware maintenance for the equipment provided.
 - 2. Test, adjustment, and calibration procedures.
 - 3. Troubleshooting and diagnosis.
 - 4. Component removal and replacement.
 - 5. Periodic maintenance.

3.05 TESTING

- A. As a minimum, the testing shall include shop tests and operational check-out test.
- B. Each test shall be in the cause and effect format. The person conducting the test shall initiate an input (cause) and, upon the system producing the correct result (effect), the specific test requirements will have been satisfied.
- C. All tests shall be conducted in accordance with, and documented on, prior approved procedures, forms, and checklists. Each specific test to be performed shall be described and a space provided after it for signoff by the appropriate party after its satisfactory completion. Copies of these signoff test procedures, forms, and checklists will constitute the required test documentation.
- D. Provide all special testing materials and equipment.
- E. The PCSS and EQUIPMENT SUPPLIER shall coordinate all of their testing with the CONTRACTOR, the ENGINEER, all affected suppliers, and the CITY.
- F. The ENGINEER reserves the right to test or retest any and all specified functions whether or not explicitly stated in the approved test procedures. The ENGINEER's decision shall be final regarding the acceptability and completeness of all testing.
- G. Check the entire equipment for proper installation, calibration and adjustment on a loop-by-loop and component-by-component basis to ensure that it is in conformance with related submittals and the Specifications.
- H. The Loop/Component Inspections and Tests shall be implemented using approved forms and checklists. These shall be developed by the PCSS and EQUIPMENT SUPPLIER and submitted for approval.
- I. Loop Status Report: Each control loop shall have a Loop Status Report to organize and track its inspection, adjustment, and calibration. These reports shall include the following information and check-off items with spaces for sign-off by the PCSS and EQUIPMENT SUPPLIER:

1. Project Name
 2. Control Loop Number or description
 3. Tag Number or description for each component of the control loop
 4. Check-offs/sign-offs for each component for proper installation, termination, and calibration/adjustment
 5. Check-offs/sign-offs for the control loop for proper panel interface terminations, I/O interface terminations, I/O signal operation relative to the computer network, and total loop operation ready
 6. Space for comments
- J. Component Calibration Sheet: Each field instrument element and each PLC I/O module shall have a Component Calibration Sheet. These sheets shall have the following information, spaces for data entry, and a space for signoff by the PCSS and EQUIPMENT SUPPLIER:
1. Project Name
 2. Component Identification or I/O Module Number
 3. Manufacturer, Model Number/Serial Number of field element
 4. Summary of Functional Requirements (scale, range, computing equation, control action, etc.)
 5. Calibrations of span, setpoints, and preset adjustable parameters
 6. Space for comments
- K. Maintain the Loop Status Reports and Component Calibration Sheets at the jobsite and make them available to the ENGINEER at any time.
- L. Witnessing: These inspections and tests do not require witnessing. However, the ENGINEER will review the Loop Status Sheets and Component Calibration Sheets and spot-check their entries periodically and upon completion of the Operational Check-out Tests. Correct any deficiencies found.

END OF SECTION

SECTION 46 30 40

LIME SLAKING AND FEED EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: This Section includes the requirements for furnishing and installing the following equipment, complete with all accessories and appurtenances required for a complete installation:
- a. Upgrade to the existing lime slaking system
 - b. New Lime Feeder
 - c. New Lime Slaker
 - d. New Fine Grit Classifier
 - e. New Slurry Aging Tank
 - f. New Slurry Transfer Pumps
 - g. New Slurry Loop Pumps and Delivery Systems
 - h. Complete electrical controls and instrumentation as described herein.
- B. The Work also requires that one System Supplier be made responsible for furnishing the Work of this Section, but without altering or modifying the CONTRACTOR'S responsibilities under the Contract Documents.
- C. The Work also includes coordination of design, assembly, testing and installation.

1.02 RELATED SECTIONS

- A. The Work of the following Sections applies to the Work of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this Work.
- | | | |
|----|------------------|---|
| 1. | Division 26 | Electrical |
| 2. | Section 40 05 01 | Supports and Anchors |
| 3. | Section 40 66 26 | Control and Data Network Equipment |
| 4. | Section 40 66 33 | Fiber Optic Cabling and Equipment |
| 5. | Section 40 67 00 | Control Panels and Enclosures and Panel Equipment |
| 6. | Section 40 90 00 | Instrumentation and Controls – General Provisions |

1.03 CODES

- A. The WORK of this Section shall comply with the current editions of the following codes:

1. Uniform Building Code
2. National Electrical Code

1.04 SPECIFICATIONS AND STANDARDS

A. Except as otherwise indicated, the current editions of the following apply to the Work of this Section:

1. Commercial Standards:

ASTM A 36	Specification for Structural Steel
ASTM A 283	Specification for Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes and Bars
AISI 8620	Alloy Steel, Hot Rolled and Cold Finished
ASTM A48	Iron Castings
SSPC-SP No. 6	Commercial Blast Cleaning
ANSI/ASME B20.1	Safety Standards for Conveyors and Related Equipment

2. System Supplier's Standards:

Conveyor Equipment System Suppliers Association (CEMA) standards
American Gear System Suppliers Association (AGMA) standards
Institute of Electrical and Electronics Engineers (IEEE) standards
National Electrical System Supplier's Association (NEMA)

1.05 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted:

1. Catalog cut sheets containing descriptive information and drawings of equipment and their components.
2. Submittal drawings including capacities and sizes, anchor bolt plan, parts nomenclature, material list and outline dimensions.

3. Drive and motor sizes and specifications.
4. Design loading to be transmitted to foundation or supports.
5. Electrical drawings including panel arrangement drawings, catalog cuts, wiring diagrams, and a P&ID diagram for the entire system.
6. Electronic and hard copies of the system PLC program.
7. Spare Parts List:
 - (3) Dosing pinch valve sleeves
 - (1) Dosing pinch valve

1.06 OPERATIONS AND MAINTENANCE MANUAL

- A. The following shall be included in the Operations and Maintenance Manual in compliance with Section 01 78 23:
 1. Technical manuals and spare parts lists.
 2. Instructions for field procedures for erection, adjustments, inspection, and testing.
 3. Certification that the equipment complies with requirements.

1.07 SERVICES OF SYSTEM SUPPLIER

- A. An authorized service representative of the System Supplier shall visit the site and provide the following services. A total of seven (7) days of field service shall be provided as described herein.
 1. Installation of the equipment for two (2) days.
 2. Inspection, checking, and adjusting the equipment for one (1) day.
 3. Startup and field testing for proper operation three (3) days.
 4. Field checkout of all equipment including the Plant SCADA HMI to verify proper operation, annunciation and alarms for one (1) day.

1.08 SYSTEM SUPPLIER

- A. The System Supplier shall have a minimum of (20) batch type Slakers that utilize a load cell based direct weight measurement operating system and the requirements of this specification. The Slaker manufacturer shall provide written list of contact names at both the Engineer and the Owner of each of the 20 installations. The lime slaking system and all related controls described in this section shall be the product of a single System Supplier and shall be as manufactured by RDP Technologies, Inc. No alternates shall be accepted or considered.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN

- A. The Slaker shall utilize direct weight measurement. The Slaker shall be sized to allow the solid-liquid phase slaking reaction to run until the slaking reaction is complete and the slaking temperature is reached. The slaking temperature is defined as the point in time when the temperature is no longer increasing, without drowning the reaction by premature or excessive water addition, and is at least 5 minutes after the end of lime addition.
- B. The Slaker shall be capable of processing the specified quantity of quicklime and designed to operate within 5° F of a predetermined temperature set point, which is selected from within the range 185° - 195° F, automatically adjusting to changes in the initial water temperature and variations in lime quality, without operator input.
- C. After the slaking reaction is completed, the Slaker shall dilute the slurry to a predetermined concentration set point, selected within the range of 10% to 20%, utilizing the direct weight measurement of lime and water via the load cells. The slurry concentration shall be within + or - 0.5% point of the set point (i.e. 9.5% - 10.5% for a 10% slurry concentration setting).
- D. Continuous Slakers shall not be accepted as meeting the design requirement. Slakers that control operation by monitoring power draw, level sensors, integral auxiliary water heaters and manual operator adjustment shall also not be accepted.
- E. The Lime Slaking System shall be designed to receive 1/4" ground quicklime, delivered by bulk pneumatic trucks and shall store the quicklime in the existing Bulk Storage Silo. The minimum available calcium oxide content shall be 93%. The system shall discharge the quicklime at a controlled rate without bridging, clogging or flooding of the lime Slaker. The Slaker shall control the reaction of quicklime and water in order to provide a hydrated lime slurry at the specified concentration and quantity. The Slurry Aging Tank shall store the hydrated lime slurry for pumping by the lime slurry pumps.

- F. The Slurry Aging Tank shall provide the specified storage volume. The System Supplier shall demonstrate by submission of calculations that the slurry tank meets the required capacity.

2.02 EQUIPMENT SCHEDULE

- A. The Lime Feeder shall be capable of providing a minimum of 10,400 pounds per hour of quicklime to the Lime Slaker. The Feeder's construction shall be carbon steel. The motor shall be 2 HP.
- B. The Lime Slaker shall be capable of slaking 2,000 pounds per hour of hydrated lime at a 10% hydrated lime concentration and up to 4,000 pounds per hour of hydrated lime at a 20% hydrated lime concentration. The Slaker construction shall be 304 Stainless Steel with a 2-B finish. The Slaker mixer motor shall be 7.5 HP. A Transfer Pump shall be provided to transfer slurry to the new Fine Grit Classifier. The motor shall be 3 HP. Slaker components shall require 10 CFM at 90-PSI plant air and a 169 GPM water supply.
- C. The Slurry Aging Tank shall store 2,000 gallons of lime slurry. The tank's construction shall be 304 Stainless Steel with a 2-B finish. The Mixer motor shall be 3 HP.
- D. One (1) Fine Grit Classifier shall be provided to separate grit from the slaked lime slurry transfer and slurry loop. Wetted components shall be 304 SST. The Classifier shall be provided with a 1 HP motor.
- E. The Lime Slurry Pumps shall be capable of pumping 10% to 20% lime slurry at a rate of 135 gallons per minute at 93 TDH. The pump motors shall be 15 HP. The Lime Delivery System shall be designed to dose 4,000 pounds per hour of hydrated lime at a 10 % slurry concentration.
- F. A Transfer Pump shall be provided for the existing to transfer slurry to the new Fine Grit Classifier. The motor shall be 3 HP.
- G. Protective coatings for equipment shall be as described above and described further. Motors, reducers, bearings, etc. incorporated into the equipment shall be provided with the manufacturers standard coating system.

2.03 LIME FEEDER

- A. The Lime Feeder equipment includes all equipment, supports and appurtenances necessary for the operation of the Feeder. The Feeder shall be shipped loose and

installed by the CONTRACTOR. This includes, but is not limited to, the Drive Unit, Inlet Flexible Connector, Maintenance Gate, Discharge Chute and supports.

- B. The Lime Feeder shall be designed to convey capacity specified in Part 2.02 and installed as shown on the drawings. Design the feeder to provide a practically continuous movement of pebble lime from the silo to the slaker without sticking, jamming, slowdowns or stoppages. Rigidly construct it of corrosion-resisting material for all parts coming in contact with the lime. Provide it free from delicate mechanisms and provide all parts accessible for inspection, adjustment, and repairs. Enclose the machine with dust-tight housing and dust-tight connections to the hopper and slaker and a dust tight cover on the hopper.
- C. The screw shall be a minimum of 9 inches in diameter mounted in a fully enclosed casing. The screw, casing and all materials shall be as specified in Part 2.02.
- D. Tail bearings shall be of the flanged external ball bearing type with grease fitting. Provide external lip type plate seal.
- E. The Feeder discharge chute shall isolate the screw feeder from the Slaker and load cell assembly. The cover of the Feeder shall also be provided with a plug switch to detect a plugged condition and stop the Feeder.
- F. The Feeders shall include a motor, which shall be directly connected to the speed reducer. The speed reducer shall be directly connected to the feeder screw. The drive shall SEW Euro drive's standard F series. The motor horsepower shall be the minimum size specified in Part 2.02.
- G. All steelwork shall be sandblasted to SSPC-SP6, followed by one coat of Tnemec 66-1211 Epoxy Primer at 3.0 to 5.0 mils D.F.T. Intermediate and finish painting shall be done in the field by the CONTRACTOR.

2.04 LIME SLAKER ASSEMBLY

- A. The Slaker tank shall be sized to provide the capacity specified in Part 2.02 and as shown on the drawings. The Slaker shall be shipped loose and installed by the CONTRACTOR. The tank shall be self-supporting on the load cell assembly and shall be shipped complete with all accessories specified. Materials of construction shall be as specified in Part 2.02. All connections to the Slaker shall be as specified by the System Supplier in order to allow for the load cell system to operate properly.
 - 1. The tank shall include a Bray Series 30 cast iron, air operated inlet damper butterfly valve, which shall automatically open and close upon the start and completion of the lime addition cycle. The inlet damper shall be controlled by an air operated control valve. The inlet damper shall be installed and tested by the System Supplier prior to shipment.

2. The tank shall be furnished with an access opening located on top of the unit. The access opening shall be complete with a cover, which shall fit securely over the opening. The cover shall be gasketed to contain steam and dust.
 5. The bottom of the tank shall include a Bray Series 30 cast iron; air operated discharge butterfly valve, which shall automatically control the draining of the tank. A separate drain opening shall be provided for maintenance and cleaning of the tank.
 4. The tank shall include a dust arrestor, which shall be located either externally on the tank wall or internally directly beneath the access opening. The dust arrestor shall have a minimum 3” opening to remove the dust from the tank. The dust arrestor shall include two separate spray nozzles to quench the steam and remove the dust from the tank. The dust arrestor shall be provided with a solenoid valve, which shall automatically control the operation of the unit.
 5. The tank shall include a wash down system consisting of multiple spray nozzles, which shall clean the inside of the tank both during water addition for the initial slaking step and the dilution step as part of each batch of lime slurry produced.
- B. The tank shall include a mixer assembly, which shall be mounted and tested by the System Supplier prior to shipment. The mixer assembly shall be SEW Eurodrive’s standard SA series and consist of a motor directly connected to a right angle speed reducer. The speed reducer shall be grease lubricated and directly connected to the mixer shaft assembly.
- C. The tank shall be mounted on a special Kistler Morse LD3 series load cell assembly, which shall weigh the tank contents and control the operation of the slaking and dilution process. The assembly shall consist of three load cells as part of the support assembly. The System Supplier shall make all final adjustments to the weighing assembly prior to the system being placed in to operation.
- D. The tank shall include a temperature sensor consisting of a type K thermocouple assembly installed in a stainless steel thermowell located at the bottom of the tank. The temperature sensor shall provide a continuous indication of the Slaker temperature, which shall be used to automatically adjust the Slaker operation in order to maintain a constant slaking temperature.
- E. One (1) lime slurry transfer pumps shall be provided to transfer slurry from the Slaker to the fine grit classifier. The slurry transfer pump shall be Warman pump, with an expected pump operating point of 100 GPM at 20-feet TDH. The pump shall be capable of pumping lime slurry at 10-20% concentration. The Lime Slurry Pump shall be provided with a 3/8” seal water solenoid valve. The solenoid valves shall be

ASCO solenoid valves equipped with a Red Hat II Coil, general purpose NEMA 4X enclosures, and a brass body valve. The coil shall be suitable for 120 volt power supply, and the valve shall be normally (de-energized) closed. The flushing water solenoid valve shall be shipped to the site loose to be installed by the CONTRACTOR in seal water piping.

- F. The system shall be provided with a Washdown Pump. The Washdown Pump is provided for periodic maintenance cleaning of Slaker, Slurry Aging Tank and Fine Grit Classifier. Maintenance cleaning shall be a manual process, requiring the Operator to add the required chemicals and initiate the acid cleaning routine via the System Control Panel. The pump shall be provided with a 1/2 HP motor and shall provide 8 GPM at a 20 psig. The pump shall be provided with a 120 volt plug and caddy to move the pump from each piece of equipment when cleaning. The pump shall be Model 4CUK6 manufactured by Dayton or approved equal.
- G. The Slaker shall be shipped in sections, and shall be field-welded and assembled by the CONTRACTOR in the Lime Building. The System Supplier shall furnish the tank sections with alignment clips for use in re-assembling the tank in the field. The CONTRACTOR shall provide an AWS welder certified in the type of welding required, to perform the welding. The field welds shall be ground smooth, burn marks removed and solvent cleaned.
- H. The solenoid valves air operators for the devices described above shall be shipped loose for mounting by the CONTRACTOR to a mounting frame provided by the System Supplier. The frame shall be located above the Slaker such that electrical devices shall be isolated from the slaking operation. The CONTRACTOR shall also provide and install Stainless Steel piping and flexible tubing from these devices to the manifolds and valves located at the Slaker. The water and air supply piping shall be provided by the CONTRACTOR.

2.05 FINE GRIT CLASSIFIER

- A. One (1) Fine Grit Classifier shall be provided. The hopper and trough of the unit shall be fabricated of 10 gauge, 304 SST and configured as shown on the drawings. An overflow and weir shall be provided for overflow and return to the Aging Tanks. An adjustable baffle shall also be provided to adjust the settling area and the grit size removal.
- B. The auger shall be of the sectional flight type 1/4 inch thick, 304 SST. The flighting shall be half pitch. The flights shall be 6 inches in diameter and directly connected to the drive unit.
- C. The trough shall be 1/8 inch thick, 304 SST. A trough cover shall be provided at the incline of the unit and shall be 14 gauge also 304 SST.

- D. The conveyor shall be supported by steelwork of angle construction, made of 304 SST as shown on the drawing.
- E. The conveyor shall be provided with a flange-mounted gearmotor. The motor shall be 240 volt, 3 phase.

2.06 SLURRY AGING TANK

- A. A Slurry Aging Tank shall be provided to store and age the lime slurry as required. The tank shall be shipped loose and installed by the CONTRACTOR. The slurry tank shall be sized to provide the capacity specified in Part 2.02 and as shown on the drawings. Materials of construction shall be as specified in part 2.02
 - 1. The tank shall be furnished with an access cover located on top of the unit. The cover shall be gasketed to contain steam and dust.
 - 2. The bottom of the tank shall include a flange connection for the slurry pump. A separate drain opening shall be provided for maintenance and cleaning of the tank.
- B. The tank shall include a mixer assembly, which shall be mounted and tested by the System Supplier prior to shipment. The mixer assembly shall consist of a motor directly connected to a speed reducer. The drive shall be the APD-Series provided by Cleveland Mixer with a helical reducer and Marathon motor. The motor horsepower shall be the minimum size specified in Part 2.02.
- C. The tanks shall be provided with a single Kistler Morse LD3 series load cell, which shall monitor the tank weight and provide a continuous level signal. The System Supplier shall make all final adjustments to the monitoring components prior to the system being placed in to operation.

2.07 SLURRY PUMP AND SLURRY DELIVERY SYSTEM

- A. A Lime Delivery Systems shall be provided to deliver 4,000 pounds per hour of calcium hydroxide to the mixer basin. The System shall operate as a continuous 3” feed loop being pumped at a rate of 130 GPM from which any Lime Delivery Assembly shall draw from. The system shall consist of the following:
 - 1. Two (2) lime slurry loop pumps shall be provided adjacent to the Slurry Aging Tank. The pumps shall be Warman AH centrifugal slurry pumps, with an expected pump operating point of 135 GPM at 93-feet TDH. The pumps shall be capable of pumping lime slurry at 10-20% concentration. Each Lime Slurry Pump shall be provided with a 3/8” seal water solenoid valve. The solenoid valves shall be ASCO solenoid valves equipped with a Red Hat II

Coil, general purpose NEMA 4X enclosures, and a brass body valve. The coil shall be suitable for 120 volt power supply, and the valves shall be normally (de-energized) closed. The flushing water solenoid valve shall be shipped to the site loose to be installed by the Contractor in seal water piping.

- B. Three (3) Lime Delivery Assemblies shall be provided, One (1) serving Basins 5&6, one (1) serving Basins 7&8, both with a dosing range of 14 ppm at 20 MGD to 60 ppm at 50 MGD. One (1) Delivery Assembly will be provided for the Actiflo Basins with a dosing range of 21 ppm at 10 MGD to 60 ppm at 60 MGD. Each Dosing assembly will consist of the following:
1. One (1) 1" Badger Meter, M Series non-contacting flow meter. The flow meter shall be the wafer type and provide a 4-20mA signal back to the Slaking System Control Panel.
 2. One (1) 1" electrically actuated pinch valve. The valve shall be an Onyx Valve series CER to infinitely adjust or shut off the flow of lime to the mixer basin. The valve shall receive a 4-20 mA signal from the Slaking System Control Panel. The valve shall be provided with an integral base, which shall anchor directly to the mixer basin wall.

2.08 MODIFICATIONS TO THE EXISTING SLAKER

- A. A new Discharge Valve shall be provided for the existing Slaker for gravity discharge to the new Slurry Aging Tank. The valve shall be a Bray Series 30 cast iron; air operated discharge butterfly valve, which shall automatically control the draining of the tank.
- B. The existing discharge valve shall remain and functioning to discharge to the existing emergency back-up Slurry Aging Tank.
- C. One (1) lime slurry transfer pump shall be provided to transfer slurry from the existing Slaker to the new Aging Tank. The slurry transfer pump shall be Warman metal lined centrifugal slurry pump, with an expected pump operating point of 100 GPM at 20-feet TDH. The pump shall be capable of pumping lime slurry at 10-20% concentration. The Lime Slurry Pump shall be provided with a 3/8" seal water solenoid valve. The solenoid valves shall be ASCO solenoid valves equipped with a Red Hat II Coil, general purpose NEMA 4X enclosures, and a brass body valve. The coil shall be suitable for 120 volt power supply, and the valve shall be normally (de-energized) closed. The flushing water solenoid valve shall be shipped to the site loose to be installed by the Contractor in seal water piping.
- D. A special inspection hatch shall be provided for the existing Slaker which will include connections and spray nozzles to adapt the Acid Wash feature.

2.09 SLAKING SYSTEM CONTROL PANEL

- A. A single 240 volt, 3 phase control panel shall be furnished to control the operation of the slaking system. The panel shall be manufactured in a UL approved shop. The panel shall be inspected, approved and labeled prior to shipment in accordance with UL 508 requirements. The panel shall be shipped loose and installed by the CONTRACTOR.
- B. The panel shall be a single NEMA 4X, 304 stainless steel enclosure with 3-point latch and shall be provided to control all motors, valves, switches and control functions for the Lime Slaking System equipment specified herein and as shown on the drawings with proper interlocking of the equipment. A single 240 volt main breaker shall be provided for the control panel interlocked with the door. Refer to Division 26, for additional requirements for the panel construction and components.
- C. The control panel shall provide the following functions:
 - 1. On/off control and starter for each electric motor
 - 2. Slaker Temperature set point and actual temperature
 - 3. Status of all valves, motors and electrical devices
- D. The System PLC shall be the Allen Bradley CompactLogix processor, programmed using ladder logic, refer to Section 40 90 00 for additional requirements. Equipment control, both automatic and manual, shall be via the existing Plant SCADA HMI (Citect). In the Manual Mode, each piece of equipment shall be independently controlled without interlocks to other equipment (except personnel and equipment safety). In the Automatic mode, each piece of equipment shall be interlocked for completely automated slaking routines.
- E. A fiber patch panel and mixed media switch shall also be provided as shown on the drawings.
- F. The System Supplier shall provide programming of the existing control panel to integrate the existing system component in with the new equipment.
- G. A new Starter Panel shall also be provided for the new Transfer Pump. The starter shall be provided in a separate 304 SST, NEMA 4X enclosure as shown on the drawings and as specified in Division 26.
- H. The System Supplier shall coordinate their work with the Process System Control Supplier specified under Section 40 90 00 for a complete and functional system. This includes coordination/modification of PLC programming to interface with the Plant SCADA HMI.

PART 3 EXECUTION

3.01 INSTALLATION

- A. All sections and loose items shall be match-marked prior to shipping.
- B. Installation shall be in accordance with the System Supplier's installation requirements.

3.02 FIELD TESTS

- A. The equipment shall be field tested after installation to demonstrate satisfactory operation without causing excessive noise, vibration, and overheating. The field testing shall be performed by an experienced field representative of the System Supplier of each major item of equipment, who shall certify the installation and shall confirm in writing that the equipment and controls have been properly installed, aligned, lubricated, adjusted, and readied for operation.

3.03 PERFORMANCE TEST

- A. The Lime Slaking System shall be capable of running, fully automatic, demonstrating the ability of the Slaker to allow the solid-liquid phased slaking reaction to run until completion, at a predetermined temperature, and then dilute to a predetermined slurry concentration, as defined in 2.01 Basis of Design. The Slaking System shall be tested over a three (3) day period, running 72 continuous hours without any adjustments made by operating personnel, demonstrating the ability to meet the requirements of these specifications. During the 72 hour performance test the Slaking Temperature Set Point and the Slurry Concentration Set shall be varied each day to demonstrate the Systems ability to adjust to input variable changes.

Number Of Batches	Slaking Temp Set Point	Slurry Concentration Set Point
2	185-F	20%
2	190-F	15%
2	195-F	10%

END OF SECTION