PROJECT MANUAL

REUSE IRRIGATION TRANSFER PUMPS

City of Palatka
Putnam County, Florida

City of Palatka
201 North 2nd Street
Palatka, Florida 32177
(386) 329-0100

PROJECT MANUAL

CONTAINING

BIDDING REQUIREMENTS

CONTRACTOR'S PROPOSAL

AGREEMENT

GENERAL CONDITIONS

SUPPLEMENTARY CONDITIONS

AND SPECIFICATIONS

FOR

REUSE IRRIGATION TRANSFER PUMPS

Prepared for:

CITY OF PALATKA
Putnam County, Florida

JUNE 2020

Engineer of Record:_____
Daryl R. Myers, P.E., #61786

Date:_____6/26/2020_____

Hanson Professional Services Inc.
8075 Gate Parkway West, Suite 204
Jacksonville, Florida 32216

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Reuse Irrigation Transfer Pumps

Located in the City of Palatka (Putnam County), Florida

Engineer/Architect of Record: Daryl R. Myers, PE
Hanson Professional Service Inc.
8075 Gate Parkway West, Suite 204
Jacksonville, Florida 32216

Invitation to Bid (ITB) 2020-09

REUSE IRRIGATION TRANSFER PUMPS

The City of Palatka is seeking bids for the Reuse Irrigation Transfer Pumps, Palatka, FL 32177. The project involves installation of new suction lift pumps, piping, electrical, controls, and appurtenances to supply reclaimed water from the City's wastewater treatment plant to a new holing pond. All interested parties must register their name, email address, address and telephone number with the CONSULTANT to receive any future changes, additions, addendums or notices concerning this ITB.

Advertisement Date: June 24, 2020

Bid Deadline: **July 22, 2020 at 2:30 PM**
City of Palatka
City Hall
201 North Second St.
Palatka, FL 32177

Period of Performance: August, 2020 – October, 2020

Contact: Daryl R. Myers, PE
Hanson Professional Services Inc.
8075 Gate Parkway West, Suite 204
Jacksonville, Florida 32216
DMyers@hanson-inc.com

Any qualified individual or firm desiring to provide the required services should submit one (1) original and two (2) digital copies on a thumb drive in a sealed envelope marked in red ink "**RESPONSE TO INVITATION TO BID 2020-09 REUSE IRRIGATION TRANSFER PUMPS**". Late submittals will be returned unopened. Submittals will be opened as soon as possible after the submission deadline. Evaluation and selection will occur in accordance with the appropriate requirements at a time and place to be determined. The City of Palatka reserves the right to reject any and all submittals, to waive any informalities or irregularities in the ITB process and to award the contract(s) in the best interest of the City.

Bidding documents (Information for Bidders, Project Manual and Drawings) may be examined online at the City's website at www.palatka-fl.gov or in person at:

Hanson Professional Services Inc.
8075 Gate Parkway West, Suite 204
Jacksonville, Florida 32216

Copies of the bid documents may be obtained from Hanson Professional Services Inc.'s office for $40.00 dollars per set (hard copies) or electronic copies (PDF) can be emailed at no charge. Checks for hard copies of the bid documents shall be made payable to Hanson Professional Services Inc. Payment is non-refundable and constitutes the cost of reproduction and handling.

Bids shall be completed on the enclosed Bid Forms as set forth in the Invitation to Bid and otherwise be in compliance with the Bidding Documents. Each bid must be submitted on the prescribed form and certified by the Bidder. Bidders shall provide three (3) references on similar projects to that proposed. Sealed bids will be received by Ms. Sunni Krantz, City Clerk, City of Palatka, 201 North Second Street, Palatka, Florida 32177 until **2:30 p.m. (local time) on July 22, 2020**. Any bids received after the specified time and date will not be considered. The sealed bids received will be publicly opened and read aloud at the City of Palatka City Hall as soon as possible after the submission deadline.

The City of Palatka reserves the right to waive any informalities or to reject any or all bids. The City of Palatka is an Equal Opportunity Employer. Each Bidder must deposit with his/her security in the amount, form and subject to the conditions provided in the Information for Bidders. Sureties used for obtaining bonds must appear as acceptable according to the Department of Treasury Circular 570.

The Bidder shall be properly licensed and fully insured and upon award of bid present to the City of Palatka paperwork indicating such. The contractor shall begin mobilization and procurement of materials within ten working days of the receipt of the "Notice to Proceed".

For further information or clarification, contact Mr. Daryl Myers, Hanson Professional Services Inc., 8075 Gate Parkway West, Suite 204, Jacksonville, Florida 32216, telephone 904-737-0090 or email at DMyers@hanson-inc.com. Prospective bidders who wish to be notified of any amendments must register their name and contact information with Daryl Myers by email.

LEGAL ADVERTISEMENT – Run Date 6/24/2020

INFORMATION FOR BIDDERS

1. Receipt and Opening of Bids

The City of Palatka (herein called the "City"), invites bids on the form attached hereto, all blanks of which must be appropriately completed. Bids will be received by Sunni Krantz at City Hall until 2:30 o'clock PM, July 22, 2020, and then at said office publicly opened and read aloud. The envelopes containing the bids must be sealed, addressed to City of Palatka, 201 North 2nd Street, Palatka, Florida 32177 designated as "**RESPONSE TO INVITATION TO BID 2020-09 REUSE IRRIGATION TRANSFER PUMPS**"

The City may consider informal any bid not prepared and submitted in accordance with the provisions thereof and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the above scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 30 days after the actual date of the opening thereof.

2. Preparation of Bid

Each bid must be submitted in a sealed envelope bearing on the outside the name of the bidder, his/her address, and the name of the project for which the bid is submitted. If forwarded by mail, the sealed envelope containing the bid must be enclosed in another envelope addressed as specified in the bid form.

Each bid must be submitted on the prescribed form and accompanied by all attachments listed below. All blank spaces for bid prices must be completed in ink or typewritten, in both words and figures, and the foregoing certifications must be fully completed and executed when submitted.

- Proposer's Certification
- Bid Bond
- Certification as to Corporate Principal
- 950.1 – Certification of Bidder Regarding Section 3
- 950.2 – Certification of Proposed Subcontractor Regarding Section 3 and Segregated Facilities
- Certification by Proposed Subcontractor Regarding Equal Opportunity Employment Opportunity
- Certification of Bidder Regarding Equal Employment Opportunity
- Certification of Owner's Attorney
- Addenda Receipt Acknowledgement
- Public Entity Crimes Statement
- Drug-Free Workplace Certificate
- E-Verify Statement
- Respondent's Certification
- Bid Form
- Florida Trench Safety Act Certification

3. Subcontracts

The prime contractor must perform 30% of the scope of work. The bidder is specifically advised that any person, or other party to whom it is proposed to award a subcontract under this contract:

a. Must be acceptable to the owner; and

b. Must submit a Certification by Proposed Subcontractor Regarding Equal Employment Opportunity and Form 950.2; Certification by Proposed Subcontractor; and Certification of Proposed Subcontractor Regarding Section 3 and Segregated Facilities. Approval of the Proposed subcontract award cannot be given by the City unless and until the proposed subcontractor has submitted the Certifications and/or other evidence showing that it has fully complied with any reporting requirements to which it is or was subject.

c. Disadvantage Business Enterprise (DBE)

The City encourages all contractors bidding on the project to actively pursue obtaining bids and quotes from Certified DBEs. The FDOT's DBE Program Plan can be found at: www.dot.state.fl.us/equalopportunityoffice/.

7-24.2 Required Contract and Subcontract DBE Assurance Language:
Per 49 CFR 26.13 (b) each Contract the Local Agency signs with a Contractor (and each subcontract the prime contractor signs with a subcontractor) must include the following assurance: "The Contractor, sub-recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted Contracts. Failure by the Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as the recipient deems appropriate."

7-24.3 DBE Records and Reports: Submit the Anticipated DBE Participation Statement at or before the Pre-Construction Conference. Report monthly to the Local Agency actual payments, retainage, of all DBE and Minority Business Enterprise (MBE) subcontractors and DBE and MBE construction material and major suppliers. Develop a record keeping system to monitor DBE affirmative action efforts which include the following: (a) the procedures adopted to comply with these Specifications; (b) the number of subordinated Contracts on Local Agency projects awarded to DBEs; (c) the dollar value of the Contracts awarded to DBEs; (d) the percentage of the dollar value of all subordinated Contracts awarded to DBEs as a percentage of the total Contract amount; (e) a description of the general categories of Contracts awarded to DBEs; and (f) the specific efforts employed to identify and award Contracts to DBEs. Upon request, provide the records to the Local Agency, Department, and the Federal

Highway Administration for review. All such records are required to be maintained for a period of five years following acceptance of final payment and have them available for inspection by the Local Agency, Department and the Federal Highway Administration.

Each month the contractor must report to the City of Palatka actual payments to all DBE subcontractors, subconsultants and suppliers.

4. Telegraphic Modifications

Any bidder may modify his/her bid by tele-graphic communication at any time prior to the scheduled closing time for receipt of bids, provided such telegraphic communication is received by the City prior to the closing time, and, provided further, the City is satisfied that a written confirmation of the telegraphic modification over the signature of the bidder was mailed prior to the closing time. The telegraphic communication should not reveal the bid price but should provide the addition or subtraction or other modification so that the final prices or terms will not be known by the City until the sealed bid is opened. If written confirmation is not received within two days from the closing time, no consideration will be given to the telegraphic modification.

5. Method of Bidding

The unit prices shall include all labor, materials, bailing shoring, removal, overhead, profit, insurance, etc., to cover the finished work. For those line items that are lump sum fees, or otherwise are not unit prices, the values shall be negotiated prior to award with the apparent successful bidder. Should the apparent successful bidder and the City not be able to come to agreement on these values, the City shall terminate negotiations with this bidder and begin negotiations with the next bidder, based on the order of preference as determined by the City after the initial bid opening and evaluation.

6. Qualifications of Bidder

The City may make such investigations as necessary to determine the ability of the bidder to perform the work, and the bidder shall furnish to the City all such information and data for this purpose as the City may request. The City reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the City that such bidder is properly qualified to carry out the obligations of the contract and to complete the work contemplated therein. Conditional bids will not be accepted.

7. Bid Security

Each bid must be accompanied by a bid bond prepared on the form of bid bond attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company approved by the City, in the amount of 5% of the bid. Bid bonds will be returned to all except the three lowest bidders within three days after the opening of bids. The remaining Bid bonds will be returned promptly after the City and the accepted bidder have executed the contract, or, if no award has been made within 30 days after the date of the

opening of bids, upon demand of the bidder at any time thereafter, so long as notification of the acceptance of the bid has not taken place.

8. Standardized Changes Conditions

Differing site conditions.

a. During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract, are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before the site is disturbed and before the affected work is performed.
b. Upon written notification, the engineer/architect will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding anticipated profits, will be made and the contract modified in writing accordingly. The engineer/architect will notify the contractor of the determination whether or not an adjustment of the contract is warranted.
c. No contract adjustment which results in a benefit to the contractor will be allowed unless the contractor has provided the required written notice.
d. No contract adjustment will be allowed under this clause for any effects caused on unchanged work.

Suspensions of work ordered by the engineer/architect.

a. If the performance of all or any portion of the work is suspended or delayed by the engineer/architect in writing for an unreasonable period of time (not originally anticipated, customary, or inherent to the construction industry) and the contractor believes that additional compensation and/or contract time is due as a result of such suspension or delay, the contractor shall submit to the engineer/architect in writing a request for adjustment within 7 calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for such adjustment.
b. Upon receipt, the engineer/architect will evaluate the contractor's request. If the engineer/architect agrees that the cost and/or time required for the performance of the contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the contractor, its suppliers, or subcontractors at any approved tier, and not caused by weather, the engineer/architect will make an adjustment (excluding profit) and modify the contract in writing accordingly. The contractor will be notified of the engineer/architect's determination whether or not an adjustment of the contract is warranted.
c. No contract adjustment will be allowed unless the contractor has submitted the request for adjustment within the time prescribed.
d. No contract adjustment will be allowed under this clause to the extent that performance would have been suspended or delayed by any other cause, or for

which an adjustment is provided or excluded under any other term or condition of this contract.

Significant changes in the character of work.

a. The engineer/architect reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations shall not invalidate the contract nor release the surety, and the contractor agrees to perform the work as altered.
b. If the alterations or changes in quantities significantly change the character of the work under the contract, whether such alterations or changes are in themselves significant changes to the character of the work or by affecting other work cause such other work to become significantly different in character, an adjustment, excluding anticipated profit, will be made to the contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the contractor in such amount as the engineer may determine to be fair and equitable.
c. If the alterations or changes in quantities do not significantly change the character of the work to be performed under the contract, the altered work will be paid for as provided elsewhere in the contract.
d. The term "significant change'' shall be construed to apply only to the following circumstances:
    a. When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction; or
    b. When a major item of work, as defined elsewhere in the contract, is increased in excess of 125 percent or decreased below 75 percent of the original contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125 percent of original contract item quantity, or in case of a decrease below 75 percent, to the actual amount of work performed.

9. Liquidated Damages for Failure to Enter into Contract

The successful bidder, upon failure or refusal to execute and deliver the contract and bonds required within 10 days after receipt of notice of the acceptance of the bid, shall forfeit to the City, as liquidated damages for such failure or refusal, the security deposited with the bid.

10. Time of Completion and Liquidated Damages

Bidder must agree to commence work on date to be specified in a written "Notice to Proceed" of the City and to fully complete the project within 180 consecutive calendar days thereafter.

Applicable liquidated damages are the amounts established in the following schedule:

Contract Amount	**Daily Charge Per Calendar Day**

$50,000 and under	$313
Over $50,000 but less than $250,000	$580
$250,000 but less than $500,000	$715
$500,000 but less than $2,500,000	$1423
$2,500,000 but less than $5,000,000	$2121
$5,000,000 but less than $10,000,000	$3057
$10,000,000 but less than $15,000,000	$3598
$15,000,000 but less than $20,000,000	$4544
$20,000,000 and over	$8537 plus 0.00027 of any amount over $20 million

For all contracts, regardless of whether the contract time is stipulated in calendar days, the engineer/architect will count days in calendar days. If the Contractor or, in case of his default, the surety fails to complete the work with the time stipulated in the contract, or within such extra time that the Owner may have granted the Contract or, in case of his default, the surety shall pay to the Owner, liquidated damages, the applicable amount above per calendar day in which work is not completed. The Owner has the right to apply, as payment on such liquidated damages, any money the Owner owes the Contractor. The Owner does not waive its right to liquidated damages due under the Contract by allowing the Contractor to continue and finish the work, or any part of it, after the expiration of the Contract Time including granted time extensions.

11. Preferred Payment

The City in its sole discretion, will determine the method of payment for goods and/or services as part of this agreement.

Payment methods may include:

1. Traditional – payment by check, wire transfer or other cash equivalent.
2. Standard – payment by credit card.

The City cautions vendors to consider both methods of payment when determining pricing as no additional surcharges or fees will be considered (per Rules for VISA Merchants and MasterCard Merchant Rules). The City will entertain proposals clearly stating pricing for standard payment methods. An additional separate discounted price for traditional payments may be provided at the initial proposal submittal if it is clearly marked as an "Additional discount for payment via traditional methods."

12. Conditions of Work

Each bidder must inform himself fully of the conditions relating to the construction of the project and the employment of labor thereon. Failure to do so will not relieve a successful bidder of his obligation to furnish all material and labor necessary to carry out the provisions of this contract. Insofar as possible the contractor, in carrying out the work, must employ such methods or means as will not cause any interruption of or interference with the work of any other contractor.

13. Addenda and Interpretations

No interpretation of the meaning of the plans, specification or other pre-bid documents will be made to any bidder orally. Every request for such interpretation should be in writing, addressed to Daryl Myers, PE, Hanson Professional Services Inc., at DMyers@hanson-inc.com and, to be given consideration, must be received at least five days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be emailed with return receipt requested to all prospective bidders (at the respective addresses furnished for such purposes), not later than 72 hours prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under the bid as submitted. All addenda so issued shall become part of the contract documents.

14. Security for Faithful Performance

Simultaneously, with delivery of the executed contract, the Contractor shall furnish a surety bond or bonds as security for faithful performance of this contract and for the payment of all persons performing labor on the project under this contract and furnishing materials in connection with this contract, as specified in the General Conditions included herein. The surety on such bond and bonds shall be a duly authorized surety company satisfactory to the City.

15. Power of Attorney

Attorneys-in-fact who sign bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

16. Records and Reports

The Contractor shall keep such records as are necessary to determine compliance with the equal employment opportunity obligations. The records kept will be designed to indicate the following:

a. The number of minority and non-minority group members employed in each work classification on the project.
b. The progress and efforts being made in cooperation with unions to increase minority group employment opportunities (applicable only to Contractors who rely in whole or in part on unions as a source of their work force).
c. The progress and efforts being made in locating, hiring, training, qualifying, and upgrading minority group employees as deemed appropriate to comply with their Equal Employment Opportunity Policy.
d. The progress and efforts being made in securing the services of minority group subcontractors or subcontractors with meaningful minority group representation among their employees as deemed appropriate to comply with their Equal Employment Opportunity Policy.

All such records must be retained for a period of three years following completion of the contract work and be available at reasonable times and places for inspection by authorized representatives to the Department and the Federal Highway Administration.

Upon request, submit to the Department a report of the number of minority and non-minority group employees currently engaged in each work classification required by this Contract work.

17. Prohibition Against Convict Produced Materials

6-12.1 Source of Supply — Convict Labor (Federal-Aid Contracts Only): Do not use materials that were produced after July 1, 1991, by convict labor for Federal-aid highway construction projects unless the prison facility has been producing convict-made materials for Federal-aid highway construction projects before July 1, 1987.

Use materials that were produced prior to July 2, 1991, by convicts on Federal-aid highway construction projects free from the restrictions placed on the use of these materials by 23 U.S.C. 114. The Department will limit the use of materials produced by convict labor for use in Federal-aid highway construction projects to:

a. materials produced by convicts on parole, supervised release, or probation from a prison or,
b. materials produced in a qualified prison facility.

The amount of such materials produced for Federal-aid highway construction during any 12-month period shall not exceed the amount produced in such facility for use in such construction during the 12-month period ending July 1, 1987.

18. Title VI Requirements

19. Equipment Rental Rates

For any machinery or special equipment (other than small tools), including fuel and lubricant, the Contractor will receive 100% of the "Rental Rate Blue Book" for the actual time that such equipment is in operation on the work, and 50% of the "Rental Rate Blue Book" for the time the equipment is directed to standby and remain on the project site, to be calculated as indicated below. The equipment rates will be based on the latest edition (as of the date the work to be performed begins) of the "Rental Rate Blue Book for Construction Equipment" or the "Rental Rate Blue Book for Older Construction Equipment," whichever is applicable, as published by Machinery Information Division of PRIMEDIA Information, Inc. (version current at the time of bid), using all instructions and adjustments contained therein and as modified below. On all projects, the Engineer will adjust the rates using regional adjustments and Rate Adjustment Tables according to the instructions in the Blue Book.

Allowable Equipment Rates will be established as set out below:

1. Allowable Hourly Equipment Rate = Monthly Rate/176 x Adjustment Factors x 100%.
2. Allowable Hourly Operating Cost = Hourly Operating Cost x 100%.
3. Allowable Rate Per Hour = Allowable Hourly Equipment Rate + Allowable Hourly Operating Cost.
4. Standby Rate = Allowable Hourly Equipment Rate x 50%.

The Monthly Rate is The Basic Machine Rate Plus Any Attachments. Standby rates will apply when equipment is not in operation and is directed by the Engineer to standby at the project

site when needed again to complete work and the cost of moving the equipment will exceed the accumulated standby cost. Standby rates will not apply on any day the equipment operates for eight or more hours. Standby payment will be limited to only that number of hours which, when added to the operating time for that day equals eight hours. Standby payment will not be made on days that are not normally considered work days on the project.

The Owner will allow for the cost of transporting the equipment to and from the location at which it will be used. If the equipment requires assembly or disassembly for transport, the Owner will pay for the time to perform this work at the rate for standby equipment.

Equipment may include vehicles utilized only by Labor, as defined above.

20. Payments to Contractor

The CONTRACTOR will receive partial payments based on the amount of work done and accepted by the ENGINEER. The partial payments shall be approximate only, and all partial payments shall be subject to correction in the final estimate and payment.

The CONTRACTOR shall prepare and submit a payment application to the ENGINEER for approval covering the total quantities under each item of work that has been completed from the start of the job up to and including the last day of the payment period, and the value of the work so completed determined in accordance with the schedule of unit prices for such items, together with supporting evidence as may be required by the OWNER and/or ENGINEER. This estimate shall also include an allowance for the cost of such materials and equipment required in the permanent work as has been delivered to the site and suitably protected but not as yet incorporated in the work. This allowance shall be a maximum of 50% of supplier's invoice.

All requests for partial payment shall be submitted to the ENGINEER. Payment shall be made to the CONTRACTOR within 45 days of receipt of a complete and valid request for partial payment.

The amount of such payments shall be the total value of the work done to the date of the estimate, based on the quantities and the contract unit prices, less an amount retained and less payments previously made. The amount retained shall be 10% of the amount due until final acceptance. The OWNER shall require, as a condition precedent to making any payment, that the CONTRACTOR provide a Contractor's Affidavit and partial or complete Release of Lien, on forms approved by the OWNER. The Contractor's Affidavit shall state that all indebtedness incurred by the CONTRACTOR for labor, equipment, materials and services has been paid by the CONTRACTOR, and for all payments subsequent to the first payment hereunder, as evidence of such payment, CONTRACTOR may be required by OWNER to provide the OWNER with Mechanic's Lien Release or Waivers of Lien from all subcontractors, suppliers of materialmen.

FINAL PAYMENT

When final acceptance has been made by the OWNER, the ENGINEER will then review the amount of final request for payment and certify the amount of this approval. All prior estimates and payments shall be subject to correction in the final estimate and payment. The amount of this estimate, less any sums that may have been deducted or retained under provisions of the contract, will be paid to the CONTRACTOR within 45 days after the final

estimate has been approved by the ENGINEER, provided that the following requirements have been met:

- The CONTRACTOR has agreed in writing to accept the balance due, as determined by the ENGINEER, as full settlement of his account under the contract, and of all claims in connection therewith.
- The CONTRACTOR has furnished affidavits to the effect that all bills are paid and no suits are pending in connection with work done under the contract, and the CONTRACTOR has otherwise fully complied with the provisions of the Florida Lien Law.
- All test results, etc., have been received by the ENGINEER.
- Any inspections, etc., required by the local governmental entities having jurisdiction have been made.

The Contract will be considered complete when all work has been finished, the final inspection certified by the ENGINEER, and the project finally accepted in writing by the OWNER. The CONTRACTOR'S responsibility shall then terminate except as otherwise required and set out in these Contract Documents.

PROPOSER'S CERTIFICATION

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

The undersigned has read the City of Palatka's _____, the other related documents identified in the ___, and any Addenda, receipt of all, which is hereby acknowledged:

Addendum No.	Addendum Date
_____	_____
_____	_____
_____	_____

On behalf of our proposal team, we agree to and accept the terms, specific limitations and conditions expressed therein. I certify that all information contained in the proposal is truthful to the best of my knowledge and belief. I further certify that I am duly authorized to submit this proposal on behalf of my team as its act and deed and that the team is ready, willing and able to perform.

_____
Name (Print)

_____
Signature Date

STATE OF FLORIDA

COUNTY OF _____

PERSONALLY APPEARED BEFORE ME, the undersigned authority, who, after first being sworn by me, affixed his/her signature at the space provided above on this ___ day of _____, 2020, and is personally known to me, or has provided _____ as identification.

_____

BID BONDS

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned, _____

_____ as Principal, and _____

_____ as Surety, are hereby held and firmly bound

unto The City of Palatka, FL as owner in the penal sum

of _____ for the payment of

which, well and truly to be made, we hereby jointly and severally bind ourselves, our

heirs, executors, administrators, successors and assigns.

Signed, this _____ day of _____. 201____.

The condition of the above obligation is such that whereas the Principal has submitted to

_____ a certain Bid, attached hereto and hereby made apart

hereof to enter into a contract in writing for the:

_____

_____

_____

_____

NOW, THEREFORE,

(A) If said Bid shall be rejected, or in the alternate,

(B) If said Bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said Bid) and shall furnish a bond for his faithful performance of said contract, and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall be in no way impaired or affected by any extension of the time within which the Owner may accept such Bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

_____ (L. S.)

_____

SEAL By: _____

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENTS: That we _____
(Name of Contractor)

_____ a _____, doing business as

_____, hereinafter

called "Principal" and _____, of _____,

State of Florida, hereinafter called the "Surety", are held and firmly bound unto

_____, Florida, hereinafter called "Owner" in the penal sum of

_____ Dollars and _____ Cents ($_____) in lawful

money of the United States for the payment of which sum well and truly to be made, we bind

ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these

presents.

THE CONDITION OF THIS OBLIGATION is such that Whereas, the Principal entered into a certain Contract with the Owner, dated the ___ day of _____, 2020, a copy of which is hereto attached and made a part hereof for the:

REUSE IRRIGATION TRANSFER PUMPS

NOW, THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements thereof which may be granted by the Owner, with or without notice to the Surety, and if he/she shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the owner all outlay and expense which the Owner may incur in making good any default, and shall promptly make payment to all persons, firms, Subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such Contract, and any authorized extension or modification thereof, including all amounts due on materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by Subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder of the Specifications accompanying the same shall in any way affect its

obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the specifications.

PROVIDED FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS HEREOF, this instrument is executed in six (6) counterparts each, one (1) of which

shall be deemed an original, this the ___ day of _____, 2018.

ATTEST:

(SEAL) _____ _____
(PRINCIPAL)

_____ By_____
WITNESS AS TO PRINCIPAL

ATTEST: _____
(Address)

(SEAL)_____ _____
(Surety) (Surety)

_____ By _____
Witness as to Surety Attorney-in-Fact

_____ _____
(Address-Zip Code) (Address-Zip Code)

Countersigned:

By _____
Attorney-in-Fact, State of Florida

_____

NOTE: Date of Bond must be prior to date of Contract.
If Contractor is Partnership, all partners should execute bond.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS that

_____
(Name of Contractor)

_____
(Address of Contractor)

a(n)_____, hereinafter called
(Corporation, Partnership or Individual)

Principal, and _____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

The City of Palatka, FL
(Name of Owner)

201 North 2nd Street, Palatka, FL 32177
(Address of Owner)

hereinafter called OWNER, in the penal sum of _____ Dollars, ($_____) in lawful money of the United States, for the payment of which sum will and truly to be made, we bind ourselves, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with OWNER, dated _____ day of _____, 2020, a copy of which is hereto attached and made a part hereof for the construction of:

REUSE IRRIGATION TRANSFER PUMPS

NOW THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions, and agreements thereof which may be granted by the Owner, with or without notice to the Surety, and if he/she shall satisfy all claims and demands incurred under such Contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the owner all outlay and expenses which the Owner may incur in making good any default, and shall promptly make payment to all persons, firms, Subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such Contract, and

any authorized extension or modification thereof, including all amounts due on materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by Subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.
PROVIDED FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to WORK to be performed thereunder or the SPECIFICATIONS accompanying the same shall in any wise affect its obligation on this BOND, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the WORK or to the SPECIFICATIONS.

PROVIDED, FURTHER, that no final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in _____ counterparts, each one of which shall be deemed an original, this _____ day of _____, 2020.

ATTEST:

_____
Principal

_____ By _____(s)
(Principal Secretary) (SEAL)

_____ _____
(Witness to Principal) (Address)

_____ _____
(Address)

_____ _____
(Surety)

ATTEST:

_____
(Surety Secretary)

(SEAL)

_____ _____
(Witness to Surety) (Attorney-in-Fact)

_____ _____
(Address) (Address)

_____ _____
NOTE: Date of BOND must be prior to the date of Contract. If CONTRACTOR is Partnership, all partners should execute BOND.

IMPORTANT: Surety companies executing BONDS must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the state where the PROJECT is located. BID FOR LUMP SUM CONTRACTS

Place _____ Date _____ Project No. _____

Proposal of _____ (hereinafter called "Bidder")

(a corporation [ ] partnership [ ] individual [ ] doing business as

_____)

to the The City of Palatka, FL hereafter called "Owner".

The bidder, in compliance with your invitation for bids for the construction of the BENEFICIAL RECLAIM WATER PROJECT

having examined the plans and specifications with related documents and the site of the proposed work, and being familiar with all of the conditions surrounding the construction of the proposed project including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies; and to construct the project in accordance with the Contract Documents, within the time set forth therein, and at the prices stated below. These prices are to cover all expenses incurred in performing the work required under the Contract Documents, of which this proposal is a part.

Bidder hereby agrees to commence work under this contract on or before a date to be specified in a written "Notice to Proceed" of the Owner and to fully complete the Project within _____consecutive calendar days thereafter as stipulated in the specifications. Bidder further agrees to pay as liquidated dames, the sum of $_____ for each consecutive calendar day thereafter as hereinafter provided in Paragraph 19 of the General Conditions.

Bidder acknowledges receipt of the following addendum:

BASE PROPOSAL: Bidder agrees to perform all of the work described in the specifications and shown on the plans for the sum of _____
($_____) (Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words will govern.

ALTERNATE PROPOSALS:

Alternate No. 1: _____

Deduct the sum of _____ ($_____)

Alternate No. 2:
_____

Deduct the sum of _____ ($_____)

Alternate No. 3: _____

Deduct the sum of _____ ($_____)

Bidder understands that the Owner reserves the right to reject any or all bids and to waive any informalities in the bidding.

Upon receipt of written notice the acceptance of this bid, Bidder will execute the formal contract attached within 10 days and deliver a Surety Bond or Bonds as required by Paragraph 29 of the General conditions.

The bid security attached in the sum of _____

_____ ($_____) is to become the property of the Owner in the event contract and bond are not executed within the time above set forth, as liquidated damages for the delay and additional expense to the Owner caused thereby.

Respectfully submitted:

By:_____
(Signature)

_____
(Title)

_____
(Business Address and Zip Code)

(SEAL - if bid is by corporation)

BONDING AND INSURANCE

1. This Attachment sets forth bonding and insurance requirements for grants. No other bonding and insurance requirements shall be imposed other than those normally required by the recipient.

2. Except as otherwise required by law, a grant that requires the contracting (or subcontracting) for construction of facility improvements shall provide for the recipient to follow its own requirements relating to bid guarantees performance bond, and payment bonds unless the construction contract or subcontract exceeds $100,000.00. For those contracts or subcontracts exceeding $100,000.00, the State may except the bonding policy and requirements of the recipient provided the State has made a determination that the State's interest is adequately protected. If such a determination has not been made, the minimum requirements shall be as follows:

(a) A bid guarantee from each bidder equivalent to five percent of the bid price. The "bid guarantee" shall consist of a firm commitment such as a bid bond, certified check, or other negotiable instrument accompanying a bid. (See Section 7 of "Information for Bidders")

(b) A performance bond on the part of the contractor for 100 percent of the contract price. A "performance bond" is one executed in connection with a contract to secure fulfillment of all the contractor's obligations under such contract.

(c) A payment bond on the part of the contractor for 100 percent of the contract price. A "payment bond" is one executed in connection with a contract to assure payment as required by law of all persons supplying labor and materials in the execution of the work provided for in the contract.

3. Where the Federal Government guarantees or insures the repayment of money borrowed by the recipient, the State, at its discretion, may require adequate bonding and insurance if the bonding and insurance requirement of the recipient is not deemed adequate to protect the interest of the Federal Government.

4. Where bonds are required in the situations described above, the bonds shall be obtained from companies holding certificates of authority as acceptable sureties (31 CFR 223).

CERTIFICATION AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the _____

_____, Secretary of the Corporation named as Principal in the within bond; that _____, who signed the said bond on behalf of the Principal was then _____ of said corporation; that I know his/her signature, and his/her signature thereto is genuine; and that said bond as dully signed, sealed, and attested to for and in behalf of said corporation by authority of this governing body.

(Corporate)

(Seal)

_____

Title: _____

Power of Attorney for person signing for surety company must be attached to bid.

Form 950.1

CERTIFICATION OF BIDDER REGARDING SECTION 3

_____ _____

Name of Prime Contractor Project Name & Number

The undersigned hereby certifies that:

(a) Section 3 provisions are included in the Contract.

(b) A written Section 3 plan was prepared and submitted as part of the bid proceedings (if bid equals or exceeds $10,000).

(c) No segregated facilities will be maintained.

Name and Title of Signer:

_____ _____

Signature Date

Form 950.2

CERTIFICATION OF PROPOSED SUBCONTRACTOR REGARDING
SECTION 3 AND SEGREGATED FACILITIES

_____ _____

NAME OF SUB CONTRACTOR PROJECT NAME & NUMBER

The undersigned hereby certifies that

(a) Section 3 provisions are included in the Contract.

(b) A written Section 3 plan was prepared and submitted as part of the bid proceedings (if bid equals or exceeds $10,000).

(c) No segregated facilities will be maintained as required by Title VI of the Civil Rights Act of 1964.

NAME & TITLE OF Signer (Print or Type):

_____ _____

Signature Date

CERTIFICATION BY PROPOSED SUBCONTRACTOR REGARDING EQUAL EMPLOYMENT OPPORTUNITY

_____

NAME OF CONTRACTOR PROJECT NUMBER

_____

INSTRUCTIONS

This certification is required pursuant to executive Order 11246 (30 F. R.12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clauses; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the subcontractor has not filed a compliance report due under applicable instructions, such subcontractor shall be required to submit a compliance report before the owner approves the subcontract or permits work to begin under the subcontract.

_____

SUBCONTRACTORS CERTIFICATION

_____

NAME AND ADDRESS OF SUBCONTRACTOR (Include Zip Code)

_____

1. Bidder has participated in previous contract subject to the Equal Opportunity Clause.
   Yes [ ] No [ ]

_____

2. Compliance reports were required to be filed in connection with such contract or subcontractor.
   Yes [ ] No [ ]

_____

3. Bidder has filed all compliance reports due under applicable instructions, including SF-100.
   Yes [ ] No [ ]

_____

4. Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended? Yes [ ] No [ ]

_____

NAME AND TITLE OR SIGNER (Please type):

_____ _____

SIGNATURE DATE

CERTIFICATION OF BIDDER REGARDING
EQUAL EMPLOYMENT OPPORTUNITY

_____

NAME OF BIDDER

_____

ADDRESS (INCLUDE ZIP CODE)

This certification is required pursuant to executive Order 11246 (30 F. R.12319-25). The implementing rules and regulations provide that any bidder or prospective contractor, or any of their proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clauses; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicates that the subcontractor has not filed a compliance report due under applicable instructions, such subcontractor shall be required to submit a compliance report before the owner approves the subcontract or permits work to begin under the subcontract.

_____

1. Bidder has participated in previous contract subject to the Equal Opportunity Clause.
   Yes [ ] No [ ]

_____

2. Compliance reports were required to be filed in connection with such contract or subcontractor.
   Yes [ ] No [ ]

_____

3. Bidder has filed all compliance reports due under applicable instructions, including SF-100.
   Yes [ ] No [ ]

_____

4. Have you ever been or are you being considered for sanction due to violation of Executive Order 11246, as amended? Yes [ ] No [ ]

_____

NAME AND TITLE OR SIGNER (Please type):

_____ _____

SIGNATURE DATE

CONTRACT

THIS AGREEMENT, made this _____ day of _____,2020,

by and between the City of Palatka herein called the "owner" through its _____ and

_____

STRIKE OUT (a corporation) (a partnership) (an individual)
IN APPLICABLE
TERMS

doing business as _____

of _____, City of _____, and State of

Florida, hereinafter called "Contractor."

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, to be made and performed by the OWNER, the CONTRACTOR hereby agrees with the OWNER to commence and complete the construction described as follows:

REUSE IRRIGATION TRANSFER PUMPS

hereinafter called the project, for the sum of $_____and all extra work in connection therewith, under the terms as stated in the General and Special Conditions of the Contract; and at the CONTRACTORS' own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, General Conditions, Supplemental General Conditions and Special Conditions of the Contract; the plans, which include all maps, plats, blue prints, and other drawings and printed or written explanatory matter thereof; the specifications and contract documents therefore as prepared by _____,herein entitled the Architect/Engineer; and as numbered in Paragraph 1 of the Supplemental General Conditions, all of which are made a part hereof and collectively evidence and constitute the contract.

The Contractor hereby agrees to commence work under this contract on a date to be specified in written "Notice to Proceed" of the Owner and to fully complete the project within 90 consecutive calendar days thereafter. The Contractor further agrees to pay, as liquidated damages, the sum of $_____ for each consecutive calendar day thereafter as hereinafter provided in Paragraph 10 of the General Conditions.

The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the contract, subject to additions and deductions, as provided in the General Conditions of the Contract, and to make payments on account thereof as provided in Paragraph 20, "Payments to Contractor," of the General Conditions.

IN WITNESS WHEREOF, the parties to these presents have executed this contract in six (6) counterparts, each of which shall be deemed an original, in the year and day first above mentioned.

(Seal)

ATTEST:

_____
(Owner)

_____ By _____
(Secretary)

_____ _____
(Witness) (Title)

(Seal)

_____
(Contractor)

_____ By: _____
(Secretary)

_____ _____
(Witness) (Title)

_____
(Address and Zip Code)

Note: Secretary of the Owner should attest. If Contractor is a corporation, Secretary should attest.

CERTIFICATE OF OWNER'S ATTORNEY

I, the undersigned, _____, the duly authorized and acting legal

representative of the City of Palatka do hereby certify as follows:

I have examined the attached contract (s) and surety bonds and the manner of execution thereof, and I am of the opinion that each of the aforesaid agreements has been duly authorized; that said representatives have full power and authority to execute said agreements on behalf of the respective parties named thereon; and that the foregoing agreements constitute valid and legally binding obligations upon the parties executing the same in accordance with terms, conditions and provisions thereof.

Date: _____ _____

ADDENDA RECEIPT ACKNOWLEDGMENT

Addendum No.	Date	Initials
_____	_____	_____
_____	_____	_____
_____	_____	_____

Bidder's Experience List

The following are contracts similar in scope to this project which the Contractor has performed within the past five (5) years:

_____

_____

_____

_____

Subcontractors List

The following are Subcontractors to be employed by the Contractor:

Name	Description of Work
_____	_____
_____	_____
_____	_____

Manufacturers List

The following are Manufacturers of materials and equipment to be utilized by the Contractor:

Name	Description of Materials and Equipment
_____	_____
_____	_____

NOTICE OF AWARD

TO: **Date:**

Project:

The Owner has considered the Bid Proposal submitted by you for the above described project in response to its Advertisement for Bids dated _____ and Instructions to Bidders.

You are hereby notified that your bid has been accepted for items in the amount of $_____.

You are required by the Instructions to Bidders to execute the Agreement and furnish the required Contractor's Performance Bond, Payment Bond, and certificates of insurance within 7 calendar days from the date of this Notice of Award to you.

If you fail to execute said Agreement and to furnish said Bonds within 7 calendar days from the date of this Notice of Award, said Owner will be entitled to consider all your rights arising out of the Owner's acceptance of your Bid Proposal as abandoned and as a forfeiture of your Bid Bond.
The Owner will be entitled to such other rights as may be granted by law. You are required to return seven duplicate original acknowledged copies of this Notice of Award to the Owner.

Dated this _____ day of _____, 2018, _____, Florida,

OWNER

By: _____

Title: _____

ACCEPTANCE OF NOTICE

Receipt of the Notice of Award is hereby acknowledged by
_____ this _____ day of
_____, 2018.

By: _____

Title: _____

CHANGE ORDER NO.

Project No. _____ Date _____

Owner: City of Palatka

Project Address: 301 River Street Palatka, FL 32177

Contractor:

Change Ordered:

Reason for Change Order:

CONTRACT AMOUNT

Original Contract Amount	$
Previous Change Orders	$
Change Order Addition	$
Change order Deduction	$
Revised Contract Amount	$

_____

This document shall become an amendment to the Contract and all stipulations and covenants of the Contract shall apply hereto.

_____ _____
Contractor Date

_____ _____
Owner (City/County) Date

_____ _____
Engineer Date

_____ _____
Project Manager Date

CONTACT SHEET

Name:_____

Federal Taxpayer ID: _____

Mailing Address: _____

City, State, & Zip Code: _____

Telephone:_____

Fax:_____

Cell Phone:_____

Email: _____

Submitted By: _____

Title: _____

Vendor Accepts Credit Cards*: Yes No (Please Circle)

Accounting Contact:

Name:_____ **Title:**_____

Email Address:_____ **Phone:**_____

***See preferred method of payment under "Prompt Payment Act" section of the Information to Bidders**

CITY OF PALATKA, FLORIDA SWORN STATEMENT UNDER F.S. SECTION 287.133(3)(A), ON PUBLIC ENTITY CRIMES

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

1. This sworn statement is submitted with Bid, Qualifications, Proposal or Contract for _____ _____.

2. This sworn statement is submitted by (entity) _____ whose business address is _____ and (if applicable) Federal Employer Identification Number (FEIN) is _____(If a Sole Proprietor and you have no FEIN, include the last four (4) digits of your Social Security Number: _____.)

3. My name is_____and my relationship to the entity named above is _____.

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

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

6. I understand that an "affiliate" as defined in Paragraph 287.133(1)(a), Florida Statutes, means:
   1. A predecessor or successor of a person convicted of a public entity crime; or
   2. An entity under the control of any natural person who is active in the management of the entity and who has been convicted of a public entity crime. The term "affiliate" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in the management of an affiliate. The City of Palatka, Florida ownership by one of shares constituting a controlling income among persons when not for fair interest in another person, or a pooling of equipment or income among persons when not for fair market value under a length

agreement, shall be a prima facie case that one person controls another person. A person who was knowingly convicted of a public entity crime, in Florida during the preceding thirty six (36) months shall be considered an affiliate.

7. I understand that a "person" as defined in Paragraph 287.133(1)(e), Florida Statutes, means any natural person or entity organized under the laws of the state or of the United States with the legal power to enter into a binding contract for provision of goods or services let by a public entity, or which otherwise transacts or applies to transact business with a public entity. The term "person" includes those officers, directors, executives, partners, shareholders, employees, members, and agents who are active in management of an entity.

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

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

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

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

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

_____

Signature Date:

STATE OF FLORIDA
COUNTY OF _____

PERSONALLY APPEARED BEFORE ME, the undersigned authority, who, after first being sworn by me, affixed his/her signature at the space provided above on this ___ day of _____, 201 ___, and is personally known to me, or has provided _____ as identification.

_____

Notary Public
My Commission expires:

DRUG-FREE WORKPLACE CERTIFICATION

The below-signed Proposer certifies that it has implemented a drug-free workplace program. In order to have a drug-free workplace, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violation of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation, and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or services a copy of the statement specified in paragraph 1.
4. In the statement in paragraph 1., notify the employees that, as a condition of working on the commodities or contractual services that are under proposal, the employee understands the terms of the statement and will notify the employer of any conviction of, or plea of nolo contendre to, any violation occurring in the workplace no later than five (5) working days after such conviction.
5. Impose a sanction on, or require fine satisfactory participation in drug abuse assistance or rehabilitation program if such is available in the employee's community, by any employee who is convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign this statement, I Certify that this firm complies fully with the above drug-free workplace requirements.

COMPANY:_____

CITY: _____ STATE: _____ ZIP CODE: _____

TELEPHONE NUMBER(S):_____

CELL PHONE: _____EMAIL: _____

SIGNATURE: _____

NAME (TYPED OR PRINTED):_____

TITLE:_____

E-VERIFY STATEMENT

Bid/Proposal/RFQ Number:_____

Project Description: _____

_____

Vendor/Consultant acknowledges and agrees to the following:

Vendor/Consultant shall utilize the U.S. Department of Homeland Security's E-Verify system, in accordance with the terms governing use of the system, to confirm the employment eligibility of:

1. All persons employed by the Vendor/Consultant during the term of the Contract to perform employment duties within Florida; and
2. All persons, including subcontractors, assigned by the Vendor/Consultant to perform work pursuant to the contract with the Department.

Company/Firm:_____

Contact Name (Print):_____

Authorized Signature:_____

Title:_____

Date:_____

RESPONDENT'S CERTIFICATION

I have carefully examined the Plans and Specifications, other related documents identified in the ITB, and the following Addenda, receipt of all which is hereby acknowledged:

Addendum No.	Addendum Date
____	_____
____	_____

1. I hereby propose to furnish the goods or services specified in the Request for Qualification. I agree that my qualification will remain firm for a period of 365 days in order to allow the City adequate time to evaluate the qualifications.

2. I certify that all information contained in this qualification is truthful to the best of my knowledge and belief. I further certify that I am duly authorized to submit this qualification on behalf of the firm as its act and deed and that the firm is ready, willing and able to perform if awarded the contract.

3. The applicant certifies to the best of his/her knowledge and belief, that his/her principals:

    a. Are not presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from covered transactions by any Federal department or agency;

    b. Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, Local) transaction or contract under a public transaction; violation of Federal or State antitrust statues or falsification or destruction of records, making false statements, or receiving stolen property;

    c. Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State, Local) with commission of any of the offenses enumerated in paragraph 1.b of this certification; and

    d. Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, Local) terminated for cause or default.

4. Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall submit an explanation to the City of Palatka, City Manager.

I further certify, under oath, that this qualification is made without prior understanding, agreement, connection, discussion, or collusion with any other person, firm or corporation submitting a qualification for the same product or service; no officer, employee or agent of the City of Palatka or any other proposer is interested in said qualification; and that the undersigned executed this Proposer's Certification with full knowledge and understanding of the matters therein contained and was duly authorized to do so.

_____

Name of Business

_____

Name (Print)

_____

Signature Date:

STATE OF FLORIDA
COUNTY OF _____

PERSONALLY APPEARED BEFORE ME, the undersigned authority, who, after first being sworn by me, affixed his/her signature at the space provided above on this ___ day of _____, 2020, and is personally known to me, or has provided _____ as identification.

_____

Notary Public
My Commission expires:

SECTION 00 41 15

BID FORM

PROJECT IDENTIFICATION: CITY OF PALATKA
REUSE IRRIGATION TRANSFER PUMPS
BID (ITB) 2020-09

BID DEADLINE: July 22, 2020 at 2:30 p.m.

THIS BID IS SUBMITTED TO: City of Palatka
201 North 2nd Street
Palatka, Florida 32177

1.01 The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with Owner in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

2.01 Bidder accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

3.01 In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

A. Bidder has examined and carefully studied the Bidding Documents and the other related data identified in the Bidding Documents.

B. Bidder has visited the Site and become familiar with and is satisfied as to the general, local and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and is satisfied as to all federal, state and local Laws and Regulations that may affect cost, progress and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in paragraph 4.02 of the General Conditions, and (2) reports and drawings of a Hazardous Environmental Condition, if any, which has been identified in the Supplementary Conditions as provided in paragraph 4.06 of the General Conditions.

E. Bidder has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect costs, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.

F. Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of the work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.

I. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by Engineer is acceptable to Bidder.

J. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

4.01 Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over Owner.

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

BASE BID					
Item No.	**Description**	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
1	Mobilization and Demobilization	1	LS		
2	Site Preparation	1	LS		
3	Reuse Transfer Pumps (Complete)	2	EA		
4	12” PVC (DR-18) Reuse Pipe	559	LF		
5	12” D.I. Reuse Pipe	21	LF		
6	12” M.J. 90 Deg. Bends	2	EA		
7	12” M.J. 45 Deg. Bends	2	EA		
8	12”x 12” FLG. Tee	1	EA		
9	12” FLG. 90 Deg. Bends	1	EA		
10	12” FLG. Base 90 Deg. Bend	1	EA		
11	12”x 10” FLG. Reducing 90 Deg. Bend	1	EA		
12	10” D.I. Reuse Pipe	43	LF		
13	10” FLG. Check Valves	2	EA		
14	10” FLG. Flare Fitting	2	EA		
15	10” FLG. 90 Deg. Bends	6	EA		
16	Asphalt Pavement Remove and Replace	43	SY		
17	Asphaltic Concrete Pavement (Type SP)	59	SY		
18	Electrical	1	LS		
19	Controls (Liquid Level Indicator, Operations, etc.)	1	LS		
20	Supports & Appurtenances	1	LS		
21	Air Relief Valve, Replace	2	EA		
22	Air Relief Valve, Furnish & Install	2	EA		
23	Concrete Box and Cover (For New Air Relief Valves)	2	EA		

TOTAL BID AMOUNT (ITEMS 1-23) $_____
(Figures)

_____
(Use Words)

All specific cash allowances are included in the price(s) set forth above and have been computed in accordance with paragraph 11.02 of the General Conditions.

Unit prices have been computed in accordance with Paragraph 11.03.B of the General Conditions.

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment of all Unit Price Bid Items will be based on actual quantities provided, determined as provided in the Contract Documents.

6.01 Bidder agrees that the Work will be substantially complete within 60 calendar days after the date when the Contract Times commence to run as provided in paragraph 2.03 of the General Conditions, and completed and ready for final payment in accordance with paragraph 14.07.B of the General Conditions within 30 calendar days after the date when the Contract Times commence to run.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the times specified above, which shall be stated in the Agreement.

7.01 The following documents are attached to and made a condition of this Bid:

A. Proposer's Certification
B. Bid Bond
C. Certification as to Corporate Principal
D. 950.1 – Certification of Bidder Regarding Section 3
E. 950.2 – Certification of Proposed Subcontractor Regarding Section 3 and Segregated Facilities
F. Certification by Proposed Subcontractor Regarding Equal Opportunity Employment Opportunity
G. Certification of Bidder Regarding Equal Employment Opportunity
H. Certification of Owner's Attorney
I. Addenda Receipt Acknowledgement
J. Public Entity Crimes Statement
K. Drug-Free Workplace Certificate
L. E-Verify Statement
M. Respondent's Certification
N. Bid Form
O. Florida Trench Safety Act Certification

8.01 The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

SUBMITTED on_____, 2020.

State Contractor License No._____.

If Bidder is:

An Individual

Name (typed or printed):_____

By:_____
(*Individual's Signature)*

Doing business as:_____

Business address:_____

_____

Phone No.:_____ Fax No.:_____

A Partnership

Partnership Name:_____

By:_____
(*Signature of general partner – attach evidence of authority to sign*)

Name (typed or printed):_____

Business address:_____

_____

Phone No.:_____ Fax No.:_____

A Corporation

Corporation Name:_____ (SEAL)

State of Incorporation:_____

Type (General Business, Professional, Service, Limited Liability):_____

By:_____

(*Signature – attach evidence of authority to sign*)

Name (typed or printed):_____

Title:_____ (CORPORATE SEAL)

Attest_____

(*Signature of Corporate Secretary*)

Business address:_____

_____

Phone No.:_____ Fax No.:_____

Date of Qualification to do business is_____

A Joint Venture

Joint Venturer Name:_____

By:_____

(*Signature of joint venture partner – attach evidence of authority to sign*)

Name (typed or printed):_____

Title:_____

Business address:_____

_____

Phone No.:_____ Fax No.:_____

Joint Venturer Name:_____

By:_____

(*Signature – attach evidence of authority to sign*)

Name (typed or printed):_____

Title:_____

Business address:_____

_____

Phone No.:_____ Fax No.:_____

Phone and FAX Number, and Address for receipt of official communications:

_____

_____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in a manner indicated above.)

SECTION 00 45 55

FLORIDA TRENCH SAFETY ACT CERTIFICATION

Bidder acknowledges that included in the various items of the proposal and in the Total Bid Price are costs for complying with the Florida Trench Safety Act (90-96, Laws of Florida) as modified October 1, 200. The Bidder further identifies the costs to be summarized below:

	Cost
1. Trench Safety Act Compliance	$_____
2. Special Shoring	$_____

Identify method of compliance for Item #1:_____

_____

Identify or attach a copy of Special Shoring requirements for Item #2:_____

_____

The undersigned certifies that he/she is the Contractor who will perform the trench excavation for this project, and hereby gives written assurance that Contractor will comply with the applicable trench safety standards specifically set forth in Florida's Trench Safety Act, Laws of Florida, 90-96.

BIDDER:_____

By:_____

Name:_____

Title:_____

Sworn to and subscribed before me this _____ day of _____, 20___.

_____

Notary Public

My Commission Expires:_____

SECTION 00 55 00

NOTICE TO PROCEED

TO: _____
CONTRACTOR
_____
ADDRESS
_____
CITY STATE ZIP

PROJECT:_____
NAME

You are hereby notified to commence work in accordance with the Agreement dated_____, 20__.

The Contract time for Substantial Completion is_____ consecutive calendar days from the date of commencement.

The Contract time for Final Completion is_____ consecutive calendar days from the date of Substantial Completion.

The Contract time commences to run _____, 20_____ .

The date of Substantial Completion is _____, 20_____ .

The date of Final Completion is_____ , 20_____ .

THE CITY OF PALATKA

BY:_____

TITLE:_____

DATE:_____

You are required to return an acknowledged copy of the Notice to Proceed to The City of Palatka, Florida, Attn: Ms. Betsy Driggers, 201 North Second Street, Palatka, Florida 32177.

ACCEPTANCE OF NOTICE

Receipt of the above Notice To Proceed is hereby acknowledged

this the_____ day of_____ , 20___ .

BY:_____

TITLE:_____

END OF SECTION

SECTION 00 62 76

APPLICATION AND CERTIFICATE FOR PROGRESS PAYMENT

OWNER: The City of Palatka

CONTRACTOR: _____

Purchase Order No.: _____ Project Title: _____

Engineer/Architect: _____

Engineer/Architect Project No.: _____ Contract Date: _____

Progress Payment No.: _____ for Period _____ to _____

1. Original Contract Sum..... $_____

2. Net Change by Change Orders ..... $_____

3. Contract Sum to Date (Line 1 ± Line 2) ..... $_____

4. Work Completed and Stored to Date..... $_____

5. Amount Retained (Percent)..... $_____

6. Total Earned Less Retainage (Line 4 minus Line 5) ..... $_____

7. Less Previous Payments ..... $_____

8. CURRENT PAYMENT DUE .....$_____

CERTIFICATION OF CONTRACTOR

The undersigned CONTRACTOR certifies that (1) all previous progress payments received from OWNER on account of Work done under the Contract referred to above have been applied on account to discharge CONTRACTOR's legitimate obligations incurred in connection with Work covered by prior Applications for Payment numbered 1 through_____ inclusive; (2) title of all Work, materials and equipment incorporated in said Work or otherwise listed in or covered by this Application for Payment will pass to OWNER at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to OWNER indemnifying OWNER against any such Lien, security interest or encumbrance); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

_____ _____
Contractor Date

By: _____ _____
(Authorized Representative) Title

CERTIFICATION OF ENGINEER / ARCHITECT

In accordance with the Contract Documents, based upon on-site observations by the undersigned or duly authorized representatives or assistants, the Engineer / Architect certifies to the Owner that to the best of its knowledge, information and belief, the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED:.....$_____
(Attach explanation if amount certified differs from the amount applied for)

ENGINEER / ARCHITECT:

By:_____ _____ _____
(Date) (Firm)

AFFIDAVIT OF CONTRACTOR

STATE OF_____

COUNTY OF_____
Before me this day personally appeared _____who, being first duly sworn, deposes and says:

That he is the_____ of_____ and the Contractor on the following described public works project:

JOB DESCRIPTION:_____

CONTRACTING AUTHORITY:_____City of Palatka_____

That all persons who furnish labor, supplies or materials or did work in connection with such improvements set out in the CONTRACT have been paid, to date, in full, including all subcontractors.

AND FURTHER AFFIANT SAYETH NOT.

By:_____

WITNESS my hand and official seal, this _____day of _____, A.D. _____.

_____
Notary Public

My Commission Expires:

Project Title: _____ City Purchase Order No.: _____

Progress Payment No.: _____ Engineer / Architect Project No.: _____

ITEM NO.	DESCRIPTION OF ITEM	ORIGINAL ESTIMATE				COMPLETED TO DATE		
		Unit	Quantity	Unit Cost	Amount	Quantity	Amount	Percent Complete

END OF SECTION

SECTION 00 63 15

CONTRACTOR'S REQUEST FOR INFORMATION

TO: **THE CITY OF PALATKA**

FROM:_____ (CONTRACTOR) DATE:_____

CONTRACTOR REQUEST FOR INFORMATION NO.:_____

PROJECT NAME:_____

PURCHASE ORDER NO.:_____

QUESTION:

BY:_____ DATE:_____

REPLY:

BY:_____ DATE:_____

END OF SECTION

SECTION 00 63 36

FIELD ORDER

PROJECT: _____ REQUEST NO: _____

PURCHASE ORDER NO.: _____

CONTRACTOR: _____

You are hereby directed to execute promptly this Field Order which interprets the Contract Documents or orders minor changes in the Work without change in Contract Price or Contract Time.

If you consider that a change in Contract Price or Contract Time is required, please submit a Work Change Directive to the Owner immediately and before proceeding with this Work.

Field Order: _____

_____

_____

_____

_____

_____

Attachments: (Listing of attached documents that support description)

1. Work Change Directive No. _____

2. _____

3. _____

4. _____

5. _____

BY: _____ DATE: _____

END OF SECTION

SECTION 00 63 49

WORK CHANGE DIRECTIVE

PROJECT: _____ REQUEST NO: _____

PURCHASE ORDER NO.: _____

CONTRACTOR: _____

You are directed to proceed promptly with the following change(s):

Description: _____

_____

_____

Purpose of Work Directive Change: _____

_____

_____

Attachments: _____

_____

If a claim is made that the above change(s) have affected the Contract Price or Contract Time, any claim for a Change Order based thereon will involve one of the following methods of determining the effect of the change(s).

Method of determining a change in Contract Price:

[ ] Time and materials

[ ] Unit prices

[ ] Cost plus fixed fee

[ ] Other _____

Method of determining change in Contract Time:

[ ] Contractor's records

[ ] Owner's records

[ ] Other _____

Estimated increase (decrease) in Contract Price: $ _____
If the change involves an increase, the the estimated amount is not to be exceeded without further authorization.

Estimated increase (decrease) in Contract Time: _____ days. If the change involves an increase, the estimated time is not to be exceeded without further authorization.

AUTHORIZED BY: _____

DATE: _____

END OF SECTION

SECTION 00 65 16

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project:_____

Purchase Order No.: _____ Contract Date:_____

This Certificate of Substantial Completion applies to:

[ ] All work under Contract [ ] Portion of work described as follows:

The Work to which this Certificate applies has been inspected by authorized representatives of the CITY and the CONTRACTOR and that Work is hereby declared to be substantially complete in accordance with the Contract Documents on :_____ .
DATE

A tentative list of items to be completed or corrected is attached hereto. This list may not be all-inclusive, and the failure to include an item in it does not alter the responsibility of CONTRACTOR to complete all the Work in accordance with the Contract Documents. The items in the tentative list shall be completed or corrected by CONTRACTOR within____ days of the above date of Substantial Completion.

The date of Substantial Completion is the date upon which all guarantees and warranties begin.

SIGNED:

THE CITY OF PALATKA OPERATIONS DEPARTMENT

By:_____ DATE: _____

THE CITY OF PALATKA CONSTRUCTION INSPECTOR

By:_____ DATE: _____

THE CITY OF PALATKA PROJECT MANAGER

By:_____ DATE: _____

CONSULTING ENGINEER/ARCHITECT, ETC.:

_____

By:_____ DATE: _____

CONTRACTOR:

_____

By:_____ DATE: _____

SECTION 00 65 16

TENTATIVE LIST OF ITEMS TO BE COMPLETED OR CORRECTED (PUNCH LIST)

Date: _____ Purchase Order No.: _____

Project: _____

Contractor: _____

This list may not be all-inclusive, and the failure to include an item does not alter the responsibility of the CONTRACTOR to complete all the Work in accordance with the Contract Documents.

NO:	ITEM:

END OF SECTION

SECTION 00 65 19

CERTIFICATE OF FINAL COMPLETION

Project:_____

Purchase Order No.: _____ Contract Date:_____

This Certificate of Final Completion applies to:

The Work under this Contract has been inspected by authorized representatives of the CITY and the CONTRACTOR and all Work is hereby declared to be complete in accordance with the Contract Documents on:_____
DATE

SIGNED:

THE CITY OF PALATKA OPERATIONS DEPARTMENT

By:_____ DATE: _____

THE CITY OF PALATKA CONSTRUCTION INSPECTOR

By:_____ DATE: _____

THE CITY OF PALATKA PROJECT MANAGER

By:_____ DATE: _____

CONSULTING ENGINEER/ARCHITECT, ETC.:

_____

By:_____ DATE: _____

CONTRACTOR:

_____

By:_____ DATE: _____

END OF SECTION

SECTION 00 65 20

WAIVER AND RELEASE OF LIEN UPON PROGRESS PAYMENT

The undersigned lienor, in consideration of the progress payment in the amount of $_____ , hereby waives and releases its lien and right to claim a lien for labor, services or materials furnished through (date) _____to (customer) _____on the job of (City property) _____, to the following described property:

This waiver and release does not cover any retention of labor, services, or materials furnished after the date specified.

Dated on_____ , 20___ .

Lienor's Name_____

Address_____

_____

By_____

Printed_____

NOTE: This is a statutory form prescribed by Section 713.20, Florida Statutes.

END OF SECTION

SECTION 00 65 21

WAIVER AND RELEASE OF LIEN UPON FINAL PAYMENT

The undersigned lienor, in consideration of the final payment in the amount of $ _____, hereby waives and releases its lien and right to claim a lien for labor, services or materials furnished through (date) _____to (customer)_____ on the job of (City property)_____ to the following described property:

Dated on_____ , 20____ .

Lienor's Name_____

Address_____

_____

By_____

Printed_____

NOTE: This is a statutory form prescribed by Section 713.20, Florida Statutes.

END OF SECTION

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the Controlling Law.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared by

ENGINEERS JOINT CONTRACT DOCUMENTS COMMITTEE

and

Issued and Published Jointly By

ACEC
American Council of Engineering Companies

National Society of Professional Engineers
Professional Engineers in Private Practice

ASCE
American Society of Civil Engineers

PROFESSIONAL ENGINEERS IN PRIVATE PRACTICE
a practice division of the
NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

_____

AMERICAN COUNCIL OF ENGINEERING COMPANIES

_____

AMERICAN SOCIETY OF CIVIL ENGINEERS

This document has been approved and endorsed by

The Associated General Contractors of America

Knowledge for Creating and Sustaining the Built Environment

Construction Specifications Institute

National Society of Professional Engineers
1420 King Street, Alexandria, VA 22314

American Council of Engineering Companies
1015 15th Street, N.W., Washington, DC 20005

American Society of Civil Engineers
1801 Alexander Bell Drive, Reston, VA 20191-4400

These General Conditions have been prepared for use with the Suggested Forms of Agreement Between Owner and Contractor Nos. C-520 or C-525 (2002 Editions). Their provisions are interrelated and a change in one may necessitate a change in the other. Comments concerning their usage are contained in the EJCDC Construction Documents, General and Instructions (No. C-001) (2002 Edition). For guidance in the preparation of Supplementary Conditions, see Guide to the Preparation of Supplementary Conditions (No. C-800) (2002 Edition).

TABLE OF CONTENTS

GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Bidding Requirements or Contract Documents and printed with initial capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.

1. *Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.

2. *Agreement*--The written instrument which is evidence of the agreement between Owner and Contractor covering the Work.

3. *Application for Payment*--The form acceptable to Engineer which is to be used by Contractor during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.

4. *Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

5. *Bid*--The offer or proposal of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

6. *Bidder*--The individual or entity who submits a Bid directly to Owner.

7. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda).

8. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, bid security of acceptable form, if any, and the Bid Form with any supplements.

9. *Change Order*--A document recommended by Engineer which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.

10. *Claim*--A demand or assertion by Owner or Contractor seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

11. *Contract*--The entire and integrated written agreement between the Owner and Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

12. *Contract Documents*-- Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents. Approved Shop Drawings, other Contractor's submittals, and the reports and drawings of subsurface and physical conditions are not Contract Documents.

13. *Contract Price*--The moneys payable by Owner to Contractor for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of Paragraph 11.03 in the case of Unit Price Work).

14. *Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Milestones, if any, (ii) achieve Substantial Completion; and (iii) complete the Work so that it is ready for final payment as evidenced by Engineer's written recommendation of final payment.

15. *Contractor*--The individual or entity with whom Owner has entered into the Agreement.

16. *Cost of the Work*--See Paragraph 11.01.A for definition.

17. *Drawings*--That part of the Contract Documents prepared or approved by Engineer which graphically shows the scope, extent, and character of the Work to be performed by Contractor. Shop Drawings and other Contractor submittals are not Drawings as so defined.

18. *Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.

19. *Engineer*--The individual or entity named as such in the Agreement.

20. *Field Order*--A written order issued by Engineer which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.

21. *General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.

22. *Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.

23. *Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.

24. *Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

25. *Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.

26. *Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.

27. *Notice of Award*--The written notice by Owner to the Successful Bidder stating that upon timely compliance by the Successful Bidder with the conditions precedent listed therein, Owner will sign and deliver the Agreement.

28. *Notice to Proceed*--A written notice given by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work under the Contract Documents.

29. *Owner*--The individual or entity with whom Contractor has entered into the Agreement and for whom the Work is to be performed.

30. *PCBs*--Polychlorinated biphenyls.

31. *Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.

32. *Progress Schedule*--A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising the Contractor's plan to accomplish the Work within the Contract Times.

33. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

34. *Project Manual*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.

35. *Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.

36. *Related Entity* -- An officer, director, partner, employee, agent, consultant, or subcontractor.

37. *Resident Project Representative*--The authorized representative of Engineer who may be assigned to the Site or any part thereof.

38. *Samples*--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.

39. *Schedule of Submittals*--A schedule, prepared and maintained by Contractor, of required submittals and the time requirements to support scheduled performance of related construction activities.

40. *Schedule of Values*--A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

41. *Shop Drawings*--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work.

42. *Site*--Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner which are designated for the use of Contractor.

43. *Specifications*--That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards and workmanship as applied to the Work, and certain

administrative requirements and procedural matters applicable thereto.

44. *Subcontractor*--An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

45. *Substantial Completion*--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.

46. *Successful Bidder*--The Bidder submitting a responsive Bid to whom Owner makes an award.

47. *Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.

48. *Supplier*--A manufacturer, fabricator, supplier, distributor, materialman, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or any Subcontractor.

49. *Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

50. *Unit Price Work*--Work to be paid for on the basis of unit prices.

51. *Work*--The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

52. *Work Change Directive*--A written statement to Contractor issued on or after the Effective Date of the Agreement and signed by Owner and recommended by Engineer ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive 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 Contract Times.

1.02 *Terminology*

A. The following words or terms are not defined but, when used in the Bidding Requirements or Contract Documents, have the following meaning.

B. *Intent of Certain Terms or Adjectives*

1. The Contract Documents include the terms "as allowed," "as approved," "as ordered", "as directed" or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action or determination will be solely to evaluate, in general, the Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of Paragraph 9.09 or any other provision of the Contract Documents.

C. *Day*

1. The word "day" means a calendar day of 24 hours measured from midnight to the next midnight.

D. *Defective*

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it:

a. does not conform to the Contract Documents, or

b. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents, or

c. has been damaged prior to Engineer's recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 14.04 or 14.05).

E. *Furnish, Install, Perform, Provide*

1. The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.

2. The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.

3. The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.

4. When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of Contractor, "provide" is implied.

F. Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2 - PRELIMINARY MATTERS

2.01 *Delivery of Bonds and Evidence of Insurance*

A. When Contractor delivers the executed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner such bonds as Contractor may be required to furnish.

B. *Evidence of Insurance:* Before any Work at the Site is started, Contractor and Owner shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which Contractor and Owner respectively are required to purchase and maintain in accordance with Article 5.

2.02 *Copies of Documents*

A. Owner shall furnish to Contractor up to ten printed or hard copies of the Drawings and Project Manual. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.

2.04 *Starting the Work*

A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.

2.05 *Before Starting Construction*

A. *Preliminary Schedules:* Within 10 days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), Contractor shall submit to Engineer for timely review**:**

1. a preliminary Progress Schedule; indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;

2. a preliminary Schedule of Submittals; and

3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.06 *Preconstruction Conference*

A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in Paragraph 2.05.A, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 *Initial Acceptance of Schedules*

A. At least 10 days before submission of the first Application for Payment a conference attended by Contractor, Engineer, and others as appropriate will be held to review for acceptability to Engineer as provided below the schedules submitted in accordance with Paragraph 2.05.A. Contractor shall have an additional 10 days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to Contractor until acceptable schedules are submitted to Engineer.

1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve Contractor from Contractor's full responsibility therefor.

2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.

3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

A. The Contract Documents are complementary; what is required by one is as binding as if required by all.

B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to Owner.

C. Clarifications and interpretations of the Contract Documents shall be issued by Engineer as provided in Article 9.

3.02 *Reference Standards*

A. Standards, Specifications, Codes, Laws, and Regulations

1. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of Owner, Contractor, or Engineer, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents. No such provision or instruction shall be effective to assign to Owner, or Engineer, or any of, their Related Entities, any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Review of Contract Documents Before Starting Work*: Before undertaking each part of the Work, Contractor shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy which Contractor may discover and shall obtain a written interpretation or clarification from Engineer before proceeding with any Work affected thereby.

2. *Contractor's Review of Contract Documents During Performance of Work*: If, during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in Paragraph 3.04.

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:

a. the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or

b. the provisions of any Laws or Regulations applicable to the performance of the Work

(unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Amending and Supplementing Contract Documents*

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof by either a Change Order or a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways:

1. A Field Order;

2. Engineer's approval of a Shop Drawing or Sample; (Subject to the provisions of Paragraph 6.17.D.3); or

3. Engineer's written interpretation or clarification.

3.05 *Reuse of Documents*

A. Contractor and any Subcontractor or Supplier or other individual or entity performing or furnishing all of the Work under a direct or indirect contract with Contractor, shall not:

1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or Engineer's consultants, including electronic media editions; or

2. reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaption by Engineer.

B. The prohibition of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein shall preclude Contractor from retaining copies of the Contract Documents for record purposes.

3.06 *Electronic Data*

A. Copies of data furnished by Owner or Engineer to Contractor or Contractor to Owner or Engineer that may be relied upon are limited to the printed copies (also known as hard copies). Files in electronic media format of text, data, graphics, or other types are furnished only for the convenience of the receiving party. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, the hard copies govern.

B. Because data stored in electronic media format can deteriorate or be modified inadvertently or otherwise without authorization of the data's creator, the party receiving electronic files agrees that it will perform acceptance tests or procedures within 60 days, after which the receiving party shall be deemed to have accepted the data thus transferred. Any errors detected within the 60-day acceptance period will be corrected by the transferring party.

C. When transferring documents in electronic media format, the transferring party makes no representations as to long term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the data's creator.

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS; REFERENCE POINTS

4.01 *Availability of Lands*

A. Owner shall furnish the Site. Owner shall notify Contractor of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work. Owner will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If Contractor and Owner are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in Owner's furnishing the Site or a part thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.

C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.02 *Subsurface and Physical Conditions*

A. *Reports and Drawings:* The Supplementary Conditions identify:

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that Engineer has used in preparing the Contract Documents; and

2. those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that Engineer has used in preparing the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.

4.03 *Differing Subsurface or Physical Conditions*

A. *Notice:* If Contractor believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:

1. is of such a nature as to establish that any "technical data" on which Contractor is entitled to rely as provided in Paragraph 4.02 is materially inaccurate; or

2. is of such a nature as to require a change in the Contract Documents; or

3. differs materially from that shown or indicated in the Contract Documents; or

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. *Engineer's Review*: After receipt of written notice as required by Paragraph 4.03.A, Engineer will promptly review the pertinent condition, determine the necessity of Owner's obtaining additional exploration or tests with respect thereto, and advise Owner in writing (with a copy to Contractor) of Engineer's findings and conclusions.

C. *Possible Price and Times Adjustments*

1. The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

a. such condition must meet any one or more of the categories described in Paragraph 4.03.A; and

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of Paragraphs 9.07 and 11.03.

2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times if:

a. Contractor knew of the existence of such conditions at the time Contractor made a final commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or

b. the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such final commitment; or

c. Contractor failed to give the written notice as required by Paragraph 4.03.A.

3. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in Paragraph 10.05. However, Owner and Engineer, and any of their Related Entities shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

A. *Shown or Indicated:* The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to Owner or Engineer by the owners of such Underground Facilities, including Owner, or by others. Unless it is otherwise expressly provided in the Supplementary Conditions:

1. Owner and Engineer shall not be responsible for the accuracy or completeness of any such information or data; and

2. the cost of all of the following will be included in the Contract Price, and Contractor shall have full responsibility for:

a. reviewing and checking all such information and data,

b. locating all Underground Facilities shown or indicated in the Contract Documents,

c. coordination of the Work with the owners of such Underground Facilities, including Owner, during construction, and

d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

1. If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer. Engineer will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

2. If Engineer concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that Contractor did not know of and could not reasonably have been expected to be aware of or to have anticipated. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, Owner or Contractor may make a Claim therefor as provided in Paragraph 10.05.

4.05 *Reference Points*

A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.06 *Hazardous Environmental Condition at Site*

A. *Reports and Drawings:* Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the Engineer in the preparation of the Contract Documents.

B. *Limited Reliance by Contractor on Technical Data Authorized:* Contractor may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," Contractor may not rely upon or make any claim against Owner or Engineer, or any of their Related Entities with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by Contractor and safety precautions and programs incident thereto; or

2. other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or

3. any Contractor interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.

C. Contractor shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. Contractor shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible.

D. If Contractor encounters a Hazardous Environmental Condition or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, Contractor shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 6.16.A); and (iii) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any.

E. Contractor shall not be required to resume Work in connection with such condition or in any affected area until after Owner has obtained any required permits related thereto and delivered to Contractor written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, either party may make a Claim therefor as provided in Paragraph 10.05.

F. If after receipt of such written notice Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in Paragraph 10.05. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 7.

G. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06. G shall obligate Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

H. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 4.06.H shall obligate Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.

I. The provisions of Paragraphs 4.02, 4.03, and 4.04 do not apply to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. Contractor shall furnish performance and payment bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all of Contractor's obligations under the Contract Documents. These bonds shall remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified

in Paragraph 13.07, whichever is later, except as provided otherwise by Laws or Regulations or by the Contract Documents. Contractor shall also furnish such other bonds as are required by the Contract Documents.

B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act.

C. If the surety on any bond furnished by Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Paragraph 5.01.B, Contractor shall promptly notify Owner and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of Paragraphs 5.01.B and 5.02.

5.02 *Licensed Sureties and Insurers*

A. All bonds and insurance required by the Contract Documents to be purchased and maintained by Owner or Contractor shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.

5.03 *Certificates of Insurance*

A. Contractor shall deliver to Owner, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Owner or any other additional insured) which Contractor is required to purchase and maintain.

B. Owner shall deliver to Contractor, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by Contractor or any other additional insured) which Owner is required to purchase and maintain.

5.04 *Contractor's Liability Insurance*

A. Contractor shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from Contractor's performance of the Work and Contractor's other obligations under the Contract Documents, whether it is to be performed by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. claims under workers' compensation, disability benefits, and other similar employee benefit acts;

2. claims for damages because of bodily injury, occupational sickness or disease, or death of Contractor's employees;

3. claims for damages because of bodily injury, sickness or disease, or death of any person other than Contractor's employees;

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained:

a. by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or

b. by any other person for any other reason;

5. claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and

6. claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.

B. The policies of insurance required by this Paragraph 5.04 shall:

1. with respect to insurance required by Paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insured (subject to any customary exclusion regarding professional liability) Owner and Engineer, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;

2. include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;

3. include completed operations insurance;

4. include contractual liability insurance covering Contractor's indemnity obligations under Paragraphs 6.11 and 6.20;

5. contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the Contractor pursuant to Paragraph 5.03 will so provide);

6. remain in effect at least until final payment and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work in accordance with Paragraph 13.07; and

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment.

a. Contractor shall furnish Owner and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to Owner and any such additional insured of continuation of such insurance at final payment and one year thereafter.

5.05 *Owner's Liability Insurance*

A. In addition to the insurance required to be provided by Contractor under Paragraph 5.04, Owner, at Owner's option, may purchase and maintain at Owner's expense Owner's own liability insurance as will protect Owner against claims which may arise from operations under the Contract Documents.

5.06 *Property Insurance*

A. Unless otherwise provided in the Supplementary Conditions, Owner shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:

1. include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, (other than caused by flood) and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;

3. include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);

4. cover materials and equipment stored at the Site or at another location that was agreed to in writing by Owner prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by Engineer;

5. allow for partial utilization of the Work by Owner;

6. include testing and startup; and

7. be maintained in effect until final payment is made unless otherwise agreed to in writing by Owner, Contractor, and Engineer with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.

B. Owner shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, and Engineer, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

C. All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with Paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to Owner and Contractor and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with Paragraph 5.07.

D. Owner shall not be responsible for purchasing and maintaining any property insurance specified in this Paragraph 5.06 to protect the interests of Contractor, Subcontractors, or others in the Work to the extent of any

deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by Contractor, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.

E. If Contractor requests in writing that other special insurance be included in the property insurance policies provided under Paragraph 5.06, Owner shall, if possible, include such insurance, and the cost thereof will be charged to Contractor by appropriate Change Order. Prior to commencement of the Work at the Site, Owner shall in writing advise Contractor whether or not such other insurance has been procured by Owner.

5.07 *Waiver of Rights*

A. Owner and Contractor intend that all policies purchased in accordance with Paragraph 5.06 will protect Owner, Contractor, Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. Owner and Contractor waive all rights against each other and their respective officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insured or additional insured (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by Owner as trustee or otherwise payable under any policy so issued.

B. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them for:

1. loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other perils whether or not insured by Owner; and

2. loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by Owner during partial utilization pursuant to Paragraph 14.05, after Substantial Completion pursuant to Paragraph 14.04, or after final payment pursuant to Paragraph 14.07.

C. Any insurance policy maintained by Owner covering any loss, damage or consequential loss referred to in Paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against Contractor, Subcontractors, or Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them.

5.08 *Receipt and Application of Insurance Proceeds*

A. Any insured loss under the policies of insurance required by Paragraph 5.06 will be adjusted with Owner and made payable to Owner as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of Paragraph 5.08.B. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and the cost thereof covered by an appropriate Change Order .

B. Owner as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to Owner's exercise of this power. If such objection be made, Owner as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, Owner as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, Owner as fiduciary shall give bond for the proper performance of such duties.

5.09 *Acceptance of Bonds and Insurance; Option to Replace*

A. If either Owner or Contractor has any objection to the coverage afforded by or other provisions of the bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract

Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by Paragraph 2.01.B. Owner and Contractor shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

A. If Owner finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in Paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to Paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction. Contractor shall not be responsible for the negligence of Owner or Engineer in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents.

B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who shall not be replaced without written notice to Owner and Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

6.02 *Labor; Working Hours*

A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall at all times maintain good discipline and order at the Site.

B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours. Contractor will not permit the performance of Work on a Saturday, Sunday, or any legal holiday without Owner's written consent (which will not be unreasonably withheld) given after prior written notice to Engineer.

6.03 *Services, Materials, and Equipment*

A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications shall expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.

C. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.07 as it may be adjusted from time to time as provided below.

1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.07) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times. Such adjustments will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the Progress Schedule that will change the Contract Times shall be submitted in accordance with the requirements of Article 12. Adjustments in Contract Times may only be made by a Change Order.

6.05 *Substitutes and "Or-Equals"*

A. Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to Engineer for review under the circumstances described below.

1. *"Or-Equal" Items:* If in Engineer's sole discretion an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by Engineer as an "or-equal" item, in which case review and approval of the proposed item may, in Engineer's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this Paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:

a. in the exercise of reasonable judgment Engineer determines that:

1) it is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

2) it will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole,

3) it has a proven record of performance and availability of responsive service; and

b. Contractor certifies that, if approved and incorporated into the Work:

1) there will be no increase in cost to the Owner or increase in Contract Times, and

2) it will conform substantially to the detailed requirements of the item named in the Contract Documents.

2. *Substitute Items*

a. If in Engineer's sole discretion an item of material or equipment proposed by Contractor does not qualify as an "or-equal" item under Paragraph 6.05.A.1, it will be considered a proposed substitute item.

b. Contractor shall submit sufficient information as provided below to allow Engineer to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by Engineer from anyone other than Contractor.

c. The requirements for review by Engineer will be as set forth in Paragraph 6.05.A.2.d, as supplemented in the General Requirements and as Engineer may decide is appropriate under the circumstances.

d. Contractor shall make written application to Engineer for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

1) shall certify that the proposed substitute item will:

a) perform adequately the functions and achieve the results called for by the general design,

b) be similar in substance to that specified, and

c) be suited to the same use as that specified;

2) will state:

a) the extent, if any, to which the use of the proposed substitute item will prejudice Contractor's achievement of Substantial Completion on time;

b) whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and

c) whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty;

3) will identify:

a) all variations of the proposed substitute item from that specified , and

b) available engineering, sales, maintenance, repair, and replacement services;

4) and shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change,

B. *Substitute Construction Methods or Procedures:* If a specific means, method, technique, sequence, or procedure of construction is expressly required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by Engineer. Contractor shall submit sufficient information to allow Engineer, in Engineer's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The requirements for review by Engineer will be similar to those provided in Paragraph 6.05.A.2.

C. *Engineer's Evaluation:* Engineer will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to Paragraphs 6.05.A and 6.05.B. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No "or equal" or substitute will be ordered, installed or utilized until Engineer's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal." Engineer will advise Contractor in writing of any negative determination.

D. *Special Guarantee:* Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. *Engineer's Cost Reimbursement*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor pursuant to Paragraphs 6.05.A.2 and 6.05.B. Whether or not Engineer approves a substitute item so proposed or submitted by Contractor, Contractor shall reimburse Owner for the charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

F. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.

6.06 *Concerning Subcontractors, Suppliers, and Others*

A. Contractor shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to Owner as indicated in Paragraph 6.06.B), whether initially or as a replacement, against whom Owner may have reasonable objection. Contractor shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom Contractor has reasonable objection.

B. If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to Owner in advance for acceptance by Owner by a specified date prior to the Effective Date of the Agreement, and if Contractor has submitted a list thereof in accordance with the Supplementary Conditions, Owner's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued . No acceptance by Owner of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of Owner or Engineer to reject defective Work.

C. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as Contractor is responsible for Contractor's own acts and omissions. Nothing in the Contract Documents:

1. shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between Owner or Engineer and any such Subcontractor, Supplier or other individual or entity, nor

2. shall anything in the Contract Documents create any obligation on the part of Owner or Engineer to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity

except as may otherwise be required by Laws and Regulations.

D. Contractor shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with Contractor.

E. Contractor shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with Engineer through Contractor.

F. The divisions and sections of the Specifications and the identifications of any Drawings shall not control Contractor in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

G. All Work performed for Contractor by a Subcontractor or Supplier will be pursuant to an appropriate agreement between Contractor and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of Owner and Engineer. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in Paragraph 5.06, the agreement between the Contractor and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against Owner, Contractor, and Engineer, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, Contractor will obtain the same.

6.07 *Patent Fees and Royalties*

A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of Owner or Engineer its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by Owner in the Contract Documents.

B. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 *Permits*

A. Unless otherwise provided in the Supplementary Conditions, Contractor shall obtain and pay for all construction permits and licenses. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

6.09 *Laws and Regulations*

A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.

B. If Contractor performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work. However, it shall not be Contractor's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve Contractor of Contractor's obligations under Paragraph 3.03.

C. Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work shall be the subject of an adjustment in Contract Price or Contract Times. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in Paragraph 10.05.

6.10 *Taxes*

A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

6.11 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.

2. Should any claim be made by any such owner or occupant because of the performance of the Work, Contractor shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

3. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused by or based upon Contractor's performance of the Work.

B. *Removal of Debris During Performance of the Work:* During the progress of the Work Contractor shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.

C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

D. *Loading Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

6.12 *Record Documents*

A. Contractor shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to Engineer for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to Engineer for Owner.

6.13 *Safety and Protection*

A. Contractor shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. all persons on the Site or who may be affected by the Work;

2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and

3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.

B. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property.

C. All damage, injury, or loss to any property referred to in Paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor (except damage or loss attributable to the fault of Draw-

ings or Specifications or to the acts or omissions of Owner or Engineer or , or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).

D. Contractor's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and Engineer has issued a notice to Owner and Contractor in accordance with Paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

A. Contractor shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.

6.15 *Hazard Communication Programs*

A. Contractor shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

6.16 *Emergencies*

A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent threatened damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, a Work Change Directive or Change Order will be issued.

6.17 *Shop Drawings and Samples*

A. Contractor shall submit Shop Drawings and Samples to Engineer for review and approval in accordance with the acceptable Schedule of Submittals (as required by Paragraph 2.07). Each submittal will be identified as Engineer may require.

1. *Shop Drawings*

a. Submit number of copies specified in the General Requirements.

b. Data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide and to enable Engineer to review the information for the limited purposes required by Paragraph 6.17.D.

2. *Samples:* Contractor shall also submit Samples to Engineer for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals.

a. Submit number of Samples specified in the Specifications.

b. Clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the submittal for the limited purposes required by Paragraph 6.17.D.

B. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.

C. *Submittal Procedures*

1. Before submitting each Shop Drawing or Sample, Contractor shall have determined and verified:

a. all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;

b. the suitability of all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;

c. all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto; and

d. shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.

2. Each submittal shall bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents

with respect to Contractor's review and approval of that submittal.

3. With each submittal, Contractor shall give Engineer specific written notice of any variations, that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be both a written communication separate from the Shop Drawing's or Sample Submittal; and, in addition, by a specific notation made on each Shop Drawing or Sample submitted to Engineer for review and approval of each such variation.

D. *Engineer's Review*

1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the Schedule of Submittals acceptable to Engineer. Engineer's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

3. Engineer's review and approval shall not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 6.17.C.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer's review and approval shall not relieve Contractor from responsibility for complying with the requirements of Paragraph 6.17.C.1.

E. *Resubmittal Procedures*

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous submittals.

6.18 *Continuing the Work*

A. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by Paragraph 15.04 or as Owner and Contractor may otherwise agree in writing.

6.19 *Contractor's General Warranty and Guarantee*

A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer and its Related Entities shall be entitled to rely on representation of Contractor's warranty and guarantee.

B. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:

1. abuse, modification, or improper maintenance or operation by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or

2. normal wear and tear under normal usage.

C. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of Contractor's obligation to perform the Work in accordance with the Contract Documents:

1. observations by Engineer;

2. recommendation by Engineer or payment by Owner of any progress or final payment;

3. the issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;

4. use or occupancy of the Work or any part thereof by Owner;

5. any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by Engineer;

6. any inspection, test, or approval by others; or

7. any correction of defective Work by Owner.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, partners, employees, agents, consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or

arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable .

B. In any and all claims against Owner or Engineer or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

C. The indemnification obligations of Contractor under Paragraph 6.20.A shall not extend to the liability of Engineer and Engineer's officers, directors, partners, employees, agents, consultants and subcontractors arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or

2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

6.21 *Delegation of Professional Design Services*

A. Contractor will not be required to provide professional design services unless such services are specifically required by the Contract Documents for a portion of the Work or unless such services are required to carry out Contractor's responsibilities for construction means, methods, techniques, sequences and procedures. Contractor shall not be required to provide professional services in violation of applicable law.

B. If professional design services or certifications by a design professional related to systems, materials or equipment are specifically required of Contractor by the Contract Documents, Owner and Engineer will specify all performance and design criteria that such services must satisfy. Contractor shall cause such services or certifications to be provided by a properly licensed professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings and other submittals prepared by such professional. Shop Drawings and other submittals related to the Work designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to Engineer.

C. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy and completeness of the services, certifications or approvals performed by such design professionals, provided Owner and Engineer have specified to Contractor all performance and design criteria that such services must satisfy.

D. Pursuant to this Paragraph 6.21, Engineer's review and approval of design calculations and design drawings will be only for the limited purpose of checking for conformance with performance and design criteria given and the design concept expressed in the Contract Documents. Engineer's review and approval of Shop Drawings and other submittals (except design calculations and design drawings) will be only for the purpose stated in Paragraph 6.17.D.1.

E. Contractor shall not be responsible for the adequacy of the performance or design criteria required by the Contract Documents.

ARTICLE 7 - OTHER WORK AT THE SITE

7.01 *Related Work at Site*

A. Owner may perform other work related to the Project at the Site with Owner's employees, or via other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:

1. written notice thereof will be given to Contractor prior to starting any such other work; and

2. if Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in Paragraph 10.05.

B. Contractor shall afford each other contractor who is a party to such a direct contract, each utility owner and Owner, if Owner is performing other work with Owner's employees, proper and safe access to the Site, a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work, and shall properly coordinate the Work with theirs. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and

properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of Engineer and the others whose work will be affected. The duties and responsibilities of Contractor under this Paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of Contractor in said direct contracts between Owner and such utility owners and other contractors.

C. If the proper execution or results of any part of Contractor's Work depends upon work performed by others under this Article 7, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.

7.02 *Coordination*

A. If Owner intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;

2. the specific matters to be covered by such authority and responsibility will be itemized; and

3. the extent of such authority and responsibilities will be provided.

B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

7.03 *Legal Relationships*

A. Paragraphs 7.01.A and 7.02 are not applicable for utilities not under the control of Owner.

B. Each other direct contract of Owner under Paragraph 7.01.A shall provide that the other contractor is liable to Owner and Contractor for the reasonable direct delay and disruption costs incurred by Contractor as a result of the other contractor's actions or inactions.

C. Contractor shall be liable to Owner and any other contractor for the reasonable direct delay and disruption costs incurred by such other contractor as a result of Contractor's action or inactions.

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

8.02 *Replacement of Engineer*

A. In case of termination of the employment of Engineer, Owner shall appoint an engineer to whom Contractor makes no reasonable objection, whose status under the Contract Documents shall be that of the former Engineer.

8.03 *Furnish Data*

A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

8.04 *Pay When Due*

A. Owner shall make payments to Contractor when they are due as provided in Paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

A. Owner's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in Paragraphs 4.01 and 4.05. Paragraph 4.02 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by Engineer in preparing the Contract Documents.

8.06 *Insurance*

A. Owner's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.

8.07 *Change Orders*

A. Owner is obligated to execute Change Orders as indicated in Paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

A. Owner's responsibility in respect to certain inspections, tests, and approvals is set forth in Paragraph 13.03.B.

8.09 *Limitations on Owner's Responsibilities*

A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

8.10 *Undisclosed Hazardous Environmental Condition*

A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 4.06.

8.11 *Evidence of Financial Arrangements*

A. If and to the extent Owner has agreed to furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract Documents, Owner's responsibility in respect thereof will be as set forth in the Supplementary Conditions.

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *Owner's Representative*

A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract Documents and will not be changed without written consent of Owner and Engineer.

9.02 *Visits to Site*

A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.

B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 9.09. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If Owner and Engineer agree, Engineer will furnish a Resident Project Representative to assist Engineer in providing more extensive observation of the Work. The authority and responsibilities of any such Resident Project Representative and assistants will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in Paragraph 9.09. If Owner designates another representative or agent to represent Owner at the Site who is not Engineer's consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Authorized Variations in Work*

A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment , a Claim may be made therefor as provided in Paragraph 10.05.

9.05 *Rejecting Defective Work*

A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work as provided in Paragraph 13.04, whether or not the Work is fabricated, installed, or completed.

9.06 *Shop Drawings, Change Orders and Payments*

A. In connection with Engineer's authority, and limitations thereof, as to Shop Drawings and Samples, see Paragraph 6.17.

B. In connection with Engineer's authority, and limitations thereof, as to design calculations and design drawings submitted in response to a delegation of professional design services, if any, see Paragraph 6.21.

C. In connection with Engineer's authority as to Change Orders, see Articles 10, 11, and 12.

D. In connection with Engineer's authority as to Applications for Payment, see Article 14.

9.07 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, subject to the provisions of Paragraph 10.05.

9.08 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. All matters in question and other matters between Owner and Contractor arising prior to the date final payment is due relating to the acceptability of the Work, and the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, will be referred initially to Engineer in writing within 30 days of the event giving rise to the question.

B. Engineer will, with reasonable promptness, render a written decision on the issue referred. If Owner or Contractor believe that any such decision entitles them to an adjustment in the Contract Price or Contract Times or both, a Claim may be made under Paragraph 10.05. The date of Engineer's decision shall be the date of the event giving rise to the issues referenced for the purposes of Paragraph 10.05.B.

C. Engineer's written decision on the issue referred will be final and binding on Owner and Contractor, subject to the provisions of Paragraph 10.05.

D. When functioning as interpreter and judge under this Paragraph 9.08, Engineer will not show partiality to Owner or Contractor and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity.

9.09 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 9.09 shall also apply to, the Resident Project Representative, if any, and assistants, if any.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 *Authorized Changes in the Work*

A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Change Order, or a Work Change Directive. Upon receipt of any such document, Contractor shall

promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

B. If Owner and Contractor are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in Paragraph 10.05.

10.02 *Unauthorized Changes in the Work*

A.Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in Paragraph 3.04, except in the case of an emergency as provided in Paragraph 6.16 or in the case of uncovering Work as provided in Paragraph 13.04.B.

10.03 *Execution of Change Orders*

A. Owner and Contractor shall execute appropriate Change Orders recommended by Engineer covering:

1. changes in the Work which are: (i) ordered by Owner pursuant to Paragraph 10.01.A, (ii) required because of acceptance of defective Work under Paragraph 13.08.A or Owner's correction of defective Work under Paragraph 13.09, or (iii) agreed to by the parties;

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and

3. changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by Engineer pursuant to Paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, Contractor shall carry on the Work and adhere to the Progress Schedule as provided in Paragraph 6.18.A.

10.04 *Notification to Surety*

A. If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any bond to be given to a surety, the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

10.05 *Claims*

A. *Engineer's Decision Required*: All Claims, except those waived pursuant to Paragraph 14.09, shall be referred to the Engineer for decision. A decision by Engineer shall be required as a condition precedent to any exercise by Owner or Contractor of any rights or remedies either may otherwise have under the Contract Documents or by Laws and Regulations in respect of such Claims.

B. *Notice:* Written notice stating the general nature of each Claim, shall be delivered by the claimant to Engineer and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. The responsibility to substantiate a Claim shall rest with the party making the Claim. Notice of the amount or extent of the Claim, with supporting data shall be delivered to the Engineer and the other party to the Contract within 60 days after the start of such event (unless Engineer allows additional time for claimant to submit additional or more accurate data in support of such Claim). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of Paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of Paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to Engineer and the claimant within 30 days after receipt of the claimant's last submittal (unless Engineer allows additional time).

C. *Engineer's Action*: Engineer will review each Claim and, within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any, take one of the following actions in writing:

1. deny the Claim in whole or in part,

2. approve the Claim, or

3. notify the parties that the Engineer is unable to resolve the Claim if, in the Engineer's sole discretion, it would be inappropriate for the Engineer to do so. For purposes of further resolution of the Claim, such notice shall be deemed a denial.

D. In the event that Engineer does not take action on a Claim within said 30 days, the Claim shall be deemed denied.

E. Engineer's written action under Paragraph 10.05.C or denial pursuant to Paragraphs 10.05.C.3 or 10.05.D will be final and binding upon Owner and Contractor, unless Owner or Contractor invoke the dispute resolution procedure set forth in Article 16 within 30 days of such action or denial.

F. No Claim for an adjustment in Contract Price or Contract Times will be valid if not submitted in accordance with this Paragraph 10.05.

ARTICLE 11 - COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

11.01 *Cost of the Work*

A. *Costs Included:* The term Cost of the Work means the sum of all costs, except those excluded in Paragraph 11.01.B, necessarily incurred and paid by Contractor in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to Contractor will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by Owner, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in Paragraph 11.01.B.

1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor. Such employees shall include, without limitation, superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by Owner.

2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts shall accrue to Owner. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to Owner, and Contractor shall make provisions so that they may be obtained.

3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, who will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 11.01.

4. Costs of special consultants (including but not limited to Engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.

5. Supplemental costs including the following:

a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

c. Rentals of all construction equipment and machinery, and the parts thereof whether rented from Contractor or others in accordance with rental agreements approved by Owner with the advice of Engineer, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.

d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, imposed by Laws and Regulations.

e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with Paragraph 5.06.D), provided such losses and damages have

resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining Contractor's fee.

g. The cost of utilities, fuel, and sanitary facilities at the Site.

h. Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expresses, and similar petty cash items in connection with the Work.

i. The costs of premiums for all bonds and insurance Contractor is required by the Contract Documents to purchase and maintain.

B. *Costs Excluded:* The term Cost of the Work shall not include any of the following items:

1. Payroll costs and other compensation of Contractor's officers, executives, principals (of partnerships and sole proprietorships), general managers, safety managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 11.01.A.1 or specifically covered by Paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the Contractor's fee.

2. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.

3. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.

4. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.

5. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraphs 11.01.A and 11.01.B.

C. *Contractor's Fee:* When all the Work is performed on the basis of cost-plus, Contractor's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, Contractor's fee shall be determined as set forth in Paragraph 12.01.C.

D. *Documentation:* Whenever the Cost of the Work for any purpose is to be determined pursuant to Paragraphs 11.01.A and 11.01.B, Contractor will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to Engineer an itemized cost breakdown together with supporting data.

11.02 *Allowances*

A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.

B. *Cash Allowances*

1. Contractor agrees that:

a. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and

b. Contractor's costs for unloading and handling on the Site, labor, installation , overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.

C. *Contingency Allowance*

1. Contractor agrees that a contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.

D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by Contractor will be made by Engineer subject to the provisions of Paragraph 9.07.

C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.

D. Owner or Contractor may make a Claim for an adjustment in the Contract Price in accordance with Paragraph 10.05 if:

1. the quantity of any item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and

2. there is no corresponding adjustment with respect any other item of Work; and

3. Contractor believes that Contractor is entitled to an increase in Contract Price as a result of having incurred additional expense or Owner believes that Owner is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

12.01 *Change of Contract Price*

A. The Contract Price may only be changed by a Change Order. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:

1. where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 11.03); or

2. where the Work involved is not covered by unit prices contained in the Contract Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 12.01.C.2); or

3. where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under Paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in Paragraph 11.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 12.01.C).

C. *Contractor's Fee:* The Contractor's fee for overhead and profit shall be determined as follows:

1. a mutually acceptable fixed fee; or

2. if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:

a. for costs incurred under Paragraphs 11.01.A.1 and 11.01.A.2, the Contractor's fee shall be 15 percent;

b. for costs incurred under Paragraph 11.01.A.3, the Contractor's fee shall be five percent;

c. where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under Paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and Contractor will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;

d. no fee shall be payable on the basis of costs itemized under Paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;

e. the amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in Contractor's fee by an amount equal to five percent of such net decrease; and

f. when both additions and credits are involved in any one change, the adjustment in Contractor's fee shall be computed on the basis of the net change in accordance with Paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.

12.02 *Change of Contract Times*

A. The Contract Times may only be changed by a Change Order. Any Claim for an adjustment in the Contract Times shall be based on written notice submitted

by the party making the Claim to the Engineer and the other party to the Contract in accordance with the provisions of Paragraph 10.05.

B. Any adjustment of the Contract Times covered by a Change Order or any Claim for an adjustment in the Contract Times will be determined in accordance with the provisions of this Article 12.

12.03 *Delays*

A. Where Contractor is prevented from completing any part of the Work within the Contract Times due to delay beyond the control of Contractor, the Contract Times will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in Paragraph 12.02.A. Delays beyond the control of Contractor shall include, but not be limited to, acts or neglect by Owner, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.

B. If Owner, Engineer, or other contractors or utility owners performing other work for Owner as contemplated by Article 7, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times, or both. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete the Work within the Contract Times.

C If Contractor is delayed in the performance or progress of the Work by fire, flood, epidemic, abnormal weather conditions, acts of God, acts or failures to act of utility owners not under the control of Owner, or other causes not the fault of and beyond control of Owner and Contractor, then Contractor shall be entitled to an equitable adjustment in Contract Times, if such adjustment is essential to Contractor's ability to complete the Work within the Contract Times. Such an adjustment shall be Contractor's sole and exclusive remedy for the delays described in this Paragraph 12.03.C.

D. Owner, Engineer and the Related Entities of each of them shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of Engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

E. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delays within the control of Contractor. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of Contractor.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 *Notice of Defects*

A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.

13.02 *Access to Work*

A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and programs so that they may comply therewith as applicable.

13.03 *Tests and Inspections*

A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.

B. Owner shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:

1. for inspections, tests, or approvals covered by Paragraphs 13.03.C and 13.03.D below;

2. that costs incurred in connection with tests or inspections conducted pursuant to Paragraph 13.04.B shall be paid as provided in said Paragraph 13.04.C; and

3. as otherwise specifically provided in the Contract Documents.

C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

D. Contractor shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for Owner's and Engineer's acceptance of materials or equipment to

be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to Owner and Engineer.

E. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, it must, if requested by Engineer, be uncovered for observation.

F. Uncovering Work as provided in Paragraph 13.03.E shall be at Contractor's expense unless Contractor has given Engineer timely notice of Contractor's intention to cover the same and Engineer has not acted with reasonable promptness in response to such notice.

13.04 *Uncovering Work*

A. If any Work is covered contrary to the written request of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and replaced at Contractor's expense.

B. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.

C. If it is found that the uncovered Work is defective, Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05.

D. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, Contractor may make a Claim therefor as provided in Paragraph 10.05.

13.05 *Owner May Stop the Work*

A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, Owner may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work shall not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

13.06 *Correction or Removal of Defective Work*

A. Promptly after receipt of notice, Contractor shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by Engineer, remove it from the Project and replace it with Work that is not defective. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).

B. When correcting defective Work under the terms of this Paragraph 13.06 or Paragraph 13.07, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.

13.07 *Correction Period*

A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the terms of any applicable special guarantee required by the Contract Documents) or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for Contractor's use by Owner or permitted by Laws and Regulations as contemplated in Paragraph 6.11.A is found to be defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:

1. repair such defective land or areas; or

2. correct such defective Work; or

3. if the defective Work has been rejected by Owner, remove it from the Project and replace it with Work that is not defective, and

4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom.

B. If Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by Contractor.

C. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications .

D. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this Paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

E. Contractor's obligations under this Paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this Paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.

13.08 *Acceptance of Defective Work*

A. If, instead of requiring correction or removal and replacement of defective Work, Owner (and, prior to Engineer's recommendation of final payment, Engineer) prefers to accept it, Owner may do so. Contractor shall pay all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by Contractor pursuant to this sentence. If any such acceptance occurs prior to Engineer's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, Owner may make a Claim therefor as provided in Paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by Contractor to Owner.

13.09 *Owner May Correct Defective Work*

A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work or to remove and replace rejected Work as required by Engineer in accordance with Paragraph 13.06.A, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any other provision of the Contract Documents, Owner may, after seven days written notice to Contractor, correct or remedy any such deficiency.

B. In exercising the rights and remedies under this Paragraph 13.09, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this Paragraph.

C. All claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 13.09 will be charged against Contractor, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and Owner shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, Owner may make a Claim therefor as provided in Paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.

D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The Schedule of Values established as provided in Paragraph 2.07.A will serve as the basis for progress

payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments*

1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that Owner has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

2. Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor stating that all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment.

3. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

B. *Review of Applications*

1. Engineer will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to Owner or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.

2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations on the Site of the executed Work as an experienced and qualified design professional and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under Paragraph 9.07, and to any other qualifications stated in the recommendation); and

c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.

3. By recommending any such payment Engineer will not thereby be deemed to have represented that:

a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract Documents; or

b. that there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:

a. to supervise, direct, or control the Work, or

b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or

c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work, or

d. to make any examination to ascertain how or for what purposes Contractor has used the moneys paid on account of the Contract Price, or

e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.

5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 14.02.B.2. Engineer may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent

inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in Engineer's opinion to protect Owner from loss because:

a. the Work is defective, or completed Work has been damaged, requiring correction or replacement;

b. the Contract Price has been reduced by Change Orders;

c. Owner has been required to correct defective Work or complete Work in accordance with Paragraph 13.09; or

d. Engineer has actual knowledge of the occurrence of any of the events enumerated in Paragraph 15.02.A.

C. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended will (subject to the provisions of Paragraph 14.02.D) become due, and when due will be paid by Owner to Contractor.

D. *Reduction in Payment*

1. Owner may refuse to make payment of the full amount recommended by Engineer because:

a. claims have been made against Owner on account of Contractor's performance or furnishing of the Work;

b. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens;

c. there are other items entitling Owner to a set-off against the amount recommended; or

d. Owner has actual knowledge of the occurrence of any of the events enumerated in Paragraphs 14.02.B.5.a through 14.02.B.5.c or Paragraph 15.02.A.

2. If Owner refuses to make payment of the full amount recommended by Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, when Contractor corrects to Owner's satisfaction the reasons for such action.

3. If it is subsequently determined that Owner's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by Paragraph 14.02.C.1.

14.03 *Contractor's Warranty of Title*

A. Contractor warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to Owner no later than the time of payment free and clear of all Liens.

14.04 *Substantial Completion*

A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete (except for items specifically listed by Contractor as incomplete) and request that Engineer issue a certificate of Substantial Completion.

B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.

C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. Owner shall have seven days after receipt of the tentative certificate during which to make written objection to Engineer as to any provisions of the certificate or attached list. If, after considering such objections, Engineer concludes that the Work is not substantially complete, Engineer will within 14 days after submission of the tentative certificate to Owner notify Contractor in writing, stating the reasons therefor. If, after consideration of Owner's objections, Engineer considers the Work substantially complete, Engineer will within said 14 days execute and deliver to Owner and Contractor a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as Engineer believes justified after consideration of any objections from Owner.

D. At the time of delivery of the tentative certificate of Substantial Completion, Engineer will deliver to Owner and Contractor a written recommendation as to division of responsibilities pending final payment between Owner and Contractor with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless Owner and Contractor agree otherwise in writing and so inform Engineer in writing prior to Engineer's issuing the definitive certificate of Substantial

Completion, Engineer's aforesaid recommendation will be binding on Owner and Contractor until final payment.

E. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to complete or correct items on the tentative list.

14.05 *Partial Utilization*

A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions.

1. Owner at any time may request Contractor in writing to permit Owner to use or occupy any such part of the Work which Owner believes to be ready for its intended use and substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor will certify to Owner and Engineer that such part of the Work is substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

2. Contractor at any time may notify Owner and Engineer in writing that Contractor considers any such part of the Work ready for its intended use and substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.

3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 5.10 regarding property insurance.

14.06 *Final Inspection*

A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in Paragraph 6.12), and other documents, Contractor may make application for final payment following the procedure for progress payments.

2. The final Application for Payment shall be accompanied (except as previously delivered) by:

a. all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by Paragraph 5.04.B.7;

b. consent of the surety, if any, to final payment;

c. a list of all Claims against Owner that Contractor believes are unsettled; and

d. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of or Liens filed in connection with the Work.

3. In lieu of the releases or waivers of Liens specified in Paragraph 14.07.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner or Owner's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien.

B. *Engineer's Review of Application and Acceptance*

1. If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations

under the Contract Documents have been fulfilled, Engineer will, within ten days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of payment and present the Application for Payment to Owner for payment. At the same time Engineer will also give written notice to Owner and Contractor that the Work is acceptable subject to the provisions of Paragraph 14.09. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.

C. *Payment Becomes Due*

1. Thirty days after the presentation to Owner of the Application for Payment and accompanying documentation, the amount recommended by Engineer, less any sum Owner is entitled to set off against Engineer's recommendation, including but not limited to liquidated damages, will become due and, will be paid by Owner to Contractor.

14.08 *Final Completion Delayed*

A. If, through no fault of Contractor, final completion of the Work is significantly delayed, and if Engineer so confirms, Owner shall, upon receipt of Contractor's final Application for Payment (for Work fully completed and accepted) and recommendation of Engineer, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by Owner for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if bonds have been furnished as required in Paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by Contractor to Engineer with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

14.09 *Waiver of Claims*

A. The making and acceptance of final payment will constitute:

1. a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to Paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from Contractor's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by Contractor against Owner other than those previously made in accordance with the requirements herein and expressly acknowledged by Owner in writing as still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 *Owner May Suspend Work*

A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to Contractor and Engineer which will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be granted an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if Contractor makes a Claim therefor as provided in Paragraph 10.05.

15.02 *Owner May Terminate for Cause*

A. The occurrence of any one or more of the following events will justify termination for cause:

1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the Progress Schedule established under Paragraph 2.07 as adjusted from time to time pursuant to Paragraph 6.04);

2. Contractor's disregard of Laws or Regulations of any public body having jurisdiction;

3. Contractor's disregard of the authority of Engineer; or

4. Contractor's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in Paragraph 15.02.A occur, Owner may, after giving Contractor (and surety) seven days written notice of its intent to terminate the services of Contractor:

1. exclude Contractor from the Site, and take possession of the Work and of all Contractor's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by Contractor (without liability to Contractor for trespass or conversion),

2. incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and

3. complete the Work as Owner may deem expedient.

C. If Owner proceeds as provided in Paragraph 15.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Owner arising out of or relating to completing the Work, such excess will be paid to Contractor. If such claims, costs, losses, and damages exceed such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this Paragraph Owner shall not be required to obtain the lowest price for the Work performed.

D. Notwithstanding Paragraphs 15.02.B and 15.02.C, Contractor's services will not be terminated if Contractor begins within seven days of receipt of notice of intent to terminate to correct its failure to perform and proceeds diligently to cure such failure within no more than 30 days of receipt of said notice.

E. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue. Any retention or payment of moneys due Contractor by Owner will not release Contractor from liability.

F. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 5.01.A, the termination procedures of that bond shall supersede the provisions of Paragraphs 15.02.B, and 15.02.C.

15.03 *Owner May Terminate For Convenience*

A. Upon seven days written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):

1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;

2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;

3. all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and

4. reasonable expenses directly attributable to termination.

B. Contractor shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 *Contractor May Stop Work or Terminate*

A. If, through no act or fault of Contractor, (i) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (ii) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (iii) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon seven days written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the Contract and recover from Owner payment on the same terms as provided in Paragraph 15.03.

B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, seven days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The provisions of this Paragraph 15.04 are not intended to preclude Contractor from making a Claim under Paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this Paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 *Methods and Procedures*

A. Either Owner or Contractor may request mediation of any Claim submitted to Engineer for a decision under Paragraph 10.05 before such decision becomes final and binding. The mediation will be

governed by the Construction Industry Mediation Rules of the American Arbitration Association in effect as of the Effective Date of the Agreement. The request for mediation shall be submitted in writing to the American Arbitration Association and the other party to the Contract. Timely submission of the request shall stay the effect of Paragraph 10.05.E.

B. Owner and Contractor shall participate in the mediation process in good faith. The process shall be concluded within 60 days of filing of the request. The date of termination of the mediation shall be determined by application of the mediation rules referenced above.

C. If the Claim is not resolved by mediation, Engineer's action under Paragraph 10.05.C or a denial pursuant to Paragraphs 10.05.C.3 or 10.05.D shall become final and binding 30 days after termination of the mediation unless, within that time period, Owner or Contractor:

1. elects in writing to invoke any dispute resolution process provided for in the Supplementary Conditions, or

2. agrees with the other party to submit the Claim to another dispute resolution process, or

3. gives written notice to the other party of their intent to submit the Claim to a court of competent jurisdiction.

ARTICLE 17 - MISCELLANEOUS

17.01 *Giving Notice*

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if:

1. delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or

2. delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents. The provisions of this Paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Contract or termination of the services of Contractor.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

17.06 *Headings*

A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SECTION 00 73 15

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC C-700, 2002 Edition). All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions which are defined in the Standard General Conditions of the Construction Contract have the meanings assigned to them in the General Conditions.

ARTICLE 1 DEFINITIONS AND TERMINOLOGY

Add the following new paragraph immediately after paragraph 1.01.52:

SC-1.01.53 SURETY – The person, firm, or corporation which is bound by the contract bonds with and for Contractor (Principal); and which is held and firmly bound unto Owner for the conditions of obligations set forth in said bonds.

ARTICLE 2 PRELIMINARY MATTERS

SC-2.02.A Amend the first sentence of paragraph 2.02.A of the General Conditions by changing “up to ten” to “five”.

SC-2.05.A Amend the first sentence of paragraph 2.05.A of the General Conditions by changing “Within 10 days after the Effective Date of the Agreement” to “At the Preconstruction Conference”.

Add the following new paragraph immediately after paragraph 2.05.A.3:

SC-2.05.B Before any Work at the Site is started, Contractor shall deliver to the Owner, certificates of insurance that Contractor is required to purchase and maintain in accordance with Article 5.

Add the following new paragraph immediately after paragraph 2.06.A:

SC-2.06.B Owner may issue Notice to Proceed at the Preconstruction Conference. Contractor shall begin the Work within twenty-four (24) hours of the date given in the Notice to Proceed. If the Contractor does not start the Work within fourteen (14) calendar days after this date, Owner may, at his discretion, terminate Contractor in accordance with paragraph 15.02.

ARTICLE 4 AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRIONMENTAL CONDITIONS; REFERENCE POINTS

Add the following to the end of paragraph 4.01.C:

SC-4.01.C Contractor shall obtain said land rights at this own expense and without liability to the Owner. Contractor shall not enter upon private property without first obtaining written permission from the rightful property owner.

Add the following new paragraph immediately after paragraph 4.02.B:

SC-4.02.C In the preparation of Drawings and Specifications, Engineer or Engineer’s Consultants relied upon the following report(s) of explorations and tests of subsurface conditions at the Site:

Amend the last sentence in paragraph 4.03.C.3 to read:

SC-4.03.C.3 However, Owner, Engineer and Engineer's Consultants shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

Add the following to the end of paragraph 4.06.A:

SC-4.06.A In the preparation of Drawings and Specifications, Engineer or Engineer's consultants relied upon the following reports and drawings relating to Hazardous Environmental Conditions at the site:

ARTICLE 5 BONDS AND INSURANCE

Delete paragraph 5.01.B in its entirety and insert the following in its place:

SC-5.01.B All Bonds shall be in the form prescribed by the Contract Documents or other form approved by Owner. All else notwithstanding, the terms of all Bonds shall be substantially in the form prescribe by Chapter 255, Florida Statutes. All Bonds shall be executed by Contractor and a corporate bonding company licensed to transact such business in the State of Florida and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570. Contractor will cause the Bonds to be recorded with the Clerk of the Circuit Court in the county in which the Work is to be performed. Failure to execute bonds in the form prescribed may constitute nonresponsiveness on the part of the Contractor. The expense for all Bonds shall be the Contractor's responsibility.

Add the following to the end of paragraph 5.02.A:

SC-5.02.A Certificates of insurance shall be issued by a company with a Best's rating of at least B+ authorized to do business in the State of Florida. Owner must approve non-rated insurers. If used, Owner shall be shown as Certificate Holder, Engineer as Additional Insured and provide a 30-day cancellation notice.

Delete paragraph 5.03.B in its entirety and insert the following in its place:

SC-5.03.B Insurance policies written on a "Claims Made" form is not acceptable without Owner's approval.

Add the following new paragraphs immediately after paragraph 5.03.C:

SC-5.03.D Umbrella Liability insurance is preferred, but and Excess Liability equivalent is acceptable. Whichever type of coverage is provided, it shall not be more restrictive than the underlying insurance policy coverages, including, but not limited to the coverage Trigger, defense, notice of occurrence/accident/circumstances, notice of claim and extended reporting period.

SC-5.03.E No work shall commence under this contract until the required Certificate(s) have been provided. Work shall not continue after expiration (or cancellation) until new Certificate(s) have been provided. Non-continuance of work after expiration (or cancellation) of Certificate(s) will not constitute a delay beyond Contractor's control as defined in paragraph 12.03.

SC-5.03.F Contractor shall arrange for its insurers' policies to include, or be endorsed to include, a serverability or interest/cross liability provision, so that Owner will be treated as if a separate policy were in existence, but without increasing the policy limits.

SC-5.03.G Contractor's deductibles/self-insured retentions shall be disclosed to Owner and may be disapproved by the latter. They shall be reduced or eliminated at the option of Owner. Contractor is responsible for the amount of any deductible or self-insured retention.

SC-5.03.H These insurance requirements shall not relieve or limit the liability of Contractor. Owner does not in any way represent that these types or amounts or insurance are sufficient or adequate to protect Contractor's interests or liabilities, but are merely minimums.

SC-5.03.I Insurance required of Contractor or any other insurance of Contractor shall be considered primary and insurance or self-insurance of Owner shall be considered excess, as may be applicable to claims that arise out of this contract.

SC-5.03.J Receipt of Certificates or other documentation of insurance or policies or copies of policies by Owner, or by any of its representatives, which indicate less coverage than required does not constitute a waiver of the Contractor's obligation to fulfill the insurance requirements herein.

SC-5.03.K The Contractor shall either (a) require each subcontractor to produce and maintain the same coverage as required of the Contractor, or (b) insure the activities of subcontractors in his own policy.

SC-5.03.L These insurance requirements are minimums and may not be adequate to cover Contractor exposures.

Add the following new paragraphs immediately after paragraph 5.04.B:

SC-5.04.C The limits of liability for the insurance required by paragraph 5.04 of the General Conditions shall provide coverage for not less than the following amounts or greater where required by Laws and Regulations:

1. Workers compensation and related coverages under paragraphs 5.04.A.1 and A.2 of the General Conditions:

a. State		Statutory
b. Applicable Federal (e.g., Longshoreman's)		Statutory
c. Employer's Liability	Each Employee	$1,000,000
	Each Accident	$1,000,000
	Disease Policy Limit	$1,000,000
	Disease Each Employee	$1,000,000

2. Contractor's General Liability under paragraphs 5.04.A.3 through A.6 of the General Conditions, which shall also include completed operations and product liability coverages and eliminate the exclusion with respect to property under the care, custody and control of the Contractor:

a. General Aggregate (Except Products – Completed Operations)	$1,000,000
b. Products – Completed Operations Aggregate	$1,000,000
c. Each Occurrence (Bodily Injury and Property Damage)	$1,000,000

d. Property Damage liability insurance may be required to include Explosion, Collapse and Underground coverages where applicable.

e. Excess or Umbrella Liability	General Aggregate	$2,000,000
	Each Occurrence	$1,000,000

3. Automobile Liability under paragraph 5.04.A.6 of the General Conditions:
Combined Single Limit $1,000,000

Delete paragraphs 5.06 through 5.10 in their entirety except for paragraph 5.06.D and insert the following in place of 5.09.A:

SC-5.09.A If Owner has any objection to the coverage afforded by or other provisions of Bonds or insurance required to be purchased and maintained by Contractor in accordance with Article 5 on the basis of non-conformance with the Contract Documents, Owner shall so notify Contractor in writing within ten days after receipt of the certificates (or other evidence requested) required by paragraph 2.05.C Contractor shall provide to Owner such additional information in respect of insurance provided as Owner may be reasonably request.

ARTICLE 6 CONTRACTOR'S RESPONSIBILITIES

Add the following to the end of paragraph 6.01.A:

SC-6.01.A Owner reserves the right to reject any means, methods, techniques, sequences or procedures proposed by Contractor which:

1. will constitute or create a hazard to the Work or to the persons or damage to property or existing utilities; or

2. will not produce finished work in accordance with the terms of the contract Documents.

Owner's failure to exercise his right to reject such means, methods, techniques, sequences or procedures shall not relieve the Contractor of his obligation to accomplish the result intended in the Contract Documents nor shall the exercise of such right create a cause of action for damages.

Add the following new paragraph immediately after paragraph 6.02.B:

SC-6.02.C Engineer shall record time and costs require by Engineer and Engineer's Consultants to provide inspection services due to Contractor's working beyond regular working hours as defined in the General Requirements. Owner's reimbursement for the charges shall be a deduction from Contractor's Partial Payment(s) in accordance with Section 01 11 00 Part 2.02.

Add the following new paragraphs immediately after paragraph 6.05.A.2.d:

SC-6.05.A.2.e Each action mentioned above required for review of proposed substitute items of material or equipment shall be followed in the order given. Failure to do so shall be cause for rejection of the proposed substitution.

SC-6.05.A.2.f Contractor shall reimburse Owner for the charges of Engineer or Engineer's Consultants for evaluation of substitutions. Owner's reimbursement for the charges shall be a deduction from the Contractor's Partial Payment(s).

Add the following to the end of paragraph 6.06.A:

SC-6.06.A Contractor shall not subcontract part(s) or the work, the aggregate cost of which is greater than 50 percent of the contract price, without prior written approval by Owner. Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work that bind Subcontractors to Contractor by the terms of the Contract Documents insofar as applicable to the work of Subcontractors and to give Contractor the same power as regards terminating any subcontract that Owner may exercise over Contractor under any provision of the Contract Documents. Nothing contained in the subcontract

shall create any contractual relationship between Subcontractor and Owner. Each Subcontractor shall discharge all duties and responsibilities of Contractor to Owner covered by his subcontract.

Add the following to the end of paragraph 6.06.B:

SC-6.06.B Subcontractors and Suppliers shall be identified on the form provided in the Bidding Requirements.

Add the following to the end of paragraph 6.08.A:

SC-6.08.A Permits, licenses, and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by Owner, unless otherwise specified.

Add the following to the end of paragraph 6.09.A:

SC-6.09.A Contractor shall also cause all Subcontractors to comply with all federal, state, county, and municipal laws, ordinances, rules, and regulations bearing on the conduct of the Work.

Add the following to the end of paragraph 6.09.B:

SC-6.09.B If Contractor observes that the Contract Documents are at variance with said laws, ordinances, rates, or regulations, Contractor shall promptly notify Engineer in writing, and any necessary changes shall be adjusted as provided in the Contract Documents. Contractor shall not proceed with the Work until so instructed by Owner.

Add the following to the end of paragraph 6.12.A:

SC-6.12.A Annotations of record documents shall be legible, precise, and complete as determined by Engineer.

Add the following new paragraph after paragraph 6.13.D:

SC-6.13.E Contractor shall be responsible at all times for precautions to achieve the protection of all persons, including employees and property. Contractor shall make special effort to detect hazardous conditions and shall take prompt action where necessary to avoid accident, injury, or property damage. OSHA and all other applicable safety laws and ordinances shall be followed as well as American National Standards Institute Safety Standards. All accidents, injuries, claims, or potential claims shall be reported promptly to Owner.

Add the following new paragraph immediately after paragraph 6.17.E.1:

SC-6.17.E.2 Contractor shall reimburse Owner for the charges of Engineer and Engineer's Consultants for costs generated as a result of more that two submittals of any one Shop Drawing or Sample being required for evaluation due to rejection for noncompliance of the original submittal or lack of information required by the Contract Documents. Owner's reimbursement for the charges shall be a deduction from Contractor's Partial Payment(s).

SC-6.20.A Amend the first paragraph of 6.20.A of the General Conditions by changing "(including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs)" to "(including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs)".

Add the following new paragraph immediately after paragraph 6.20.A.1:

SC-6.20.A.1 Five percent of the Contract Price is given as consideration for this indemnification.

Add the following new paragraph immediately after paragraph 6.20.C:

SC-6.20.D Neither Contractor nor Owner shall sell, transfer, assign, or otherwise dispose of the contract or any portion thereof, or any right, title, or interest therein, or any obligations thereunder, without written consent of the other party.

ARTICLE 8 OWNER'S RESPONSIBILITIES

SC-8.02 Amend paragraph 8.02 of the General Conditions by striking out the following words: "to whom Contractor makes no reasonable objection."

ARTICLE 9 ENGINEER'S STATUS DURING CONSTRUCTION

Add the following new paragraph immediately after paragraph 9.05.A:

SC-9.05.B Contractor shall reimburse the Owner for the charges of Engineer and Engineer's Consultants for any additional field observations, engineering analysis, correspondence, meetings, or other work due to non-complying or defective construction, materials, or equipment performed or furnished by the Contractor, Subcontractors, or Suppliers. Owner's reimbursement for the charges shall be a deduction from the Contractor's Partial Payment(s).

ARTICLE 10 CHANGES IN THE WORK; CLAIMS

SC-10.05.B Amend the first sentence of paragraph 10.05.B of the General Conditions by changing "(but in no event later than 30 days)" to "(but in no event later than 15 days)".

ARTICLE 11 COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK

Add the following to the end of paragraph 11.01.A.5.c:

SC-11.01.A.5.c In no case shall rates exceed those published by the current edition of Data Quest Incorporated titled, Rental Rate Blue Book for Construction Equipment, and other procedures established by Florida Department of Transportation.

SC-11.01.A.5.f Amend the first sentence of paragraph 11.01.A.5.f by striking out the following words: "(except losses and damages within the deductible amounts of property insurance established in accordance with paragraph 5.06.D)".

Add the following new paragraphs immediately after paragraph 11.01.A.5.i:

SC-11.01.A.5.j The cost of specific consideration for the indemnifications set forth in paragraph 6.20.

SC-11.01.A.5.k The cost of compliance with current local, state and federal safety regulations.

Delete paragraph 11.03.D in its entirety and insert the following in its place:

SC-11.03.D The unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:

1. if the total cost of a particular item of Unit Price Work amounts to 25% or more of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more that 25% from the estimated quantity of such item indicated in the Agreement; and

2. if there is no corresponding adjustment with respect to any other item of work; and

3. if Contractor believes that Contractor has incurred additional expenses as a result thereof; or if Owner believes that the quantity variation entitles Owner to an

adjustment in the unit price, either Owner or Contractor may make a claim for an adjustment in the Contract Price in accordance with Article 10 if the parties are unable to agree as to the effect of any such variations in the quantity of Unit Price Work performed.

Add the following new paragraphs immediately after paragraph 11.03.D:

SC-11.03.E If Owner objects to Contractor's quoted adjustment in Unit Price Work set forth in paragraph 11.03.D, Owner may assign such work to its own forces or another contractor.

SC-11.03.F Owner reserves the right to delete any Unit Price Work without financial penalty incurred from Contractor.

ARTICLE 13 TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

Add the following to the end of paragraph 13.03.A

SC-13.03.A Contractor shall reimburse Owner for the charges of Engineer and Engineer's Consultants for all costs due to work not being ready for tests and/o inspections when the Contractor has notified Engineer that work is ready for tests and/or inspections. Contractor shall reimburse Owner for all failed tests and subsequent retests. Reimbursement for the charges shall be a deduction from the Contractor's Partial Payment(s).

Delete paragraph 13.03.B of the General Conditions and add the following in its place:

SC-13.03.B The Contractor shall obtain and employ an independent testing laboratory to provide the services specified herein and shall include all costs for these services in the contract price. The Contractor shall submit for approval by the Owner and Engineer, the independent testing laboratory, including qualifications.

Copies of all testing agency invoices submitted to the Contractor for payment shall be forwarded with the Contractor's request for partial payment. Invoices shall be submitted routinely throughout the project and shall be pertinent to the partial payment period under consideration. Testing agency invoices in excess of sixty (60) days old shall not be considered for payment. Invoices shall clearly indicate type and amount of test performed, unit and total cost, and shall indicate if the invoiced testing cost is a result of retests required due to the Contractor's failure to achieve specified requirements. The cost of retesting due to test failure will be borne by the Contractor. Payment to the Contractor for testing shall not be made without the required itemized invoicing.

SC-13.08 Amend the first sentence of 13.08 by changing "(including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs)" to "(including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs)"

SC-13.09.C Amend the first sentence of 13.09.C by changing "(including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs)" to "(including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs)"

ARTICLE 14 PAYMENTS TO CONTRACTOR AND COMPLETION

Delete paragraph 14.02.A.2 in its entirety and insert the following in its place:

SC-14.02.A.2 Beginning with the second Application for Payment, each Application shall include an affidavit of Contractor certifying that Contractor has disbursed to all subcontractors and

suppliers having an interest in the contract their pro rata shares of the payment out of previous progress payments received by Contractor for all work completed and materials furnished in the previous work period, less a retainage withheld by Contractor pursuant to an agreement with a subcontractor. Within 30 days of receipt for the final progress payment or any other payments received thereafter except the final payment, Contractor shall pay all subcontractors and suppliers having an interest in the contract their pro rata shares of the payment for all work completed and materials furnished.

Add the following words to the end of paragraph 14.02.B.1:

"or direct Engineer to present the Application to Owner with Engineer's recommendation of partial payment."

SC-14.02.B.2 After the word "schedules", add the words "and the Contract Documents"

Add the following new paragraph immediately after paragraph 14.02.B.2.c:

SC-14.02.B.2.d Contractor's other obligations under the Contract Documents have been fulfilled.

Add the following new paragraph immediately after paragraph 14.02.C.1:

SC-14.02.C.2 If Owner fails to make payment within 30 calendar days after recommendation by Engineer, in addition to other remedies available to Contractor, the interest rate defined in the Agreement shall commence on the first day after said payment is due and continue until payment is received by Contractor.

Amend paragraph 14.09.A.1 to read:

SC-14.09.A.1 a waiver of all Claims by Owner against Contractor, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein whenever said failure occurs or from Contractor's continuing obligations under the Contractor Documents; and

Add the following new paragraph immediately after paragraph 14.09.A.2:

SC-14.09.A.3 The acceptance of final payment by Contractor designated and identified by Engineer as final payment shall be and shall operate as a release to Owner of all claims and all liability to Contractor other than claims in stated amounts as may be specifically excepted by Contractor for all things done or finished in connection with the Work and for every act of Owner and others relating to or arising out of the Work. Any payment, however, final or otherwise, shall not release Contractor or Contractor's Surety(ies) from any obligations under the Contract Documents or Bonds.

ARTICLE 15 SUSPENSION OF WORK AND TERMINATION

SC-15.02.A.1 After the word "Contractor's", add the words "start the work in accordance with the Notice to Proceed or Contractor's".

END OF SECTION

DIVISION 01

GENERAL REQUIREMENTS

SECTION 01 11 00

SUMMARY OF WORK

PART 1 THE WORK AND ITS PERFORMANCE

1.01 CHARACTER OF THE WORK

Unless otherwise expressly provided in the Contract Documents, the Work must be performed in accordance with best modern practice, with materials and workmanship of the highest quality to the satisfaction of the Owner.

1.02 DESCRIPTION OF THE PROJECT

A. The project title is: **CITY OF PALATKA**
REUSE IRRIGATION TRANSFER PUMPS

B. The Work consists of furnishing all labor, equipment, and materials for the construction of the facilities consisting of, but not limited to, the following:

The project is located at the City of Palatka Wastewater Treatment Plant. Construction involves furnishing and installing 10-inch D.I. suction pipe, two new suction lift reuse transfer pumps, concrete base slab for pumps at the east end of the existing effluent clear well tank, electrical instrumentation and flow meter, 12-inch PVC reuse piping from reuse transfer pumps to existing 12-inch PVC reuse pipe stub, replace 2 existing air relief valves along the reuse effluent pipe and add 2 air relief valves with concrete box and covers along the reuse effluent pipe.

C. The specification divisions and drawings are an integrated part of the contract documents and, as such, will not stand alone if used independently as individual sections, divisions, or drawings sheets. The drawings and specifications establish minimum standards of quality for this project. They do not purport to cover all details entering into the design and construction of materials and equipment.

PART 2 WORKING HOURS

2.01 GENERAL

Work under this contract shall not be prosecuted on Sundays or on state and/or national holidays, except in time of emergency, and then only under written permission from the Owner who shall be the sole judge as to the urgency of that situation. On weekdays and Saturdays, the workday shall be limited to daylight hours.

Should the Contractor deem it necessary to work on Sundays, holidays, or beyond daylight hours in order to comply with his construction schedule or because of an emergency, the Contractor shall request permission of the Owner. If, in the opinion of the Owner, the need is bona fide, he will authorize the Contractor to work such hours as may be necessary.

2.02 REIMBURSEMENT FEES

The following hourly rates shall be applied as Owner's reimbursement of Engineer's fee to be paid by Contractor for expenses defined in Supplemental Conditions SC-6.02.C, SC-6.05.A.2.f, SC-6.17.E.2, SC-9.05.B and SC-13.03.A.

A.	Project Manager	$ 130
B.	Construction Administrator	$ 100
C.	Engineer	$ 95
D.	Administrative Assistant	$ 65

PART 3 ABBREVIATIONS

3.01 ORDINANCES, REGULATIONS, STANDARDS, AND CODES

Reference in the specifications to known standards, codes, specifications, etc., promulgated by professional or technical associations, institutions, and societies, is intended to mean the latest edition of each such standard adopted and published as of the date of the Invitation to Bid on this project except where otherwise specifically indicated. Each such standard referred to shall be considered a part of the specifications to the same extent as if reproduced herein in full. The following is a list of applicable documents that apply to this contract.

American Association of State Highway and Transportation Officials (AASHTO) formerly (AASHO)

American Concrete Institute (ACI)

American Institute of Steel Construction (AISC)

American Iron and Steel Institute (AISI)

American National Standards Institute (ANSI)

American Standards Association (ASA)

American Society of Mechanical Engineers (ASME)

American Society of Testing and Materials (ASTM)

American Water Works Association (AWWA)

American Welding Society (AWS)

Anti-Friction Bearing Manufacturer's Association (AFBMA)

Building Officials and Code Administrators International, Inc. (BOCA)

Construction Specifications Institute (CSI)

Federal Specifications (FS)

Florida Department of Transportation (FDOT) Standard Specifications for Road and Bridge Construction, Latest English Edition (Standard Specifications)

Florida Department of Traffic Design Standards Latest English Edition(FDOT Index)

National Bureau of Standards (NBS)

National Electrical Manufacturer's Association (NEMA)

National Fire Protection Association (NFPA)

Portland Cement Association (PCA)

Occupational Safety and Health Act (Public Law 91-596), U.S. Department of Labor (OSHA)

Steel Structures Painting Council (SSPC)

Southern Standards Building Code (SSBC)

Underwriters' Laboratories, Inc. (UL)

United States of America Standards Institute (USASI)

Regulations of Florida Industrial Commission Regarding Safety

All local, state, county, or municipal building codes requirements of the Owner's Insurance

END OF SECTION

SECTION 01 11 80

WORK SEQUENCE

1.01 SUMMARY

A. The work shall be performed in accordance with general sequence or phasing outlined below. Contractor shall be responsible of the specific sequence of work within this general outline.

1.02 WORK SEQUENCE

A. The work shall be performed in the following sequence or phases:

1. Clear and grub pump construction site and pipe route
2. Construct base concrete slab and pumps
3. Install reuse piping
4. Install electrical and controls

END OF SECTION

SECTION 01 22 50

MEASUREMENT AND PAYMENT

PART 1 GENERAL

Work under this Contract shall be paid as designated below under the appropriate items associated with the Bid Schedule. Payment shall be in accordance with Lump Sum or Unit Price bid by the Contractor in his proposal.

When Lump Sum prices are contained in the Bid Schedule, the Contractor shall provide a detailed breakdown of each Lump Sum cost acceptable to the Engineer, which will be used for estimating partial payment requests.

Contractual costs for work not specifically mentioned under a payment item and which are incidental to the overall conduct of the work shall be included in the individual items at the Contractor's option. No additional charges shall be made to the Owner for items not specifically mentioned under individual payment items. Examples of these types of costs include, but are not limited to, the following: bonds, insurance, permits, licenses, traffic control, dust control, clean-up, temporary access, temporary facilities, soil erosion control, temporary drainage, temporary offices, restoration of disturbed areas, temporary utilities, test pits locating existing utilities, temporary water and sewer, surveying, layout, and other items similar to above.

PART 2 BID SCHEDULE ITEMS

Item 1 Mobilization and Demobilization

A. Measurement – Lump Sum not to exceed five (5) percent of the total bid amount.

B. Payment shall be full compensation for mobilizing/demobilizing of equipment to the job site, establishing on-site operations, and other materials, equipment and facilities deemed necessary for the contractor to establish operations at the project site.

Item 2 Site Preparation

A. Measurement will be based on the Engineer's determination of the actually completed and approved Lump Sum Bid Item Work, as shown and specified herein.

B. Payment: Payment shall be made at the contract lump sum price bid for measured site work and shall be full compensation for all sitework including but not limited to: construction photographs, maintenance of traffic, clearing and grubbing for all required areas, disposal of materials, site preparation, stripping and stockpiling of top soil, anti-erosion structures and devices, turbidity reduction efforts, seeding, by-pass pumping, site safety, cleanup, preparation, obtaining and paying for NPDES permit, dewatering permit, and preparing, obtaining and paying for any additional County or City permits that may be required.

Item 3 Furnish and Install Reuse Irrigation Transfer Pumps

A. Measurement of pumps shall be the number of pumps actually furnished and installed and accepted by the Engineer.

B. Payment: Payment will be made at the applicable unit prices as set forth in the Bid Form and shall constitute full compensation for each pump of the size and type furnished and installed. The respective unit prices shall be payment in full for the item including, but not limited to, construction of reuse transfer pumps, effluent well piping, support, anchorage, electrical connections and minor adjustments necessary for a complete and operable system.

Item 4 Furnish and Install 12-Inch PVC (DR-18) Reuse Pipe

A. Measurement - The length of each size and type of reuse distribution main to be measured for payment will be the laying length in linear feet, actually installed and approved, measured along the horizontal projection of the centerline of the completed pipe with no deduction made for those spaces occupied by valves or fittings. Where the measurement terminates at a valve, bend, tee or other fitting, the centerline of the valve or fitting shall be the point of termination. Provide 12 gauge wire along reuse main route and bring up into new valve boxes.

B. Payment: Payment will be made at the applicable unit prices as set forth in the Bid Form, and shall constitute full compensation for the size and type of pipe material; excavation; backfill; dewatering; laying; jointing; restrained joints; connections to valves; removing plugs; gaskets; metallic tracer tape and 12 gauge wire including valve boxes; mobilization; demobilization; removal and disposal of construction debris; maintenance of traffic and traffic control; dust control; erosion control; construction videos; and density testing and pressure testing.

Item 5 Furnish and Install 12-Inch D.I. Reuse Piping

A. Measurement - The length of each size and type of reuse transmission main to be measured for payment will be the laying length in linear feet, actually installed and approved, measured along the horizontal projection of the centerline of the completed pipe with no deduction made for those spaces occupied by valves or fittings. Where the measurement terminates at a valve, bend, tee or other fitting, the centerline of the valve or fitting shall be the point of termination.

B. Payment: Payment will be made at the applicable unit prices as set forth in the Bid Form and shall constitute full compensation for the size and type of pipe material; laying, jointing, connections, valves, fittings, supports, anchorage, and other items of work required for a complete and operable system as shown on the drawings and in the specifications.

Item 6 Furnish and Install Ductile Iron Fittings - 12” - M.J. 90 Degree Bends

A. Measurement - Measurement of ductile iron fittings shall be the number of fittings actually installed and accepted by the Engineer.

B. Payment: Payment will be made for each ductile iron fitting of the size and type furnished and installed at the applicable unit price entered in the Bid Form. Payment will be in addition to the unit price paid for reuse main as shown on the drawings and specified herein.

Item 7 Furnish and Install Ductile Iron Fittings - 12” - M.J. 45 Degree Bends

A. Measurement - Measurement of ductile iron fittings shall be the number of fittings actually installed and accepted by the Engineer.

B. Payment: Payment will be made for each ductile iron fitting of the size and type furnished and installed at the applicable unit price entered in the Bid Form. Payment will be in addition to the unit price paid for reuse main as shown on the drawings and specified herein.

Item 8 Furnish and Install Ductile Iron Fittings - 12"x 12" - FLG. Tee

A. Measurement - Measurement of ductile iron fittings shall be the number of fittings actually installed and accepted by the Engineer.

B. Payment: Payment will be made for each ductile iron fitting of the size and type furnished and installed at the applicable unit price entered in the Bid Form. Payment will be in addition to the unit price paid for reuse main as shown on the drawings and specified herein.

Item 9 Furnish and Install Ductile Iron Fittings - 12" - FLG. 90 Degree Bends

A. Measurement - Measurement of ductile iron fittings shall be the number of fittings actually installed and accepted by the Engineer.

B. Payment: Payment will be made for each ductile iron fitting of the size and type furnished and installed at the applicable unit price entered in the Bid Form. Payment will be in addition to the unit price paid for reuse main as shown on the drawings and specified herein.

Item 10 Furnish and Install Ductile Iron Fittings - 12" - FLG. Base 90 Degree Bend

A. Measurement - Measurement of ductile iron fittings shall be the number of fittings actually installed and accepted by the Engineer.

B. Payment: Payment will be made for each ductile iron fitting of the size and type furnished and installed at the applicable unit price entered in the Bid Form. Payment will be in addition to the unit price paid for reuse main as shown on the drawings and specified herein.

Item 11 Furnish and Install Ductile Iron Fittings - 12"x 10" - FLG. Reducing 90 Degree Bend

A. Measurement - Measurement of ductile iron fittings shall be the number of fittings actually installed and accepted by the Engineer.

B. Payment: Payment will be made for each ductile iron fitting of the size and type furnished and installed at the applicable unit price entered in the Bid Form. Payment will be in addition to the unit price paid for reuse main as shown on the drawings and specified herein.

Item 12 Furnish and Install 10-Inch D.I. Reuse Suction Piping

A. Measurement - The length of each size and type of reuse transmission main to be measured for payment will be the laying length in linear feet, actually installed and approved, measured along the horizontal projection of the centerline of the completed pipe with no deduction made for those spaces occupied by valves or fittings. Where the measurement terminates at a valve, bend, tee or other fitting, the centerline of the valve or fitting shall be the point of termination.

B. Payment: Payment will be made at the applicable unit prices as set forth in the Bid Form and shall constitute full compensation for the size and type of pipe material; laying, jointing, connections, valves, fittings, supports, anchorage, and other items of work required for a complete and operable system as shown on the drawings and in the specifications.

Item 13 Furnish and Install Check Valves - 10" FLG.

A. Measurement - Measurement of check valves shall be the number actually installed and accepted by the Engineer.

B. Payment - Payment will be made for each check valve of the size and type furnished and installed at the applicable unit price entered in the Bid Form. Payment will be full compensation for all labor, materials and equipment specified and shown on the plans necessary to complete the work.

Item 14 Furnish and Install Ductile Iron Fittings - 10" FLG. Flare

A. Measurement - Measurement of ductile iron fittings shall be the number of fittings actually installed and accepted by the Engineer.

B. Payment: Payment will be made for each ductile iron fitting of the size and type furnished and installed at the applicable unit price entered in the Bid Form. Payment will be in addition to the unit price paid for reuse main as shown on the drawings and specified herein.

Item 15 Furnish and Install Ductile Iron Fittings - 10" FLG. 90 Degree Bends

A. Measurement - Measurement of ductile iron fittings shall be the number of fittings actually installed and accepted by the Engineer.

B. Payment: Payment will be made for each ductile iron fitting of the size and type furnished and installed at the applicable unit price entered in the Bid Form. Payment will be in addition to the unit price paid for reuse main as shown on the drawings and specified herein.

Item 16 Asphalt Pavement Removal and Replacement

A. Measurement: Measurement for payment of asphalt pavement, incidental base material, and incidental stabilization replaced shall be the actual square feet cut, measured on the horizontal plane, along the centerline of the piping installed. Measurement shall be from edge to edge of pavement cut. Only that pavement located directly over the centerline of the piping being installed, will be considered eligible for payment unless otherwise shown on the drawings or authorized by the Engineer. There shall be no duplication of measurement; e.g., pavement replacement measured for payment along a pipeline cannot be again measured for payment along an intersecting pipeline. The measurement basis for payment in all cases for pipe work will be limited to the width tabulated for various cuts and pipe sizes involved as indicated on the Typical Details. Where the centerline of the pipe is to one side of the centerline of the pavement or adjacent to the pavement, the limiting width of pavement repair will be proportioned to the relative distance between the centerline of the pipe and the original edge of the pavement.

B. Payment: Payment for pavement removed and later replaced, measured as defined above, shall be at the respective unit prices set forth in the Bid Form.

The respective unit prices shall be payment in full for the item including, but not limited to, all compaction required, saw cutting, stabilized subbase, limerock base, prime coat, 1 ½ inch Type SP asphalt, concrete as specified and shown on the drawings. Wherever pavement is disturbed or destroyed in excess of the amounts listed above in order to avoid sheeting, or for any reason, the cost of the excess pavement replacement will be borne by the Contractor unless such additional removal and replacement is specifically authorized in writing by the Engineer or Owner. Payment will not be allowed for pavement placed outside the boundaries of the original pavement.

Item 17 Asphalt Pavement

A. Measurement: Measurement for payment of asphalt pavement, incidental base material, and incidental stabilization shall be the actual square feet, measured on the horizontal plane installed. Measurement shall be from edge to edge of pavement. Only that pavement being installed, will be considered eligible for payment unless otherwise shown on the drawings or authorized by the Engineer.

B. Payment: Payment for pavement, measured as defined above, shall be at the respective unit prices set forth in the Bid Form. The respective unit prices shall be payment in full for the item including, but not limited to, all compaction required, stabilized subbase, limerock base, prime coat, 1 ½ inch Type SP asphalt, concrete as specified and shown on the drawings. Wherever pavement is disturbed or destroyed in excess of the amounts listed above in order to avoid sheeting, or for any reason, the cost of the excess pavement replacement will be borne by the Contractor unless such additional removal and replacement is specifically authorized in writing by the Engineer or Owner. Payment will not be allowed for pavement placed outside the boundaries shown on the plans.

Item 18 Electrical

A. Measurement will be based on the Engineer's determination of the actually completed and approved Lump Sum Bid Item Work, as shown and specified herein.

B. Payment: Payment will be made at the applicable lump sum contract price and shall constitute full compensation for the electrical work (for the liquid level sensor and reuse transfer pumps) which includes, installation of electrical components and equipment, conduits, wiring, connections, trenching, and permitting, as shown on the drawings and specified herein.

Item 19 Controls

A. Measurement will be based on the Engineer's determination of the actually completed and approved Lump Sum Bid Item Work (liquid level sensor and support), as shown and specified herein.

B. Payment - Payment will be made at the applicable lump sum contract price and shall constitute full compensation for the controls necessary for complete operation, connection and tie into the existing Supervisory Control and Data Acquisition (SCADA) system at the wastewater treatment plant. This will include any required programming to see the signals and control the operation of the equipment installed.

Item 20 Furnish and Install Supports and Appurtenances

A. Measurement will be based on the Engineer's determination of the actually completed and approved Lump Sum Bid Item Work, as shown and specified herein.

B. Payment: Payment will be made at the applicable lump sum contract price and shall constitute full compensation for the size and type of supports and appurtenances shown on the drawings and specified herein.

Item 21 Furnish and Install Air Relief Valves (Remove and Replace)

A. Measurement - Measurement of air relief valves shall be the number actually removed and replaced installed and accepted by the Engineer.

B. Payment - Payment will be made for each air relief valves of the size and type furnished and installed at the applicable unit price entered in the Bid Form. Payment will be full compensation for all labor, materials and equipment specified and shown on the plans necessary to complete the work.

Item 22 Furnish and Install Air Relief Valves

A. Measurement - Measurement of air relief valves shall be the number actually installed and accepted by the Engineer.

B. Payment - Payment will be made for each air relief valves of the size and type furnished and installed at the applicable unit price entered in the Bid Form. Payment will be full compensation for all labor, materials and equipment specified and shown on the plans necessary to complete the work.

Item 23. Furnish and Install Concrete Box and Cover (Air Relief Valve)

A. Measurement - Measurement of manholes shall be the number of manholes actually installed and accepted by the Engineer for air relief valve protection.

B. Payment: Payment will be made for each sanitary sewer manhole of the size and type furnished and installed at the applicable unit price entered in the Bid Form. Payment will be the unit price paid for sanitary sewer manholes as indicated on the drawings and specified herein.

SECTION 01 29 76

PROGRESS PAYMENT PROCEDURES

PART 1 – GENERAL

1.01 DESCRIPTION

A. Scope of Work: Submit Application for Payments to the Owner in accordance with schedule established by Conditions of the Contract and Agreement between Owner and Contractor.

B. Related Requirements Described Elsewhere:

1. Agreement between Owner and Contractor.

2. Application for Payment Form.

3. Schedule of Values.

4. Contract Closeout.

5. Project Record Documents.

6. NPDES Permit Conformance.

1.02 FORMAT AND DATA REQUIRED

A. Submit applications typed on forms provided by the Owner, “Application and Certificate for Progress Payment”, with itemized data typed on 8-1/2 inch x 11 inch or 8-1/2 inch x 14 inch white paper continuation sheets.

B. Provide itemized data on continuation sheet of format, schedules, line items and values: Those of the Schedule of Values approved by the Engineer.

1.03 PREPARATION OF APPLICATION FOR EACH PROGRESS PAYMENT

A. Application Form:

1. Fill in required information, including that for Change Orders executed prior to date of submittal of application.

2. Fill in summary of dollar values to agree with respective totals indicated on continuation sheets.

3. Execute certification with signature of a responsible officer of Contract firm.

B. Continuation Sheets:

1. Fill in total list of all scheduled component items of work, with items number and scheduled dollar value for each item.

Fill in dollar value in each column for each scheduled line item when work has been performed or products stored. Round off values to nearest dollar, or as specified for Schedule of Values.

3. List each Change Order executed prior to date of submission, at the end of the continuation sheets. List by Change Order Number, and description, as for an original component item of work.

4. To receive approval for payment on component material stored on site, submit copies of the original invoices with the Application for Payment.

5. As provided for in the "Application and Certificate for Progress Payment" form, the Contractor shall certify, for each current pay request, that all previous progress payments received from the Owner, under this Contract, have been applied by the Contractor to discharge in full all obligations of the Contractor in connection with Work covered by prior Applications for Payment, and all liens, claims, security interest and encumbrances. Contractor shall attach to each Application for Payment like affidavits by all Subcontractors.

1.04 SUBSTANTIATING DATA FOR PROGRESS PAYMENTS

A. When the Owner requires substantiating data, Contractor shall submit suitable information, with a cover letter identifying:

1. Project.

2. Application number and date.

3. Detailed list of enclosures.

4. For stored products:

a. Item number and identification as shown on application.

b. Description of specific material.

B. Submit one (1) copy of data and cover letter for each copy of application.

C. Submit requisite number of photographs with each application.

D. List the name and address of all Subcontractors and Suppliers who have performed work or provided supplies or material for each application.

E. Submit certified payroll sheets for Contractor’s forces and all Subcontractors for the month preceding the submitted application.

F. Submit revised monthly progress schedules with each month’s Application for Payment, including cash flow projections.

G. The Contractor is to maintain an updated set of drawings to be used as record drawings in accordance with the Contract Documents. AS A PREREQUISITE FOR PAYMENT OF MONTHLY PROGRESS PAYMENTS, THE CONTRACTOR IS TO EXHIBIT THE UPDATED RECORD DRAWINGS FOR REVIEW BY THE OWNER.

H. Submit a summary of NPDES Permit Conformance events with each application.

1.05 PREPARATION OF APPLICATION FOR FINAL PAYMENT

A. Fill in Application Form as specified for progress payments.

B. Refer to General Conditions Sections 14.8 and 14.9.

1.06 SUBMITTAL PROCEDURE

A. Submit Applications for Payment to the Owner at the time stipulated in the Agreement. Review the percents complete with the Owner to resolve any conflicts or discrepancies.

B. Number of copies for each Application for Payment:

1. Owner: Four (4) copies

2. Contractor: As required for his needs.

C. When the Owner finds Application properly completed and correct, the Owner will process Certificate for Payment.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 19

PROJECT MEETINGS

1.01 PRECONSTRUCTION CONFERENCE

A. A preconstruction conference will be scheduled after award of contract and prior to beginning work. This meeting shall be attended by Engineer, Owner, and an authorized representative of Contractor.

B. Meeting will consider matters of contract administration and initial construction operations.

C. Contractor shall submit proposed construction schedule prior to or at preconstruction conference; see Section 01 33 00.

1.02 PROGRESS MEETINGS

A. Periodic progress meetings will be held at a time and place mutually agreed upon at preconstruction conference. A responsible representative of Contractor and electrical subcontractors who can bind Contractor/subcontractor to decisions shall attend. A responsible representative of other subcontractors working on site shall also attend.

B. Meetings will be held to coordinate and expedite progress of work and shall be conducted by Contractor. Contractor and each subcontractor on site shall submit a written report at each meeting indicating:

1. Work progress since last meeting.
2. Upcoming work sequences and schedules.
3. Requests for information.

C. Contractor shall record meeting minutes and shall distribute a typewritten copy to all parties involved in the project within 48 hours of each meeting. Minutes shall document all issues discussed and decisions reached at progress meeting.

END OF SECTION

SECTION 01 33 00

SUBMITTAL PROCEDURES

1.01 SUMMARY

A. Submit items to Engineer for review as listed below and as required by the other Contract Documents. Refer to individual specification sections, General Conditions, Supplementary Conditions, and sections of Division 01 - General Requirements for submittal requirements.

1.02 CONSTRUCTION SCHEDULE

A. Prior to or at preconstruction conference, submit two copies of a proposed schedule of operations. Coordinate activities of the various trades for orderly completion of the work. Coordinate activities with those of Owner to schedule a minimum of temporary disruptions to continuing operations. Allow ample time for Owner to alter operations as required.

B. After acceptance of construction schedule, distribute copies to subcontractors and other parties required to comply with scheduled dates.

C. When revisions to schedule are made, notify all parties of changes in writing.

1.03 SCHEDULE OF SUBMITTALS

A. Within 10 days of acceptance of construction schedule, submit two copies of a schedule of submittals. Schedule shall list anticipated date for each required submittal and shall allow A/E reasonable time for reviews. Strive to submit all submittals requiring Engineer review within 30 days of acceptance of construction schedule.

B. After acceptance of schedule of submittals, distribute copies to subcontractors and other parties required to comply with submittal dates.

1.04 SHOP DRAWINGS

A. Required shop drawings are designated under the various specification sections. Submit shop drawings for review prior to fabrication, delivery, or installation. Submit a minimum of five copies; two copies will be retained and the remainder returned to Contractor who shall keep one copy at project site.

B. Fabrication and erection drawings may consist of a reproducible and two sets of prints; the reproducible copy will be returned to Contractor.

C. Each brochure of shop drawings shall contain an index of contents and shall consist of layout details, schedules, setting instructions, manufacturer's literature, and other data specifically prepared for the work. Shop drawings shall be identified with project name, numbered consecutively, and bear the stamp of approval of Contractor as evidence of accuracy, compatibility, and conformance with contract requirements. Drawings not so stamped will be returned without being examined. Reproductions of contract drawings may not be used without prior approval.

D. Specific written notice shall be given of each variation that shop drawings may have from requirements of the Contract Documents.

E. Partial submittals will not be considered; each portion of work shall be complete in one submittal.

F. Shop drawings shall not be used in the work unless they have been reviewed and bear the stamp and signature of Engineer. Shop drawings will only be reviewed for general conformance with the design concept of the project and general compliance with the

information given in the Contract Documents. Contractor shall be responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction, coordinating his or her work with that of all other trades, and performing all work in a safe and satisfactory manner. Corrections or comments made on shop drawings shall not relieve Contractor from compliance with requirements of Drawings and Specifications and shall not be considered an order for extra work.

G. If information on previously reviewed shop drawings is altered, submit changes for review.

1.05 PRODUCT DATA

A. Required product data submittals are designated under the various specification sections. Submit product data for review in accordance with procedures for shop drawings.

B. Product data shall consist of manufacturer's literature, illustrations, and brochures of catalog cuts; instructions for handling, storage, and installation; and specifications and design data. Where multiple options are indicated, identify specific options as required for this project.

C. Products subject to product data review shall not be used in the work until they have been reviewed and bear the stamp and signature of Engineer.

1.06 SAMPLES

A. Prior to fabrication, delivery, or installation, submit samples as designated in the various specification sections; allow reasonable time for review and testing.

B. Submit samples in sufficient quantity and of adequate size to show quality, type, and extremes of color range, finish, and texture. Submit a minimum of two sets of appearance and color samples. Label each sample stating material, description, project name, and Contractor's name. Expedite submittal of appearance and color samples following Notice to Proceed.

C. Submit samples with transmittal letter requesting review; prepay transportation charges. Samples shall become Owner's property, unless otherwise designated.

D. Samples will be reviewed for acceptability or selection of color, pattern, and texture only. Compliance with specifications is the responsibility of Contractor.

E. Order no materials subject to sample review until receipt of written notice of completion of review. Installed materials shall match reviewed samples. No review of samples shall be taken in itself to change contract requirements.

1.07 CERTIFICATES OF COMPLIANCE

A. Submit two copies of certificates of compliance as designated in the various specification sections.

B. Certificates shall be furnished by manufacturer, producer, or supplier of material or product and shall indicate that material or product conforms to or exceeds specified requirements. Include supporting reference data as appropriate. Certificates may be recent or previous test results on material or product, but must be acceptable to Engineer.

1.08 PERMITS AND APPROVALS

A. Submit one copy of permits, code inspections, and agency approval documents, as designated in the various specification sections.

1.09 TEST REPORTS

A. Submit two copies of test reports as designated in the various technical specifications.

1.10 OPERATION AND MAINTENANCE (O/M) MANUALS AND INSTRUCTIONS

A. Prior to Substantial Completion, submit two bound sets (unless otherwise specified in the various specification sections) of operation and maintenance manuals covering each item of equipment furnished or installed under the Contract. For each item of equipment, include the following information:

1. Engineer-reviewed shop drawings.
2. Installation and operating instructions.
3. Maintenance instructions and address of authorized service center.
4. Wiring diagrams and parts lists.
5. Test data and certifications.

B. Designate correct model number where literature covers more than one model.

C. Write and furnish duplicate operation and maintenance instructions for items fabricated or assembled by Contractor.

D. Furnish data in 8-1/2 in. x 11 in. or 11 in. x 17 in. size; photographically reduce information if required. Place data into D-style, 3-ring hard cover binders; fold 11 in. x 17 in. sheets as required. Group data according to specification section and organize with tabbed index dividers on which the product name is typed.

E. Label binders as follows:

[Systems or Equipment Designation]
OPERATION AND MAINTENANCE MANUAL
[Project Name]
[Project Location]

F. Integrate general, mechanical, and electrical construction into same binder(s) when practicable. Individual subcontract O/M manuals will be acceptable provided they are placed in binder(s) as specified above.

G. Provide competent instructors to train Owner's personnel in proper care, operation, adjustment, and maintenance of all equipment and systems. Conduct training during normal working hours, at times agreeable to Owner. Submit a letter indicating names of personnel trained, dates of instruction, and a list of manuals delivered.

1.11 PROJECT RECORD DOCUMENTS

A. Keep a current set of documents at job site that are marked to show all changes made during construction. Dimension underground and concealed work and utilities from permanent reference points; record vertical distances. Submit project record documents upon completion of Work.

END OF SECTION

SECTION 01 41 23

PERMITS AND FEES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Scope of Work: Obtain and pay for all permits and licenses including required by authorities having jurisdiction, including but not limited to, land clearing permit, dewatering permit, NPDES Notice of Intent, electrical permit, and building permit.

B. Permits by Owner: The Owner has applied and paid for the following permits:

WASTEWATER PERMIT APPLICATION FORM 2A FOR DOMESTIC WASTEWATER FACILITIES (SUBSTANTIAL MODIFICATION) (FDEP).

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 45 00

QUALITY CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

Certification and testing, examination by the Owner, quality assurance testing, and final approval or work.

1.02 CERTIFICATION AND TESTING

The materials and equipment used in the construction of the project shall be subject to adequate certification and testing in accordance with generally accepted standards, as required and defined in the Contract Documents.

1.03 CONTRACTOR TO PROVIDE

The Contractor shall provide all tools, testing apparatus, materials to be tested, and labor as necessary to provide certification required by the Contract Documents.

1.04 OUTSIDE AGENCY

If the Contract Documents, laws, ordinances, rules, regulation or orders of any pubic authority having jurisdiction require any work to be certified, tested, or approved by someone other that the Owner, the Contractor will give the Engineer timely notice of readiness. The Contractor will then furnish the Owner the required certification and/or testing certificates for approval.

1.05 LIMIT OF APPROVALS

Certifications, tests, or approvals by the Owner, Engineer, or others shall not relieve the Contractor from his obligations to perform the work in accordance with the requirements of the Contract Documents.

1.06 ACCESS TO WORK SITE

The Owner and his representative will at all times have access to the work. In addition, authorized representatives and agents of any participating federal or state agency shall be permitted access to all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The Contractor will provide proper facilities for such access and observation of the work.

PART 2 EXAMINATION BY THE OWNER

2.01 ACCESS

The Owner contemplates and the Contractor agrees to thorough examination of the work at all times by the Owner and the Engineer, including all labor performed and materials furnished, delivered, or intended to be used in the work, including manufacture, preparation, and testing. The Contractor shall not use any material which has not been tested and accepted. The Contractor shall keep the Engineer advised of the progress of the work away from the site requiring certification of witnessing of tests to ensure that scheduling conflicts or delays do not develop.

2.02 ACCEPTANCE TESTS

Tests, or acceptance of any materials prior to shipment, shall not be deemed as a final acceptance of the materials. The Owner may require tests or analysis of any portion of the materials at any time. Any material which is found to be defective or which does not otherwise conform to the requirements of the specifications shall be rejected and removed forthwith from the site, as provided in the contract.

2.03 RIGHT TO EXAMINE WORK

The Owner and the Engineer shall have the right to examine all materials and work done during any phase of construction, fabrication, or manufacture. The Contractor shall furnish all reasonable facilities and aid to the Engineer and safe and convenient means for the examination of any part of the work. No work shall be closed or covered until it has been duly examined and approved.

PART 3 QUALITY ASSURANCE TESTING

3.01 DESCRIPTION

The Contractor is required to provide all testing as described in these specifications. Testing shall be completed by an independent testing laboratory retained by the Contractor and approved by the Engineer. Approved, independent, testing laboratories are as follows: Ellis & Associates, Inc.; Universal Engineering Sciences, Inc.; and PSI, Inc. The Contractor is still required to submit independent testing laboratory qualifications. The Contractor may obtain other independent testing laboratories not listed, with approval by the Engineer. Certifications, tests, or approvals by the Owner, Engineer, or others shall not relieve the Contractor from his obligations to perform the Work in accordance with the requirements of the Contract Documents.

3.02 CODES AND REGULATIONS TESTING

Testing will be in accordance with all pertinent codes and regulations and with selected standards of the American Society of Testing and Materials. The Engineer shall process and distribute all required copies of test reports and related instruction to ensure all necessary retesting and/or replacement of materials with the least possible delay in progress of work.

3.03 RETESTING

When initial quality assurance tests indicate noncompliance with the Contract Documents, all subsequent retesting occasioned by the noncompliance shall be performed by the same testing laboratory and the costs thereof shall be borne by the Contractor.

3.04 COOPERATION WITH OWNER'S TESTING LABORATORY

The Owner may perform any additional tests that he may deem necessary at his own expense. Representatives of the Owner' testing laboratory shall have access to the work at all times. The Contractor shall provide facilities for such access in order that the laboratory may properly perform its functions.

3.05 ADDITIONAL TESTING

If the Owner orders sampling, analysis, or tests of materials which are specified to be accepted on certification by the manufacturer, but which appear defective or not conforming to the requirements of the specifications, the Contractor shall bear all the costs of sampling, transportation, tests, and analyses if the material is in fact found defective or does not conform to the specifications. If the material is found to be sound and conforming to the specifications, the Owner will pay for the testing.

PART 4 FINAL APPROVAL

4.01 FINAL APPROVAL

Final approval of the Work shall be made by the Owner and the Engineer and shall be contingent upon the findings of a thorough examination of the Work. Such examination shall be made within ten (10) working days after receipt of the Contractor's written request. The Work will be accepted and deemed completed as of the date of such examination if, upon such examination, the Engineer and Owner find that no further Work remains to be done at the site. If the examination reveals items of Work still to be performed, the Contractor shall promptly perform them and request a re-examination. If upon any reinspection the Engineer and Owner determine that the Work is complete, the date of completion shall be deemed to be the actual date of such re-examination.

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

1.01 TEMPORARY ELECTRICITY

A. Contractor shall provide temporary electric service and distribution facilities as required for its own construction purposes. Provide portable power supply or make arrangements with local utility company for temporary service including service poles, driven ground, main service switch, transformer, and metering facilities. Pay for electrical energy consumed.

1.02 TEMPORARY LIGHTING

A. Contractor shall provide temporary lighting sufficient to enable its workers to complete work and to enable inspectors to check work, as required.

1.03 TEMPORARY WATER

A. Contractor shall be responsible for obtaining water for its needs. Pay cost of water used and meter rental, if applicable.

1.04 TEMPORARY SANITARY FACILITIES

A. Contractor shall provide temporary outside toilets sufficient for its own workers.

1.05 TEMPORARY FIRE PROTECTION

A. Contractor shall provide fire extinguishers and other fire protection equipment for all possible classes and types of fire.

1.06 PROTECTION OF WORK AND PROPERTY

A. Observe safety provisions of applicable laws and regulations.

B. Erect and maintain all required planking, barricades, guard rails, fences, safety lanterns, and temporary walkways of sufficient size, strength, and type necessary for protection of material storage, adjacent property, and new construction, as well as to prevent accidents to public and workers at job site. Execute work in a manner to avoid interference with use of adjacent facilities.

C. Notify Owner if existing property interferes with work so that arrangements for proper protection can be made.

D. Protect all work, materials, apparatus, and fixtures incorporated in work or stored on site against damage. At end of day, cover all new work likely to be damaged.

E. Protect all finished construction until acceptance by Owner. Repair damage to finished work to satisfaction of Owner.

1.07 ENVIRONMENTAL CONTROLS

A. Maintain erosion control measures to protect the project site and prevent sediment pollution of adjacent water courses and properties.

1. Install erosion control measures prior to start of construction and maintain them until final completion of work. Unless otherwise instructed, remove temporary erosion control measures prior to final application for payment.

2. Strive to limit stripping of sod and vegetation to a period that will expose bare soil to the least possibility of erosion that construction requirements allow.
3. Construct and maintain silt fence barriers, erosion bale barriers, or temporary diversions to receive runoff leaving site.
4. Protect storm drain inlets by using silt fence barriers, erosion bale barriers, or equivalent.
5. Remove at the end of each work day soils and sediment reaching public or private streets not part of the construction site.
6. Unless otherwise shown or specified, erosion control measures shall comply with the planning, design, and maintenance provisions of the FDOT Standard Specifications for Road and Bridge Construction, Section 104, latest edition, and as required by the St. John's River Water Management District.

B. Provide controls to confine dust and dirt within project area. Thoroughly soak masonry and debris during demolition and loading operations. Water exposed soils or aggregates as required to prevent windblown dust.

C. Provide noise control measures to limit the amount of noise and prevent nuisance. Properly equip all equipment with mufflers. Limit construction activities generating significant noise to normal working hours.

1.08 TRAFFIC CONTROL

A. Conduct operations to ensure minimum interference with streets, walks, and adjacent facilities not part of construction project.

B. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

1.09 CONSTRUCTION CLEANING

A. Remove rubbish and debris from work area promptly upon its accumulation. Perform a broom cleaning of all appropriate surfaces weekly.

B. Immediately clean-up spillages of oil, grease, or other liquids which could cause a slippery or otherwise hazardous situation or stain a finished surface.

C. Form or scrap lumber shall have all nails withdrawn or bent over and shall be stacked, placed in trash bins, or removed from site.

D. At completion of project, thoroughly clean, sweep, and wash work to remove foreign matter, spots, and soil from work and equipment under this contract. Remove temporary guards and protective coatings.

1.10 DISPOSAL

A. Provide industrial type waste containers in number and size required or provide other acceptable methods of disposing of debris. Place containers at adequate locations to handle debris and have them emptied as required.

B. No burning of rubbish or debris will be allowed at site.

C. Store combustible waste in fire-resistive containers. Store hazardous wastes, such as caustics, acids, and harmful dusts, in appropriate covered containers. Dispose of wastes regularly.

D. If a contractor does not remove rubbish or clean work as specified above, Owner reserves right to have work done by others at Contractor's expense.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

1.01 PRODUCTS

A. Provide new, high quality products manufactured and conditioned for the particular application as recommended by manufacturer, unless otherwise noted. Transport, handle, store, and protect products as specified and in accordance with manufacturer's recommendations.

1.02 MANUFACTURER'S DIRECTIONS

A. Wherever work is to be performed or products are to be installed in accordance with manufacturer's instructions, furnish copies of printed instructions before installation.

1.03 SOURCE OF PRODUCTS

A. In order that ready availability of materials, parts, or components for repair, replacement, or expansion can be assured, original equipment and components shall be obtained where feasible from domestic sources which maintain a regular stock.

1.04 ACCEPTABLE MANUFACTURERS

A. Products, materials, and equipment identified by reference to a manufacturer's name, catalog number, or model are identified for the purpose of establishing a standard of quality, type, and function. Products first named in specifications are depicted for general descriptive purposes only. Any other product, material, or equipment which will perform adequately the duties imposed by the general design will be considered for substitution in accordance with the provisions below.

1.05 OPTIONS AND CHANGES

A. Wherever options consisting of two or more choices are permitted for any product, procedure, or method, Contractor may select any of the named alternatives.

B. Changes and revisions to Contract Documents may be made by Change Order, Field Order, or other procedure authorized under the Contract Documents.

C. All other revisions not defined as options or changes shall be treated as Substitutions. (Options and changes will not be treated as Substitutions.)

1.06 BID PHASE SUBSTITUTIONS

A. Substitutions and alternatives proposed prior to the Bid Deadline shall be submitted in accordance with the Instructions to Bidders.

1.07 CONSTRUCTION PHASE SUBSTITUTIONS

A. Substitutions proposed after Contract has been awarded shall be submitted for approval prior to their use. Consideration will be given only to proposed substitutions for those products named in the Contract Documents which are no longer available or cannot be provided within the Contract Time, or where standard products are no longer in conformance, or where Owner's interests may be adversely affected.

B. If substitutions are approved, Contractor assumes responsibility for any other changes in systems or for modifications required in other work to accommodate the substitution, regardless of approval of the substitution.

C. Requests for substitution of alternate products shall be submitted with complete references to manufacturer's product identification and product data indicating composition, guarantee, availability, applicable standards or agency approvals met or exceeded, restrictions imposed on product, and manufacturer's recommended method of application or installation. Substitutions will be considered acceptable if the product will perform adequately the duties imposed by the general design and, in opinion of Engineer, is of equal substance, quality, appearance, and function, unless the named item is necessary for interchangeability or if the named product has been demonstrated to be most cost-effective.

1.08 DEFECTIVE PRODUCTS

A. All products which do not conform to specified requirements shall be considered defective and shall be removed from the Work. If in place, faulty materials shall be corrected or replaced to meet specified requirements.

1.09 TRANSPORTATION AND HANDLING

A. Products shall be transported and handled in accordance with the Contract Documents and as defined below. Deliver in original packaging with manufacturer's brand, seals, and labels intact. Refer to individual sections of specifications for specific requirements.

B. Arrange for product transportation as required for construction. Select means of transportation which will reasonably assure timely and safe arrival. Products shall be suitable for intended use upon arrival at project and shall be undamaged and free from defects.

C. Select appropriate methods for handling products to preserve their integrity, quality, and function.

1.10 MATERIAL PROTECTION

A. Protect materials in accordance with Section 01 50 00, specific requirements of individual sections of specifications, and according to manufacturer's recommendations.

B. Provide and maintain watertight storage sheds with raised floors for storage of products that might be damaged by weather. Cement, lime, and other materials affected by moisture shall be stored on platforms.

1.11 STORAGE

A. Confine storage of products to limits designated by Owner. Do not bring products to site until needed for progress of work. Storage of products within buildings shall not exceed design capacity of structural system.

B. Owner assumes no responsibility for products stored on site. Contractor shall assume full responsibility for damage to stored products, except as covered by property insurance for the work under construction (see General and Supplementary Conditions).

C. Contractor shall allot space to subcontractors for storage of products and erection of offices and tool sheds. Locate storage buildings, temporary sheds, and stockpiles to avoid interference with new and existing facilities; move sheds, storage platforms, and materials as necessary.

D. Upon completion, restore areas disturbed by construction.

END OF SECTION

SECTION 01 71 23

FIELD ENGINEERING

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Provide field engineering service for project as indicated on Drawings and specified in this Section.

1.02 QUALIFICATIONS OF SURVEYOR OR ENGINEER

A. Florida Registered Engineer or Land Surveyor.

1.03 SURVEY REFERENCE POINTS

A. Existing basic horizontal and vertical control points are designated on Drawings. All elevations are based on the benchmarks shown on the plans. Establish all vertical and horizontal controls required for construction.

B. Locate and protect control points prior to starting site work, and preserve permanent reference points during construction.

1. Make no changes or relocations of such points without prior written notice to Engineer.

2. Report to Engineer when any reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

3. Require surveyor to replace control points which may be lost or destroyed. Establish replacements based on original survey control.

4. Engineer will identify existing control points and properly line corner stakes indicated on Drawings, as required.

1.04 PROJECT SURVEY REQUIREMENTS

A. Establish a minimum of two (2) permanent bench marks on the project site, all referenced to data established by survey control points. Record locations, with horizontal and vertical data, on Project Record Documents.

B. Establish lines and levels, locate and lay out, by instrument and similar appropriate means.

1. Site improvements.

2. Building foundation, column locations, floor levels and roof levels.

3. Controlling lines and levels required for mechanical and electrical trades.

C. Verify layouts by same methods from time to time.

1.05 RECORDS

A. Maintain a complete, accurate log of control and survey work as it progresses.

B. On completion of foundations and major site improvements, prepare a certified survey showing finished dimensions, locations, angles and elevations of construction.

1.06 SUBMITTALS

A. Submit name and address of surveyor or professional engineer to Engineer.

B. On request of Engineer, submit documentation to verify accuracy of field survey work.

C. Submit certificate signed and sealed by a State of Florida Registered Engineer or Land Surveyor certifying that elevations and locations of improvements are in conformance with Contract Documents.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 75 16

STARTUP PROCEDURES

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope of Work: Demonstrate to Owner and Engineer that the Work functions as a complete and operable system under normal and emergency operating conditions.

B. Contractor shall provide all materials, personnel, equipment and expendables as needed and as specified to perform the required startup and demonstration tests.

C. Related Work Described Elsewhere:

1. Progress Schedules: Section 01 33 00

2. Equipment:: Division 11

3. Electrical: Division 16

PART 2 – PRODUCTS

2.10 STARTUP PLAN

A. Submit for approval by the Engineer a detailed startup plan outlining the schedule and sequence of all tests and startup activities, including submittal of checkout forms, submittal of demonstration test procedures, startup, demonstration and testing, submittal of certification of completed demonstration and training. Startup and commissioning may not begin until the plan is approved by the Engineer.

PART 3 – EXECUTION

3.01 COMPONENT TEST AND CHECK-OUT

A. Startup Certification: Prior to system startup, successfully complete all the testing required of the individual components of the Work. Submit six (6) copies of Check-Out Memo for each individual component or piece of equipment, signed by the Contractor or the subcontractor and the manufacturer’s representative.

B. All copies of the Operation and Maintenance Manuals must be provided before startup may begin. These forms shall be completed and submitted before Instruction in Operation to Owner or a request for initiating any final inspections. Insert one (1) copy of this form in the applicable section of each Operation and Maintenance Manual.

C. Demonstrate to the Engineer and the Owner’s representative, that all temporary jumpers and/or bypasses have been removed and that all of the components are operating under their own controls as designated.

D. Coordinate startup activities with the Owner’s operating personnel at the treatment plant site and with the Engineer prior to commencing system startup.

3.02 STARTUP

A. Confirm that all equipment is properly energized, that the valves are set to their normal operating condition and that the flow path through the new Work is unobstructed.

B. Slowly fill each hydrostatic structure in the process flow stream with water.

C. Initiate startup and training in accordance with and with the use of the plant operation and maintenance manuals.

D. Observe the component operation and make adjustments as necessary to optimize the performance of the Work.

E. Coordinate with Owner for any adjustments desired or operational problems requiring debugging.

F. Make adjustments as necessary.

3.03 STARTUP DEMONSTRATION AND TESTING

A. After all Work components have been constructed, field tested, and started up in accordance with the individual specifications and manufacturer requirements, and after all Check-Out Forms have been completed and submitted, perform Startup Demonstration and Testing. The demonstration period shall be held upon completion of all systems at a starting date to be agreed upon in writing by the Owner or his representative. Prior to beginning the startup demonstration testing, the Contractor shall submit a detailed schedule of operational circumstances for approval by the Engineer. The schedule of operational circumstances shall describe, in detail, the proposed test procedures for each piece of equipment. Provide similar test procedure forms for each piece of equipment or section of the Work to include all particular aspects and features of that equipment or section of the Work and as specified in the Technical Sections of the Specifications.

B. The startup Demonstration Testing will be conducted for five (5) consecutive days. The Work must operate successfully during the five (5) day testing period in the manner intended. If the Work does not operate successfully, or if the startup is interrupted due to other contracts, the problems will be corrected and the test will start over from day one. The party causing the interruption will be subject to the assessment of actual damages due to delay.

C. During the startup demonstration period, operate the Work, instruct designated plant operating personnel in the function and operation of the Work, and cause various operational circumstances to occur. As a minimum, these circumstances will include average and peak daily flows, random equipment or process failures of the equipment and its relationship to other equipment. The approved schedule of operational circumstances and Demonstration Test Procedures Forms will be use as the agenda during the Startup Demonstration Testing period for all equipment and sections of the Work. Coordination of the demonstration test schedule will be accomplished through the Engineer.

D. Acceptability of the Work's performance will be based on the Work performing as specified under these actual and simulated operating conditions, to provide water treatment facilities functioning as intended and as defined in the Contract Documents. The intent of the startup demonstration and testing is for the Contractor to demonstrate to the Owner and the Engineer that the Work will function as a complete and operable system under normal, as well as emergency operating conditions, and is ready for final acceptance.

E. Demonstrate the essential features of all the mechanical systems including, but not limited to, the following as they apply to the Work. Each system shall be demonstrated once only, after completion of testing.

F. Demonstrate the essential features of all electrical and instrumentation systems including, but not limited to, the following as they apply to the work:

1. Electrical systems controls and equipment.

    a. Electrical power equipment.

b. Motor control centers.

c. Motor control devices.

d. Relays.

e. Special transformers.

f. Starting devices

2. Supervisory control and data acquisition system.

a. Computer based controls/operation.

3. Communications systems.

4. Lighting fixtures (including relamping and replacing lenses).

a. Exit and safety fixtures.

b. Fixtures, indoor and outdoor.

c. Floodlighting.

5. Panelboards.

a. Distribution panels

b. Lighting panels

c. Main panels, power panels

d. Switchboard

6. Transfer switch (manual)

7. Wiring devices

a. Face plates

b. Low-voltage controls

c. Outlets: convenience, special purpose.

d. Switches: regular, time.

G. Upon successful completion of the Startup, Demonstration and Testing, the Owner's personnel will receive the specified training for each system. Training of the Owner's personnel will not be considered valid unless it takes place using a system that has successfully passed the Startup, Demonstration and Testing.

H. Upon completion of all specified operator training, the Contractor shall submit to the Engineer six (6) copies of the Certificate of Completed Demonstration Form, for each item of equipment of system in the Work, signed by the Contractor, Subcontractor, Engineer, and the Owner. Insert one (1) copy of this form in the applicable section of each Operations and Maintenance Manual.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

1.01 SUMMARY

A. Complete closeout procedures and final submissions as listed below and as required by the other Contract Documents. Refer to General Conditions regarding Substantial Completion, final completion, and final payment.

1.02 FACILITY START-UP

A. Test equipment and operating systems at full operating conditions to insure proper operation, compliance with manufacturer's instructions, and compliance with codes and with Contract Documents.

B. Submit test reports before requesting certification of Substantial Completion.

1.03 SUBSTANTIAL COMPLETION

A. Contractor shall notify Engineer when it considers the Work (or a portion of the Work which Owner agrees to accept separately) to be substantially complete. Contractor's notice shall include a comprehensive list of items to be completed or corrected prior to final payment.

B. Upon receipt of Contractor's list, Engineer, Owner, and Contractor shall make an inspection to verify that the Work is substantially complete.

1. If Engineer considers the Work to be substantially complete, Engineer will issue a Certificate of Substantial Completion along with a "punch list" of items to be completed or corrected prior to final payment. Items on punch list shall be completed within 30 days. Required submittals (see below) shall be completed prior to or when requesting final payment.

2. If Engineer does not consider the work to be substantially complete, Engineer will inform Contractor of items that need to be completed or corrected before substantial completion. Contractor shall promptly complete these items and request a reinspection by Engineer.

1.04 FURNISHED PRODUCTS AND LOANED TOOLS

A. Prior to final payment, return all extra materials, unused parts, and equipment furnished by Owner; return loaned tools and equipment.

1.05 FINAL COMPLETION

A. Contractor shall notify Engineer when it considers all Work to be complete. Engineer, Owner, and Contractor shall make an inspection to verify that the Work is complete.

1. If Engineer considers the Work to be complete, Contractor shall submit final Application for Payment.

2. If Engineer does not consider the Work to be complete, Engineer will inform Contractor of items that need to be completed or corrected before completion. Contractor shall promptly complete these items and request a reinspection by Engineer.

B. Prime Contractor is responsible for reviewing all punch list items, including those of mechanical and electrical trades, and verifying that each item is complete before requesting final inspection.

1.06 CHARGES FOR REINSPECTIONS

A. Engineer will inspect the Work (or a portion of the Work which Owner agrees to accept separately) at substantial completion and at final completion. If the Work is not complete to the required level at either substantial completion or final completion, and a reinspection is required, Contractor shall reimburse Owner for charges of Engineer and Engineer's consultants for performing the reinspection.

END OF SECTION

DIVISION 03

CONCRETE

SECTION 03 20 00

CONCRETE REINFORCING

PART 1 GENERAL

1.01 SUMMARY

A. The work under this section includes the furnishing, fabrication, delivery and installation of all reinforcing steel including connectors, accessories and miscellaneous steel items shown on the drawings necessary to complete the work.

B. Provide concrete reinforcing as shown and as specified. Comply with applicable provisions of Divisions 00 and 01.

C. Shop Drawings: Furnish Shop Drawings for approval. Comply with ACI 315. Fabrication of parts before approval of shop drawings will be at the Contractor's risk. Shop drawings shall be submitted to the Engineer for review and approval. Make submittals in accordance with Section 01 33 00.

D. Substitutions: Make requests for substitutions of reinforcing steel and modifications to details by obvious notations of shop drawings. Do not proceed with the substitution until specified approval has been granted by the Engineer.

E. Marking: Shop mark each piece of reinforcing steel, plainly, in a protected location in accordance with reference numbers on the shop drawings.

1.02 RELATED SECTIONS

03 30 00 Concrete Work.

1.03 CODES & STANDARDS

A. Comply with the following codes and standards, except as otherwise designated:

1. ACI 315 Details and Detailing of Concrete Reinforcement.
2. ACI 318 Building Code Requirements for Structural Concrete.
3. CRSI Manual of Standard Practice.

1.04 QUALITY ASSURANCE

A. Notify Engineer 24 hours prior to concrete placement to permit review of reinforcement.

1.05 DELIVERY AND STORAGE

A. Deliver reinforcement bundled and marked using metal tags corresponding to placement diagrams. Store concrete reinforcement to prevent damage and accumulation of dirt or excessive rust.

PART 2 PRODUCTS

2.01 REINFORCING BARS

A. ASTM A615, Grade 60, deformed, new billet steel.

2.02 WELDED WIRE FABRIC (WWF)

A. ASTM A185, welded steel wire fabric.

2.03 SUPPORTS FOR REINFORCEMENT

A. Furnish bolsters, chairs, spacers, hangers, and other devices for spacing, supporting and fastening reinforcement in place. Use wire bar type supports complying with CRSI specifications, unless otherwise indicated. Do not use wood, brick, or other unacceptable materials.

B. For slabs-on-grade, use supports with sand plates or horizontal runners where wetted base materials will not support chair legs.

C. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

D. For sandblasted, bush-hammered, and tooled concrete, provide stainless steel accessories.

E. Over waterproof membranes, use precast concrete chairs or blocks to prevent penetration of membrane. Use concrete blocks with a strength equal to or greater than the concrete in which they are to be placed and have wires cast into them for fastening to the steel. Moist-cure the blocks for at least 3 days. Provide a letter stating the class of concrete used to fabricate the concrete blocks, and identifying the batch and load of concrete from which the concrete blocks were cast.

2.04 FABRICATION

A. Shop-fabricate reinforcing bars to conform to required shapes and dimensions; comply with fabrication tolerances of ACI 315. In case of fabricating errors, do not re-bend or straighten reinforcement in a manner that will injure or weaken material. Reinforcement with the following defects will not be permitted:

1. Bar exceeding specified fabrication tolerances.
2. Bend or kinks not indicated on Drawings or final shop drawings.
3. Bars with reduced cross-section due to excessive rusting or other cause.

PART 3 EXECUTION

3.01 PLACING REINFORCEMENT

A. Comply with specified codes and standards, and CRSI recommendations.

B. Clean reinforcement to remove loose rust and mill scale, earth, ice, and other materials which interfere with bond to concrete.

C. Position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing with metal chairs, runners, bolsters, spacers, and hangers, as required to carry reinforcement.

D. Provide a minimum center-to-center spacing of 2-1/2 bar diameters and a minimum clear spacing between bars 1-1/2 times maximum aggregate size. Place reinforcement to obtain minimum concrete coverages specified below.

E. Securely tie bars and bar supports together with 16 ga annealed iron wire to hold reinforcement accurately in position during concrete placement operations. Set wire ties so that ends are directed away from exposed concrete surfaces. Do not place reinforcing bars more than 2 in. beyond last leg of any continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.

3.02 PLACING FABRIC

A. Install welded wire fabric in as long lengths as practicable. Lap adjoining pieces at least one full mesh, but not less than 6 in. on side joints and 12 in. on end joints; lace splices with 16 ga annealed iron wire. Do not make end laps midway between supporting beams, or directly over beams of continuous structures. Offset end laps in adjacent widths to prevent continuous laps in either direction.

3.03 SPLICES AND TERMINATIONS

A. Comply with requirements of ACI 318, CRSI, and as shown.

B. Provide standard reinforcement splices by lapping ends, placing bars in contact, and tightly wire tying.

C. Splices and laps indicated in reinforcement for beams, columns, elevated slabs, and walls shall be 30 bar diameters minimum, unless otherwise noted. Stagger adjacent laps and splices, unless otherwise shown.

D. Horizontal reinforcement in footings, foundations and walls at corners and intersections shall be made continuous using corner bars or "L" dowels of same diameter; lap 30 bar diameters, unless otherwise shown.

E. Splices not shown on Drawings or shop drawings shall be determined on basis of safe bond stress and stress in reinforcement; splices shall not be less than 24 bar diameters and minimum 12 in. length.

F. Terminate horizontal reinforcement in beams, elevated slabs and walls with a standard hook, unless otherwise shown.

G. Rebar splicing devices and anchorage systems, such as inserts in lieu of continuous bars to facilitate gang forming, will be allowed provided strength capacities are equal to rebar they replace. Submit details for approval before installation.

3.04 CONCRETE COVER

A. Provide the following minimum concrete cover over steel reinforcement, unless otherwise shown:

Footings:	3"
Foundation walls:	2"
Walls exposed to earth:	2"
Walls to dry interior spaces:	1"
Beams, interior:	1-1/2"
Columns, interior:	1-1/2"
Slabs, surfaces exposed to dry interior spaces:	3/4"
Slabs exposed to water and wastewater:	2"

END OF SECTION

SECTION 03 21 00

REINFORCING STEEL

PART 1 GENERAL

1.01 SUMMARY

A. The work under this section includes the furnishing, fabrication, delivery and installation of all reinforcing steel including connectors, accessories and miscellaneous steel items shown on the drawings and necessary to complete the work.

B. Furnish and place in concrete masonry reinforcing steel of the quality, type, size, and quantity designated.

C. Shop Drawings: Furnish Shop Drawings for approval. Fabrication of parts before approval of shop drawings will be at the Contractor's risk. Shop drawings shall be submitted to the Engineer for review and approval.

D. Substitutions: Make requests for substitutions of reinforcing steel and modifications to details by obvious notations of shop drawings. Do not proceed with the substitution until specified approval has been granted by the Engineer.

E. Marking: Shop mark each piece of reinforcing steel, plainly, in a protected location in accordance with reference numbers on the shop drawings.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials shall meet the requirements in accordance with ASTM A 615, latest edition/revision. Reinforcing Steel shall be grade 60.

B. Protection of Material: Store steel reinforcement above the surface of the ground, upon platforms, skids, or other supports, and protect it as far as practicable from mechanical injury and surface deterioration caused by exposure to conditions producing rust. When placing steel reinforcement in the work, ensure that the steel reinforcement is free from loose rust, scale, dirt, paint, oil, and other foreign material.

C. Wire for Tying: For tying reinforcing steel, use soft pliable wire, that readily bends and twists without breaking and that provides a tie of sufficient strength to hold the reinforcing steel in its proper position.

PART 3 EXECUTION

3.01 FABRICATION

A. Fabricate reinforcing bars as prescribed in the CRSI Manual of Standard Practice. Bend the reinforcement cold to the shapes indicated in the plans. Perform bending in the shop before shipment, and not in the field unless shown otherwise in the Contract Documents. Do not bend or straighten, weld, or thermal cut reinforcing steel unless otherwise specified in the Contract Documents.

3.02 INSTALLATION

A. Use precast concrete blocks to space and support the reinforcing steel. Use concrete blocks with a strength equal to or greater than the concrete in which they are to be placed and have

wires cast into them for fastening to the steel. Moist-cure the blocks for at least 3 days. Provide a letter stating the class of concrete used to fabricate the concrete blocks, and identifying the batch and load of concrete from which the concrete blocks were cast.

B. Splices: Where splices are authorized, rigidly clamp the bars or tie them in a manner meeting the Engineer's approval. Use the splice length as shown on the plans. The Contractor may submit additional splices the Speciality Engineer recommends for approval prior to use. Do not use welded splices except specifically authorized by the Engineer and, when authorized, meet the requirememtns of AWS D 1.4, "Structural Welding Code – Reinforcing Steel". Use mechanical couplers or splice devices which develop at least 125% of the specified yield strength of the bar being spliced.

C. Bar Spacing – General: Except otherwise specified herein, ensure that each bar is within 1 inch of the plan position.

D. Concrete Blocks for Spacing: Use precast concrete blocks to space and support the reinforcing steel. Use concrete blocks with a strength equal to or greater than the concrete in which they are to be placed and have wires cast into them for fastening to the steel. Moist-cure the blocks for at least 3 days. Provide a letter stating the class of concrete used to fabricate the concrete blocks, and identifying the batch and load of concrete from which the concrete blocks were cast.

E. Dowel Bars for Walls:

1. Supports and Positioning: Position dowel bars projecting into walls so as to allow splicing of the vertical wall bars to the dowels and to tie the dowel bars in their plan position. Support the dowel bars by a rigid template constructed across the top, and attach them to the template in such manner that placing the concrete does not disturb their position. Set the supports prior to the pouring of concrete, and do not push dowel bars into the wet concrete after placing the concrete.

2. Tolerances: Place the dowels within 1/2 inch of their plan position and with a side clearance tolerance not exceeding 1/4 inch.

F. Wall Steel (Not Including Dowel Bars):

1. Supports: Space-off wall steel from the side forms by concrete blocks of dimensions not greater than 2 by 2 inches by clearance dimensions. Fix the spacing between wall mats by means satisfactory to the Engineer.

2. Tolerance: Except where it is necessary in order to clear a fixture, place each bar within 1 inch of its specified position. In any case, ensure that the number of bars in any affected unit is as specified, and place the remainder of the bars (not thus affected) within the specified 1 inch tolerance.

3. Tying: Tie wall steel with a cross tie or "figure 8" tie. On the periphery, tie the steel at each intersection. Within the mat, the steel at every third intersection, except that where the wall is of such size that it is necessary that workmen use the reinforcing as a ladder, the Engineer may require tying at every other intersection , or at every intersection, as he deems necessary.

G. Deck Slabs:

1. Supports: (a) Bottom Mats: In general, support the bottom mats of steel by one row of slab blosters placed 6 inches from the edge of the slab and by two rows down each panel. Do not allow the spacing between rows to exceed 4 feet, measured center to center. As an exception, when deemed satisfactory by the Engineer, the Contractor may use concrete blocks in lieu of slab bolsters. Use blocks 2 by 2 inches by clearance dimensions. Space concrete blocks 4 feet on center as a maximum. If at

any time, however, the Engineer judges that the concrete blocks do not provide the proper support, he may require using slab bolsters. (b) Top Mats: Support the top mats of steel by either continuous high chairs or individual high chairs. Place the outside row of high chairs 6 inches from the edge of the slab. If using individual high chairs, space them transversely, as specified for the continuous high chair, and do not allow the longitudinal spacing to be greater than 4 feet.

2. Tolerances: Ensure that top and bottom clearances are within 1/4 inch from those shown on the plans. Ensure that end and edge clearances are within 1/4 inch from those shown on the plans. Ensure that end and edge clearances are within 1/4 inch of the clearance specified.

3. Tying: Tie all steel in each layer with a double-strand single tie at every intersection on the periphery and at every third intersection in the interior area. If encountering difficulty in maintaining the reinforcing steel in position during the placing of concrete, tie additional intersections as necessary to hold the reinforcing steel secure.

H. Cleaning: Before placing any concrete, clean all mortar from the reinforcement.

I. Chairs and Bolsters:

1. General: Provide reinforcing steel bar supports manufactured in accordance with all requirements of the CRSI Manual of Standard Practice. Use chairs and bolsters of adequate strength to withstand a 300 pound concentrated load without permanent deformation of breakage, with the deformation under a 300 pound load being less than 5% of the support height. Ensure that no more than 5% of the reinforcing steel var supports exhibit unsatisfactory performance, breakage, or permanent deformation during rebar tying and/or concrete placement operations. If a bar support does not achieve this level of performance, reduce the average spacing between bar supports by 15%, or remove that product from use on the job. Ensure that bar supports, both chair and bolster, do not move during concrete placing operations. To prevent movement, tie supports to the reinforcing steel. When using bar supports on corrugated metail stay-in-place forms, use supports specifically designed for form being used. For structural elements located in extremely aggressive environments, do not use metal chairs and bolsters in contact with forms or floor surfaces to support reinforcing steel.

2. Metal Chairs and Bolsters: For metal bar supports in contact with steel stay-in-place forms and metal bar supports in contact with boundary surfaces of concrete to be cast, provide supports constructed with molded plastic legs or plastic protected steel legs. Do not allow any portion of the bar support other than the molded plastic leg or plastic protected portion of the steel leg to be closer than 1/2 inch from the boundary surface of concrete to be cast. Certify that all metal bar supports meet the following requirements:

(a) That they are manufactured from cold drawn steel wire in accordance with the wire sizes and geometrical dimensions shown in the CRSI Manual of Standard Practice, Chapter 3, Table II.

(b) That the plastic used for protection of the steel legs has a thickness of 3/32 inch or greater at points of contact within the form work.

Provide plastic protection by a dipping operation, by adding premolded plastic tips to the legs of the support or by molding plastic to the top wire of the support. Ensure that the plastic material used for protection of steel legs does not chip, crack, deform, or peel under ordinary job conditions. Provide molded plastic legs that have sufficient strength to carry the weight of the supported reinforcing steel in its required position without deformation and relaxation under job conditions.

3. Plastic Chairs and Bolsters: Use chair and bolsters comprised of either reinforced or non-reinforced virgin or recycled plastic, able to meet the concentrated load requirements within a working temperature range of 20° F to 150° F, and have a maximum water absorption rate of 0.5%, as per ASTM D 570. Protect plastic rebar chairs from exposure to sunlight until placed in the form. Mold plastic rebar supports in a configuration which does not restrict concrete flow and consolidation around and under the rebar support. Do not use continuous legs or rails on concrete surfaces. Due to the wide range of applications and heights, ensure that the manufacturer additionally certifies all plastic chair and/or bolster systems for 2 inch, 3 inch, 4 inch and 4 1/2 inch heights. Provide each individual bar support with an identification number unique to the particular model permanently marked on the surface.

END OF SECTION

SECTION 03 30 00

CONCRETE WORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Formwork for structural concrete.

B. Reinforcing.

C. Cast-in-place concrete.

1.2 SYSTEM DESCRIPTION

A. Design/Performance Requirements: Design, engineering and construction of formwork and shoring is responsibility of the Contractor.

1. Design formwork with sufficient strength to withstand forces due to placement and vibration and sufficient rigidity to maintain specified tolerances.
2. Design loads, lateral pressure, and allowable stresses in accordance with ACI 347.

1.3 SUBMITTALS

A. Product Data: Manufacturers data and application and installation recommendations for admixtures, curing compounds, and others as requested.

B. Mix Designs: 4 copies of each mix design required. Include specific admixture names and proportions for each mix design.

PART 2 – PRODUCTS

2.1 FORM MATERIALS

A. Structural Concrete Forms for Foundations, Beams, Columns and Slabs: New or properly reconditioned plywood material designed to conform to requirements of ACI Special Publication No. 4 to support wet concrete without deflection; PS-1 B-B plywood; Class 1; EXT-APA; sanded; mill oiled; and edge sealed.

B. Structural Concrete Forms for Joists: New or properly reconditioned removable 18 gage steel or fiberglass pan forms with tapered end closures.

C. Form Coatings: Colorless commercial formulation form release and sealer compounds that will not bond with stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

D. Form Ties: Adjustable length, removable or snapoff metal form ties, 1-1/2 in. break back, and maximum hole left 1-1/4 in. diameter.

E. Bevels and Rustications: Wood strips milled to shapes indicated or formed rigid plastic strips.

F. Construction Joints: 24 ga. galvanized steel keyway form type with knockout holes spaced 6 in. on center to receive doweling.

G. Waterstops: Centerbulb serrated type, 6 in. x 3/8 in. size, Polyvinyl Chloride, Corps of Engineers CRD-C 572.

H. Joint Fillers: Premolded mastic strips, asphalt impregnated, ASTM D1751

I. Fasteners and Anchorages: Nails, spikes, bolts, lag bolts, and other types sized as required to maintain formwork in place.

2.2 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed, except that stirrups, ties and dowels may be Grade 40.

B. Galvanized Reinforcing Bars: ASTM A 767, Class II (2.0 ox. zinc psf) hot-dip galvanized, after fabrication and bending.

C. Epoxy Coated Reinforcing Bars: ASTM A 775.

D. Steel Wire: ASTM A 82, plain, cold-drawn steel.

E. Welded Wire Fabric: ASTM A 185; welded.

F. Welded Deformed Steel Wire Fabric: ASTM A 497.

G. Supports for Reinforcement: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place.

H. Tie Wire: 16 ga. annealed.

I. Headed Stud Anchor: ASTM A 108, min. tensile strength 60,000 psi, min. elongation 20 percent in 2 inches.

J. Welding Electrodes: AWS AB.1, Series E70.

K. Fabricate reinforcing in accordance with ACI 315.

2.3 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type III with max. 8 percent tricalcium aluminate. Use one brand of cement throughout project.

B. Fly Ash: ASTM C 618, Type F, except that the maximum allowable loss on ignition shall be 2.5 percent and a maximum of 24 plus or minus 2 percent may be retained on a no. 325 sieve. Use one source of fly ash throughout project. Add with cement.

C. Aggregates:

1. Coarse: ASTM C 33, clean, washed, sound and crushed, from a single source for exposed concrete. Use largest size practicable for each condition except do not exceed the following:

   a. 1/5 the narrowest dimension between forms.
   b. 3/4 of the minimum clear spacing between reinforcing bars.
   c. 1/3 the thickness of slabs.

2. Fine: ASTM C 33, clean, washed sand, sound and uncoated grains.

3. Local aggregates not complying with ASTM C 33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to Architect/Engineer.

D. Water: Drinkable.

E. Air-Entraining Admixture: ASTM C 260. Source Products/Mfgs.:

1. Sika Aer/Sika Corp.
2. MB-VR/Master Builders.
3. Darex AEA/W.R. Grace.
4. Protex/Protex Industries, Inc.

F. Water-Reducing Admixture: ASTM C 494, Type A, and containing not more than 0.1 percent chloride ions. Source Products/Mfgs.:

1. Darex WRDA/W.R. Grace.
2. Eucon WR-75/Euclid Chemical Co.
3. Pozzolith 200N/Master Builders.
4. Plastocrete 160/Sika Chemical Corp.

G. Water-Reducing, Non-Chloride Accelerator Admixture: ASTM C 494, Type E, and containing not more than 0.1 percent chloride ions. Source Products/Mfgs. include:

1. Darex Set Accelerator/W.R. Grace.
2. Accelguard 80/Euclid Chemical Co.

H. Water Reducing, Retarding Admixture: ASTM C 494, Type D, and containing not more than 0.1 percent chloride ions. Source Products/Mfgs.:

1. Pozzolith 100XR/Master Builders.
2. Eucon Retarder 75/Euclid Chemical Co.
3. Daratard 17/W.R. Grace.
4. Plastiment/Sika Chemical Co.

2.4 RELATED MATERIALS

A. Vapor Barrier: Water vapor barrier ASTM E 1745, Class C. Minimum permeance ASTM E-96, 0.04 perms. Thickness, ACI 302.1R-96 not less than 10 mils. Available Product: Subject to compliance with requirements includes but is not limited to the following:

1. Griffolyn T-85 by Reef Industries, Inc.
2. Dura-Skrim D16 WB by Raven Industries.
3. Stego Wrap Vapor Barrier by Stego Industries LLC.

B. Non-Shrink Grout: CRD-C 621, non-metallic factory pre-mixed grout, minimum compressive strength of 2400 psi in 2 days and 7000 psi in 28 days. Source Products/Mfgs.:

1. Masterflow 713/Master Builders.
2. Euco-NS/Euclid Chemical Co.
3. Five Star Grout/U.S. Grout Corp.

C. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.

D. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.

1. Waterproof paper.
2. Polyethylene film.
3. Polyethylene-coated burlap.

E. Liquid Membrane Forming Curing Compound: ASTM C 309, Type 1-D, Class A. Moisture loss not more than 0.055 gr./sq. cm. when applied at 200 sq. ft./gal. Source Products/Mfgs.:

1. Masterseal/Master Builders.
2. Kure-N-Seal/Sonneborn-Rexnord.
3. L&M Cure/L & M Construction Chemicals.

F. Bonding Compound: Acrylic or Styrene Butadiene base. Source Products/Mfgs.:

1. Everbond/L & M Construction Chemicals.
2. Sonocrete/Sonneborn-Rexnord.
3. Acrylic Bondcrete/The Burke Co.
4. Daraweld C/W.R. Grace.

G. Epoxy Adhesive: ASTM C 881, 2 component material suitable for use on dry or damp surfaces. Provide material Type, Grade, and Class to suit project requirements. Source Products/Mfgs.:

1. Thiopoxy/W.R. Grace.
2. Sikadur Hi-Mod/Sika Chemical Corp.
3. Euco Epoxy 452 or 620/Euclid Chemical Co.
4. Patch and Bond Epoxy/The Burke Co.

2.5 PROPORTIONING AND DESIGN OF MIXES

A. Contractor shall provide and pay for Testing Laboratory services for preparation of design mixes for each type and strength of concrete by either laboratory trial batch or past field experience methods as specified in ACI 301.

1. Proportion materials as specified in ACI 211.1, except as modified herein.
2. Fly Ash: Maximum 15 percent by weight of total cementitious material of mix.

B. Schedule of Concrete Types: Provide mix designs for the compressive strength scheduled with the following minimum properties:

Minimum 28 day Compressive Strength (f'c) (psi)	Maximum Water-Cement Ratio by Weight (lb/lb)	Minimum Cement Content (lbs/Cubic Yard)
4000	0.45	564
3000	0.50	470
2500	0.55	423
2000	0.65	376

1. Introduce admixtures in quantities and according to methods recommended by the admixture manufacturer. Do not use calcium chloride.
2. Use 4000 psi for reuse pumping station slab.

C. Air Entrainment: Provide concrete with total air content as follows, and as measured in accordance with ASTM C 231:

Nominal maximum size of coarse aggregate, in.	Total air content percentage by volume
3/8	6 to 10
1/2	5 to 9
3/4	4 to 8
1	3.5 to 6.5
1-1/2	3 to 6

D. Slump Limits: Concrete, when placed at the forms, shall have a slump within the following limits as measured in accordance with ASTM C 143.

1. Minimum slump of one in.
2. Tolerance of plus or minus one in.
3. Mass concrete: 2 in.
4. Reinforced concrete: 3 in.

2.6 CONCRETE MIXING

A. Provide batch ticket for each batch discharged and used in work.

B. Ready-Mix Concrete: Comply with requirements of ASTM C 94, and as herein specified.

1. Mix concrete minimum 10 minutes, 5 minutes of which is at job site, after last addition of water.
2. Do not retemper concrete in truck. Do not use concrete which has been in truck for more than 1-1/2 hours after addition of water, or concrete which has become harsh or nonplastic.
3. Do not add water to concrete at site.

C. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Coordinate and examine formwork, reinforcing steel, embed inserts, sleeves, joint materials and vapor retarder for proper installation.

B. Do not proceed until unsatisfactory work has been corrected.

3.2 INSTALLATION

A. Design, erect, support, brace, and maintain formwork to support vertical and lateral, static, and dynamic loads that might be applied until such loads can be supported by concrete structure.

1. Allowable tolerances for Structural Concrete Forms shall comply with ACI 301 and 347; camber in slabs and beams shall comply with ACI 301.
2. Locate and install formed construction joints as shown or, if not indicated, locate so as not to impair strength and appearance of the structure, and as approved by the Architect/Engineer.
3. Provide keyways at least 1-1/2 in. deep in construction joints in walls, slabs, and between walls and footings; accepted bulkheads designed for this purpose may be used for slabs.

B. Space shoring in such a manner that no member will be excessively loaded or will induce stress in concrete members. Extend shores beyond minimums to ensure proper distribution of loads throughout structure.

C. Comply with CRSI Manual of Standard Practice, ACI 315, and ACI 318 for details and methods of reinforcement, placement, and supports.

1. Clean reinforcement of loose rust and mill scale, earth, and other materials which

reduce or destroy bond with concrete.

2. Where conduit, piping, inserts, and other penetrations or sleeves interfere with the placing of reinforcing steel, notify Architect/Engineer and obtain directions for relocating prior to pouring concrete.

D. Concrete Placement:

1. Moisten wood forms immediately before placing concrete where form coatings are not used.
2. Comply with ACI 304, Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete, and as herein specified.
3. Deposit concrete in forms in horizontal layers not deeper than 24 in.; place each layer while preceding layer is still plastic to avoid cold joints.
4. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping in accordance with ACI 309.
5. Do not use vibrators to transport concrete inside forms. Do not insert vibrators into lower layers of concrete that have begun to set.
6. Deposit and consolidate concrete slabs in a continuous operation within limits of construction joints.
7. Bring slab surfaces to correct level with straightedge and strikeoff. Do not disturb slab surfaces prior to beginning finishing operations.
8. Maintain reinforcing, inserts, embeds, and joints in proper position during concrete placement operations.

E. Reinforcement Concrete Coverage:

1. Concrete cast against and permanently exposed to earth: 3 in.
2. Concrete exposed to a saltwater environment: 3 in.
3. Concrete exposed to earth or weather: 2 in.
4. Slabs, walls and joists not exposed to weather or in contact with ground: 1-1/2 in.
5. Beams and columns not exposed to weather or in contact with ground - primary reinforcement, ties, stirrups, and spirals: 1-1/2 in.

F. In the event of rain during concrete placement, terminate pour as soon as practicable at a point approved by the Architect/Engineer and protect freshly placed concrete with a waterproof covering that will prevent marring or damage of surfaces.

G. Contraction (Control) Joints in Slabs-on-Ground: Saw cut 1/8 in. x 1/4 slab depth as soon as possible after slab finishing. If joint pattern not shown, provide joints not exceeding 20 ft. o.c. each way.

H. Hot Weather Placing: Comply with ACI 305 and as herein specified.

1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg. F.
2. Fog spray forms, reinforcing steel, and subgrade just before concrete is placed.
3. Use approved water-reducing retarding admixture when required by high temperatures, low humidity, or other adverse placing conditions.

3.3 REMOVAL OF FORMS AND SHORING

A. Remove formwork and shoring progressively and in accordance with ACI 301 and ACI 347 so that no unbalanced loads are imposed on the structure. Notify Architect/Engineer when formwork removal is scheduled to begin.

B. Do not remove shoring and formwork until members have acquired strength required to support their own weight plus imposed loads and the concrete has attained 75 percent of required 28 day compressive strength. Reshore structural members as original shores are removed.

C. Formwork not directly supporting weight of concrete, may be removed after 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and providing curing and protection operations are maintained.

D. In the event the Contractor wishes to remove formwork at an earlier time than specified, the Contractor shall pay for and have testing laboratory obtain 2 additional concrete test cylinders to confirm strength requirement for early form recovery.

3.4 FINISH OF FORMED SURFACES

A. Repair of tie holes and deep depressions:

1. Flush with clean water and tamp to overfill with cement drypack mix.
2. Cure as specified for concrete and grind flush with adjacent surface.

B. Repair of Rock Pockets, Honeycomb, and Sand Streaks:

1. Cut and remove concrete to at least one in. deep with sides perpendicular to surface.
2. Flush with clean water, coat with Neat cement paste, then fill with cement drypack mix in at least 2 layers to overfill.
3. Cure as specified for concrete and grind smooth and flush with adjacent surfaces.

C. As Cast Finish: For formed concrete surfaces not exposed-to-view in the finish work.

1. Repair and patch tie holes and defective areas and rub down or chip off fins and other projections exceeding 1/4 in. in height.
2. Fill and patch bug holes one in. and larger.

3.5 MONOLITHIC SLAB FINISHES

A. Apply slab finishes in accordance with ACI 301.

1. Screed surfaces to proper elevations and profiles indicated before bleedwater accumulates on surface.
2. Begin finish procedures as soon as bleedwater disappears from surfaces.

3. Slope surfaces uniformly to drains where required.

B. Float Finish: Apply to surfaces to receive trowel finish, membrane or elastic waterproofing.

1. Power float to a true plane within 1/4 in. in 10 ft. - Class B tolerance.
2. Hand float if area is small or inaccessible to power units.
3. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

C. Trowel Finish: Apply to surfaces to be exposed-to-view, and slab surfaces to be covered with paint or other thin film finish coating system.

1. Power trowel to a true plane within 1/8 in. in 10 ft. - Class A tolerance.
2. Begin final troweling when surface produces a ringing sound then consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance
3. Grind smooth surface defects which would telegraph through applied floor covering system.

D. Light Broom Finish: Apply to exterior concrete platforms, steps, and ramps, walks, and other pedestrian traffic areas. Apply float finish, then immediately slightly roughen concrete surface by brooming with soft fiber bristle broom perpendicular to main traffic route.

E. Heavy Broom Finish: Apply to paving slabs, and toppings in vehicular traffic areas. Apply as specified for light broom finish except use a stiff fiber bristle broom to produce heavier texture.

3.6 CONCRETE CURING AND PROTECTION

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Begin curing procedures before concrete has dried and continue for at least 7 days in accordance with ACI 301 procedures.

1. Cure high early strength concrete for at least 3 days.
2. Extend specified curing time if 7 days compressive strength tests indicate that 28 day compressive strength will be less than 90 percent of specified strength.

C. Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture retaining cover curing, and by combinations thereof, as herein specified.

1. Provide moist curing by one of the following methods.

a. Maintain surface continuously wet by covering with water or sprinklering.
b. Continuous water fog spray.
c. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet.

2. Provide moisture cover curing as follows:
    a. Cover surface with moisture retaining cover lapped at least 12 in. and sealed by waterproof tape or adhesive.
    b. Wet entire surface thoroughly with fine spray of water.

3. Provide curing/sealing compound on exterior slabs, walks, etc as follows:

    a. Apply to concrete slabs as soon as final finishing operations are complete in continuous operation by power spray or roller in accordance with manufacturer's directions.
    b. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete.
    c. Apply a second coat over areas scheduled to receive a sealer/dustproofer finish.

D. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs, and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above.

E. Curing Unformed Surfaces: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method, except cure surfaces to receive liquid floor hardener or finish flooring by use of moisture retaining cover.

3.7 FIELD QUALITY CONTROL

A. The Contractor shall employ a testing laboratory to perform tests and to submit test reports, except as designated otherwise.

B. Sampling Fresh Concrete: ASTM C 172, except modified for slump to comply with ASTM C 94.

1. Slump: ASTM C 143; one test at point of discharge for each set of compression cylinders taken; additional tests when concrete consistency appears to have changed. In addition, Contractor shall perform one test on each truck load of concrete delivered to the site.
2. Air Content: ASTM C 231 pressure method for normal weight concrete; one for each set of compression cylinders taken.
3. Molded Concrete Compression Cylinders: Sample in accordance with ASTM C 172, process and cure in accordance with ASTM C 31, and prepare and test in accordance with ASTM C 39.
    a. Obtain one set of 5 cylinders for each 50 cu. yd., or fraction thereof, for each day's placement of each mix design.
    b. Test 2 cylinders at age 3 days or 7 days, as required by job conditions, and 2 cylinders for one valid strength test at 28 days.
    c. Cure and hold fifth cylinder for testing at 42 days if 28 day test indicates deficient results, or as a spare in case of cylinder damage.

END OF SECTION

DIVISION 05

METALS

SECTION 05 50 00

METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY

A. Provide metal fabrications (except structural steel framing) as shown and as specified. Comply with applicable provisions of Divisions 00 and 01.

1.02 COORDINATION

A. Furnish inserts and anchoring devices to be embedded in concrete or masonry for installation of miscellaneous metal work. Provide setting drawings, templates, and instructions for installation of anchorage devices. Coordinate delivery with related work to avoid delays.

B. See concrete and masonry sections for installation of inserts and anchors.

1.03 SUBMITTALS

A. Shop Drawings: Submit shop drawings for fabrication and erection of miscellaneous metal assemblies. Include product data, load tables, layouts, elevations, details of sections, connections, anchorage and accessory items. Provide templates for anchors and bolts installed under other sections.

B. Make submittals in accordance with Section 01 33 00.

1.04 FIELD MEASUREMENTS

A. Take measurements prior to shop fabrication. Allow for trimming and fitting to make field adjustments. Correct defects resulting from failure to take proper measurements.

PART 2 PRODUCTS

2.01 STEEL

A. Shapes, Plates, and Bars: ASTM A36.

B. Sheet: ASTM A1011, Grade 30.

C. Tubing: ASTM A500, Grade B, cold-formed steel tubing.

D. Pipe: ASTM A53, standard weight (Sch. 40) unless otherwise indicated.

2.02 STAINLESS STEEL

A. Sheet, Strip, and Plate: ASTM A240 or ASTM A666, Type 304 or Type 316.

B. Bars and Shapes: ASTM A276, Type 304 or Type 316.

C. Tubing: ASTM A554, Grade MT304 or Grade MT316.

D. Pipe: ASTM A312, Grade TP304 or Grade TP316.

2.03 ALUMINUM

A. Plate and Sheet: ASTM B209, Alloy 6061-T6.

B. Extrusions: ASTM B221, Alloy 6063-T6.

2.04 CASTINGS

A. Gray Iron Castings: ASTM A48, Class 30.

B. Malleable Iron Castings: ASTM A47.

2.05 INSERTS AND ANCHORS

A. Inserts: Concrete inserts shall be threaded or wedge type, galvanized castings of malleable iron, ASTM A47, or cast steel, ASTM A27. Provide hot-dip galvanized bolts, washers and shims.

B. Anchors: Concrete and masonry anchors shall be expansion type, FS FF-S-325, minimum 1500 lb pullout, unless otherwise indicated; Hilti, ITW Ramset/Red Head, Simpson Strong-Tie, Wej-it, or approved equal.

2.06 FASTENERS

A. Unfinished Steel: Unfinished bolts, nuts and washers shall conform to ASTM A307, Grade A. Unfinished high-strength bolts, nuts and washers shall conform to ASTM A325, Type 1.

B. Galvanized Steel: When galvanized or zinc-coated fasteners are specified, zinc coating shall comply with ASTM A153; except fasteners 1/2 in. or less in diameter may be coated with electrodeposited zinc or cadmium, ASTM B633.

C. Stainless Steel: When stainless steel fasteners are specified, bolts shall comply with ASTM F593, and nuts shall comply with ASTM F594; Alloy Group 1 or Alloy Group 2.

D. Furnish fasteners of compatible materials and matching finish.

2.07 PRIMER

A. Rust-inhibitive, lead and chromate free, alkyd or modified alkyd primer, unless otherwise designated in Section 09 90 00. Primer shall be compatible with finish coats specified.

2.08 GALVANIZING REPAIR PAINT

A. High zinc-dust content paint for regalvanizing welds in galvanized steel, complying with SSPC-Paint 20.

2.09 FABRICATION

A. Use materials of designated type, size, and thickness or, if not shown, of required strength, stiffness, and durability. Work to field measurements and shop drawings, using proven details of fabrication and support. Miscellaneous framing and support members shall comply with AISC Specification.

B. Where exposed to view, use materials that are smooth and free of surface blemishes such as pitting, seam marks, roller marks, rolled trade names, and roughness.

C. Form work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32 in. unless otherwise shown. Form

bent-metal corners to smallest radius possible without causing grain separation or other impairment. Shearings and punchings shall be clean and true.

D. Weld corners and seams continuously; comply with AWS recommendations. Grind exposed welds smooth and flush; match and blend with adjoining surfaces. Weld discoloration of exposed surfaces is not acceptable.

E. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type shown or, if not shown, Phillips flathead (countersunk) screws or bolts.

F. Provide anchorage devices and fasteners for securing miscellaneous metal items to in-place construction, including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required. Cut, reinforce, drill, and tap miscellaneous metal work as required to receive hardware and connections required by other trades.

G. Preassemble and fit items to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly identify units for reassembly and installation.

2.10 SHOP PAINTING

A. Shop prime ferrous metal work in accordance with Section 09 90 00, except portions of members to be embedded in concrete, surfaces and edges to be field welded, and galvanized surfaces, unless otherwise designated. Prime contact surfaces between dissimilar metals. Coat aluminum in contact with concrete, masonry, and treated wood with primer or bituminous paint.

B. Prepare steel surfaces exposed to exterior and wet environments by commercial blast cleaning (SSPC SP-6), unless otherwise designated in Section 09 90 00. Prepare all other ferrous metal surfaces by removing scale, loose rust and other deleterious materials by power tool (SSPC SP-3) or commercial blast cleaning (SSPC SP-6). Remove oil, grease, and contaminants by solvent cleaning (SSPC SP-1).

C. Immediately after surface preparation, apply primer at 2.0 mils dry film thickness in accordance with manufacturer's instructions. Fully cover joints, corners, edges, and exposed surfaces. Apply a second coat of primer (tinted) to surfaces that will be inaccessible after assembly or erection.

2.11 GALVANIZING

A. Galvanize designated items in accordance with ASTM A153 for iron and steel hardware and ASTM A123 for iron and steel products.

B. Galvanize after fabrication where practicable.

2.12 STAINLESS-STEEL FINISHES

A. Remove tool and die marks and stretch lines or blend into finish.

B. Provide dull satin finish No. 6, unless otherwise indicated.

C. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

2.13 ALUMINUM FINISHES

A. Provide mill finish unless anodic finish or other coating is designated.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install anchorage devices and fasteners for adequate support. Perform cutting, drilling, and fitting, as required. Set work accurately in location, alignment, and elevation, plumb, level, true, and free of rack, measured from established lines. Provide temporary bracing or anchors in formwork for items to be built into concrete, masonry, or similar construction.

B. Fit exposed connections to form tight hairline joints. Field weld connections which cannot be shop welded because of shipping size limitations. Comply with AWS Code for manual shielded metal-arc welding, appearance and quality of welds, and methods for correcting welding work. Grind exposed joints smooth and touch-up with shop primer. Do not weld, cut, or abrade surfaces of exterior units which have been hot-dip galvanized after fabrication and are intended for bolted or screwed field connections.

3.02 TOUCH-UP PAINTING

A. Immediately after erection, clean field welds, fasteners, and abraded areas; apply field primer by brush or spray to provide a minimum dry film thickness of 2.0 mils. Repair damage to galvanized surfaces in accordance with ASTM A780.

B. Provide finish paint in accordance with Section 09 90 00.

END OF SECTION

DIVISION 11

EQUIPMENT

SECTION 11 05 00

BASIC EQUIPMENT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Basic requirements for mechanical installations including requirements common to more that one section of Division 11. Comply with applicable provisions of Div. 00 and 01.

1.02 RELATED SECTIONS

03 30 00 - Concrete Work
33 35 10 - Piping
46 13 13 - Non-Clog Centrifugal Pumps

1.03 PIPE LOCATION

A. Exterior pipelines will be located substantially as indicated on the drawings, but the right is reserved to the Owner acting through the Engineer, to make such modifications in location as may be determined by field conditions. Where fittings, etc., are noted on the drawings, such notation is for the Contractor's convenience and does not relieve him from laying and jointing different or additional items where required without additional compensation.

B. All piping shown on the drawings, not tied down by dimension, is indicated diagrammatically and exact location shall be determined from approved shop drawings. Piping shall be arranged in a neat, compact, and workmanlike manner with a minimum of crossing and interlacing and, in general, without diagonal runs.

C. Small interior piping, generally less than 2" in diameter, is indicated diagrammatically on the drawings and the exact location is to be determined in the field. Piping shall be arranged in a neat, compact, and workmanlike manner, with a minimum of crossing and interlacing, and In general, without diagonal runs.

1.04 BOLTS, ANCHOR BOLTS, AND NUTS

A. All anchor bolts, anchor bolt templates, and location drawings required for the installation of the equipment, support columns, and for all other equipment or machinery included under this Contract shall be furnished by the Contractor. Anchor bolts, sleeves, and inserts shall be set in place in forms and cast in the concrete by the General Contractor. It shall be the responsibility of the Contractor to obtain such anchor bolts, templates, and approved location drawings in proper time to avoid delay, and It shall be his further responsibility to check and approve the location and setting of the anchor bolts, sleeves, and inserts prior to the casting of the concrete. Parts of anchors of metal work that are not built into masonry and concrete shall be coated with approved red lead paint. Anchor bolts for column base plates and other structural elements shall be of galvanized steel unless indicated otherwise; anchor bolts for drives, motors, fans, blowers, and other mechanical equipment shall be of 304 stainless steel or high strength bronze. Anchor bolts shall be of ample size and shall be provided with hexagonal nuts of the same quality of metal as the bolts. All threads shall be clean cut and of United States Standard sizes. All anchor bolts and nuts for anchoring equipment exposed to sewage shall be 316 stainless steel.

B. Expansion bolts shall have malleable iron and lead composition elements of the required number of units and size. Expansion bolts, if called for on the drawings, shall be furnished and installed by the Contractor. All expansion bolts exposed to sewage shall be 316 stainless steel.

C. Unless specified otherwise, stud, tap, and machine bolts shall be of the best quality refined bar iron. Hexagonal nuts of the same quality of metal as the bolts shall be used. All threads shall be clean cut and shall conform to ANSI Standard B1.1 latest for "Unified and American Screw Threads for Screws, Bolts, Nuts, and Other Threaded parts". All bolts exposed to sewage shall be 316 stainless steel.

D. Bolts, anchor bolts, nuts, and washers not specified to be stainless steel shall be zinc-coated by the hot-dip process, after being threaded, in conformity with the ASTM Standard Specification for "Zinc (Hot Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip", Designation A 123 latest, or the ASTM Standard Specification for "Zinc Coating (Hot-Dip) on Iron and Steel Hardware", Designation A 153 latest, as is appropriate.

E. Anchor bolts and expansion bolts shall be set accurately. Anchor bolts which are set before the concrete has been placed shall be carefully held in suitable templates of approved design provided under this Contract. Where indicated on the drawings, specified, or required, anchor bolts shall be provided with square plates at least 4 inches by 4 inches by 3/8-inch or shall have square heads and washers and be set in the concrete forms with suitable pipe sleeves, or both. If expansion or, with prior approval, anchor bolts are set after the concrete has been placed, all necessary drilling and grouting and caulking shall be done at the Contractor's expense, and care shall be taken not to damage the structure or finish by cracking, shipping, spalling, or otherwise during the drilling and caulking.

1.05 CONCRETE INSERTS

A. Concrete inserts shall be designed to support safely, in the concrete that is used, the maximum load that can be imposed by the hangers used in the inserts. Inserts shall be of a type which will permit adjustment of the hangers both horizontally (in one plane) and vertically and locking of the hanger head or nut. All inserts shall be galvanized.

1.06 SLEEVES

A. Unless indicated otherwise on the drawings or specified, openings for the passage of pipes and conduits through floors and walls shall be formed of sleeves of standard weight, galvanized steel pipe. The sleeves shall be ample diameter to pass the pipe and its insulation, if any, and to permit such expansion as may occur. Sleeves shall be of sufficient length to be flush at the walls and the bottom of slabs and to project 1 inch above the finished floor surface. Threaded nipples shall not be used as sleeves.

B. Sleeves in exterior walls, below ground, or in walls to have water, sewage, or wastes on one or both sides shall have a 2-inch annular fin of 1/8-inch plate welded with a continuous weld completely around the sleeve at mid-length.

C. All sleeves shall be set accurately before the concrete is placed or shall be built in accurately as the masonry is being built.

1.07 CUTTING AND PATCHING

A. The Contractor shall leave all chases or openings for the installation of his own or any other contractor's or subcontractor' work, or shall cut the same in existing work, and shall see that all sleeves or forms are at the work and properly set in ample time to prevent delays. He shall see that all such chases, openings, and sleeves are located accurately and are of proper size and shape and shall consult with the Engineer and the contractors or subcontractors concerned in reference to this work.

B. In case of his failure to leave or cut all such openings or have all such sleeves provided and set in proper time, he shall cut them or set them afterwards at this own expense, but in so doing he shall confine the cutting to the smallest extent possible consistent with the work to

be done. In no case shall piers or structural members be cut without the consent and approval of the Engineer.

C. The Contractor shall carefully fit around, close up, repair, patch, and point around the work specified herein to the entire satisfaction of the Engineer.

D. All of this work shall be done by careful workmen competent to do such work and with the proper small hand tools. Power tools shall not be used except where the type of tool proposed can be used without damage to the structure beyond the limits of the work.

E. Except with the consent of the contractor or subcontractor involved, given in writing or in the presence of the Engineer, the Contractor shall not himself, and shall not permit his subcontractors to, cut or alter the work of any other contractor or subcontractor. All cutting and patching or repairing made necessary by the negligence, carelessness, or incompetence of the Contractor or any subcontractor shall be done by the contractor or subcontractor who constructed the work, but such cutting and repairing or patching shall be done at the expense of the contractor at fault.

1.08 FOUNDATIONS, INSTALLATION, AND GROUTING

A. The Contractor shall furnish the necessary materials and construct suitable concrete foundations for all equipment installed by him at no additional cost to the Owner, even though such foundations may not be indicated on the drawings. The tops of foundations shall be at such elevations as will permit grouting as specified herein. All equipment foundations so required shall be submitted, fully dimensioned, with the shop drawings for such equipment.

B. All equipment shall be installed by skilled mechanics and in accordance with the instructions of the manufacturer.

C. In setting pumps, motors, and other items of equipment customarily grouted, the Contractor shall make an allowance of at least 1 inch for grout under the equipment bases. Shims used to level and adjust the bases shall be metal. Shims may be left embedded in the grout, in which case they shall be brass or bronze and installed so as to be as inconspicuous as possible in the completed work.

D. Grout shall be non-shrink and applied and cured in strict conformance with manufacturer's recommendations. Where practicable, the grout shall be placed through the grout holes in the base and worked outward and under the edges of the base and across the rough top of the concrete foundation to a peripheral form so constructed as to provide a suitable chamfer around the top edge of the finished foundation. Where such procedure is impracticable, the method of placing grout shall be as approved. After the grout has hardened sufficiently all forms, hoppers, and excess grout shall be removed and all exposed grout surfaces shall be patched in an approved manner, if necessary, and given a burlap-ribbed finish.

1.09 SERVICES OF MANUFACTURER’S REPRESENTATIVE

A. The Contractor shall arrange for a qualified service representative from the company manufacturing or supplying each item of equipment listed in this division to perform the duties herein described.

B. After installation of the equipment has been completed and the equipment is presumably ready for operation, but before it is operated by others, the representative shall inspect, operate, test, and adjust the equipment. The inspection shall include, but shall not be limited to, the following points as applicable.

1. Soundness (Without cracked or otherwise damaged parts).

2. Completeness in all details, as specified.

3. Correctness of setting, alignment, and relative arrangement of various part.

4. Adequacy and correctness of packing, sealing, and lubricants.

5. Correction of calibration, etc.

The operation, testing, and adjustment shall be as required to prove that the equipment is in proper condition for satisfactory operation under the conditions specified.

C. While the manufacturer's representative is at the job site he shall also instruct the Owner's personnel in the use and maintenance of the equipment.

D. On completion of his work, the manufacturer's or supplier's representative shall submit in triplicate to the Engineer a complete signed report of the result of his inspection, operation, adjustments, and tests. The report shall include detailed descriptions of the points inspected, tests and adjustments made, quantitative results obtained if such are specified, and the suggestions for precautions to be taken to ensure proper maintenance. The report also shall include a certificate that the equipment conforms to the requirements of the Contract and is ready for permanent operation and that nothing in the installation will render the manufacturer's warranty null and void. The manufacturer or supplier shall file with his shop drawing submittal an equipment warranty guaranteeing his equipment for a period of one (1) year from date of final acceptance of the equipment by the Owner

E. In addition to the above requirements, the Contractor shall employ the services of a factory service engineer for the special service specified in the division's subsections.

1.10 STANDARDIZATION OF GREASE FITTINGS

A. The Contractor shall ensure that all grease fittings on all pieces of equipment furnished under this Contract are standardized so that only the zerk type of fitting is used. Fittings shall be standard or giant size according to the type of service to be performed. Unless approved otherwise, all fittings shall be the product of one manufacturer. Fillings which are not readily accessible shall be piped to an accessible location.

1.11 NAMEPLATES

A. With the exceptions mentioned below, each piece of equipment shall be provided with a substantial nameplate of noncorrodible metal, securely fastened in place, and clearly and permanently inscribed with the manufacturer's name, model or type designation, serial number, principal rated capacities, electrical, or other power characteristics, and similar information as appropriate.

B. This requirement shall not apply to standard, manually operated hydrants; gate, globe, check, and plug valves; or accessories and specialties not having an electrical connection.

1.12 VALVE IDENTIFICATION AND DIRECTORIES

A. Each shutoff or control valve installed under this Contract shall be provided with 1 1/2inch minimum diameter heavy brass tag. Each tag shall bear the identifying number of the valve and, when so directed in the Project Specifications and/or on the drawings, an identifying letter symbol of the service line.

B. The tags shall be attached to the valve by split-key rings soldered so that ring and tag cannot be removed. The numbers and letters shall be of block type, with 1/2-inch numbers and 1/4-inch high letters stamped thereon and filled with black enamel.

C. Each buried valve shall have a concrete pad constructed around the valve box with a brass identifying tag embedded In the pad as indicated on the drawings.

D. The Contractor shall furnish and install approved schematic pipe diagrams and valve directories for each piping system. Each schematic pipe diagram shall be single line showing the relative position of valves, valve nurnbers, and the direction of flow. Each directory shall

show each valve number and the location of each valve. Each diagram and directory shall be on an approved material and framed in a glazed frame with screw eyes and wires for hanging and shall be located as directed by the Engineer.

1.13 OPERATING INSTRUCTIONS AND PARTS LISTS

A. For each piece of equipment, in accordance with the provisions of the General Conditions and Special Conditions, the Contractor shall furnish complete, neatly bound sets giving the information listed below:

1. Equipment data including: installation, operation, and maintenance instructions, pump curves, factory test reports, startup reports, and other data which may be required for the operation and service of all equipment. These instructions shall include a complete lubrication chart.

2. List of all parts for the equipment, with catalog numbers and other data necessary for ordering replacement parts.

3. In addition to the above, the Contractor, prior to requesting payment for equipment stored on site, shall submit to the Engineer a complete list of maintenance and spare parts requirements as specified below. For each piece of mechanical equipment furnished under this contract, the following information shall be supplied:

a. Complete parts list.

b. Complete set of preventive maintenance requirements as a function of running and/or elapsed time.

c. Complete set of lubrication instructions including schedule and quantity and type of lubricant(s).

d. Complete listing of consumable items sufficient for one year's operation, i.e., light bulbs, belts, etc.

e. Recommended spare parts inventory.

B. Such instructions and parts lists shall have been prepared for the specific equipment furnished and shall not refer to other sizes and types or models of similar equipment.

1.14 LUBRICANTS

A. The Contractor shall furnish all lubricants used during testing and prior to acceptance and, in addition he shall furnish an estimated one (1) year's supply of all grease and oil necessary for the proper lubrication of all equipment furnished under this Contract. Lubricants for this supply shall be furnished in the original sealed containers, each correctly identified as a brand and grade and with reference to the particular piece of equipment for which it is intended.

1.15 TOOLS

A. For each type of equipment furnished by him, the Contractor shall provide a complete set of all special tools (including grease guns or other lubricating devices for each type of grease) which may be necessary for the adjustment, operation, maintenance and disassembly of such equipment. Tools shall be high-grade, smooth, forged alloy, tool steel.

1.16 PATENTS

A. The Contractor shall guarantee to the Owner that all equipment offered under these specifications, or that any process resulting from the use of such equipment in the manner stated, is not the subject of patent litigation and that he is not knowingly offering equipment,

the installation or use of which is likely to result in a patent controversy, in which the Owner as user is likely to be made the defendant.

B. Where patent infringements are likely to occur, each Contractor shall submit, as a part of his bid, license arrangement between himself, or the manufacturer of the equipment offered, and the patent owner or the controller of the patent, which will permit the use in the specified manner of such mechanical equipment as he may be bidding upon.

C. Each Contractor, by submitting his bid, agrees to hold and save the Owner or it officers, agents, servants, and employees harmless from liability of any nature or kind, including cost and expenses, for, or on account or, any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the work under this Contract, including the use of same by the Owner.

1.17 PIPING AND CONNECTIONS

A. Equipment shall be oriented and connected as indicated on the drawings. Deviations from dimensions and arrangements shown on the drawings caused by equipment characteristics shall be shown on complete dimensioned layouts and submitted by the Contractor to the Engineer for approval prior to installation of the equipment. The approved deviation and all related charges in piping, conduit, supports, etc., shall be made at no additional cost to the Owner.

B. Electrical connections shall be performed as specified under Division 16 – Electrical.

1.18 ELECTRICAL MOTORS

A. Unless specified otherwise, all electric motors shall be provided with the driven equipment and shall be as specified in the section of these specifications entitled Electric Motors.

1.19 ELECTRICAL VARIABLE SPEED DRIVES

A. Unless specified otherwise, all electric variable speed drives (variable frequency, slip recovery, wound secondary resistance, etc.) shall be provided by the variable speed drive manufacturer and shall be as specified in the section of these specifications entitled Electrical Apparatus.

B. It shall be the responsibility of the Contractor to furnish and install a complete coordinated pump, motor, and variable speed drive system in accordance with the intended application and operation

C. To assist in verification of coordination and proper system performance, the Contractor shall provide the following for review:

1. System data including pump head vs. flow curves, pump hp vs. flow curves (throughout the complete system operating speed range), pump and motor speed vs. torque curves (showing accelerating steps and speed regulation points), etc.

2. Pump data including torque requirements, etc.

3. Motor data Including primary and secondary volts, amps, 100% ohms of secondary and resistor bank design (for wound rotor applications), current vs. hp curves, etc.

4. Control data including written intended sequence of operation, interlocking provided, field adjustments available, etc.

1.20 BIDS ON MAJOR EQUIPMENT

A. The Contractor is required to list the names of the furnishers of items of equipment in the spaces provided in the Proposal. Failure to list such will constitute grounds for declaring the

bid irregular or, if the Owner chooses, gives the prerogative of selection of equipment solely to the Owner.

B. The Contractor may offer alternate equipment by manufacturers not listed in the specifications in the space provided in the Proposal. The bid price for the installation of alternate equipment shall include the cost of, and all costs related or incidental to, changes in the structural, mechanical, electrical, and appurtenant work which may be necessary for the accommodation of the alternate equipment, which changes shall be determined by the Engineer.

C. In instances where a Contractor wishes to use equipment by a manufacturer not listed by name in the specifications, the equipment supplier may be listed in the Proposal provided the equipment supplier listed submits with the Contractor's bid, data sufficient to show that the proposed equipment meets the specifications. All deviations from the specifications shall be specifically noted in the submittal.

D. If it is determined that any equipment offered does not conform with the specifications, the Contractor will be required to furnish and install other equipment meeting the specifications in full at no change in the Contract price.

E. Alternate equipment offered at a lower price by reason of smaller or lighter weight members of mechanisms will not be considered.

F. Insofar as practical, effort will be made to use equipment of the fewest number of different manufacturers in order to avoid future duplication of service calls and thereby to achieve ultimate economy.

1.21 SUBMISSION OF APPROVAL DATA WITH BID

A. It shall be the Contractor's responsibility to submit with his bid, or cause to be filed direct with the Engineer prior to the bid date, complete information on the equipment offered. In the case of equipment listed or specified herein, this may be a statement to the effect that the equipment being offered meets the specifications and conforms with the drawings in every detail; any and all exceptions shall be listed so that a decision may be made prior to award, otherwise it will be assumed the equipment conforms to these specifications in every respect.

B. For equipment not listed or specified herein, complete shop drawings and specifications shall be filed listing or showing weights, thicknesses, materials, performance characteristics, etc.

C. For pumps, the manufacturer's information shall show the manufacturer of the motor(s) for all pumps over 50 gpm, a guaranteed performance curve and/or other data required in the paragraphs delineating the pump(s).

1.22 INFORMATION TO BE OBTAINED FROM THE MANUFACTURER

A. The Contractor shall obtain all items named in these specifications or so noted on the drawings from the equipment manufacturer and such incidental items as may be required for the safe and proper operation of the equipment for the purpose(s) intended.

B. Shop drawings will not be approved until all materials are listed along with the names and catalog numbers of any units being furnished by separate manufacturers.

C. Equipment offered contrary to the provision of this paragraph will be subject to rejection.

1.23 TESTING

A. All testing, and retesting if required, of equipment included in this division of the specifications, including any and all superintendence, labor, power, fuel, water, special devices and/or testing equipment required shall be performed by the Contractor at no additional expense to the Owner.

B. A factory-certified test shall be performed on each pump, when indicated in accordance with the test requirements of the Hydraulic Institute. The pumps shall be tested with a calibrated dynamometer. The test shall be sufficient to determine capacity, head, power input, efficiency, and water horsepower. A minimum of 6 points shall be taken including the rated condition and the shutoff. Certified performance curves shall be supplied. Each pump shall be subjected to a hydrostatic test and certification of the hydrostatic test shall be provided. The hydrostatic pressure shall, in any case, not be less than 1-1/2 times the shutoff pressure of the pump. Prior tests on similar or identical pumps will not be acceptable.

C. A factory-certified test shall be performed on each blower when indicated in accordance with the latest edition of the ASME Power Test Code. Prior tests on similar or identical blowers will not be acceptable.

D. Where no certified test is required, data from prior tests on identical units shall be submitted. All characteristic curves shall be submitted on minimum 8-1/2-inch by 11-inch charts.

1.24 SHOP PAINTING

A. Unless noted otherwise in the individual sections of this division, all shop ferrous metal preparation and priming and, where appropriate, finish painting of equipment shall be as specified herein.

B. Before exposure to the weather, the structural steel and other ferrous components of the equipment which will not be submerged in sewage shall be sandblasted in accordance with SSPC-SP6, "Commercial Blast Cleaning", or pickled in accordance with SSPC-SP8, "Pickling". Structural Steel and other ferrous components which will be submerged in sewage shall be sandblasted to SSPC-SP1 0, "Near-White Blast Cleaning", or pickled in accordance with SSPC-SP8.

C. Following cleaning (and if the part has been pickled, while still warm), the surfaces shall be primed as specified in the section of these specifications entitled Painting.

D. Equipment, such as motors, shall be furnished in the manufacturer's standard, machinery finish with coatings compatible with the field coats.

E. Bearing areas of shafts, chains, etc., which obviously are not to be painted, shall be protected against corrosion by a heavy coating of grease or approved rust-resistant coating. This coating shall be maintained as necessary to prevent corrosion during the period of erection and shall be satisfactory to the Engineer up to the time of conclusion of the final tests.

F. Maintenance of shop coatings and field painting are specified in the section of these specifications entitled Painting.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

DIVISION 31

EARTHWORK

SECTION 31 05 10

SITE PREPARATION

PART 1 GENERAL

1.01 SUMMARY

A. Provide site preparation as shown and as specified. Comply with applicable provisions of Div. 00 and 01.

B. Work includes, but is not limited to:

1. Protection of improvements, plants, and utilities.
2. Removal and replacement of improvements.
3. Location of utilities and coordination with utility companies.
4. Clearing and grubbing trees and vegetation.
5. Topsoil salvage.

1.02 MEASUREMENT AND PAYMENT

A. Site preparation will be considered incidental to the work except where separate pay items are included in Bid Schedule.

B. Drawing notes related to removals and replacements shall be interpreted as directives to Contractor for such work at no extra cost except where separate pay items are provided in Bid Schedule.

PART 2 (NOT USED)

PART 3 EXECUTION

3.01 PROTECTION

A. Protect improvements on site and on adjoining properties. Provide barricades, coverings, or other types of protection as necessary to prevent damage and to safeguard against injury. Restore to original condition improvements damaged by the work or improvements which required temporary removal during construction.

B. Protect existing vegetation indicated to remain against unnecessary cutting, breaking, bruising, or smothering by stockpiling excavated materials or parking of vehicles within drip line. Provide temporary fences, tree wells, barricades, or guards; repair or replace trees and vegetation damaged by construction operations.

C. Protect survey monuments, reference points, and benchmarks from movement. Should removal be necessary, notify Engineer who will set reference stakes and give notice that monument may be removed. Owner will reset monument after construction at no cost to Contractor. Contractor shall pay cost for re-establishing monuments lost due to its negligence or failure to notify Engineer.

D. No extra payment or time will be allowed for protection work that could have been suspected or anticipated by site inspection and interpretation of bidding documents prior to execution of contract.

3.02 UTILITIES

A. Location and description of underground utilities and structures shown on drawings are approximate and are based on records available to Owner or surface features indicating their existence. There may be other utilities within project area that are not shown.

B. Notify all affected utility companies of construction operations at least three working days before beginning work near their facilities. Do not begin excavation work until underground utility locations have been marked.

C. Use caution when excavating so that exact location of underground utilities, both known and unknown, may be determined. Provide adequate protection and support for utilities during construction operations.

D. If uncharted or incorrectly charted utilities are encountered during excavation work, or if proposed construction conflicts with existing utilities, give prompt notice and submit proposed solution to Engineer for approval. If required, make arrangements with utility companies for relocation of interfering utilities. No extra cost or time will be allowed for unexpected delays or coordination work, except for authorized alterations as follows. When a change is permitted to avoid a utility relocation, Engineer will determine whether such change constitutes extra work. Underground utilities and structures located outside of construction limits which Contractor wishes to have moved to facilitate construction shall be arranged with each owner of such facilities; Contractor shall pay all costs of such relocations for convenience.

E. During construction of pipe lines, it may be necessary to cross under certain underground utilities and structures. Prevent damage to such facilities. Where necessary, divert flow in drains or culverts so that trenches are kept dry during work. Deposit and compact sand or gravel bedding and backfill around exposed facilities by mechanical means in layers not to exceed 6 in. Wherever such facilities are disturbed or broken, restore them to good condition at no additional cost to Owner.

3.03 SITE CLEARING

A. Remove trees, stumps, snags, shrubs, brush, heavy growths of grass, weeds and other vegetation, improvements, rubbish and debris, and obstructions that interfere with proposed construction; remove items only as necessary for completion of work.

B. Cut brush and vegetation flush with ground. Grub out stumps, roots having a diameter of 2 in. or larger, and root clusters to a depth of at least 2 ft below subgrade elevation for pavements, structures, and embankments and 6 in. below ground surface in other areas.

C. Carefully and cleanly cut roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction. Cut back roots a minimum of 1 ft from concrete work, paving, and structures and to a depth of not less than 2 ft below structures, foundations, and embankments.

3.04 TOPSOIL STRIPPING

A. Topsoil shall include all friable, fertile, loam soil suitable for grass and plants, found at surface to a depth of approximately 4 in., reasonably free of subsoil, clay lumps, stones, objects over 2-in. diameter, weeds, large roots, root clusters, and other objectionable material.

B. Strip topsoil from project area to whatever depths encountered; prevent intermingling with underlaying subsoil or other objectionable material. Remove heavy growths of grass from areas before stripping topsoil.

C. Where trees are indicated to remain, terminate stripping a sufficient distance from such trees to prevent damage to root system.

D. Stockpile topsoil in storage piles in areas where designated. Construct storage piles to freely drain surface water. Cover or sprinkle water on storage piles to prevent windblown dust.

3.05 DEMOLITION

A. Remove structures, pavements, and improvements within construction limits as shown and as required for construction. Saw cut asphaltic and concrete pavement to provide a smooth straight joint. Remove below-grade items encountered, such as slabs and foundations, that interfere with construction.

B. Owner shall have first right to retain all useful salvage. All items not retained by Owner and construction debris shall become property of Contractor.

3.06 DEBRIS DISPOSAL

A. Remove debris and excess materials from site and legally dispose of it. Burning of combustible materials on site will be permitted only if authorized by official permit and approved by Owner; submit copy of burning permit to Owner. Burning areas and times may be designated by Owner. Comply with federal, state, and local laws and regulations.

END OF SECTION

SECTION 31 05 15

CONSTRUCTION DEWATERING

PART 1 GENERAL

1.01 SUMMARY

A. Provide construction dewatering as shown and as specified. Comply with applicable provisions of Div. 00 and 01.

B. Work under this Section shall consist of removal of surface water and ground water as necessary to perform required work, including:

1. Building and maintaining temporary impounding works, channels, and diversions.
2. Furnishing, installing, and operating pumps, piping, and other facilities and equipment.
3. Removing temporary works and equipment when no longer required.

C. Contractor shall be responsible for:

1. Protection of work area and safely passing stream flow for duration of construction.
2. Means and methods for dewatering work areas, including the actual dimensions, configurations, stability, and dewatering capacity of cofferdams and protective works.

D. Contractor shall repair, at its expense, any damage to foundations, structures, or other improvements caused by failure of any part of cofferdams or protective works.

1.02 PERMITS

A. Any dewatering as part of the project shall be in accordance with Florida Department of Environmental Protection (FDEP), St. Johns River Water Management District, and U.S. Army Corps of Engineers (COE), requirements.

PART 2 PRODUCTS

2.01 MATERIALS

A. Contractor shall furnish all materials for and shall construct and maintain, as it deems necessary, all cofferdams, channels, drains, sumps, and protective works for protection of work areas.

PART 3 EXECUTION

3.01 DIVERTING SURFACE WATER

A. Construct, maintain, and operate cofferdams, channels, flumes, sumps, and other temporary diversion and protective works to divert streamflow and other surface water through or around construction site and away from work while construction is in progress. Unless otherwise specified, diversions must discharge into the same natural drainageway in which its headwaters are located.

B. Surface water diversion procedures shall not create a condition where erosion or deposition of materials occurs in stream. Riprap or other means of protection shall be provided for erosion protection adjacent to all cofferdams where flows could occur.

C. Diversion works which are moved out of position by any cause during installation shall be righted or enlarged so as to provide necessary clearance.

D. As work area is dewatered, diversion works that are not watertight shall be plugged or sealed as much as practical to reduce infiltration of water into work area.

E. No shoring will be permitted in diversion works which will induce stress, shock, or vibration in permanent structure.

3.02 DEWATERING EXCAVATIONS AND WORK AREAS

A. Foundations, cutoff trenches, and other parts of construction site shall be dewatered and kept free of standing water or excessively muddy conditions for proper execution of construction work. Furnish, install, operate, and maintain wells, drains, sumps, pumps, and other equipment needed to perform dewatering as specified. Dewatering methods that cause loss of fines from foundation materials will not be permitted.

B. Maintain pumping operations to keep work area dry until all materials, equipment, and debris have been removed and diversion works is to be removed.

3.03 REMOVAL OF TEMPORARY WORKS

A. Remove temporary works when no longer required; level and grade earth as required to restore appearance and to prevent obstruction to flow or any other interference with operation of or access to permanent works.

B. Unless otherwise noted, pipes and casings shall be removed from temporary wells and wells shall be filled to adjacent ground level with gravel or other approved material.

C. Construction dewatering material shall be removed from site and properly disposed of.

D. Contractor shall make its own arrangements for a disposal site and shall pay all costs involved.

END OF SECTION

SECTION 31 20 00

EARTHWORK

PART 1 GENERAL

1.01 SUMMARY

A. Provide earthwork as shown and as specified. Comply with applicable provisions of Div. 00 and 01.

1.02 RELATED SECTIONS

31 05 10 Site Preparation.

1.03 CLASSIFICATION

A. Excavation of materials encountered under this work will be unclassified without regard to type, difficulty to remove, or suitability for use in construction.

1.04 SUBMITTALS

A. Test Reports: Submit reports for laboratory and field tests required under "Testing" article. Test reports for footing, slab, and pavement subgrades shall be submitted prior to placing concrete or paving materials. Make submittals in accordance with Section 01 33 00.

1.05 TESTING

A. Contractor shall arrange and pay for soil sampling and testing by a qualified testing agency, acceptable to Owner and independent of Contractor. Test soil materials for suitability for intended purpose using standard, recognized procedures.

B. Determine mechanical analysis, liquid and plastic limit, and moisture-density curve (ASTM D1557) for each type of soil encountered.

C. During course of work, testing agency shall inspect and approve subgrades and fill layers before further construction work is performed on each layer. Perform field density tests as follows:

1. Footing Subgrade: Perform at least one field density test to verify required design bearing capacities shown on drawings for every 10,000 sq ft of structure area, but in no case less than three tests.
2. Structure Slabs and Paved Areas: Perform at least one field density test on fill subgrade for every 2000 sq ft of structure slab or paved area, but in no case less than three tests. In each compacted fill layer, perform at least one field density test for every 2000 sq ft of overlaying structure slab or paved area, but in no case less than three tests.
3. Utility Trench Backfill (Pavement and Structure Areas): Perform at least two field density tests in random compacted backfill layers for every 400 linear feet of trench under pavements and structures.
4. Foundation Wall Backfill: Perform at least two field density tests at locations and elevations as directed.

D. If in opinion of Engineer, based on reports of testing agency and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional cost to Owner.

1.06 PROTECTION

A. Protect existing improvements, utilities, trees and shrubs, and reference marks in accordance with Section 31 05 10.

1.07 BLASTING

A. Use of explosives is not permitted.

PART 2 PRODUCTS

2.01 SOIL MATERIALS, GENERAL

A. Soil materials shall be free of organic matter, debris, frozen soils, ice, and other objectionable materials. Rock particles larger than maximum size specified shall be removed prior to placement of soil.

B. Select existing material from required excavations may be used for fill or backfill if it meets the specified product requirements. If necessary, furnish additional approved material from suitable off-site sources.

2.02 GRANULAR FILL, BEDDING, AND BACKFILL

A. Select soils complying with ASTM D2487 soil classification groups GW (well-graded gravel), GP (poorly-graded gravel), SW (well-graded sand), or SP (poorly-graded sand). Aggregate shall pass a 3/4-in. sieve and not more than 35% shall be retained on a No. 10 sieve. Maximum 5% by weight shall pass a No. 200 sieve.

2.03 FILL AND BACKFILL

A. Previously excavated soils, free of aggregate larger than 3 in., and suitable for intended purpose.

PART 3 EXECUTION

3.01 PREPARATION

A. Prepare site for work in accordance with Section 31 05 10. Layout and stake lines and grades as required to complete the work.

3.02 EXCAVATION

A. Excavate to achieve necessary dimensions, lines, grades, and cross-sections. Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10 ft.

B. For footings and foundations, take care not to disturb bottom of excavation. Excavate to final grade just before concrete is placed. Trim bottoms to required lines and grades to leave solid, undisturbed base to receive granular fill, base course, or concrete as shown.

3.03 TRENCHING

A. Excavate trenches so that pipe can be laid safely and accurately to required line and grade. Hand excavate for bells, fittings and projections to allow for proper jointing and to insure that pipe rests evenly along barrel and is not resting on bell.

B. In sand and gravel soils, bottom of trench may be shaped to fit bottom 1/3 of pipe. In silt or clay soils, bottom of trench shall be 4 in. below pipe barrel and 3 in. below bell. Under

foundations and footings, bottom of trench shall be 8 in. below pipe. Provide Granular Bedding as specified below.

3.04 UNAUTHORIZED EXCAVATION

A. Unauthorized excavation consists of removal of materials beyond indicated elevations or side dimensions without specific direction of Engineer. Unauthorized excavation, as well as remedial work, shall be at Contractor's expense. Notify Engineer if unauthorized excavations are made.

B. Backfill and compact unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed.

3.05 ADDITIONAL EXCAVATION (OVER EXCAVATION)

A. When excavation has reached required subgrade elevation, notify Engineer who will make an inspection of conditions. Inform Engineer of unsuitable, unconsolidated subgrade soils.

B. If unsuitable bearing materials, such as poorly compacted fill, existing foundations, rubble, debris, or organic deposits, are encountered at required subgrade elevations, carry excavations deeper and replace excavated material with properly compacted Fill as directed by Engineer.

C. Removal of unsuitable material and its replacement as directed will be paid for as extra work. Do not proceed with extra work until authorized.

3.06 STABILITY OF EXCAVATIONS

A. Maintain sides and slopes of excavations in a safe condition until completion of backfilling. Slope sides of excavations to angle of repose of material excavated; otherwise, shore and brace where sloping is not possible either because of space restrictions or stability of material excavated. Comply with applicable codes and ordinances.

3.07 DEWATERING

A. Perform earthwork in a manner to prevent surface water and ground water from flowing into excavations. Promptly remove water from excavations using pumps, sumps, and dewatering system components necessary to convey water away from excavations. If underground springs are encountered, notify Engineer before proceeding.

3.08 STOCKPILING

A. Stockpile excavated materials meeting the requirements for fill and backfill where directed until required for the work. Place, grade, and shape stockpiles for proper drainage. Locate stockpiles a sufficient distance from edge of excavations to prevent such material from falling or sliding into excavations and to prevent cave-ins.

3.09 COLD WEATHER PROTECTION

A. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 deg F by covering with dry insulating materials of sufficient depth to prevent frost penetration.

3.10 EXAMINATION OF SUBGRADE

A. Examine subgrade prior to placement of fill or backfill. Do not place materials on frozen subgrade. Plow, strip, or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that material will bond with subgrade. When subgrade has a density less than that specified for the particular area, breakup ground surface, pulverize, moisture-condition to optimum content, and compact top 12 in. to density specified in Part 4 Schedules.

3.11 FILLING AND BACKFILLING, GENERAL

A. Do not place fill or backfill until required excavation and subgrade preparation have been inspected and approved by Engineer.

B. Place fill or backfill in approximately horizontal layers; do not exceed the maximum lift thickness specified in Part 4 Schedules before compaction. Spread piles and windrows uniformly.

C. Adjacent to structures, place fill or backfill to prevent damage and allow structures to assume loads gradually and uniformly, at approximately the same rate on all sides of structure.

3.12 GRANULAR FILL

A. Provide 6 in. of Granular Fill immediately below concrete slabs and elsewhere as indicated on Drawings.

3.13 TRENCH BEDDING AND BACKFILL

A. Bedding, haunching, and initial backfill for rigid pipes shall be in accordance with ASTM C12, Class C or better. Bedding, haunching, and initial backfill for flexible pipes shall be in accordance with ASTM D2321, Class II or better.

B. Trenches dug in sandy or gravelly materials may use undisturbed earth for bedding provided surface is shaped to conform to pipe. Provide Granular Bedding in all other trenches from subgrade to a point supporting bottom 1/3 of pipe for rigid pipe and to springline (mid-height) for flexible pipe. Place and compact bedding so that it fills and supports pipe haunch area.

C. Immediately after installation of pipe, provide tamped Granular Backfill up to a minimum depth of 1 ft above pipe. Take special care in placing and tamping initial backfill material so alignment and grade of pipe is not disturbed nor pipe damaged.

3.14 BACKFILL

A. Provide Backfill material to bring excavations to natural or designated grade.

3.15 GRADING

A. Grade area within project limits by cutting and/or filling as necessary to achieve lines and grades shown. Grade areas adjacent to structure lines to drain away from structure to prevent ponding. Finish surface to be reasonably smooth and free from irregular surface changes. Tolerance for areas to receive topsoil shall be 0.3 ft above or below established grade, less allowance for topsoil. Tolerance for areas to be paved shall be 0.1 ft above or below established pavement subgrade.

3.16 COMPACTION

A. Compact each layer of soil material to not less than the percentage of maximum density specified in Part 4 Schedules.

B. Provide compaction equipment required to obtain specified compaction. Compaction by travel of grading equipment is not considered adequate for uniform compaction. Small vibratory compactors are required wherever fill is placed adjacent to foundation walls, footings, and piers. Pipe bedding and initial backfill shall be hand or mechanically tamped.

C. During placement and compaction, maintain moisture content of materials within optimum range.

3.17 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. Remove excess excavated material, trash, debris, and other waste materials and legally dispose of them off-site.

PART 4 SCHEDULES

4.01 COMPACTION SCHEDULE

Location	Lift Thickness [1]	Compaction [2]
Below foundations, slabs, pavements, walks, and other designated areas.	8"-10"	98%
Bedding and initial backfill around pipe and conduit.	6"	85%
Unpaved areas 10 ft. or less outside structure line.	8"-10"	90%
Unpaved areas more than 10 ft. outside structure line.	12"	85%

[1] Place manually compacted materials in maximum 4-in. layers.

[2] Percent of maximum density determined in accordance with ASTM D1557 (Modified Proctor test).

END OF SECTION

SECTION 31 22 00

SITE GRADING

PART 1 GENERAL

1.01 SUMMARY

A. Provide site grading, including preparation of subgrade for pavements and walks, as shown and as specified. Comply with applicable provisions of Div. 00 and 01.

1.02 RELATED SECTIONS

31 05 10 Site Preparation.
31 20 00 Earthwork

1.03 CLASSIFICATION

A. Excavation of materials encountered under this work will be unclassified without regard to type, difficulty to remove, or suitability for use in construction.

1.04 SUBMITTALS

A. Test Reports: Submit reports for laboratory and field tests required under "Testing" article. Test reports for slab and pavement subgrades shall be submitted prior to placing concrete or paving materials. Make submittals in accordance with Section 01 33 00.

1.04 SUBMITTALS

A. Samples: Two weeks prior to start of construction, indicate source and submit samples of proposed fill and backfill materials for testing and review. Make submittals in accordance with Section 01 33 00.

1.05 TESTING

A. Contractor shall arrange and pay for soil sampling and testing by a qualified testing agency, acceptable to Owner and independent of Contractor. Test soil materials for suitability for intended purpose.

B. Test subgrade and fill materials for gradation in accordance with ASTM C136 for conformance with ASTM D2487 gradation limits. Test materials for liquid limit and plasticity index in accordance with ASTM D4318. Analyze materials within 3 ft of finished grades of paved areas to determine frost susceptibility.

C. Provide one optimum moisture-maximum density curve for each type of soil encountered in subgrade and fills under structure slabs and foundations and paved areas; determine maximum densities in accordance with ASTM D1557.

D. During course of work, testing agency shall inspect and approve subgrades and fill layers before further construction work is performed on each layer. Perform field density tests in accordance with standard, recognized procedures. Take tests as follows:

1. Structure Slabs: Perform at least one field density test on fill subgrade for every 2000 sq ft of structure slab, but in no case less than three tests. In each compacted fill layer, perform at least one field density test for every 2000 sq ft of overlaying structure slab, but in no case less than three tests.

2. Paved Areas: Perform at least one field density test on fill subgrade for every 10,000 sq ft of paved area, but in no case less than three tests. In each compacted fill layer, perform one field density test for every 10,000 sq ft of paved area, but in no case less than three tests.

E. If in opinion of ENGINEER, based on reports of testing agency and inspection, subgrade or fills which have been placed are below specified density, provide additional compaction and testing at no additional cost to Owner.

1.06 PROTECTION

A. Protect existing improvements, utilities, trees and shrubs, and reference marks in accordance with Section 31 05 10.

PART 2 PRODUCTS

2.01 SOIL MATERIALS, GENERAL

A. Soil materials shall be free of organic matter, debris, frozen soils, ice, and other objectionable materials. Rock particles larger than maximum size specified shall be removed prior to placement of soil.

B. Select existing material from required excavations may be used for fill or backfill if it meets the specified product requirements. If necessary, furnish additional approved material from suitable off-site sources.

2.02 STRUCTURAL FILL

A. Select soils complying with ASTM D2487 soil classification groups GW, GP, SW, or SP; or these groups in combination with groups GM, GC, SM, or SC (dual symbol soils). Maximum aggregate size shall be 1/2 specified lift thickness. Maximum 12% by weight shall pass a No. 200 sieve; plasticity index shall not exceed 5.

2.03 SITE FILL

A. Select, natural, free draining soils complying with ASTM D2487 soil classification groups GW, GP, SW, SP, GM, GC, SM, SC, or combinations thereof, and suitable for compaction. Maximum aggregate size shall be 1/2 specified lift thickness.

PART 3 EXECUTION

3.01 GRADING

A. Grade area within project limits by cutting and filling as necessary to achieve new lines and grades shown.

B. For lawn areas, allow 4 in. for topsoil placement. For landscape plants, allow 6 in. for topsoil placement. For surfaced areas such as slabs, pavements, and walks, grade to underside of respective surfacing or base course.

C. Grade excavated and filled sections and adjacent transition areas to be reasonably smooth, compacted, and free from irregular surface changes. Degree of finish shall be that ordinarily obtained from either blade grader or scraper operations, except as otherwise specified. Tolerance for areas to receive topsoil shall be 0.3 ft above or below established grade, less allowance for topsoil. Tolerance for areas to receive surfacing shall be 0.1 ft above or below established subgrade.

3.02 SUBGRADE PREPARATION

A. Examine subgrade prior to placement of fill. Remove any organic materials or debris subject to rot or corrosion. Plow, strip, or break-up sloped surfaces steeper than 1 vertical to 4 horizontal so that fill material will bond with subgrade.

B. In structure areas, compact exposed subgrade in-place to the density specified in Part 4 Schedules by several passes of a large vibratory roller traveling at a relatively slow rate.

C. In pavement areas, proofroll exposed subgrade with a loaded, tandem axle dump truck to detect soft or yielding areas.

D. Notify ENGINEER of unsuitable, unconsolidated subgrade soils.

3.03 FILLING

A. Provide Structural Fill under structure slabs, pavements, and walks. Provide Site Fill in unpaved areas.

B. Place fill in approximately horizontal layers; do not exceed maximum lift thickness specified in Part 4 Schedules before compaction.

C. During placement and compaction, maintain moisture content of materials within optimum range. Compact each layer of fill to not less than the percentage of maximum density specified in Part 4 Schedules.

D. Do not place fill on frozen subgrade.

3.04 MAINTENANCE

A. Protect newly graded areas from traffic and erosion, and keep free of trash and debris. Repair and re-establish grades in settled, eroded, and rutted areas to specified tolerances.

B. Maintain erosion control measures to prevent run-off and sediment pollution of adjacent water courses.

3.05 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. Remove excess excavated material, trash, debris, and other waste materials and legally dispose of them off-site.

PART 4 SCHEDULES

4.01 COMPACTION SCHEDULE

Location	Lift Thickness	Compaction [1]
Structure Slab, Pavement, and Walk Areas		See Section 31 20 00
Structure Slabs	8"-10"	92%
Pavement and Walk Areas	8"-10"	90%
Unpaved Areas	12"	85%

[1] Percent of maximum density determined in accordance with ASTM D1557 (Modified Proctor test).

END OF SECTION

SECTION 31 23 35

ROADWAY EXCAVATING AND FILLING

PART 1 GENERAL

1.01 SUMMARY

A. Provide excavating and filling for roadways and pavements as shown and as specified. Comply with applicable provisions of Div. 00 and 01.

1.02 RELATED SECTIONS

31 05 10 Site Preparation.

1.03 CLASSIFICATION

A. Excavation of materials encountered under this work will be unclassified without regard to type, difficulty to remove, or suitability for use in construction.

1.04 SUBMITTALS

A. Test Reports: Submit reports for laboratory tests and field density tests required under "Testing" article. Make submittals in accordance with Section 01 33 00.

1.05 TESTING

A. Contractor shall arrange and pay for soil sampling and testing by a qualified testing agency, acceptable to Owner and independent of Contractor. Test soil materials for suitability for intended purpose using standard, recognized procedures. Determine mechanical analysis, liquid and plastic limit, and moisture-density curve (ASTM D698) for each type of soil encountered.

B. Perform at least one field density test on subgrade and in each 2 ft (or less) of compacted fill for every 400 linear feet of roadway. Density tests shall be at randomly selected locations and in accordance with ASTM D1556 (sand cone method) or ASTM D2922 (nuclear method). Where field testing indicates that soils are below specified density, provide additional compaction and testing at no additional cost to Owner.

1.06 PROTECTION

A. Protect existing improvements, utilities, trees and shrubs, and reference marks in accordance with Section 31 05 10.

1.07 BLASTING

A. Use of explosives is not permitted.

1.08 MEASUREMENT AND PAYMENT

A. Excavating, filling, grading, compacting, disposal of excess materials, temporary drainage, and related earthwork for roadways will be paid for at the contract lump sum price for ROADWAY EARTHWORK; no additional compensation will be allowed unless otherwise provided below.

B. When a pay item for EXCAVATION BELOW SUBGRADE (EBS) is included in Bid Schedule, authorized EBS to remove undesirable materials will be paid for at the contract unit price per cubic yard in place. Unit price shall include furnishing and placing Granular Fill to replace materials removed.

PART 2 PRODUCTS

2.01 SOIL MATERIALS, GENERAL

A. Soil materials shall be free of organic matter, debris, frozen soils, ice, and other objectionable materials. Rock particles larger than maximum size specified shall be removed prior to placement of soil.

B. Select existing material excavated from site may be used if it meets requirements specified. If necessary, furnish additional approved material from suitable off-site sources.

2.02 GRANULAR FILL

A. Granular material complying with requirements of FDOT Standards and Specifications. Maximum aggregate size shall not exceed 6 in.

2.03 ROADWAY FILL

A. Previously excavated soils, free of aggregate larger than 6 in., and suitable for intended purpose.

PART 3 EXECUTION

3.01 PREPARATION

A. Provide site preparation, including clearing (if required) and topsoil removal, in accordance with Section 31 05 10.

B. When shown, protect trees or shrubs around which fills are placed by tree wells built in accordance with Details or as directed.

C. Take precautions to protect and continue service of existing drain tiles, sewers, and other subsurface utilities; repair damage to drains, sewers, and utilities.

D. During construction, drain roadway, ditches, and channels at all times by keeping excavation areas and embankments sloped to approximate section of final earth grade. If existing surface drainage must be interrupted, provide temporary drainage. Perform construction to avoid washing, sloughing, or deposition of materials into channels which may result in contamination or silting of waterway.

3.02 EXCAVATION

A. Excavate materials as required for construction of roadway subgrade (including curb and gutter or shoulder areas) to lines, grades, and cross-sections shown. Subgrade is considered top surface of roadbed upon which subbase, base, and surface courses (as applicable) will be constructed. Excavate and grade entrances, approaches, ditches, and channels within and beyond right-of-way as shown or as located by Engineer.

B. Remove and satisfactorily dispose of surface and base courses, embankment surcharge, masonry walls, foundations of buildings, or other obstructions that lie within construction limits.

3.03 SUBGRADE PREPARATION

A. Proofroll exposed subgrade with a loaded, tandem axle dump truck to detect soft or yielding areas. Remove deposits of frost-heave material, unstable soils, topsoil containing considerable amounts of organic matter, or other undesirable foundation material from area within roadbed to depths as shown or as directed. Notify Engineer of questionable materials. Excavation below subgrade (EBS) to remove undesirable materials will be considered extra

work, unless a pay item is included in Bid Schedule; do not proceed with extra or unit price work until authorized.

B. Scarify subgrade to depth necessary to accomplish blading, leveling and compacting operations. Remove stones larger than maximum size specified for roadway fill.

3.04 FILLING

A. Suitable material from excavations shall be used for construction of fills and embankments. Place fill and embankment material in conformity with lines, grades, cross-sections and dimensions shown. Provide Granular Fill material where designated.

B. Spread fill in successive uniform horizontal layers not exceeding 12-in. depth over entire area before compaction. Each layer shall be worked to break down clods over 6-in. size and to secure uniform moisture content. Where filling in 12-in. layers is not feasible, as in case of filling in water or over steep slopes, construct fill in one layer to minimum elevation at which equipment can be operated. Above this elevation, construct fill in layers of specified depth.

C. Materials to be incorporated in top 12 in. of earth fills and embankments shall be free of any substantial quantity of gravel or broken stone which would significantly affect scarifying and finishing of subgrade.

3.05 COMPACTION

A. Compact top 12 in. of subgrade and each layer of fill material to 95% of maximum density as determined by ASTM D698/AASHTO T99 (Standard Proctor test).

3.06 FINAL GRADING

A. During grading operation and prior to placement of base or surface courses, if included in the work, provide continuous maintenance of entire roadbed. Maintain subgrade to specified section and in a firm smooth condition, removing ruts or surface irregularities produced by equipment or traffic. Correct soft or yielding places, holes, or other defects which develop in subgrade by reason of traffic, hauling, poor drainage, unstable materials, and similar causes. Remove snow and ice, if any, from roadbed before base or surface course is placed.

3.07 RESTORATION

A. Unless otherwise specified, restore surface drainage, pavements, lawns, and other areas disturbed by construction to their original conditions. Areas adjacent to roadway shall be sloped to drain.

3.08 DISPOSAL OF EXCESS AND WASTE MATERIALS

A. If directed by Owner, deliver excess excavated materials to designated areas within one mile of point of loading. Dispose of excess excavated materials not wanted by Owner and waste materials at legal disposal site.

END OF SECTION

SECTION 31 25 00

EROSION & SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

A. In addition to the requirements of the applicable sections in Divisions 01 and 02:

1. All erosion, sedimentation and water pollution control features shall be in place or relocated as necessary prior to the start of any clearing, grading or construction. Contractor shall be responsible for the installation and maintenance of all temporary erosion control features.

2. Location of the control features shall be as required to facilitate drainage and control erosion and sedimentation within and adjacent to the site.

3. Control features are defined as, but not limited to, swales, berms, silt fences, silt barriers and temporary fences.

1.02 QUALITY ASSURANCE

A. The provisions for prevention, control and abatement of erosion, sedimentation and water pollution shall be as stated in the FDOT Standard Specifications for Road and Bridge Construction, Section 104, latest edition, and as required by the St. John's River Water Management District.

1.03 SUBMITTALS

A. Procedures shall be in accordance with General Conditions.

B. Product data: Manufacturers' literature, application instructions and samples.

C. List of materials and their characteristics for other erosion control items.

1.04 START OF WORK

A. Do not start work until erosion control measures are in place.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Silt Barriers

1. One (1) type of silt barriers shall be installed in accordance with the plans: silt barriers installed on the ground.

2. Silt barriers (filter fabric) shall be synthetic and contain ultraviolet ray inhibitors and Stabilizers to provide a minimum of six (6) months of expected usable construction life at a temperature range of zero degree Fahrenheit (0° F) to one hundred twenty degrees Fahrenheit (120° F). Hay bales shall not be used for silt barriers, unless specifically approved by the City.

3. Filter fabric shall be a pervious sheet of propylene, nylon or polyester and shall be certified by the manufacturer or supplier to conform to the following specifications:

Filter efficiency (Test VTM-51):	75%
Minimum tensile strength at 20% elongation (Test ASTM-D-1682):	120 lbs.
Tear strength (Test ASTM D2263):	50 lbs.

4. Contractor shall submit further filter fabric specifications and installation configuration prior to start of construction.

5. Silt barriers shall be maintained in place until substantial completion of the Project.

6. Filter fabric shall be purchased in a continuous roll cut to the length of the barrier to avoid use of joints. When joints are necessary filter fabric shall be spliced together only at a support post, with a six-inch (6“) overlap, and securely sealed.

7. The following items shall be installed and maintained in accordance with the applicable sections of the FDOT Standard Specifications:

   a. Temporary silt fences and staked silt barriers
   b. Floating silt barrier

B. Temporary Fence

1. Brightly colored fence as manufactured by Mirafi, product Mirasafe, or approved equal.

2. Material shall be four feet (4') high, attached to six feet (6') metal posts at twelve feet (12') centers. Posts shall be driven eighteen inches (18") into ground.

C. Filter Fabric for Placement Beneath Rip-Rap

1. Filter Fabric should be Mirafi 600X or approved equal.

D. Rip-Rap

1. Rubble type rip-rap consisting of broken stone meeting the requirements of Section 530-2.3 of the FDOT Standard Specifications for Road and Bridge Construction, 1991 Edition.

PART 3 - EXECUTION

3.01 GENERAL

A. Temporary erosion control features shall consist of, but not be limited to, temporary grassing, temporary sodding, temporary mulching, sandbagging, slope drains, sediment basins, artificial coverings, berms, baled hay or straw, floating silt barriers, staked silt barriers, and staked silt fences. Design details for some of these items may be found in the Water Quality Section of the applicable edition of the FDOT Roadway and Traffic Design Standards. All of these items shall be constructed in accordance with applicable sections of the FDOT Standard Specifications.

B. Incorporate permanent erosion control features into the project at the earliest practical time. Correct conditions, using temporary measures, that develop during construction to control erosion prior to the time it is practical to construct permanent control features.

C. Construct temporary and permanent erosion and sediment control measures and maintain Them to prevent the pollution of adjacent water ways in conformance with the laws, rules and regulations of Federal, State and local agencies.

D. Copies of approved permits will be provided to the Contractor for his review and use. Contractor shall be required to comply with all General and Special Conditions noted within the permit by the particular permitting agency. The Contractor shall maintain copies of these permits on the job site at all times.

3.02 INSTALLATION

A. The following items shall be installed and in accordance with the FDOT Standard Specifications. The procedures are only generally described herein.

1. Temporary Grassing: This work shall consist of furnishing and placing grass seed.

2. Temporary Sod: This work shall consist of furnishing and placing sod.

3. Temporary Mulching: This work shall consist of furnishing and applying a two-inch to four-inch thick blanket of straw or hay mulch and then mixing or forcing the mulch into the top two inches of the soil in order to temporarily control erosion. Only decayed straw or hay, which can readily be cut into the soil, shall be used. Other measures for temporary erosion control such as hydro-mulching, chemical adhesive soils stabilizers, etc., may be substituted for mulching with straw or hay with the approval of the City. When permanent grassing operations begin, temporary mulch materials shall be plowed under in conjunction with preparation of the ground.

4. Sandbagging: This work shall consist of furnishing and placing sandbags in configurations, so as to control erosion and siltation.

5. Slope Drains: This work shall consist of constructing slope drains, utilizing pipe, fiber mats, rubble, cement concrete, asphaltic concrete, plastic sheeting, or other acceptable materials, in accordance with the details shown in FDOT's Roadway and Traffic Design Standards or as suitable to adequately perform the intended function.

6. Sediment Basins: Sediment basins shall be constructed in accordance with the details shown in FDOT's Roadway and Traffic Design Standards or as suitable to adequately perform the intended function. Sediment basins shall be cleaned out as necessary.

7. Artificial Coverings: This work shall consist of furnishing and applying fiber mats, netting, plastic sheeting, or other approved covering to the earth surfaces.

8. Berms: This work shall consist of construction of temporary earth berms to divert the flow of water from an erodible surface.

a. This work shall consist of construction of baled hay or straw dams or earth berms to protect against downstream accumulations of silt. The baled hay or straw dams shall be constructed in accordance with the details shown in FDOT's Roadway and Traffic Design Standards.

b. The berm dam shall be placed so as to effectively control silt dispersion under conditions present on this project. Alternate solutions and usage of materials may be used if approved.

9. Filter Fabric for placement beneath rip-rap:

a. Unroll filter fabric adequately longitudinally with the swale.

b. Install anchoring pins in the fabric to protect the material from wind uplift.

c. Toe filter fabric into soil a minimum of twelve inches (12") at the top and bottom of the slope.

10. Rubble Rip-Rap:

a. Rip-rap should be placed carefully to not damage or displace the filter fabric. Filter fabric which rips or becomes displaced during rip-rap placement should be repaired. The placement of the rip-rap should proceed from the bottom up to the top of the slope. At no time should the rip-rap be dumped onto the fabric from the tip of the slope and allowed to roll down the surface of the fabric.

b. Placement of rip-rap shall be in accordance with Section 530-3.3 of the FDOT Standard Specifications for Road and Bridge Construction 1991 edition.

c. Minimum thickness of rip-rap layer is two feet (2').

3.03 SILT BARRIERS

A. Silt barriers shall be installed and maintained at the locations shown on the Drawings. The Contractor is required to prevent the possibility of silting onto any adjacent parcel.

B. Silt barrier shall be of the staked type and stakes shall be installed as indicated in the Drawings.

C. The height of the silt barrier fabric shall be a minimum of forty-two inches (42").

D. The stakes shall be two inch (2") x four inch (4") wood, five feet (5') long and shall be spaced a maximum of ten feet (10) apart at the barrier location and driven securely into the ground.

E. A trench shall be excavated approximately four inches (4") wide by four (4") deep along the line of stakes. The filter fabric shall be tied or stapled to the wooden stakes and eight inches (8") of fabric shall be extended into the trench. The staples shall be heavy duty wire and at least one-half inch (1/2") long. The trench shall then be backfilled and the soil compacted over the filter fabric.

3.04 FLOATING SILT BARRIERS

A. Floating silt barriers shall be located as shown on the Drawing and shall be in place prior to the start of any construction or grading.

B. Floating silt barriers shall meet or exceed the Florida Department of Transportation Roadway and Traffic Design Standards, Index No. 102, Floating Silt Barrier. Contractor shall submit fabric filter material specifications and installation configuration for approval prior to the start of construction.

3.05 TEMPORARY FENCE

A. Furnish, install and maintain on wetland lines, buffer lines, tree save lines and otherwise as shown on Drawings. Attach silt barrier to the temporary fence.

B. Follow manufacturer's installation recommendations.

3.06 MAINTENANCE

A. Silt barriers and temporary fences shall be inspected immediately after each rainfall and at least once a day during periods of prolonged rainfall. Any repairs shall be made immediately.

B. Should the fabric on a silt barrier or temporary fence decompose or become ineffective, the installation shall be repaired or replaced immediately at no additional cost to the City. If the Contractor fails to repair or replace the items as above, the City shall have the right to stop work without additional cost to the City in accordance with Article 15 of the General Conditions until such time as the repair or replacement has been made.

C. Sediment deposits shall be removed after each storm event. The Contractor will repair and restore the installations to a working and effective condition to the satisfaction of the City.

D. At the completion of all work, the silt barriers and the temporary fences will be removed unless otherwise directed by the City.

E. Any sediment deposits in place after the silt fence or filter barrier is no longer required shall be dressed to conform to the existing grade and prepared for seeding or sodding.

3.07 CONTROL OF CONTRACTOR's OPERATIONS WHICH MAY RESULT IN WATER POLLUTION

A. Take sufficient precautions to prevent pollution of streams, canals, lakes, reservoirs, wetlands and other sensitive areas with silt, sediment, fuels, oils, bitumens, calcium chloride, or other harmful materials. Conduct and schedule operations so as to avoid or otherwise minimize pollution or siltation of such streams, etc. and to avoid interference with movement of migratory fish. Do not pump the residue from dust collectors or washers into any water body.

B. Construction operations in rivers, streams, lakes, tidal waters, reservoirs, canals, and other impoundments shall be restricted to those areas where it is necessary to perform filling or excavation to accomplish the work shown in the contract Documents and to those areas which must be entered to construct temporary or permanent structures. As soon as conditions permit, promptly clear rivers, streams, and impoundments of all obstructions placed therein or caused by construction operations.

C. Except as necessary for construction, do not deposit excavated material in rivers, streams, canals, or impoundments, or in a position close enough thereto, to be washed away by high water or run-off.

D. Where pumps are used to remove highly turbid waters from enclosed construction areas such as cofferdams or forms, treat the water prior to discharge into State or other waters. Pump the water into grassed swales, appropriately vegetated areas, or sediment basins, or confine it by an appropriate enclosure such as siltation curtains when other methods are not considered appropriate. Do not contaminate State or other waters.

E. Do not disturb lands or waters outside the limits of construction, unless approved in advance and in writing by the City. No operations within non-permitted wetlands or upland buffers are allowed.

3.08 PROTECTION DURING SUSPENSION OF CONTRACT TIME

A. In the event that it is necessary that the construction operations be suspended for any appreciable length of time, shape the top of the earthwork in such a manner as to permit run-off of rainwater and construct earth berms along the top edges of embankments to intercept run-off water. Provide temporary slope drains to carry run-off from cuts and embankments which are located in the vicinity of rivers, streams, canals, lakes and impoundments. Should such preventative measures fail, immediately take such other action as necessary to effectively prevent erosion and siltation.

END OF SECTION

DIVISION 32

EXTERIOR IMPROVEMENTS

SECTION 32 12 05

ASPHALTIC PAVEMENT

PART 1 GENERAL

1.01 SUMMARY

A. Provide asphaltic pavement, including prepared base, as shown and as specified. Comply with applicable provisions of Div. 00 and 01.

1.02 DEFINITIONS

A. References to "FDOT Standards and Specifications" shall mean Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, latest edition, including current Supplemental Specifications.

1.03 SUBMITTALS

A. Test Reports: Submit reports for laboratory and field tests required under "Testing" article. Test reports for base course shall be submitted prior to placing asphaltic pavement. Make submittals in accordance with Section 01 33 00.

1.04 TESTING

A. Base Course: Contractor shall arrange and pay for base course compaction testing by a qualified testing agency, acceptable to Owner and independent of Contractor. Determine laboratory density of base course material. Perform at least one field density test for every 2000 sq ft of paved area, but in no case less than three tests.

B. Asphalt Mixture Design: Asphaltic pavement job mix formula shall be derived from tests performed by a qualified testing agency paid for by Contractor. Results of previous tests performed on aggregates from same source and using asphaltic material of same brand as used in a previous mix design may be used. If requested, submit job mix formula for review.

C. Asphalt Mixture Quality Control: Contractor shall maintain a quality control program in accordance with FDOT Standards and Specifications to ensure that the asphalt produced meets the job mix design, but documentation submittals are not required. Owner will not provide mix verification testing.

PART 2 PRODUCTS

2.01 BASE COURSE

A. Crushed stone or crushed gravel meeting requirements of FDOT Standards and Specifications, for 1-1/4 in. base.

2.02 ASPHALTIC PAVEMENT

A. General: Hot-mixed asphaltic pavement consisting of 5 to 7 percent asphalt cement (by weight), aggregate, and mineral filler (as required) meeting requirements of FDOT Standards and Specifications, Section 331, for Type S pavement.

B. Asphalt Cement: Asphalt cement meeting the requirements of FDOT Standards and Specifications, Section 331.

C. Aggregate: Sound, angular crushed stone, crushed gravel, sand and other approved material meeting requirements of FDOT Standards and Specifications.

1. Lower Layer(s) (Binder Course): 19 mm (3/4 in.) nominal size.
2. Upper Layer (Surface Course): 12.5 mm (1/2 in.) nominal size.

D. Mineral Filler: Limestone dust, portland cement, or other inert filler material; ASTM D242 or AASHTO M17.

2.03 TACK COAT

A. Emulsified asphalt.

2.04 WHEEL STOPS

A. Precast concrete wheel stops as shown. Provide 3/4 in. diameter by 30 in. long galvanized steel pins.

2.05 TRAFFIC MARKING PAINT

A. Factory mixed, quick-drying, non-bleeding traffic marking paint complying with AASHTO M248, Type S. Color shall be white, except where yellow is designated.

PART 3 EXECUTION

3.01 PREPARATION

A. Shape and compact subgrade to uniform density and to required alignment and cross-section. Foundation shall be smooth and at proper elevation and contour to receive base course.

B. Whenever new work adjoins existing pavement, saw cut existing pavement to form a straight, vertical joint line.

3.02 PLACING BASE COURSE

A. Place base course to grade as shown with proper allowance for asphaltic pavement. Base course shall be compacted to 95% maximum density at optimum moisture content in accordance with ASTM D698 or AASHTO T99.

B. Base course in excess of 6 in. thickness shall be compacted in two lifts.

3.03 OVERLAYS

A. Before placing an overlay on existing asphaltic or portland cement concrete pavement, apply tack coat to contact surfaces at rate of 0.05 to 0.15 gal per sq yd. Allow to dry until at proper condition to receive new paving.

3.04 PLACING ASPHALT MIXTURE

A. Construct asphaltic pavement in accordance with FDOT Standards and Specifications, except as otherwise designated.

B. Place asphaltic pavement in one or more layers to thicknesses and grades shown using self-propelled spreading and finishing machines. Maximum compacted thickness of individual layers shall not exceed 4 in. for binder courses and 2.5 in. for surface courses. Minimum compacted thickness of individual layers shall not be less than 2-1/4 in. for binder courses and 1-1/2 in. for surface courses.

C. Compact paving to 91.5% of the target maximum density in accordance with FDOT Standards and Specifications.

D. Tolerance on finished surface shall be 1/4 in. in 10 ft. Paving shall meet manholes, curbs, and other construction at required grade.

3.05 ROLLING

A. Begin rolling when mixture will bear roller weight without excessive displacement.

B. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.

C. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling, and repair displaced areas by loosening and filling, if required, with hot material.

D. Second Rolling: Following breakdown rolling and as soon as possible while mixture is hot. Continue second rolling until mixture has been thoroughly compacted.

E. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until all roller marks are eliminated and course has attained maximum density.

F. Remove and replace paving areas mixed with foreign materials and defective areas. Cut-out such areas and fill with fresh, hot asphaltic pavement. Compact by rolling to maximum surface density and smoothness.

G. Protect work using barricades until pavement has hardened.

3.06 LANE AND PARKING MARKING

A. Paint line work on asphaltic paving, concrete curbs, sidewalks, and ramps as shown.

B. Clean surface in areas to receive markings. Paint markings and symbols with traffic marking paint. Apply paint with mechanical equipment to produce uniform straight edges. Apply two coats at manufacturer's recommended rates.

END OF SECTION

SECTION 32 19 10

PAVEMENT REPLACEMENT

PART 1 GENERAL

1.01 SUMMARY

A. Replace pavements and appurtenant improvements disturbed by construction as shown and as specified. Comply with applicable provisions of Div. 00 and 01.

B. Restore surfaces as near as practical to condition existing prior to construction and as designated. Clean site and remove equipment, salvaged material, unused materials, and debris resulting from construction. Repair or replace pavements and other items within and beyond construction limits damaged or destroyed through carelessness or failure to follow reasonable safeguards.

1.02 RELATED SECTIONS

32 92 23 Sodding.

1.03 TESTING

A. Engineer may sample and test replacement materials. Where materials do not conform to type or density specified, they shall be replaced or reworked to conform. Cost of extra tests for replaced or reworked areas shall be paid for by Contractor.

1.04 MEASUREMENT AND PAYMENT

A. Replacement of pavements, curb and gutter, sidewalk, and driveways, and sawcutting joints will be considered incidental to bid items, unless included in Bid Schedule as separate pay items.

B. When Bid Schedule contains a unit price for (type) PAVEMENT REPLACEMENT, payment will be made at contract unit price per square yard within limits shown.

C. When Bid Schedule contains a unit price for CURB AND GUTTER REPLACEMENT, payment will be made at contract unit price per linear foot.

D. When Bid Schedule contains a unit price for SIDEWALK REPLACEMENT, payment will be made at contract unit price per square foot.

E. When Bid Schedule contains a unit price for (type) DRIVEWAY REPLACEMENT, payment will be made at contract unit price per square foot.

PART 2 PRODUCTS

2.01 GRANULAR SUBBASE COURSE

A. Granular material meeting the requirements of FDOT Standards and Specifications.

2.02 BASE COURSE

A. Crushed stone or crushed gravel meeting the requirements of FDOT Standards and Specifications

2.03 ASPHALTIC CONCRETE

A. Asphaltic concrete shall conform to FDOT Standards and Specifications, Type S. Asphalt cement grade shall be as recommended by asphalt plant for the area(s) of pavement to be replaced.

2.04 CONCRETE

A. Cast-in-place concrete shall be in accordance with Section 03 30 00.

PART 3 EXECUTION

3.01 PAVEMENT REPLACEMENT, GENERAL

A. Prepare for pavement replacement after excavations have been backfilled and compacted. Level and grade as necessary. Neatly sawcut adjacent permanent pavement. Restore and adjust to grade manhole castings, valve boxes, curb stops, and other utility appurtenances.

B. Designated types of pavement replacements shall be considered as minimums to be used for bidding purposes. Wherever existing pavement is heavier than the replacement indicated, contact Engineer concerning the required replacement.

C. Comply with construction methods of FDOT Standards and Specifications, unless otherwise indicated.

3.02 TYPE "A" PAVEMENT REPLACEMENT

A. Provide 12 in. of granular subbase course and 8 in. of reinforced concrete.

B. Compact subbase course to 95% of Standard Proctor density (ASTM D698).

C. Place reinforcing fabric at mid-depth of concrete slab. Place expansion joint filler where concrete abuts fixed objects. Provide joints that match existing pattern. Cure concrete with plastic sheets or commercial curing compound to prevent loss of moisture for at least 48 hr.

3.03 TYPE "B" PAVEMENT REPLACEMENT

A. Provide 8 in. of granular subbase course, 6 in. of base course, and 1 1/4 in. of asphaltic concrete. Compact subbase course and base course to 95% of Standard Proctor density (ASTM D698).

3.04 TYPE "C" PAVEMENT REPLACEMENT

A. Provide 8 in. of base course compacted to 95% of Standard Proctor density (ASTM D698).

B. Place base course 2 in. below grade of existing asphaltic pavement to allow for asphaltic concrete paving by others. Provide additional base course where required to create transitions to existing pavement not removed under this work.

3.05 CURB AND GUTTER REPLACEMENT

A. Concrete curb and gutter shall be non-reinforced concrete constructed on 6 in. thick compacted granular subbase course. Match size and shape of original curb and gutter.

B. Cure concrete with plastic sheets or commercial curing compound to prevent loss of moisture for at least 48 hr.

3.06 SIDEWALK REPLACEMENT

A. Concrete sidewalks shall be non-reinforced concrete, 4 in. minimum thickness except 6 in. thickness across driveways, constructed on 6 in. thick compacted granular subbase course. Match width and joint pattern of original walk.

B. Cure concrete with plastic sheets or commercial curing compound to prevent loss of moisture for at least 48 hr.

3.07 DRIVEWAY REPLACEMENT

A. Concrete driveways shall be non-reinforced concrete, 6 in. minimum thickness, constructed on 12 in. thick compacted granular subbase course. Match width and joint pattern of original driveway. Cure concrete with plastic sheets or commercial curing compound to prevent loss of moisture for at least 48 hr.

B. Asphaltic driveways shall be 2 in. thick asphaltic concrete constructed on 6 in. thick base course.

C. Aggregate driveways shall be 6 in. thick base course.

PART 4 SCHEDULES

4.01 PAVEMENT REPLACEMENT SCHEDULE

Location	Pavement Replacement
Concrete Pavements	Type A
Asphaltic Pavements	Type B
Aggregate Surfaces	Type C

END OF SECTION

SECTION 32 92 23

SODDING

PART 1 GENERAL

1.01 SUMMARY

A. All non-paved disturbed areas shall be sodded with Bermuda type sod supplied from a sod farm in northeast Florida. Sodding shall be in accordance with Section 570 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition.

1.02 DESCRIPTION

A. The works specified under this section shall include furnishing of all labor, materials, and equipment necessary for the sodding of grass on slopes, shoulders, disturbed grassed areas and specified other areas called for on the plans.

END OF SECTION

DIVISION 33

UTILITIES

SECTION 33 05 60

MANHOLES AND STRUCTURES

PART 1 GENERAL

1.01 SUMMARY

A. Provide manholes and structures as shown and as specified. Comply with applicable provisions of Divisions 00 and 01.

1.02 RELATED SECTIONS

31 20 00 Earthwork

1.03 MEASUREMENT AND PAYMENT

A. Manholes, including risers, base, cone/top, adjusting rings, and appurtenances, will be paid for at the contract unit price per vertical foot for (size) MANHOLE measured to the nearest tenth of a foot from invert of out flowing sewer to bottom of casting.

B. Inlets, including base, riser, adjusting rings, and appurtenances, will be paid for at the contract unit price per vertical foot for (size) INLET, measured to the nearest tenth of a foot from invert of out flowing sewer to bottom of casting.

C. Catch basins, including base, riser, adjusting rings, and appurtenances, will be paid for at the contract unit price per vertical foot for (size) CATCH BASIN, measured to the nearest tenth of a foot from invert of sump to bottom of casting.

D. Storm inlets and catch basins will be paid for at the contract unit price for each (size) STORM INLET or (size) CATCH BASIN.

E. Castings, consisting of a frame and lid or grating, will be paid for at the contract unit price each for CASTING (type).

F. Manhole chimney seals will be paid for at the contract unit price each for MANHOLE CHIMNEY SEAL.

G. Manhole drop entrances will be paid for at the contract unit price per vertical foot for MANHOLE DROP ENTRANCE measured between high and low inverts of drop assembly.

H. Connecting to existing manholes by making new openings as specified and installing pipeline will be paid for at the contract unit price each for CONNECT TO EXISTING MANHOLE.

I. Adjustment of existing castings to required grade by adding or removing adjusting rings will be incidental to the contract unit prices.

1.04 SUBMITTALS

A. Shop Drawings: Submit shop drawings for manholes and other structures in accordance with Section 01 33 00.

PART 2 PRODUCTS

2.01 MANHOLES

A. General: Manholes shall be precast reinforced concrete and shall comply with ASTM C478.

B. Precast Risers: Precast reinforced concrete of 48-in. inside diameter, unless otherwise designated. Joint shape shall be compatible with designated joint materials.

C. Base: Precast or cast-in-place concrete base. Precast bases shall be minimum 6-in. thick and integral with first riser. Cast-in-place concrete bases shall be minimum 12-in. thick and cast with first riser embedded at least 4 in., unless otherwise designated.

D. Top: Manhole top shall be precast eccentric cone. Where space does not permit a cone top, a minimum 6-in. thick (48-in. diameter) or 8-in. thick (60-in. or greater diameter) slab top with eccentric opening may be substituted.

2.02 INLETS AND CATCH BASINS

A. Small inlets and catch basins (36 in. or less diameter) shall be reinforced concrete pipe sections, ASTM C76, sizes as shown on Drawings.

B. Rectangular inlets and catch basins shall be precast reinforced concrete, ASTM C478 or ASTM C913, dimensions as shown on Drawings.

2.03 MANHOLE AND STRUCTURE APPURTENANCES

A. Adjusting Rings: Precast reinforced concrete rings with diameter/dimensions matching casting frame.

B. Joint Sealant: Rubber ring gaskets or butyl rubber sealant. Rubber ring gaskets shall comply with ASTM C443. Butyl rubber sealant shall be preformed, high adhesion material, packaged ready for use between protective paper strips, complying with ASTM C990.

C. Pipe Seals: Flexible, watertight, gasketed seals for pipe entrance holes complying with ASTM C923. Pipe entrances into storm manholes (only) may be made with mortar in lieu of flexible seals.

D. Manhole Chimney Seals: External, flexible rubber sleeve and stainless steel compression bands (if compression bands are required by manufacturer) designed to prevent leakage of water into manhole in adjusting ring area between manhole frame and top of cone or flat top. Seal shall remain flexible, allowing repeated vertical movements of frame due to frost lift, ground movement, or other causes of up to 2 in. and/or repeated horizontal movements of frame due to thermal movement of pavement or other causes of up to 1/2 in. for a 20 year design life. Provide Adaptor, Inc. "I/E.A. Seal", Cretex Specialty Products "External Manhole Chimney Seal", Sealing Systems, Inc. "Infi-Shield Uniband", or approved equal.

2.04 MANHOLE DROP ENTRANCES

A. Outside Drop Entrance: Drop assembly shall consist of a tee or wye connecting to inflowing sewer, a drop pipe of same diameter as inflowing sewer, and a 90 deg bend at bottom, all encased in concrete and resting on manhole base.

B. Inside Drop Entrance: Fiberglass drop bowl and vertical PVC pipe matching diameter of inflowing sewer, secured to inside wall of manhole by stainless steel pipe brackets (60 in. diameter or larger manholes only).

2.05 CASTINGS

A. Casting frames, lids, and grates shall be cast iron, ASTM A48, Class 30, of uniform quality, free from blow holes, porosity, hard spots, shrinkage defects, cracks or other serious defects. Castings shall be true to pattern with machined bearing faces between frame and cover.

B. Type of castings shall be as designated on Details or approved equal. Provide traffic-rated castings, unless otherwise noted. Lids for sanitary manholes shall have self-sealing neoprene O-ring gaskets and concealed pick holes.

2.06 CONCRETE BLOCK (NOT USED)

2.07 CAST-IN-PLACE CONCRETE

A. Job-mixed or ready-mixed concrete in accordance with Section 03 30 00, Class CC or better.

PART 3 EXECUTION

3.01 MANHOLE CONSTRUCTION

A. Construct standard manholes of precast or cast-in-place bases, precast risers, precast top section, adjusting rings, and appurtenances in accordance with Drawing Details. Alternate construction with cast-in-place concrete forms or other procedures shall be submitted for review.

B. Excavate as necessary to construct manholes. Set precast bases on firm, level, granular bedding. Pour cast-in-place bases on undisturbed earth; if over excavation occurs, backfill with concrete or compacted granular material. On wet subgrades, provide 6 in. of washed or crushed stone under bases.

C. Join risers, top sections, adjusting rings, and castings using compatible rubber rings or butyl rubber sealant. When butyl rubber sealant is used, joining surfaces shall receive manufacturer's approved primer, as required. Under weight of superimposed sections, sealant shall form a tightly packed, watertight seal in annular joint space.

F. Adjust manhole castings to within plus 0 in. to minus 1/2 in. of grade shown for finished pavement. Match street cross-slope.

G. Install chimney seals on all sanitary manholes in accordance with manufacturer's instructions.

H. Backfill and compact soils around manholes as required for adjacent piping.

3.02 INLET AND CATCH BASIN CONSTRUCTION

A. Construct inlets and catch basins of precast or cast-in-place bases, precast risers, adjusting rings, and appurtenances in accordance with Drawing Details. Alternate construction with cast-in-place concrete forms or other procedures shall be submitted for review.

B. Excavate as necessary to construct structures. Set precast bases on firm, level, granular bedding. Pour cast-in-place bases on undisturbed earth; if over excavation occurs, backfill with concrete or compacted granular material. On wet subgrades, provide 6 in. of washed or crushed stone under bases.

C. Join risers, adjusting rings, and castings using compatible rubber rings or butyl rubber sealant. When butyl rubber sealant is used, joining surfaces shall receive manufacturer's approved primer, as required. Under weight of superimposed sections, sealant shall form a tightly packed, watertight seal in annular joint space.

D. Adjust castings to within plus 0 in. to minus 1/2 in. of grade shown for finished pavement. Match street cross-slope.

E. Backfill and compact soils around structures as required for adjacent piping.

3.03 PIPING INSTALLATION

A. Complete pipe seals in accordance with manufacturer's instructions.

1. For manholes and other structures with flexible seals, support pipe outside structures by bedding as specified for type of pipe installed.
2. For manholes and other structures with rigid (mortar) seals, support pipe outside structures until reaching undisturbed soil or to first joint by a 6 in. thick wall of cast-in-place concrete, brick, or solid concrete block contoured at top to fit lower 1/3 of pipe.

B. Manholes with more than one entrance pipe and manholes at changes in alignment or grade shall have formed flow channels with smooth radius transitions. Unless precast in shop, flow channel shall not be poured until manhole is completely built and backfilled. Flow channel shall be the same diameter as the larger of adjoining sewers.

C. When flow channels are field poured in manholes with flexible seals, maintain seal flexibility by plugging interior space between pipe and manhole wall with butyl rubber sealant.

D. For inlets, slope invert toward pipe at 1/2 in. per ft.

3.04 MANHOLE DROP ENTRANCE INSTALLATION

A. Install manhole drop entrances where indicated, constructed according to Drawing Details.

3.05 PROVISION FOR FUTURE CONNECTION

A. Connections for future sewers, when indicated, shall consist of a short piece of sewer terminating with a bell end and stopper or bulkhead not more than 1 ft or one stub diameter outside manhole wall, unless otherwise shown. If no elevation is given, set invert at spring line of main sewer.

3.06 CONNECTING TO EXISTING MANHOLES

A. Where a new connection is required to an existing manhole, core drill opening in manhole riser to avoid damage to existing manhole. Retrofit a new pipe seal (manhole boot) into opening in order to create a watertight seal.

B. For storm manholes (only), a new connection to an existing manhole may be made by neatly sawing a new opening and filling the annular spacing between new pipe and manhole wall using non-shrink grout.

3.07 ADJUSTING EXISTING CASTINGS

A. Manholes: Adjust existing manhole castings in work area to within plus 0 in. to minus 1/2 in. of required elevation by removing or adding adjusting rings or masonry and reinstalling fixtures, supporting them in a collar of concrete masonry constructed to hold them firmly in place.

B. Inlets and Catch Basins: Adjust existing inlet and catch basin castings in work area to within plus 0 in. to minus 1/2 in. of required elevation by removing or adding adjusting rings or masonry and reinstalling fixtures, supporting them in a collar of concrete masonry constructed to hold them firmly in place.

END OF SECTION

SECTION 33 35 10

WATER MAIN & OTHER PIPE

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK

The extent of work as specified under this section shall generally include, but not be limited to, the furnishing of all labor and materials required to install all piping, fittings, sleeves and seals required for the construction under this contract. All materials shall be new unless specifically called for otherwise.

1.02 QUALITY ASSURANCE STANDARDS

All reference to Industry Standards (ASTM, ANSI, AWWA, etc.) shall be the latest revision unless otherwise stated.

A. American National Standards Institute, Inc. (ANSI)

1. All potable water pipe shall meet ANSI/NSF Standard 61
2. ANSI/AWWA C104-95, Cement Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
3. ANSI/AWWA C106-80, Cast Iron Pipe Centrifugally Cast in Metal Molds for Water or Other Liquids.
4. ANSI/AWWA C108-75, Cast Iron Pipe Centrifugally Cast in Sand-Lined Molds for Water or Other Liquids.
5. ANSI/AWWA C110-03, Ductile Iron and Gray Iron Fittings, 3 in. through 48 in. for Water and Other Liquids.
6. ANSI/AWWA C111-00, Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe Fittings.
7. ANSI/AWWA C115-99, Flanged Ductile-Iron Pipe with Threaded Flanges.
8. ANSI/AWWA C150-02,Thickness Design of Ductile Iron Pipe.
9. ANSI/AWWA C151-02, Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds for Water or Other Liquids.
10. AWWA C153-00, Ductile Iron Compact Fittings, 3 in. through 64 in. for Water Service.
11. AWWA C219-01, Bolted, Sleeve-type Couplings for Plain End Pipe.
12. AWWA C605-94, Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water.
13. AWWA C509-87, Resilient-Seated Gate Valves for Water and Sewage Systems.
14. AWWA C600-99, Installation of Ductile-Iron Water Mains and Their Appurtenances.
15. AWWA C651-99), Disinfecting Water Mains.
16. AWWA C900-97, Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. through 12 in., for Water Distribution.
17. AWWA C905-97, Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 in. through 48 in., for Water Distribution and Transmission.

B. American Society for Testing and Materials (ASTM)

1. A53-81a, Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
2. A120-81, Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Ordinary Uses.
3. A126-73 (1979) Gray Iron Castings for Valves, Flanges and Pipe Fittings.
4. D1785-76, Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80 and 120.
5. D2241-80, Polyvinyl Chloride (PVC) Plastic Pipe (SDR-PR).
6. D-2464, Threaded Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80.
7. D2466-78, Socket Type Polyvinyl Chloride (PVC)Plastic Pipe Fittings, Schedule 40.
8. D2467-78, Socket Type Polyvinyl Chloride (PVC)Plastic Pipe and Fittings, Schedule 80.
9. D2564-80, Solvent Chemicals for Polyvinyl Chloride (PVC)Plastic Pipe and Fittings.
10. D2855-81, Making Solvent Cemented Joints with Polyvinyl Chloride (PVC) Pipe and Fittings.
11. ASTM F402, Practice for Safe Handling of Solvent Cements, Primers and Cleaners used for Joining Threaded Plastic Pipe and Fittings.
12. ASTM F437, Specification for Thermo Chlorinated Polyvinyl Chloride (CPVC), Plastic Pipe Fittings, Schedule 80.
13. F439-77, Socket Type Chlorinated Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80.
14. F441-77, Chlorinated, Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80 and 120.
15. ASTM F493, Specification for Solvent Cements for Chlorinated Polyvinyl Chloride (CPVC) Plastic Pipe and Fittings.
16. ASTM F656, Specification for Primers for Use in Solvent Cement Joints of Polyvinyl (CPVC) Plastic Pipe and Fittings.

C. Manufacturer's name and model numbers are listed to establish a standard of quality. Equivalent items of other manufacturers are acceptable.

1.03 SUBMITTALS:

A. Provide complete detail shop drawing submittal to include but is not limited to the following:

1. Catalog data, brochures and descriptive literature
2. Submit manufacturer's certification of materials' conformance to specifications.
3. Submit manufacturer's literature, catalog data and installation instructions.
4. Submit certified pressure test reports.

1.04 PRODUCT DELIVERY AND HANDLING:

A. Exercise care to prevent damage of product during loading, transporting, unloading and storage.

B. Do NOT drop pipe or fittings.

C. Do not store directly on ground and assure that materials are kept clean.

PART 2 – PRODUCTS

2.01 PIPE:

A. General

Pipe shall be furnished free from defects impairing strength and durability and should be of best commercial quality for purpose specified. Structural properties shall be sufficient to safely sustain or withstand strains to which it is normally subjected.

1. The pipe material for this project is either PVC or ductile iron. DIP shall conform to ductile iron material specified below. PVC shall conform to the reuse PVC pipe material specified below

B. Pipe Materials:

1. Ductile Iron (D.I)
   a. AWWA C151, Pressure Class 350, 3 in. through 12 in., Pressure Class 250, 14 in. and larger.
   b. AWWA C115 with solid, ductile iron flanges.
2. Carbon Steel ASTM A53, Type E or S, Grade B:
   a. Class: Schedule 40, unless indicated or specified otherwise.
   b. Galvanized: ASTM A120, hot-dipped zinc coated; base metal, ASTM A53.
3. Polyvinyl Chloride (PVC) Gravity Sewer Pipe: Gravity sewer pipe PVC 3034, SDR26 and SDR35, the PVC compound shall conform to ASTM D-1784. Pipe shall be color coded green and clearly marked in 5 feet intervals or less indicating manufacturers name, nominal size, cell classification and legend. Pipe installed deeper than 11 feet from grade to invert must be heavy wall SDR26. Maximum depth of gravity sewer without prior approval shall be 15 feet.
4. Polyvinyl Chloride (PVC) Sewage Forcemain: DR18 (C-900), Class 150, PVC for Force Main conforming to ASTM D-2241, D-3139, and F-477, color coded green (no white pipe accepted) and marked on at least 2 sides with the words “Force Main” at every 12” along barrel of pipe. Coupling shall be rubber gasketed, and push-on type conforming to ASTM D-2122.
5. Polyvinyl Chloride (PVC) Water Main or Reclaimed Water Main: DR25, (C-900) Class 150 PVC for Reclaimed Transmission and Distribution Mains above 12”, DR18, Class 150 PVC for Reclaimed Distribution Mains 4” thru 12”, conforming to ASTM D-1784, D-2241, D-3139 and F-477, color coded blue or purple and marked on at least 2 sides with the word “water” or “reclaimed water” at every 12” along barrel of pipe. Couplings shall be rubber gasketed, push-on type conforming to ASTM D-2122.
6. Polyvinyl Chloride (PVC), 3 in. and Smaller:
   a. Specification: ASTM D1785
   b. Compound: PVC 12454-B, ASTM D1784
   c. Thickness: Schedule 80
7. Stainless Steel (SS)
   a. Specification: ASTM A312
   b. Type 304

c. Thickness: Schedule 405

8. Fusible Polyvinyl Chloride (PVC) for Watermain, Reclaimed Watermain and Sewage Forcemain:

a. Specification: DR18 Fusible C900™, 4" through 12" nominal outside diameter. DR18 Fusible C905™, 14" through 48" Ductile Iron Pipe size

b. Compound: Cell Classification 12454B, ASTM D1784-02, AWWA C900-97 of AWWA standard for PVC Pressure Pipe, AWWA C905-97 of AWWA standard for PVC Pressure Pipe, AWWA C605-94 of AWWA standard for PVC Pressure Pipe, NSF-61 Drinking Water System Components, PPI PVC Range Composition Listing of Qualified Ingredients TR-2/2003.

c. Thickness: Class 150, DR 18

C. Pipe Joints:

1. Ductile Iron:

a. Mechanical: ANSI/AWWA C111.

b. Push On: ANSI/AWWA C111, single gasket type.

c. Flanged: ANSI B16.1, Class125; Bolts and Gaskets shall comply with Appendix A of AWWA C110. Bolts shall have hex heads and heavy hex nuts; gaskets shall have one or more annular rings to improve joint performance.

d. Restrained: ANSI/AWWA C111-90 Acceptable: Lock-Fast, American Ductile Iron Pipe; TR Flex, U.S. Pipe; SuperLock, Clow Corporation.

e. Restraining Devices: Megalug Series 110 and Series 1700.

2. Carbon Steel:

a. Screwed: 150# ASTM A197, Malleable Iron, , ANSI B16.3; galvanized with galvanized pipe.

b. Flanged: ANSI B16.5, Class 150, slip on flanges.

3. Polyvinyl Chloride, 4 in. and Larger:

a. Push On: ASTM F477 Elastomeric Gaskets

b. Restrained: Uni-Flange Restrainer, Series 1300, 1350 or 1390,

4. Polyvinyl Chloride, 3 in. and Smaller:

a. Screwed: ASTM D2464

b. Solvent Weld: ASTM D2855

c. Solvent: ASTM D2564

5. CPVC:

a. Threaded: Teflon Tape or CPVC compatible pipe dope.

b. Solvent Weld: ASTM F439.

c. Solvent: ASTM F493, Weldon-on 724.

d. Primer: ASTM F656

6. Stainless Steel

a. Screwed.

D. Linings and Coatings:

1. Ductile Iron for potable water and reclaimed water service:
    a. Interior Lining: cement mortar lining, ANSI/AWWA C104, factory applied, bonded to pipe, with seal coat.
    b. Exterior Coating: Asphaltic coating a minimum of 1 mil. thick for all pipe to be installed underground. Pipe that will be above ground or otherwise exposed to view shall not have outside coating.
2. Ductile Iron for sanitary sewer service:
    a. Interior Lining: Virgin polyethylene complying with ANSI/ASTM D1248, compounded with an inert filler and with sufficient carbon black to resist ultraviolet rays during storage of the pipe and fittings. The polyethylene shall be bonded to the interior of the pipe or fitting by heat. Lining thickness shall be 40 mils nominal thickness. Minimum lining thickness shall be 30 mils.
    b. Exterior Coating: Asphaltic coating a minimum of 1 mil. thick for all pipe to be installed underground.
3. Polyvinyl Chloride (PVC) color coding and markings:
    a. Pipe shall be color coded Blue for water, Green for sewer, and Purple for reclaimed water.
    b. Pipe shall be marked per the appropriate section of the AWWA standard.

E. Pipe Fittings:
1. Ductile Iron and Polyvinyl Chloride (PVC) pipe 4 in. and Larger:
    a. ANSI/AWWA C110, Ductile Iron fittings.
    b. ANSI/AWWA C153, Compact Fittings
    c. ANSI/AWWA C104, mortar lined.
    d. Mechanical: ANSI/AWWA C111.
    e. Push On: ANSI/AWWA C111.
    f. Flanged: ANSI B16.1, Class125.
    g. Restrained-Ductile Iron: Same as Ductile Iron pipe joints.
    h. Restrained-PVC: Same as PVC Pipe Joints.
2. Carbon Steel:
    a. Screwed: Malleable Iron, ANSI B16.3 galvanized.
    b. Flanged: ANSI B16.5, Class 150
3. Polyvinyl Chloride (PVC) 3 in. and Smaller:
    a. ASTM D2464, Schedule 80 PVC threaded fittings.
    b. ASTM D2467, Schedule 80 PVC socket type fittings.
    c. ASTM D2855 and ASTM D2672, solvent weld joints.
    d. ASTM D2564, solvent cement
4. CPVC
    a. ASTM F493, Socket Type (preferred)
    b. ASTM F437, threaded (only when necessary)
5. Stainless Steel

a. ASTM A1821, 150#, Screwed, Type 304.

2.02 ACCESSORIES:

A. Flanged Coupling Adapters: AWWA C219, Cast Iron, ASTM A126, Class B or ductile iron to ASTM A536. Flanges to match ASTM B16.1, Class125 Flanges. Flanged coupling adaptors shall be rated for 150 psi, have stainless steel bolting and shall be of the restrained type, megaflange 2100 or equal.

B. Wall Sleeves:

1. Cast iron or hot dip galvanized steel with exterior ring cast at center of sleeve.
2. Caulked type: Acceptable: Figure No. F-1430, Clow Corporation or equal.
3. Mechanical Joint: Acceptable Figure No. F-1436, Clow Corporation or Equal.

C. Wall Sleeve Seals: Space between pipe and wall sleeve.

1. Interlocking synthetic rubber links assembles with austenitic stainless steel bolts and nuts.
2. Glass fiber reinforced plastic pressure plates under each bolt head and nut.
3. For Piping 10” and Larger: Links shall have reinforced centering blocks in the lower 90 quadrant or assembly.
4. Acceptable: Link-Seal or equal.

D. Pipe Couplings

The Contractor shall furnish and install pipe couplings as required to complete the work. Pipe couplings used to join two pieces of ductile iron pipe or PVC shall be sized to match the outside diameters. The coupling sleeve shall be manufactured of ductile iron conforming to ASTM A536 and be coated with 14 mils of epoxy. The bolts shall be manufactured of a metal of high corrosion resistance and shall conform to ANSI 21.11 (AWWA C111). Gaskets shall be wedge-type and manufactured of virgin SBR for water and sewer services. The installation of all couplings shall be in accordance with manufacturer’s recommendations. After installation, all coupling surfaces including bolts and nuts shall be coated with an approved coating as specified in this section of these specifications.

E. Full Circle Repair Clamps

Full circle repair clamps shall have type 304 stainless steel shell, lugs, bolts, nuts and washers as per ASTM A193, A194, A240, or shall have type 304 stainless steel shell per ASTM A240, ductile iron lugs as per ASTM A536, and 304 stainless steel bolts, washers and nuts. Gaskets for both types shall be virgin SBR as per ASTM D2000 for water and sewer service.

PART 3 – EXECUTION

3.01 INSPECTION:

A. Examine area to receive pipe for defects that adversely affect execution of work or cause deviation beyond allowable tolerances for piping clearances.

B. Carefully examine each section of pipe before installation. Do not use defective or damaged pipe. Remove such pipe from project site immediately.

3.02 PREPARATION:

A. Provide proper facilities for lowering sections of pipe into trench.

B. Thoroughly clean inside of pipe of all foreign matter. Comply with Section 4.3 of AWWA C651.

3.03 SCHEDULE: Unless indicated or specified otherwise, use the following types of pipe.

A. Ductile Iron (D.I.):

1. Where indicated.
2. All piping 3 in. diameter and larger:
   a. Mechanical or Push on Joints and Fittings: Underground.
   b. Flange Joints and Fittings: Above ground and in structures.

B. Carbon Steel:

1. Where indicated.
2. Galvanized: All above-ground water piping 2-1/2 in. diameter or less.

C. Polyvinyl Chloride (PVC)

1. Where indicated.
2. Above Grade - solvent weld, Sch 80 PVC
3. Below Grade - solvent weld, Sch 80 or push-on joints with restraint where needed.
4. Reuse pipe shall be solvent weld Sch 80 PVC where available. Sch 40 PVC is acceptable otherwise.

D. CPVC

1. Where indicated.
2. Solvent weld, Sch. 80.

E. Stainless Steel

1. Where indicated.

3.04 INSTALLATION

A. Underground Piping:

1. General
   a. PVC piping 4 inches and larger shall be installed in accordance with AWWA C605. PVC and CPVC piping 3 inches and smaller shall be installed in accordance with ASTM D2774 and the piping manufacturer's installation instructions such as published by Corzan Industrial systems. Ductile Iron Piping shall be installed in accordance with AWWA C600.
   b. Minimum cover shall be as follows unless shown otherwise (greater depth permissible as required):

      Plastic Pipe: 36 in.

      Metal Pipe: 30 in.

   c. Location of lines shall be generally as indicated. Adjust line location to avoid conflicts as required and as approved by the Engineer.
2. Laying Pipe:
   c. Keep clean during construction by means of plugs or other suitable methods.

d. Do not allow trench water to enter pipe or fittings.

e. Lay piping on firm bed for entire length of trench except where supports are otherwise provided.

f. Lay in reasonably straight lines.

g. Adjust to changes in grade following contour of ground with long, sweeping curves.

h. Abrupt changes in grade are not permitted unless indicated or approved by the Engineer.

i. Employ partial backfilling and cradling to hold pipe in secure position during backfilling operations.

j. Restrain pipe, valves and fittings in pressure lines with mechanical restrainers at all points of unbalanced reaction (see Section 15090).

k. Laying Conditions:

Ductile Iron or Cast iron: AWWA C600, Laying Condition Type 3.
Polyvinyl Chloride Pipe: AWWA C905 Laying Condition Type 3.

B. Exposed Piping:

1. General:

a. Present neat and orderly appearance with completed installation.

b. Install parallel, or at right angles, to all walls, or other building surfaces, where possible, unless indicated otherwise.

c. Space for easy removal and maintenance.

2. Vertical Piping shall be supported at sufficiently close intervals to keep pipe in alignment and to support weight of pipe and its contents.

3. Horizontal Piping shall be supported at sufficiently close intervals to prevent sagging, and provide thrust restraint. Install supports at ends of runs or branches and at each change of direction or alignment.

4. Wall Penetrations:

a. Install wall sleeves or pipes in cast-in-place concrete walls or floors prior to placing concrete. For miscellaneous Small Piping (in lieu of wall sleeves), provide length of galvanized steel pipe or galvanized heavy wall conduit equal to wall thickness.

b. Caulk to provide watertight, vermin-proof joint.

C. Cutting Pipe:

1. General: Make all cuts square with pipe. Cut ductile iron pipe in accordance with AWWA C600 and PVC pipe in accordance with AWWA C605.

2. Polyvinyl Chloride Pipe: Cut with knife or hand saw. Remove burrs or smooth edges with a knife, file or sandpiper.

D. Joints:

1. General: Shall be absolutely watertight and be of a type approved by Engineer prior to installation and in accordance with manufacturer's recommendations.

2. Screwed joints shall be assembled using joint compound applied to male thread of pipe only. Provide sufficient unions to facilitate maintenance or removal.

3. Polyvinyl Chloride (PVC) and Chlorinated Polyvinyl Chloride (CPVC)

   Pipe:

   a. Solvent weld, ASTM D2855

   b. Threaded: Tighten by strap wrench to not more than one full turn beyond hand tight.

4. For flanged joints, flange faces shall be aligned and shall bear uniformly on the gasket. Tighten bolts to the required torque, alternating from one side to the other, in several steps.

E. Connections to Existing Piping now in service:

1. General: At locations shown or as directed by Engineer. Install connections to meet conditions encountered. Use standard fittings as indicated and/or as directed by Engineer. Schedule operations to cause minimum interruption in flow of line. Provide all required fittings, accessories and operating equipment on site prior to starting work on connection.

3.05 FIELD QUALITY CONTROL:

A. Inspection

1. Visually inspect all pipe and fittings for faults or defects.
2. Correct all deviations or omissions from the plans and specifications immediately.
3. Remove defective pipe or fittings and replace with sound materials.

B. Tests:

1. General:

   a. Perform all tests in presence of Engineer.

   b. Repair all leaks noted.

   c. Retest until test requirements are met.

2. Water Lines, Pressure Sewers or Reuse Lines: Use Hydrostatic Test Procedure in AWWA C600 for ductile iron pipe and AWWA C605 for PVC pipe. Perform simultaneous leakage and pressure test of pipeline at pressure noted below:

   a. Process Piping (Non-pressure): 50 psi (all piping not pressurized by a pump).

   b. Pressure Process Piping: 150 psi for a minimum of two hours

   c. Sodium hypochlorite solution piping: 100 psig.

3. Raw water, aerated water, and potable water mains.

   The disinfection of water piping shall be conducted in accordance with AWWAC651 using the continuous-feed method and shall be performed by specialty trained personnel. Provide all temporary filling, flushing and testing connections (complying with Figures 1 and 2 of AWWA C651), water, chemicals, sampling and bacteriological test results. The continuous-feed method shall include slowly and completely filling the main to remove air pockets, preliminary flushing, and filling the main with chlorinated water having a free chlorine concentration of no less than 25 mg/l. At the end of a 24-hour contact time, the heavily chlorinated water, having a free chlorine residual of not less than 10 mg/l, shall be flushed from the main until the chlorine concentration leaving the main is no higher than 4.0 ppm. Neutralize the heavily chlorinated water leaving the main with one of the chemicals named in Appendix C of AWWA C651. Conduct bacteriological sampling and testing in accordance with Section 5 of AWWA C651. After sampling, maintain a minimum pressure of 20 psig in

the mains until regulatory permission is granted to place the mains into service. Provide satisfactory test results consisting of two consecutive sets of samples, taken at least 24 hours apart, showing the absence of total coliform organisms and the presence of a chlorine residual. If necessary, re-disinfect until satisfactory test results are obtained.

END OF SECTION

SECTION 33 35 30

VALVES AND ACCESSORIES

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK: The extent of work contained in this section of specifications shall generally include but not be limited to the furnishing and installation of all types of valves, strainers, and other accessories required to control or prevent flow of gas or liquids through or at existing pipe or new piping as indicated on contract drawings and as contained in these specifications.

1.02 QUALITY ASSURANCE: - *All reference to Industry Standards (ASTM, ANSI, AWWA, etc.) shall be the latest revision unless otherwise stated.*

A. Standards:

1. American National Standards Institute (ANSI):

a. B16.1-1975, Cast Iron Pipe Flanges and Flanged Fittings, class 25, 125, 250 and 800.

2. American Society for Testing and Materials (ASTM):

a. A 126-73 (79), Gray Iron Castings for Valves, Flanges and Pipe Fittings.

b. A536-80, Ductile Iron Castings.

c. B 62-82, Composition Bronze or Ounce Metal Castings.

d. B 148-82, Aluminum Bronze Sand Castings.

e. B 584-82, Copper Alloy Sand Castings for General Application.

3. American Water Works Association (AWWA):

a. C500-86, Gate Valves – 3 in. through 48 in. – for Water and Sewerage Systems.

b. C504, Rubber Seated Butterfly Valves

c. C508-82, Swing-Check Valves for Waterworks Service 2 in. through 24 in.

d. C509-87, Resilient Seated Gate Valves – 3 in. through 12 in. for Water and Sewerage Systems.

1.03 SUBMITTALS:

A. Provide complete detail shop drawing submittal to include but is not limited to the following:

1. Submit manufacturer's certification of materials' conformance to specifications.

2. Submit manufacturer's literature, catalog data and installation instructions.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Seal ends of valves for shipment to prevent entry of foreign matter into valve.

B. Box, crate, completely enclose and protect valves and accessories from accumulations of foreign matter.

C. During loading, transporting, and unloading exercise care to prevent damage to materials. Handle items to prevent damage to interior or exterior surfaces.

D. Do not drop valves or accessories.

E. Store valves and accessories in area protected from weather, moisture or possible damage. Do not store materials on ground.

PART 2 – PRODUCTS

2.01 VALVES:

A. General:

1. Valves shall be rated for not less than 150 psi cold water, non-shock service unless specified or indicated otherwise.
2. End Conditions: Fit joints specified indicated and/or required for piping.
3. Turn to left (counterclockwise) to open.
4. Provide valve boxes with all buried valves.
5. All Valves greater than 12-inches in diameter shall be gear operated.
6. All above ground valves shall be equipped hand wheels.

B. Gate Valves:

1. Smaller than Three Inches: Shall be equipped with handwheel.
   a. Type III (double wedge disc, rising stem, inside screw)
   b. Class B (150 lb. steam rating)
2. Three inches through 12 inches: Shall be AWWA C509, Iron body, resilient seat, non-rising bronze stem with 2” square operating nut on buried valves, handwheel on above ground or vault valves.
   a. Working pressure of 200 psi.
   b. Internal Metal Surfaces shall be two-part thermosetting epoxy coating, 4 mils thick.
   c. Sealing Mechanism shall have zero leakage at 200 psi with flow in either direction.
   d. Acceptable: Mueller Series A-2370, American CRS-80 or equal.
3. Larger Than 12 Inches: Shall be manufactured to meet AWWA C500 or AWWA C509 and meet the requirements of Paragraph 2.01, B.2 above.

C. Butterfly Valves:

1. Greater than 12-Inch: Shall be AWWA C504, iron body, rubber seated with 2” square operating nut, turn to the left (counterclockwise) to open.
2. Working pressure of 150 psi.
3. End connections to fit joints specified and/or required for piping.
4. Acceptable: Mueller, Dezurik, or approved equal.

D. Swing Check Valves: Check valves shall be cast iron, bronze mounted and conform to AWWA C508-82. Ends shall be flanged joint. Valves shall be furnished with all jointing accessories. Lever and weight, or spring, shall be provided where required. All check valves shall be from a single manufacturer. Acceptable manufacturers: American Darling, M&H or Mueller

.

E. Plug Valves:

1. Plug valves except as noted shall be of the non-lubricated, eccentric type with resilient faced plugs, and screwed, flanged, or mechanical joint ends as shown on the plans. All plug valves shall provide drip-tight shutoff up to the full pressure rating of the valve with pressure in the seating direction. Valves with operators shall be drip-tight in either direction. Bodies shall be semi-steel with raised seats. Seats in three (3) inch and larger valves shall have a welded-in overlay of not less than ninety percent pure nickel on all surfaces contacting the plug face. Valves through twenty (20) inches shall have Type 316 stainless steel permanently lubricated upper and lower plug stem bushings. All valves four (4) inches and larger shall be of the bolted bonnet design. Packing on all valves shall be adjustable without disassembly of the actuator or valve. All exposed nuts, bolts, springs and washers shall be zinc plated. Means of actuation shall be by lever, gear actuator, tee wrench, extension stem, above ground operator, floorstand, etc., as indicated on the plans or by the Engineer. Flanged valves shall be faced and drilled to ANSI 125 Standard. All plug valves shall be as manufactured by Dezurik or approved equal.

2. All buried plug valves larger than 12-inches shall be equipped with gear actuators. Mounting brackets shall be totally enclosed with gasket seals. Valves in buried service shall have all exterior surfaces coated with coal tar epoxy. Buried valves shall have valve box and cover set at finished grade, with operating nut extended to within 6" from top of valve box, DeZurik Figure 341 or approved equal. Provide one tee wrench per valve.

3. Plug valves six (6) inch and smaller shall have 2" square nut and be wrench operated except where, due to lack of space for the wrench, or where the valve centerline is more than 5'-0" above the floor, they shall be either worm gear or spur gear operated and have wheel and chain where necessary.

4. Unless otherwise specified or approved, a suitable wrench shall be provided for each four (4) wrench-operated valves and at least one (1) for each operating station. Wrenches or wheels and chains shall be of suitable size and sufficient length for easy operation of the valves at their rated working pressure.

F. Tapping Valves and Sleeves:

1. Tapping valves shall meet AWWA C509. The body shall be cast iron. The valve shall consist of ductile iron wedge disc with solid guide lugs; a resilient rubber seat ring; a non-rising bronze stem; 0-ring seals; thermoplastic anti-friction washer and a fully epoxy- coated interior on all parts which come in contact with water except the stem. The valve shall be operated by two-inch square operating nuts. Mueller Company H-667, or approved equal.

2. Tapping sleeves shall be solid cast iron body with Class 125 outlet flange. Mueller Company, H-615, or approved equal.

G. Air Release and Vacuum Relief Valves: Combination integral type with a valve assembly which functions as both an air and vacuum valve and an air release valve.

1. Design valves for a water working pressure of 300 psi. Construct with stainless steel floats. All working parts shall be constructed of brass, stainless steel, or other corrosion-resistant materials.

2. Pipe exhaust from each valve to a suitable disposal point. Provide a shutoff valve in the piping to each combination air release and vacuum relief valve assembly.

3. Manufacturer: APCO Model 200 A, or approved equal.

H. Ball Valves:

1. Water Service: Ball valves shall be designed for a water working pressure of not less than 150 psi, shall be constructed of PVC and when in the fully-open position, shall have a port diameter not less than Schedule 80 PVC pipe of the same nominal diameter. Valves shall be designed with true union ends to permit removal of the valve from the line and with end connectors designed for solvent welding to the pipe. Acceptable: ASAHI Duo-Bloc, Chemitrol or equal.

2. Vacuum Service: Ball valves shall be designed for a water working pressure of not less than 150 psi and shall be full vacuum rated. Valves shall be PVC with a port diameter not less than Schedule 80 PVC of the same nominal diameter. Valves shall be designed with true union ends to permit removal of the valve from the line and with end connectors to allow a threaded connection in the vacuum line. Acceptable: ASAHI Duo-Block or approved equal.

I. Wye Strainers: Wye strainers shall be made of transparent PVC. Submit standard screen sizes for selection. Screens shall be PVC or stainless steel, and shall be designed for cleaning or changing without removing strainer from pipeline. Acceptable: ASAHI; George Fischer Type 306; or approved equal.

J. Miscellaneous Valves: Indicated or required but not specified. Type required by standard practice for intended conditions of service.

2.02 VALVE BOXES:

A. Provide at all manually operated valves installed on underground lines. Covers shall be marked "Water" for water distribution systems and "Sewer" for wastewater transmission systems.

B. Cast iron, 3 piece extension type, with cover and flared base to suit valve furnished.

C. Acceptable: Figure No. F-2450, Clow Corporation; Catalog No. H10357, Mueller Co.; Figure No. E-3002, M & H Valve and Fittings Co. or equal.

2.03 FIRE HYDRANTS

A. General:

Fire hydrants shall be 5 ¼ inch ductile iron body, dry-barrel, fully bronze mounted, for minimum 150 psi working pressure, complying with ANSI/AWWA Standard C502, Associates Factory Mutual Fire Insurance Companies and listed with Underwriter's Laboratories. The inlet connection shall be 6-inch mechanical joint type. All nuts and bolts shall be 304 stainless steel. The integral shut-off valve shall be compression type opening against water pressure and open left (couter-clockwise) as marked on the bonnet. The main valve seat and the threaded portion of the hydrant into which it screws shall be bronze or stainless steel. The hydrant barrel drain valve and port shall be bronze. The hydrant barrel drain shall be actuated by operation of the main valve stem. The stem operating threads and thrust bearing shall be sealed, by "O" rings, from exposure to moisture and shall be provided with means for lubrication. The hose nozzles shall be bronze with National Standard fire hose coupling screw threads, one 4 ½ inch pumper nozzle and two 2 ½ inch hose nozzles. The hydrant operating nut and nozzle cap nuts shall be pentagon shaped (5-sided) measuring 1 ½ inches from point to flat. The nozzle caps shall be securely chained to the hydrant barrel and be constructed of heavy duty corrosion-resistant material. The hydrants shall be "Traffic" type with a frangible flange or lugs and operating stem section at the ground level. The outside surface of the upper barrel (top) of the hydrant and all above ground piping shall be primed and then painted "Traffic Yellow" color (RUS-KIL

Enamel – International yellow or equal). The base (shoe) shall be painted with a minimum of 4 mils thick epoxy (inside and outside surfaces). The lower barrel (inside and outside surfaces) and the inside surface of the upper barrel shall be asphaltic or epoxy coated.

1. Acceptable: American Flow Control, M & H Valve Company, Mueller (Standard or Aqua Grip), US Pipe, AVK.

PART 3 – EXECUTION

3.01 INSPECTION:

A. General: All valves shall be subject to inspection at the time of delivery and in the field just prior to installation. All valves which in the opinion of the Engineer do not conform to these specifications will be rejected and shall be removed by the Contractor.

3.02 INSTALLATION:

A. Valves shall be set with stems set vertically above centerline of pipe unless indicated otherwise. Keep valves tightly closed during installation and take care to prevent dirt from damaging seating surfaces. Valves shall be installed so that the direction of flow through the valve is in accordance with the manufacturer's recommendations. Tighten stuffing box, if provided, and operate valve to see that all parts are in working condition before installation.

B. Tapping Valves and Sleeves: Install tapping valves and sleeves, as directed by the Owner, in existing water mains at locations where it is not practical to shut off the pressure. Test, sterilize and flush new line as specified hereinafter and obtain approval of the Engineer before putting a connection to an existing line into service.

C. Operate valve to verify that all parts are in working condition prior to installation.

1. Buried valves:

a. Set valve box plumb and place directly over valve operating nut.

b. Tamp earth fill completely around valve box for a distance of one foot.

c. Provide valve box extensions where required for depth of cover.

D. Records: Prepare and submit to the Owner a reproducible or list in duplicate, as directed, indicating size and location of all valves installed. Reference valves by distance and direction from enough prominent and permanent landmarks to assure ease of location.

3.03 FIELD QUALITY CONTROL:

A. Supervision, calibrations and initial start-up shall be conducted by a factory trained representative of the valve manufacturer for a minimum of one (1) day at the job site(s).

B. This representative shall have a minimum of five (5) years experience and his duties shall include:

1. Verify proper installation.
2. Make all predetermined settings.
3. Start-up and adjustments.
4. Approve installation in writing.
5. Instruct Owner's personnel in proper operation and maintenance procedures.

END OF SECTION

SECTION 33 35 50

SUPPORTS, ANCHORS AND THRUST CONTROL

PART 1 – GENERAL

1.01 DESCRIPTION OF WORK: The extent of work covered under this specification shall include, but not be limited to furnishing of all labor and materials required to adequately hang, support, anchor, tie back, isolate, restrain and provide thrust control for new piping work required under this contract.

1.02 QUALITY ASSURANCE:

A. American Society for Testing and Materials (ASTM): All manufacturing of equipment and accessories covered in this specification as well as the installation of such shall be done in accordance with the applicable standard set forth in ASTM.

1.03 SUBMITTALS:

A. Submit manufacturer's certificate of material conformance to specification.

B. Submit manufacturer's literature, catalog data and installation instructions.

C. Submit shop drawing indicating dimensions, construction details, materials, finish, deflection for spring hanger and maximum load.

D. Submit design calculations and methods for thrust control devices.

PART 2 – PRODUCTS

2.01 GENERAL:

A. Furnish standard and fabricated supports and anchors complete with necessary inserts, bolts, nuts, rods, washers and other accessories.

B. Prevent contact between dissimilar metals by use of rubber or vinyl coatings.

2.02 ANCHORS AND SUPPORTS:

A. Expansion Bolts: Federal Specification FF-S-325.

1. In Concrete: Use Group II, Type 4, Class 1 or Group VIII, Type 1.
2. In Masonry: Use Group II, Type 3, Class 3.
3. Material: 18-8 stainless steel, including clips, washers and nuts.
4. Size and Length: As required or indicated.
5. Drilling: Conformance with manufacturer's instructions.
6. Acceptable: ITT Phillips Drill Division or equal.

B. Pipe Hangers and Supports: Provide where indicated on the drawings or where required.

1. Material: Galvanized steel unless indicated otherwise.
2. Size and Length: As required or indicated.
3. Acceptable: ITT Grinnell or equal.

2.03 RESTRAINED JOINTS:

A. RESTRAINERS

The restrainers shall be manufactured of ductile iron and shall meet or exceed all the requirements of ANSI A21.11 (AWWA C111) and ASTM A536. The restrainer system shall provide anchoring of PVC pipe to mechanical joint fittings or bell to spigot PVC pipe joints. Restraints shall provide a full 360 degree contact with sufficient gripping action to secure the clamp to the pipe and be designed so that restraint action is increased as a result of increases in line pressure. The restrainer shall accommodate the full working pressure rating of the pipe plus surge allowance.

B. RETAINER GLANDS

Retainer glands shall be manufactured of ductile iron grade 64-42-10, ASTM A536 or CCUA pre-approved equal and shall be designed to fit standard mechanical joint bells conforming to applicable sections of ANSI A21.10 (AWWA C110), ANSI A21.11 (AWWA C111) and ANSI A21.53 (AWWA C153). The restraining device shall be rated for the full working pressure of the pipe including surge allowance and a 2:1 safety factor. Mechanical restraints shall include a restraining mechanism which, when actuated, imparts a wedging action against the pipe, increasing its resistance as the pressure increases. The restraint shall be compatible with the type of joint being installed. The joint deflection shall not exceed 80% of the pipe manufacturer's recommended maximum deflection. Deflection, if necessary, shall be made before tightening the set screws. Bolts and screws shall be tightened alternately, 180 degrees apart, to the torque recommended by the manufacturer. Retainer glands having set screws that make point contact with the pipe without using a pad to disperse point loading shall not be used on PVC pipe. The restraining device shall not damage or lower the working pressure of the pipe installed.

C. For Ductile Iron Pipe: Restrained joints shall be American Flex-Ring,

Lok-Ring, US Pipe TR Flex, EBAA Iron Megalug, or equal.

D. For PVC Pipe: Restrained joints shall be Uni-flange Series 1300, 1350, 1390 or approved equal.

E. Thrust Blocking: Thrust blocking shall not be allowed unless specifically indicated on drawings or directed by Engineer.

PART 3 – EXECUTION

3.01 JOB CONDITIONS:

A. Locate hanger, supports and anchors where indicated and as required to support pipelines, valves and additional concentrated loads.

1. Install items to be embedded before concrete is placed.
2. Fasten embedded items securely to prevent movement when concrete is placed.
3. Adjust as required using grout for concrete supports.

B. Pipe Thrust Restraints: Mechanical restrainers shall be installed as required to properly restrain all piping systems. At a minimum, restrainers shall be provided on all below-grade valves and fittings and at the required number of pipe joints in each direction. Required lengths of restrained pipe shall be as shown in pipe restraint schedule below for the type of pipe and type of soil encountered. For above-grade piping, all valves and fittings shall be threaded, flanged or solvent welded with supports as required.

PIPE RESTRAINT SCHEDULE

MINIMUM LENGTH OF PIPE (IN FEET) REQUIRED TO BE RESTRAINED ON EACH SIDE OF A VALVE OR FITTING FOR SANDY SOILS (SW, SP, SM, SC)

PIPE TYPE	PIPE SIZE	90° BEND	45° BEND	≤22.5° BEND	TEE OR CROSS	VERTICAL OFFSET[a]		REDUCER [b]	VALVE	DEAD END
						LOW	HIGH			
DUCTILE IRON	≤4	18	18	18	18	18	18	18	18	33
	6	20	18	18	18	18	19	35	36	47
	8	26	18	18	18	18	25	44	36	61
	10	31	18	18	18	18	30	60	54	73
	12	37	18	18	18	18	36	63	54	86
	14	41	18	18	18	18	41	64	72	98
	16	46	19	18	36	18	46	66	72	111
	18	51	21	18	36	18	51	66	72	122
	20	56	23	18	36	18	56	67	72	134
	24	64	27	18	36	21	65	85	90	156
	30	75	31	18	36	25	78	118	90	188

PIPE RESTRAINT SCHEDULE

MINIMUM LENGTH OF PIPE (IN FEET) REQUIRED TO BE RESTRAINED ON EACH SIDE OF A VALVE OR FITTING FOR CLAYEY AND SILTY SOILS (CL, CH, ML, MH)

IPE TYPE	PIPE SIZE	90° BEND	45° BEND	≤22.5° BEND	TEE OR CROSS	VERTICAL OFFSET[a]		REDUCER [b]	VALVE	DEAD END
						LOW	HIGH			
DUCTILE IRON	≤4	18	18	18	18	18	18	18	18	35
	6	22	18	18	18	18	20	25	36	49
	8	29	18	18	18	18	27	46	36	64
	10	35	18	18	18	18	32	62	54	77
	12	41	18	18	18	18	37	66	54	90
	14	47	20	18	18	18	43	67	72	103
	16	53	22	18	36	19	48	68	72	115
	18	59	24	18	36	21	53	69	72	127
	20	65	27	18	36	23	58	70	72	140
	24	76	31	18	36	27	67	89	90	162
	30	91	38	18	36	32	80	122	90	194

Assumptions:

1. Pipe Test Pressure = 150 PSI
2. Minimum Pipe Depth = 3.0 Feet
3. Laying Condition = Type 5
4. Safety Factor = 2.0

[a] "Low" represents the minimum length of pipe (in feet) required to be restrained on the low side of the vertical offset, which is typically downstream of the offset fitting. "High" represents the minimum length of pipe (in feet) required to be restrained on the high side of the vertical offset, which is typically upstream of the offset fitting. Required restrained lengths assume an offset angle $\leq 45°$.

[b] Distance represents the linear feet of large diameter pipe upstream of the reducer required to be restrained. Restrain small diameter pipe at reducer at a minimum. If there is an unobstructed run downstream of the reducer (i.e. small diameter pipe) of at least 2.5 times the required length of large diameter pipe to be restrained, then restraint is required only at the reducer fitting. If small end of reducer is more than three pipe sizes smaller than large end, consult Engineer for required length to be restrained.

END OF SECTION

DIVISION 40

PROCESS PIPING

SECTION 40 05 10

COMMON WORK RESULTS FOR PROCESS PIPING

PART 1 GENERAL

1.01 SUMMARY

A. Provide process piping work in accordance with Division 40. Comply with applicable provisions of Divisions 00 and 01.

1.02 RELATED SECTIONS

Division 01: For temporary facilities.
Division 01: For cutting and patching.

1.03 ABBREVIATIONS

AGA - American Gas Association.
ANSI - American National Standards Institute.
API - American Petroleum Institute.
ASME - American Society of Mechanical Engineers.
ASSE - American Society of Sanitary Engineering.
ASTM - American Society for Testing and Materials.
AWS - American Welding Society.
AWWA - American Water Works Association.
CISPI - Cast Iron Soil Pipe Institute.
CS - Commercial Standard (U.S. Dept. of Commerce).
IEEE - Institute of Electrical and Electronic Engineers.
NEMA - National Electrical Manufacturers Association.
NSF - National Sanitation Foundation.
NFPA - National Fire Protection Association.
PPI - Plastic Pipe Institute.
PVC - Poly (vinyl chloride).
UL - Underwriters Laboratories.

1.04 SUBMITTALS

A. Submit shop drawings and other submittals in accordance with Section 01 33 00 and requirements for individual products.

B. Submit operation and maintenance (O/M) manuals for equipment and instruct Owner's personnel in accordance with Section 01 33 00.

1.05 CODES

A. Comply with State and local laws and ordinances, including State Plumbing Code, State and National Electrical Code, and other applicable codes, rules, and regulations. Work shall be acceptable to local utilities and to municipal inspection authorities.

B. Above paragraph shall not be construed to permit use of products or workmanship inferior to that required by these Specifications.

1.06 LICENSES, PERMITS, AND FEES

A. Contractor shall make application for, obtain, and pay for permits, lateral connections, inspections, and tests required by local, state, or federal authorities having jurisdiction.

B. Furnish duplicate certificates of inspection and approval from authorities having jurisdiction for approval or acceptance of work, duly signed by proper authorities.

C. Secure rights and pay fees to use patented articles, methods, equipment, or apparatus, thus relieving Owner of liability.

1.07 STANDARDS

A. Products and methods of construction shall meet or exceed applicable requirements of referenced industry standards.

PART 2 PRODUCTS

2.01 GENERAL PRODUCT REQUIREMENTS

A. Products shall be new and of quality designated. Unless otherwise specified, provide standard products of manufacturers regularly engaged in production of that item.

B. Use same brand or manufacturer for each specific application of pumps, valves, fittings, and other equipment. All rotating equipment shall be statically and dynamically balanced for minimum vibration and low operating noise levels.

C. Each major component of equipment shall have manufacturer's name, address, catalog number, and serial number permanently attached in a conspicuous place.

D. All equipment shall be listed, approved, or rated by a nationally recognized testing and rating bureau or the recognized manufacturers association responsible for setting voluntary industry standards. Electrical equipment and apparatus shall be U.L. listed.

2.02 PRODUCT SUBSTITUTIONS

A. Submit product substitutions for approval in accordance with Section 01 60 00 and Instructions to Bidders.

PART 3 EXECUTION

3.01 GENERAL INSTALLATION REQUIREMENTS

A. All work shall be done by qualified workers that are knowledgeable and experienced in operations they are performing. Workers shall be licensed where applicable. Fabrications and installation methods, procedures, and materials shall be in accordance with accepted industry practice and with standards of manufacturing and contracting associations applicable to work. All work shall be neatly done with special emphasis on appearance of work exposed to view. Pipes shall be run plumb unless otherwise required for functional reason. Gradient of pitched lines shall be continuous.

B. Install products in accordance with manufacturer recommendations. Locate items of equipment so that parts requiring service and adjustment are accessible.

C. Provide work as required for a complete installation, ready for service, and in accordance with intent of Contract Documents. Omission of an express reference to any parts necessary for or reasonably incidental to a complete installation shall not release Contractor from furnishing such parts.

3.02 DIMENSIONS AND LOCATIONS

A. Piping is depicted to indicate approximate size, capacity, location, orientation, and relationship of one phase of work to another, based on equipment scheduled, but not

necessarily exact detail or arrangement of construction. If before installation, a more convenient or workable arrangement would result by altering arrangements as indicated, Contractor may make such changes at no additional cost to Owner, after obtaining written approval.

B. Contractor shall be responsible for changes resulting from use of equipment other than that scheduled.

C. Systems shown on mechanical drawings were coordinated with other drawings, however, minor variations may occur. Verify dimensions, heights, door swings, and other information critical to placement of devices to assure proper installation. Field measurements shall take precedence over drawing dimensions. Plans shall not be scaled to locate equipment.

D. Verify sewer inverts and water main locations before installation of related work; failure to verify services shall be cause for correction of work at Contractor expense.

3.03 BASES AND EQUIPMENT SUPPORTS

A. Furnish and install bases, supports, and appurtenances for items of equipment unless specifically indicated to be work of another Contract. Furnish and install built-in items and supervise their positioning during concrete pours.

B. Inform General trade of sizes and locations of concrete pads, curbed openings, and recesses as required. Where information is not furnished to General trade in time, Plumbing trade shall provide its own accommodations.

3.04 CONSTRUCTION PHASE MAINTENANCE

A. Provide lubrication, filters, cleaning, maintenance, and service work as required until Owner assumes responsibility for operation.

3.05 CLEANING

A. Clean piping systems and appurtenant equipment as designated in sections of Division 40 and in accordance with Division 01.

3.06 PAINTING

A. Where factory-applied coatings have been damaged, touch up paint to match original factory finish as approved by Engineer.

END OF SECTION

SECTION 40 05 20

PIPING AND FITTINGS

PART 1 GENERAL

1.01 SUMMARY

A. Provide piping and fittings as shown and as specified. Comply with Section 40 05 10 and applicable provisions of Divisions 00 and 01.

1.02 RELATED SECTIONS

40 05 70 Hangers and Supports.

1.03 SUBMITTALS

A. Test Reports: Upon request, submit three certified copies of test and inspection reports on pipe in accordance with applicable material standards covering hydrostatic tests, physical and chemical properties, and coating analysis.

B. Make submittals in accordance with Section 01 33 00.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Carefully unload and store pipe to prevent chipping, cracking or damage to surface coating. Do not skid pipe. Remove structurally damaged pipe from site. Repair damaged coatings.

PART 2 PRODUCTS

2.01 PIPE, GENERAL

A. Piping shall be of size shown, shall conform to quality and type specified in this section, and shall be of material and joint type as scheduled in the individual piping system sections.

2.02 STAINLESS STEEL PIPE

A. Low-carbon stainless steel pipe, ASTM A312 or A778; Grade TP 304L, Sch. 10S, unless otherwise designated. Joints shall be welded or flanged.

2.03 UNIONS

A. ANSI B16.39, malleable iron, Class 150, hexagonal stock, with ball and socket joints, metal to metal bronze seating surfaces, and female threaded ends for threaded ferrous piping.

B. Fed. Spec. WW-U-516, bronze, for soldered copper piping.

C. Dielectric isolating type for transitions from ferrous to non-ferrous metal pipe.

2.04 DRAIN VALVES

A. Tee fitting, 3/4 in. ball valve, and short 3/4 in. threaded nipple and cap.

2.05 MANUAL AIR VENTS

A. 1/4 in. brass petcock with 1/2 in. pipe nipple serving as air chamber.

2.06 AUTOMATIC AIR VENTS

A. Apco "142WD", or approved equal.

PART 3 EXECUTION

3.01 PIPE INSTALLATION, GENERAL

A. Install pipe and fittings in accordance with manufacturer's recommendations and as specified for various systems. Piping systems shall be installed substantially as shown and placed to avoid interference with other work.

B. Cut pipe accurately to measurements established at site. Work into place without springing or forcing. Install piping to permit free expansion and contraction without damage. Make changes in direction with fittings.

C. Install unions or flanged joints suitably located to facilitate maintenance and removal of valves, traps, strainers, and other equipment whether specifically shown or not. Locate unions and flanges in accordance with accepted trade practices.

D. Provide pipe hangers and supports in accordance with Section 40 05 70 and as shown. Provide pipe sleeves, seals, and curbs in accordance with Section 40 05 75 and as shown.

E. Connections between pipe, fittings, hangers, and equipment of dissimilar metals shall be avoided wherever practical. Wherever such connections are unavoidable, they shall be insulated against direct contact, using a high grade dielectric insulating material of Teflon, Milarta, neoprene or approved equal.

3.02 PIPE INSTALLATION, INTERIOR AND ABOVEGROUND

A. Where practicable, run piping concealed except in unfinished spaces. Pipe lines shall be straight, evenly spaced, parallel or perpendicular to walls and floors. Vertical pipe lines shall be plumb.

B. Make provisions for thermal expansion of piping. Where pipe is embedded in masonry or in direct contact with adjoining construction, provide a 1/2 in. thick cushion of fiberglass insulation around pipe.

3.03 TESTING

A. Test, adjust, and balance piping systems as specified in individual piping system section(s).

END OF SECTION

SECTION 40 05 70

HANGERS AND SUPPORTS

PART 1 GENERAL

1.01 SUMMARY

A. Provide hangers and supports as shown and as specified. Comply with Section 40 05 10 and applicable provisions of Divisions 00 and 01.

1.02 SUBMITTALS

A. Product Data: Submit product data on hangers in accordance with Section 01 33 00.

PART 2 PRODUCTS

2.01 HANGER RODS

A. Galvanized, carbon steel, end threaded or continuous threaded rods, with coarse threads. Chain, wire, and perforated strap may not be used.

2.02 HANGERS AND SUPPORTS

A. General: Hangers and supports shall be factory-fabricated components complying with MSS SP-58 and the following, unless otherwise indicated.

B. Hangers for Pipe Sizes 1/2 to 1-1/2 in.: Malleable iron, adjustable swivel, split ring.

C. Hangers for Pipe Sizes 2 to 4 in. and Cold Pipe Sizes 6 in. and Over: Carbon steel, adjustable, clevis.

D. Hangers for Hot Pipe Sizes 6 in. and Over: Adjustable steel yoke, cast iron roll, double hanger.

E. Wall Support for Pipe Sizes to 3 in.: Cast iron hook.

F. Wall Support for Pipe Sizes 4 in. and Over: Welded steel bracket and wrought steel clamp; adjustable steel yoke and cast iron roll for hot pipe sizes 6 in. and over.

G. Vertical Support: Steel riser clamp.

H. Floor Support for Hot Pipe Sizes to 4 in. and All Cold Pipe Sizes: Cast iron adjustable pipe saddle, locknut nipple, floor flange, and concrete pier or steel support.

I. Floor Support for Hot Pipe Sizes 6 in. and Over: Adjustable cast iron roll and stand, steel screws, and concrete pier or steel support.

J. Coatings:

1. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
2. Use copper-plated hangers and copper or stainless-steel attachments for copper piping and tubing.

2.03 INSULATION SHIELDS AND SADDLES

A. Insulation shields shall be 180 deg galvanized steel of gauge and length recommended by manufacturer.

B. Insulation protection saddles shall be steel plate of gauge and length recommended by manufacturer.

PART 3 EXECUTION

3.01 SUPPORT, GENERAL

A. Install hangers and supports in accordance with MSS SP-69 and MSS SP-89, unless otherwise indicated.

B. Piping shall be substantially supported, making provision for movement, expansion, and contraction.

C. Support piping from structural members and slabs utilizing beam clamps, concrete inserts, or anchor bolts of type and strength recommended for the application. Attach to top or bottom chord of open-web joists at panel points. Do not hang work from other piping or ductwork.

3.02 HORIZONTAL PIPING SUPPORT

A. Support horizontal steel and ductile iron piping with hanger rods of size and spacing as follows:

Pipe Size	Rod Diameter	Maximum Spacing
Up to 1-1/4 in.	3/8 in.	8 ft
1-1/2 and 2 in.	3/8 in.	10 ft
2-1/2 to 3-1/2 in.	1/2 in.	12 ft
4 and 5 in.	5/8 in.	15 ft
6 in.	3/4 in.	17 ft
8 to 12 in.	7/8 in.	22 ft

B. Support horizontal copper tubing with hanger rods of size and spacing as follows:

Pipe Size	Rod Diameter	Maximum Spacing
Up to 1 in.	3/8 in.	6 ft
1-1/4 and 1-1/2 in.	3/8 in.	8 ft
2 in.	3/8 in.	9 ft
2-1/2 in.	1/2 in.	9 ft
3 and 4 in.	1/2 in.	10 ft

C. Support plastic pipe as recommended by manufacturer for service and temperature encountered or at 4-ft intervals, at ends of branches, and at changes of direction or elevation. Provide additional supports at expansion joints in compliance with state and local codes.

D. Support horizontal cast iron soil pipe at each joint and at intervals of not more than 5 ft.

E. Trapeze hangers for multiple pipes may be used with specific approval for each condition.

3.03 VERTICAL PIPING SUPPORT

A. Vertical piping, other than risers 4 ft or less in vertical length, shall be adequately supported. Use riser clamps immediately below a coupling or hub, or support heel of riser by pipe hanger

as close to elbow as possible. Support riser pipes over 3 in. with band clamp at each floor through which riser passes.

3.04 INSULATION SHIELD AND SADDLE INSTALLATION

A. Provide shields at points of pipe support on insulated lines. Place shield on outside of insulation so that it will not penetrate insulation and vapor barrier. At Contractor's option, piping 2-1/2 in. diameter or less may be placed in direct contact with hanger or support. See Section 40 42 10.

B. Provide steel plate saddles on insulated lines passing over pipe rollers.

END OF SECTION

DIVISION 46

WATER AND WASTEWATER EQUIPMENT

SECTION 46 13 13

NON-CLOG CENTRIFUGAL PUMPS

PART 1.00 GENERAL

1.01 SUMMARY

A. Suction lift pumps shall be All Prime (XS-10 Series) pumps that are self-priming solids handling centrifugal type for mounting above ground; designed for raw waste water.

B. The manufacturer of the pumps has an ISO 9001 quality management system certificate.

C. The pumps carry a one-year manufacturer's materials and workmanship warranty.

D. The pumps have the necessary characteristics and are properly selected to perform under the operating conditions and efficiency as shown on performance curve.

2.01 MATERIALS

A. Materials and Construction Features:

1. Pump casing is made from class 30 cast-iron with integral volute and incorporate the listed features:

   a. Broad based feet to prevent tipping even when disassembled.

   b. Casing will have a large diameter drain plug at the lowest level for complete draining.

   c. Casings have a recirculation port sized to accommodate a spherical solid the size of the solids passing capacity of the pump.

   d. A 3½" diameter fill port covered by a Teflon gasketed plate with restrained clamp bar is used for initial liquid filling.

   e. Cleanout cover is made from class 30 cast-iron and is retained with clamp bars over the plate. Cleanout cover is sealed with a gasket.

   f. A pressure relief valve which operates at 75 to 200 PSI is permanently attached to assure safety.

   g. A hardened steel alloy wear-plate.

2. The rotating assembly has an integral bearing housing with seal plate, shaft, bearings, impeller, mechanical seal, oil seals, and oil chambers which are removable as a unit without disturbing suction or discharge piping and have the following features:

   a. The seal plate and bearing housing are class 30 cast-iron and contain separate oil chambers for seal oil and bearing oil.

   b. The impeller is ductile-iron open-type two-vane non-clog design with back side pump out vanes and will be threaded on the shaft and further retained by locking impeller bolt and protective washer.

c. The shaft is constructed of 4140 alloy steel with no more than 82% of the centerline bearing to centerline bearing distance protruding beyond the impeller end bearing.

d. Bearings are anti-friction ball type of sufficient size and design to withstand all radial and thrust loads incurred during normal operations.

e. The rotating assembly is sealed with one large diameter Buna-N o-ring.

f. The mechanical seal is oil lubricated from a dedicated chamber with faces of tungsten titanium carbide alloy each lapped to within three light bands using an optical flat and monochromatic light. The stationary face shall be mounted in its holder using an o-ring design to better secure alignment during times of extreme stress. All metallic parts of the seal are 316 stainless-steel. The mechanical seal is warranted on a prorated basis for four years, as follows:

Failure Within:	Percent New Price:
2 years	25%
3 years	50%
4 years	75%

g. The rotating assembly impeller end clearance can be adjustable over its full range of adjustability externally without removal of the rotating assembly or its fasteners and without the use of special tools by utilizing socket head cap screws set into the pump casing to move the rotating assembly away from the wear plate and the hex head machine bolts to move the rotating assembly toward the wear plate and secure it in the proper place against the socket head cap screws. The socket head cap screws shall also act as jacking bolts when removing the rotating assembly.

h. Lubrication: Separate oil filled chambers, vented to atmosphere, and are provided for mechanical seal and bearings. Three oil lips seals prevent leakage of oil. Each chamber has a vented plug to prevent the entry of excess moisture. Both chambers shall have a clear oil level sight gauge.

- Mechanical Seal chamber and Bearing chamber are isolated from each other to atmosphere (air gap) providing protection of the bearings in the event of a seal leak. This air gap ‘port’ provides an external monitoring of the seal integrity.

3. The pump contains a suction check valve in order to save energy by preventing re- priming at each start up. The valve is floating type to help prevent clogging and is made from nylon and steel reinforced neoprene. The valve shall not be required for re- priming and pumps requiring such a valve to re-prime shall not be acceptable.

4. The pumps have as standard a removable flanged suction piece and inlet suction head with plugged tapped holes suitable for the attachment of gauges or other devices such as air release valves.

3.01 TESTING

B. Pump performance characteristics:

1. The pump can pass a spherical solid as shown on the applicable pump curve through all impeller vanes, internal passages, and recirculation ports.

2. The pump will re-prime at a depth shown on the applicable pump curve while using an air release line without the aid of a suction check valve. Re-prime performance shall be confirmed using the following test.

a. A check valve equal to or larger than the pump discharge shall be installed in the pump

discharge line. A suction line equal to the pump suction opening shall be used.

b. An air release pipe open to atmosphere and similar in capacity to a 1" air release valve shall be installed between the discharge and the check valve.

c. The pump suction check valve shall be removed and the pump suction shall be at the specified job re-prime lift above the test tank water level.

d. Prior to each re-prime test the suction pipe must be cleared of water to sump level.

e. The pump must re-prime to full flow within 5 minutes of energizing on each of 5 tests to be acceptable.

f. After 5 consecutive tests the pump must be at a temperature within the operating range as indicated on the applicable technical data sheets.

4.01 PUMP DESIGN CONDITIONS

Function & Description	RPM	Sphere Passing Size in.	GPM	TDH (feet)	HP	Power Eff. %	Remarks
XS-10 (2 each)	850	3"	2,100	29	25	79%	Effluent Wet Well Pumps