Technical Construction and Material Specifications and Guidelines for the Lakes 11, 19 and 31 Restoration Project, Collier County, Naples, Florida

100 Percent Submittal

Prepared for:
City of Naples
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Naples, Florida 34102

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Wood Project No.: 6788-20-3223

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PART 1 GENERAL

1.1 SECTION INCLUDES

A. Description of Work:
B. CONTRACTOR's Use of Site
C. Work Sequence
D. City Occupancy

1.2 DESCRIPTION OF WORK

A. General: The Work to be done under this Contract is shown on the drawings and detailed below:
   a. This project is comprised of three lakes—Lake 19, 11 and 31. Work for Lakes 19 and 11 will involve dredging of lake bottom to restore historically natural sand substrate and reconstructing the existing shoreline to create a littoral shelve for native species recruitment. The use of hydraulic and mechanical dredging technologies will be allowed to remove in situ organic muck sediments and in situ sandy sediment from the lake bottom. The dewatering operations for the dredged material will be staged in 20 YD roll off containers with trash/sand screen and 20 yard roll off containers lined with TenCate 50 sieve woven geotextile bags, or approved equivalent.

      Lake 19 material will be injected with a duel treatment program, using a cationic emulsion Flopam C-6267 (5.0 lbs per dry ton) followed by anionic emulsion A-6350 (1.8 lbs per dry ton), or approved equivalent, to increase coagulation. Lake 11 material will be injected with a duel treatment program, using an anionic emulsion Flopam A-6350 (5.7 – 6.3 lbs per dry ton) followed by cationic emulsion C-6267 (3.2 – 3.8 lbs per dry ton) to increase coagulation. Once dewatered, bagged material may be transported to a temporary staging location to allow for continued dewatering or transported to final disposal location. Final disposal location may be the Collier County Landfill or other site recommended by Contractor and approved by City. Additionally, best management practices will be implemented including curb inlet filters, nutrient separating baffle boxes and new inlet and outfall infrastructure, armored with riprap.

      Lake 31 will be restored to serve as a treatment wetland, utilizing overflow weirs to direct water into different treatment cells and an overflow structure at the inlet to allow bypass during storm events. The treatment wetland will include vegetated wetland areas with varied water depths.

      Lake 19 will further incorporate public outreach amenities and improvements to existing stormwater infrastructure. The public outreach amenities include the installation of a 5’ concrete sidewalk to tie into the concrete sidewalk on the corner of 10th Street North and 15th Avenue North. The sidewalk will transition to porous asphalt along the lake with a reinforced pervious swale and then transition back to concrete sidewalk. The sidewalk will include 2 pedestrian crossings across 15th Avenue North. Additionally, informational signage about the nutrient separating baffle box will be installed.

B. The Work includes:

   1. Furnishing of all labor, material, superintendence, plant, power, light, heat, fuel, water, tools, appliances, equipment, supplies, services and other means of construction necessary or proper for performing and completing the Work.
   2. Sole responsibility for adequacy of plant and equipment.
   3. Maintaining the Work area and site in a clean and acceptable manner.

4. Maintaining existing facilities in service at all times including Maintenance of Traffic plans.
5. Protection of finished and unfinished Work.
6. Repair and restoration of Work or existing facilities damaged during construction.
7. Furnishing as necessary proper equipment and machinery, of a sufficient capacity, to facilitate the Work and to handle all emergencies normally encountered in Work of this character.
8. Furnishing, installing, and protecting all necessary guides, track rails, bearing plates, anchor and attachment bolts, and all other appurtenances needed for the installation of the devices included in the equipment specified. Make anchor bolts of appropriate size, strength and material for the purpose intended. Furnish substantial templates and shop drawings for installation.

C. Implied and Normally Required Work: It is the intent of these Specifications to provide the City with complete operable systems, subsystems and other items of Work. Any part or item of Work, which is reasonably implied or normally required to make each installation satisfactorily and completely operable, is deemed to be included in the Work and the Contract Amount. All miscellaneous appurtenances and other items of Work incidental to meeting the intent of these Specifications are included in the Work and the Contract Amount even though these appurtenances may not be specifically called for in these Specifications.

D. Quality of Work: Regard the apparent silence of the Contract Documents as to any detail, or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished as meaning that only the best general practice is to prevail and that only materials and workmanship of the best quality are to be used. Interpretation of these specifications will be made upon this basis.

1.3 CONTRACTOR'S USE OF SITE

A. Limit use of site and premises for work and storage to allow for the following:

1. Coordination of the Work under this CONTRACT with the work of the other contractors where Work under this CONTRACT encroaches on the Work of other contractors.
2. City occupancy and access to operate existing facilities.
3. Coordination of site use with ENGINEER.
4. Responsibility for protection and safekeeping of products under this CONTRACT.
5. Providing additional offsite storage at no additional cost to the City as needed.

B. Use of Premises: Contractor shall confine all construction equipment, the storage of materials and equipment and the operations of workers to the Project Site and land and areas identified in and permitted by the Contract Documents and other lands and areas permitted by law, rights of way, permits and easements, and shall not unreasonably encumber the Project site with construction equipment or other material or equipment. Contractor shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or any land or areas contiguous thereto, resulting from the performance of the Work.

1.4 WORK SEQUENCE

A. Construct Work in stages to accommodate the City's use of premises during construction period and in accordance with the limitations on the sequence of construction specified. Coordinate construction schedules and operations with ENGINEER. The Contractor shall not open up work to conflict with work already in progress. The Engineer may, however require the Contractor to finish a section on which work is in progress prior to starting another section.

B. Coordinate Work of all subcontractors.

1.5 CITY OCCUPANCY

A. The City will occupy premises during entire period of construction in order to maintain normal operations. Cooperate with the City's Manager or designee in all construction operations to minimize conflict, and to facilitate City usage.

B. Conduct operations with the least inconvenience to the general public.

1.6 PROTECTION OF EXISTING UTILITIES

A. In case of damage to existing utilities caused by construction activities, contact the owner of the utility or appropriate City department (Water, Wastewater and Roads) immediately. Repair any damage to existing utilities caused by construction activities in coordination with or as directed by the owner of the utility.

Contractor shall locate all existing roadways, railways, drainage facilities and utility services above, upon, or under the Project site, said roadways, railways, drainage facilities and utilities being referred to in this Section as the “utilities”. Contractor shall contact the owners of all Utilities to determine the necessity for relocating or temporarily interrupting any Utilities during the construction of the Project. Contractor shall schedule and coordinate its Work around any such relocation or temporary service interruption. Contractor shall be responsible for properly shoring, supporting and protecting all Utilities at all times during the course of the Work. The Contractor shall conduct his work at all times such that adequate drainage is provided and shall not interfere with or block existing drainage facilities such as gutters, ditches, storm drains, or other drainage appurtenances. Existing fire hydrants adjacent to the project shall be kept accessible for fire apparatus at all times and no material or equipment shall be placed within 25 feet of any hydrant.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

A. Starting Work: Start Work within 10 days following the date stated in the Notice to Proceed and execute with such progress as may be required to prevent delay to other contractors or to the general completion of the project. Execute Work at such items and in or on such parts of the project, and with such forces, material and equipment, as to complete the Work in the time established by the Contract. At all times, schedule and direct the Work so that it provides an orderly progression to completion within the specified time for completion. The Contractor shall obtain all necessary building permits prior to commencement of work. The Contractor shall become totally familiar with the requirements of all permits prior to start of work.

B. Intent of Contract Documents: It is the intent of the Contract Documents to describe a functionally complete project (or portion thereof) to be constructed in accordance with the Contract Documents. Any work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result shall be supplied whether or not specifically called for. When words which have a well known technical or trade meaning are used to describe work, materials or equipment, such works shall be interpreted in accordance with that meaning. Reference to standards specifications, manuals or codes of any technical society, organization or association or to the laws or regulations of any governmental authority having jurisdiction over the Project, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, law or regulation in affect at the time the Work is performed, except as may be otherwise specifically stated herein.

If before or during the performance of the Work the Contractor discovers a conflict, error or discrepancy in the Contract Documents, Contractor immediately shall report same to the Engineer in writing and before proceeding with the Work affected thereby shall obtain a written interpretation or clarification from the Engineer. Contractor shall take field measurements and verify field conditions and shall carefully compare such field measurements and conditions and other information known to Contractor with the Contract Documents before commencing any portion of the Work.

Drawings are intended to show general arrangements, design and extent of work and are not intended to serve as shop drawings. Specifications are separated into divisions for convenience of reference only and shall not be interpreted as establishing divisions for the Work, trades, subcontracts, or extent of any part of the Work. In the event of a discrepancy between or among the drawings, specifications or other Contract Document provisions, Contractor shall be required to comply with the provision which is the more restrictive or stringent requirement upon the Contractor, as determined by the Engineer. Unless otherwise specifically mentioned, all anchors, bolts, screws, fittings, fillers, hardware, accessories, trim and other parts required in connection with any portion of the Work to make a complete, serviceable, finished and first quality installation shall be furnished and installed as part of the Work, whether or not called for by the Contract Documents.

B. Investigation and Utilities: Contractor shall have the sole responsibility of satisfying itself concerning the nature and location of the Work and the general and local conditions, and particularly, but without limitation, with respect to the following: those affecting transportation, access, disposal, handling and storage of materials; availability and quality of labor; water and electric power; availability and condition of roads; work area; living facilities; climatic conditions and seasons; physical conditions at the work-site and the project area as a whole; topography and ground surface conditions; nature and quantity of the surface materials to be encountered; subsurface conditions; equipment and facilities needed preliminary to and during performance of the Work; and all other costs associated with such performance. The failure of Contractor to acquaint itself with any applicable conditions shall not relieve Contractor from any of its responsibilities to perform under the Contract Documents, nor shall it be considered the basis for any claim for additional time or compensation.

C. Schedule: The Contractor, within ten (10) calendar days after receipt of the Notice of Award, shall prepare and submit to the Engineer, for review and approval, a progress schedule for the Project (herein “Progress Schedule”). The Progress Schedule shall relate to all Work required by the Contract Documents and shall provide for expeditious and practicable execution of the Work within the Contract Time. The Progress Schedule shall indicate the dates for starting and completing the various stages of the Work.

The Progress Schedule shall be updated monthly by the Contractor. All monthly updates to the Progress Schedule shall be subject to the Engineer’s review and approval. Contractor shall submit the updates to the Progress Schedule with its monthly Applications for Payment noted below. The Engineer’s review and approval of the submitted Progress Schedule updates shall be a condition precedent to the City’s obligation to pay Contractor.

D. Submittals and Substitutions: Contractor shall carefully examine the Contract Documents for all requirements for approval of materials to be submitted such as shop drawings, data, test results, schedules and samples. Contractor shall submit all such materials at its own expense and in such form as required by the Contract Documents in sufficient time to prevent any delay in the delivery of such materials and the installation thereof.

Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier, the naming of the item is intended to establish the type, function and quality required. Unless the name is followed by

words indicating that no substitution is permitted, materials or equipment of other suppliers may be accepted by the City if sufficient information is submitted by Contractor to allow the City to determine that the material or equipment proposed is equivalent or equal to that named. Requests for review of substitute items of material and equipment will not be accepted by the City from anyone other than Contractor and all such request must be submitted by Contractor to the Engineer within thirty (30) calendar days after Notice of Award is received by Contractor.

If Contractor wishes to furnish or use a substitute item of material or equipment, Contractor shall make application to the Engineer for acceptance thereof, certifying that the proposed substitute shall perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application shall state that the evaluation and acceptance of the proposed substitute will not prejudice Contractor's achievement of substantial completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with the City for the Project) to adapt the design to the proposed substitute and whether or not the incorporation or use by the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service shall be indicated. The application also shall contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs for redesign and claims of other contractors affected by the resulting change, all of which shall be considered by the Engineer in evaluating the proposed substitute. The Engineer may require Contractor to furnish at Contractor's expense additional data about the proposed substitute.

If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, Contractor may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to the Engineer, if Contractor submits sufficient information to allow the Engineer to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedures for submission to and review by the Engineer shall be the same as those provided herein for substitute materials and equipment.

The Engineer shall be allowed a reasonable time within which to evaluate each proposed substitute. The Engineer shall be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without the Engineer's and the City's prior written acceptance which shall be evidenced by either a Change Order or an approved Shop Drawing. The City may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

E. Daily Reports, As-Builts and Meetings: Unless waived in writing, the CEI shall complete and submit to the City on a weekly basis a daily log of the Contractors work for the preceding week in a format approved by the City. The daily log shall document all activities of Contractor at the Project site including, but not limited to, the following:

1. Weather conditions showing the high and low temperatures during work hours, the amount of precipitation received on the Project site, and any other weather conditions which adversely affect the Work;
2. Soil conditions which adversely affect the Work;
3. The hours of operation by Contractor's and subcontractor's personnel;
4. The number of Contractor's and subcontractor's personnel present and working at the Project site, by subcontract and trade;
5. All equipment present at the Project site, description of equipment use and designation of time equipment was used (specifically indicating any down time);
6. Description of Work being performed at the Project site;

7. Any unusual or special occurrences at the Project site;
8. Materials received at the Project site;
9. A list of all visitors to the Project site; and
10. Any problems that might impact either the cost or quality of the Work or the time of performance.

The daily log shall not constitute nor take the place of any notice required to be given by Contractor to the City pursuant to the Contract Documents.

Contractor shall maintain in a safe place at the Project site one record copy of the Contract Documents, including, but not limited to, all drawings, permits, specifications, addenda, amendments, Change Orders, Work Directive Changes and Field Orders, as well as all written interpretations and clarifications issued by the Engineer, in good order and annotated to show all changes made during construction. The annotated drawings shall be continuously updated by the Contractor throughout the prosecution of the Work to accurately reflect all field changes that are made to adapt the Work to field conditions, changes resulting from Change Orders, Work Directive Changes and Field Orders, and all concealed and buried installations of piping, conduit and utility services. All buried and concealed items, both inside and outside the Project site, shall be accurately located on the annotated drawings as to depth and in relationship to not less than two (2) permanent features (e.g. interior or exterior wall faces). The annotated drawings shall be clean and all changes, corrections and dimensions shall be given in a neat and legible manner in a contrasting color. The “As-Built” record documents, together with all approved samples and a counterpart of all approved shop drawings shall be available to the Engineer for reference. Upon completion of the Work and as a condition precedent to the Contractor’s entitlement to final payment, these “As-Built” record documents, samples and shop drawings shall be delivered to the Engineer by Contractor.

Contractor shall keep all records and supporting documentation which concern or relate to the Work hereunder for a minimum of five (5) years from the date of termination of this Agreement or the date the Project is completed, whichever is later. The City, or any duly authorized agents or representatives of the City, shall have the right to audit, inspect and copy all such records and documentation as often as they deem necessary during the period of this Agreement and during the five (5) year period noted above; provided, however, such activity shall be conducted only during normal business hours.

F. Contract Time and Time Extensions: Should Contractor be obstructed or delayed in the prosecution of or completion of the Work as a result of unforeseeable causes beyond the control of the Contractor, and not due to its fault or neglect, including but not restricted to acts of God or of the public enemy, acts of government, fires, floods, epidemics, quarantine regulation, strikes or lockouts, Contractor shall notify the City in writing within forty-eight (48) hours after the commencement of such delay, stating the cause or causes thereof, or be deemed to have waived any right which Contractor may have had to request a time extension.

G. No interruption, interference, inefficiency, suspension or delay in the commencement or progress of the Work from any cause whole or in part, shall relieve Contractor of his duty to perform or give rise to any right to damages or additional compensation from the City. Contractor expressly acknowledges and agrees that it shall receive no damages for delay. Contractor’s sole remedy, if any, against the City will be the right to seek an extension to the Contract Time; provided, however, the granting of any such time extension shall not be a condition precedent to the aforementioned “No Damage For Delay” provision. This paragraph shall expressly apply to claims for early completion, as well as to claims based on late completion.

H. Changes in Work: The City shall have the right at any time during the progress of the Work to increase or decrease the Work. Promptly after being notified of a change, Contractor shall submit an itemized estimate of any cost or time increases or savings it foresees as a result of the change.

Except in an emergency endangering life or property, or as expressly set forth herein, no addition or changes to the Work shall be made except upon written order of the City, and the City shall not be liable to the Contractor for any increased compensation without such written order.

I. Claims and Disputes: A claim is a demand or assertion by one of the parties seeking an adjustment or interpretation of the terms of the Contract Documents, payment of money, extension of time or other relief with respect to the terms of the Contract Documents. The term "Claim" also includes other disputes and matters in question between the City and Contractor arising out of or relating to the Contract Documents.

The responsibility to substantiate a Claim shall rest with the party making the Claim.

Claims by the Contractor shall be made in writing to the City within forty-eight (48) hours after the first day of the event giving rise to such Claim or else the Contractor shall be deemed to have waived the Claim. Written supporting data shall be submitted to the City within fifteen (15) calendar days after the occurrence of the event, unless the City grants additional time in writing, or else the Contractor shall be deemed to have waived the Claim.

The Contractor shall proceed diligently with its performance as directed by the City, regardless of any pending claim, action, suit or administrative proceeding, unless otherwise agreed to by the City in writing. The City shall continue to make payments in accordance with the Contract Documents during the pendency of any Claim.

J. Other Work: The City may perform other work related to the Project at the site by the City's own forces, have other work performed by utility owners or let other direct contracts. If the fact that such other work is to be performed is not noted in the Contract Documents, written notice thereof will be given to Contractor prior to starting any such other work. If Contractor believes that such performance will involve additional expense to Contractor or require additional time, Contractor shall send written notice of that fact to the City within forty-eight (48) hours of being notified of the other work. If the Contractor fails to send the above required forty-eight (48) hour notice, the Contractor will be deemed to have waived any rights it otherwise may have had to seek an extension to the Contract Time or adjustment to the Contract Amount.

Contractor shall afford each utility owner and other contractor who is a party to such a direct contract (or the City, if the City is performing the additional work with the City's employees) proper and safe access to the site and a reasonable opportunity for execution of such work and shall properly connect and coordinate its Work with theirs. Contractor shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and 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 the 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 the City and such utility owners and other contractors.

If any part of Contractor's Work depends for proper execution or results upon the work of any other contractor or utility owner (or the City), Contractor shall inspect and promptly report to the Engineer in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results.. Contractor's failure to report will constitute an acceptance of the other work as fit and proper for integration with Contractor's Work.

K. Compliance with Laws: Contractor agrees to comply, at its own expense, with all federal, state and local laws, codes, statutes, ordinances, rules, regulations and requirements applicable to the Project, including but not limited to those dealing with taxation, worker's compensation, equal employment and safety (including, but not limited to, the Trench Safety Act, Chapter 553, Florida

Statutes). If Contractor observes that the Contract Documents are at variance therewith, it shall promptly notify the Engineer in writing.

L. Assignment: Contractor shall not assign this Agreement or any part thereof, without the prior consent in writing of the City. If Contractor does, with approval, assign this Agreement or any part thereof, it shall require that its assignee be bound to it and to assume toward Contractor all of the obligations and responsibilities that Contractor has assumed toward the City.

M. Permits, Licenses and Taxes: Pursuant to Section 218.80, F.S., the City will pay for all permits and fees, including license fees, permit fees, impact fees or inspection fees applicable to the work through an internal budget transfer(s). Contractor is not responsible for paying for permits issued by The City of Naples, but is responsible for acquiring all permits.

All permits, fees and licenses necessary for the prosecution of the Work which are not issued by the City shall be acquired and paid for by the Contractor unless otherwise noted.

N. Termination for Default: Contractor shall be considered in material default of the Agreement and such default shall be considered cause for the City to terminate the Agreement, in whole or in part, as further set forth in this Section, if Contractor: (1) fails to begin the Work under the Contract Documents within the time specified herein; or (2) fails to properly and timely perform the Work as directed by the Engineer or as provided for in the approved Progress Schedule; or (3) performs the Work unsuitably or neglects or refuses to remove material or to correct or replace such Work as may be rejected as unacceptable or unsuitable; or (4) discontinues the prosecution of the Work; or (5) fails to resume Work which has been suspended within a reasonable time after being notified to do so; or (6) becomes insolvent or is declared bankrupt, or commits any act of bankruptcy; or (7) allows any final judgment to stand against it unsatisfied for more than ten (10) days; or (8) makes an assignment for the benefit of creditors; or (9) fails to obey any applicable codes, laws, ordinances, rules or regulations with respect to the Work; or (10) materially breaches any other provision of the Contract Documents.

The City shall notify Contractor in writing of Contractor's default(s). If the City determines that Contractor has not remedied and cured the default(s) within seven (7) calendar days following receipt by Contractor of said written notice, then the City, at its option, without releasing or waiving its rights and remedies against the Contractor's sureties and without prejudice to any other right or remedy it may be entitled to hereunder or by law, may terminate Contractor's right to proceed under the Agreement, in whole or in part, and take possession of all or any portion of the Work and any materials, tools, equipment, and appliances of Contractor, take assignments of any of Contractor's subcontracts and purchase orders, and complete all or any portion of Contractor's Work by whatever means, method or agency which the City, in its sole discretion, may choose.

If the City deems any of the foregoing remedies necessary, Contractor agrees that it shall not be entitled to receive any further payments hereunder until after the Project is completed. All monies expended and all of the costs, losses, damages and extra expenses (including Engineer and attorney's fees) or damages incurred by The City incident to such completion, shall be deducted from the Contract Amount, Contractor agrees to pay promptly to the City on demand the full amount (including appeals) and interest thereon at the maximum legal rate of interest until paid. If the unpaid balance of the Contract Amount exceeds all such costs, expenditures and damages incurred by the City to complete the Work, such excess shall be paid to the Contractor. The amount to be paid to the Contractor, shall be approved by the Engineer, upon application, and this obligation for payment shall survive termination of the Agreement.

The liability of Contractor hereunder shall extend to and include the full amount of any and all sums paid, expenses and losses incurred, damages sustained, and obligations assumed by The City in good faith under the belief that such payments or assumptions were necessary or required, in completing the Work and providing labor, materials, equipment, supplies, and other items

therefore or re-letting the Work, and in settlement, discharge or compromise of any claims, demands suits, and judgments pertaining to or arising out of the work hereunder.

If, after notice of termination of contractor's right to proceed pursuant to this Section, it is determined for any reason that Contractor was not in default, or that its default was excusable, or that the City is not entitled to the remedies against Contractor provided herein, then Contractor's remedies against the City shall be the same as and limited to those afforded Contractor under "Completion" section below.

O. Termination for Convenience and Right of Suspension: The City shall have the right to terminate this Agreement without cause upon seven (7) calendar days written notice to Contractor. In the event of such termination for convenience, Contractor's recovery against the City shall be limited to that portion of the Contract Amount earned through the date of termination, together with any retainage withheld and reasonable termination expenses incurred, but Contractor shall not be entitled to any other or further recovery against the City, including, but not limited to, damages or any anticipated profit on portions of the Work not performed.

   The City shall have the right to suspend all or any portions of the Work upon giving Contractor not less than two (2) calendar days' prior written notice of such suspension. If all or any portion of the Work is so suspended, Contractor's sole and exclusive remedy shall be to seek an extension of time to its schedule in accordance with the procedures set forth in the Contract Documents. In no event shall the Contractor be entitled to any additional compensation or damages. Provided, however, if the ordered suspension exceeds six (6) months, the Contractor shall have the right to terminate the Agreement with respect to that portion of the Work which is subject to the ordered suspension.

P. Completion: When the entire Work (or any portion thereof designated in writing by the City) is ready for its intended use, Contractor shall notify the Engineer in writing that the entire Work (or such designated portion) is substantially complete and request that the Engineer issue a Certificate of Substantial completion (or Certificate of Partial Substantial Completion). Within a reasonable time thereafter, the City, Contractor and Engineer shall make an inspection of the Work (or designated portion thereof) to determine the status of completion. If the City and Engineer do not consider the Work (or designated portion) substantially complete, the Engineer shall notify Contractor in writing giving the reasons therefore. If the City and Engineer consider the Work (or designated portion) substantially complete, the Engineer shall prepare and deliver to Contractor a Certificate of Substantial Completion (or Certificate of Partial Substantial Completion) which shall fix the date of Substantial Completion for the entire Work (or designated portion thereof) and include a tentative punchlist of items to be completed or corrected by Contractor before final payment. The City shall have the right to exclude Contractor from the Work and Project site (or designated portion thereof) after the date of Substantial Completion, but the City shall allow Contractor reasonable access to complete or correct items on the tentative punchlist.

   Upon receipt of written certification by Contractor that the Work is completed in accordance with the Contract Documents and is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Engineer will make such inspection and, if he finds the Work acceptable and fully performed under the Contract Documents, he shall promptly issue a final Certificate for Payment, recommending that, on the basis of his observations and inspection, and the Contractor's certification that the Work has been completed in accordance with the terms and conditions of the Contract Documents, that the entire balance found to be due Contractor is due and payable. Neither the final payment nor the retainage shall become due and payable until Contractor submits: all data establishing payment or satisfaction of al obligations, such as receipts, releases and waivers of liens, arising out of the Contract Documents, to the extent and in such form as may be designated by the City. The City reserves the right to inspect the Work and make an independent determination as to the Work's acceptability, even though the Engineer

may have issued his recommendations. Unless and until the City is completely satisfied, neither the final payment nor the retainage shall become due and payable.

Q. Warranty: Contractor shall obtain and assign to the City all express warranties given to Contractor or any subcontractors by any material, men supplying materials, equipment or fixtures to be incorporated into the project. Contractor warrants to the City that any materials and equipment furnished under the Contract Documents shall be new unless otherwise specified, and that all Work shall be of good quality, free from all defects and in conformance with the Contract Documents. Contractor further warrants to the City that all materials and equipment furnished under the Contract Documents shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable manufacturers, fabricators, suppliers or processors except as otherwise provided for in the Contract Documents. If, within one (1) year after final completion, any Work is found to be defective or not in conformance with the Contract Documents, Contractor shall correct it promptly after receipt of written notice from the City. Contractor shall also be responsible for and pay for replacement or repair of adjacent materials or Work which may be damaged as a result of such replacement or repair. These warranties are in addition to those implied warranties to which the City is entitled as a matter of law.

R. Supervision and Superintendents: Contractor shall plan, organize, supervise, schedule, monitor, direct and control 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 responsible to see that the finished work complies accurately with the Contract Documents. Contractor shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without prior written notice to the Engineer except under extraordinary circumstances. The superintendent shall be Contractor's representative at the Project site and shall have authority to act on behalf of Contractor. All communications given to the superintendent shall be as binding as if given to the Contractor. The City shall have the right to direct Contractor to remove and replace its Project superintendent, with or without cause.

S. Protection of Work: Contractor shall fully protect the Work from loss or damage and shall bear the cost of any such loss or damage until final payment has been made. If Contractor or any one for whom Contractor is legally liable for is responsible for any loss or damage to the Work, or other work or materials of the City or the City's separate contractors, Contractor shall be charged with the same, and any monies necessary to replace such loss or damage shall be deducted from any amounts due Contractor.

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.

Contractor shall not disturb any benchmark established by the Engineer with respect to the Project. If Contractor, or its subcontractors, agents or anyone for whom Contractor is legally liable, disturbs the Engineer's benchmark, Contractor shall immediately notify The City and Engineer. The Engineer shall reestablish the benchmark and Contractor shall be liable for all costs incurred by The City associated therewith.

T. Emergencies: In the event of an emergency affecting the safety or protection of persons or Work or property at the Project site of adjacent thereto, Contractor, without special instructions or authorization from the City or Engineer is obligated to act to prevent threatened damage, injury or loss. Contractor shall give Engineer written notice within forty-eight (48) hours after the occurrence of the emergency, if Contractor believes that after the occurrence of the emergency, if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If the Engineer determines that a change in the Contract

Documents is required because of the action taken in response to an emergency, a Change Order shall be issued to document the consequences of the changes or variations. If Contractor fails to provide the forty- eight (48) hour written notice noted above, the Contractor shall be deemed to have waived any right it otherwise may have had to seek an adjustment to the Contract Amount or an extension to the Contract Time.

U. Project Meetings: Prior to the commencement of Work, the Contractor shall attend a preconstruction conference with the Engineer and others as appropriate to discuss the Progress Schedule, procedures for handling shop drawings and other submittals, and for processing Applications for Payment, and to establish a working understanding among the parties as to the Work. During the prosecution of the Work, the Contractor shall attend any and all meetings convened by the Engineer or the City with respect to the Project, when directed to do so. Contractor shall have its subcontractors and suppliers attend all such meetings (including the preconstruction conference) as may be directed by the City or Engineer.

V. Traffic Control Plan: A traffic control plan to support the Contractor's operations shall be submitted at least 72 hours prior to commencing work that shall conform to the Florida Department of Transportation's "Manual on Traffic Control and Safe Practices" which shall be obtained by the Contractor at his expense.

W. Hours of Work: Work within the travelled way of the project shall commence no earlier than 7:00 a.m. local time and be completed no later than 7:00 p.m. local time. Hours of work may be altered at any time at the discretion of the City.

X. Tax Exemption: The City of Naples is exempt from the payment of sales or use tax. The tax exemption certificate number is: 85-8012621645C-0.

PART 4 SAFETY

A. Contractor shall be 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 employees on the Work and other persons and/or organizations who may be affected thereby;
2. All the Work and materials and equipment to be incorporated therein, whether in storage on or off the Project site; and
3. Other property on Project site or adjacent thereto, including trees, shrubs, walks, pavements, roadways, structures, utilities and any underground structures or improvements not designated for removal, relocation or replacement in the Contract Documents.

B. Contractor shall comply with all applicable codes, laws, ordinances, rules and regulations of any public body having jurisdiction for the safety of persons or property or to protect them from damage, injury or loss. Contractor shall erect and maintain all necessary safeguards for such safety and protection. Contractor shall notify owners of adjacent property and of underground structures and improvements and utility-owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation or replacement of their property. Contractor's duties and responsibilities for the safety and protection of the Work shall continue until such time as the Work is completed and final acceptance of same by The City has occurred.

C. Contractor shall designate a responsible representative at the Project site whose duty shall be the prevention of accidents. This person shall be Contractor's superintendent unless otherwise designated in writing by Contractor to The City.

END OF SECTION

SECTION 01026 – MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Explanation and Definitions
B. Measurement
C. Payment
D. Schedule of Values

1.2 EXPLANATION AND DEFINITIONS

A. The following explanation of the Measurement and Payment for the Bid Schedule items is made for information and guidance. The omission of reference to any item in this description shall not, however, alter the intent of the Bid Schedule or relieve the CONTRACTOR of the necessity of furnishing such as a part of the Contract. Measurement and payment for all Contract Items shall made be in accordance with this section.

1.3 MEASUREMENT

A. The quantities set forth in the Bid Schedule are approximate and are given to establish a uniform basis for the comparison of bids. The CITY reserves the right to increase or decrease the quantity of any class or portion of the work during the progress of construction in accord with the terms of the Contract.

1.4 PAYMENT

A. Make payment for the items listed on the Bid Schedule on the basis of the work actually performed and completed, such work including but not limited to, the furnishing of all necessary labor, materials, equipment, transportation, clean up, restoration of disturbed areas, and all other appurtenances to complete the construction and installation of the work as shown on the drawings and described in the specifications.

B. Unit prices are used as a means of computing the final figures for bid and Contract purposes, for periodic payments for work performed, for determining value of additions or deletions and wherever else reasonable.

1.5 SCHEDULE OF VALUES

A. Approval of Schedule: Submit for approval a preliminary schedule of values, in duplicate, for all of the Work. Prepare and submit final schedule of values within 10 calendar days after the Effective Date of the Agreement.

B. Format: Utilize a format similar to the Table of Contents of the Project Specifications. Identify each line item with number and title of the major specification items. Identify site mobilization, bonds and insurance. Include within each line item, a direct proportional amount of CONTRACTOR’s overhead profit.

C. Revisions: With each Application for Payment, revise schedule to list approved Change Orders.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 MEASUREMENT AND PAYMENT

A. Make payment on the basis of work actually performed completing each item in the Bid, such work including, but not limited to, the furnishing of all necessary labor, materials, equipment, transportation, cleanup, and all other appurtenances to complete the construction and installation of the work to the configuration and extent as shown on the drawings and described in the specifications. Payment for each item includes compensation for cleanup and restorations. Cost of cleanup and surface restorations (including pavement replacement) will be considered as the percentage retained in accordance with the Contract Documents, and complete payment will not be made until cleanup, restorations and as-builts are completed.

1. Mobilization: Payment for mobilization will be made for at the Contract lump sum price.

2. Performance and Payment Bond Premiums and Insurance:

3. Erosion and Sediment Control: Payment for obtaining a NPDES permit and installing/removing silt fence, floating turbidity barriers, and hay bales will be made for at the Contract lump sum price. Install and remove all erosion and sediment controls in accordance with the specifications and details shown on the Plans.

4. Dredging and Dewatering: The maximum estimated quantity of sediment to be removed from within the Lake limits shall be, for bidding and payment purposes, in-situ sediments. The Contractor's pay volume will be limited to a maximum of 100% of this volume dredge quantity based upon the design depth. The Contractor shall provide bids for each Lake based on the estimated volumes.

Lakes	Design Dredge Volume (CY)
Lake 19	13,179.18
Lake 11	16,820.72
Total	**29,999.90**

The total computed quantities of material required to be removed within the specified limits of the cross sections are based on the pre-construction surveys performed by the Engineer at 50 ft baseline stations. The Contractor is required to remove a minimum 100% of the design dredge volume within the Lakes and meet the design depth at all locations within the dredge areas.

The basis of measurement of quantities for payment shall be the comparison of the pre-construction surveys, as shown on the Contract Drawings, and the post-construction acceptance surveys of the dredging. Quantities will be calculated based on the average end area method for volume computations at 50 feet baseline stations surveyed.

To meet the minimum excavation requirement, the Contractor's vertical accuracy of the surveying equipment shall be considered. For example if the required design depth is 10' and the surveyor is using equipment with a plus or minus 2" tolerance, the post-construction surveys shall show excavation to a minimum depth of 10'-2" to ensure that the design depth was reached in all locations.

The Engineer shall be notified a minimum of forty-eight (48) hours in advance of each acceptance of Lakes to allow for observation by a representative of the Engineer, unless waived by the Engineer. The Contractor may call for post-construction acceptance surveys on completed Lakes.

The Contractor may elect to independently conduct pre-construction surveys to be used for payment. These surveys must be performed in the presence of the Engineer and be performed by a professional survey licensed in the State of Florida.

The City will not pay for material excavated from areas unauthorized by this Contract. Excavation of such areas is a violation of the regulatory permits and may results in Contractor fines. If it is determined that the Contractor has excavated outside of the approved excavation areas or below the allowable excavation limit, the quantity of material excavated from these areas will be computed and subtracted directly from the pay quantity.

Debris, such as stumps, rock fragments, roots, logs, trash, etc. and any other objects except archeological or historical resources which exist within the project area or are unearthed during dredging operations shall be removed, transported and disposed of at the Collier County Landfill and should be expected to be encountered during the dredge operations and will not constitute a change of condition to the contract.

5. Stormwater Infrastructure Modifications: Payment for relocating, cleaning, furnishing and installing stormwater pipelines (various sizes and types), reinforced concrete nutrient separating boxes (various sizes and types), inlet filters (various sizes and types), floating trash baffle and pavement repair will be made at the Contract unit price per linear foot for the pipe and floating trash baffle , unit price per each for the mitered end sections and inlet filters, and unit price per square yard for pavement surface and base. This item includes clearing and disposal of trees and bushes, all necessary fittings, pipe coatings and linings, connections to existing mains, labor, equipment and materials for the furnishing and laying modifications, signs, maintenance of traffic, dewatering, compaction, pipe bedding, backfilling, sheeting, restrained joint piping, detectable tape, clamps, harnessing, plugs and caps, adapters, excavation of all material encountered, including rock, backfill, replacement of grass, sod, clearing and grubbing, landscaping, pavement, driveways, sidewalks, mailboxes, culverts, and storm sewers. Stormwater infrastructure modifications shall be performed in accordance with the specifications and details shown on the Plans.

6. Public Outreach Amenities: Payment for concrete and asphalt trail, turfstone, signage, pavement markings, and vegetation will be made at the Contract unit price per ton for concrete and asphalt trail, and unit price per each for signage and vegetation. Public Outreach Amenities shall be performed in accordance with the specifications and details shown on the Plans.

7. Construction and As-Built Surveys: Payment for construction surveys will be made for at the Contract lump sum price.

B. Prior to submitting first monthly Application for Payment, Contractor shall submit to Engineer, for review and approval, a schedule of values based upon the Contract Price, listing the major elements of the Work and the dollar value for each element. After its approval by the Engineer, this schedule of values shall be used with the bid tabulation as the basis for the Contractor's monthly Applications for Payment.

C. Prior to submitting first monthly Application for Payment, Contractor shall submit to The City a complete list of all its proposed subcontractors and materialmen, showing the work and materials involved and the dollar amount of each proposed subcontract and purchase order. The first

Application for Payment shall be submitted no earlier than thirty (30) days after the Commencement Date.

D. If payment is requested on the basis of materials and equipment not incorporated into the Project, but delivered and suitably stored at the site or at another location agreed to by the City in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice or other documentation warranting that the City has received the materials and equipment free and clear of all liens, charges, security interests and encumbrances, together with evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect the City's interest therein, all of which shall be subject to the City's satisfaction.

E. Contractor shall submit two (2) copies of its monthly Application for Payment to the Engineer on or before the 25th day of each month for work performed during the previous month. Invoices received after the 25th day of each month shall be considered for payment as part of the next month's application. Within ten (10) calendar days after receipt of each Application for Payment, the Engineer shall either:

1. indicate his approval of the requested payment;
2. indicate his approval of only a portion of the requested payment, stating in writing his reasons therefore; or
3. return the Application for Payment to the Contractor indicating, in writing, the reason for refusing to approve payment.

In the event of a total denial and return of the Application for Payment by the Engineer, the Contractor may make the necessary corrections and resubmit the Application for Payment. The City shall, within thirty (30) calendar days after the Engineer's approval of an Application for Payment, pay the Contractor the amounts so approved. Provided, however, in no event shall the City be obligated to pay any amount greater than that portion of the Application for Payment approved by the Engineer.

F. The City shall retain ten (10%) of the gross amount of each monthly payment request or ten percent (10%) of the portion thereof approved by the Engineer for payment, whichever is less. Such sum shall be accumulated and not released to the Contractor until final payment is due.

G. Monthly payments to Contractor shall in no way imply approval or acceptance of Contractor's work.

H. Contractor agrees and understands that funding limitations exist, and that the expenditure of funds must be spread over the duration of the Project at regular intervals based on the Contract Amount and Progress Schedule. Accordingly, prior to submitting its first monthly Application for Payment, Contractor shall prepare and submit for the Engineers review and approval, a detailed Project Funding Schedule, which shall be updated as necessary and approved by the City to reflect approved adjustments to the Contract Amount and Contract Time. No voluntary acceleration or early completion of the Work shall modify the time of payments to Contractor as set forth in the approved Project Funding Schedule.

3.2 PAYMENTS WITHHELD

A. The Engineer may decline to approve any Application for Payment, or portions thereof, because of subsequently discovered evidence or subsequent inspections. The Engineer may nullify the whole or any part of any approval for payment previously issued and the City may withhold any agreement between the City and Contractor, to such an extent as may be necessary in the City's opinion to protect it from loss because of:

1. Defective Work not remedied;

2. Third party claims filed or reasonable evidence indicating probable filing of such claims
3. Failure of Contractor to make payment properly to subcontractors or for labor, materials or equipment;
4. Reasonable doubt that the Work can be completed for the unpaid balance of the Contract Amount;
5. Reasonable indication that the Work will not be completed within the Contract Time;
6. Unsatisfactory prosecution of the Work by the Contractor; or
7. Any other material breach of the Contract Documents.

B. If these conditions in above are not remedied or removed, the City may, after three (3) days written notice, rectify the same at Contractor's expense. The City also may offset against any sums due Contractor the amount of any liquidated or unliquidated obligations of Contractor whether relating to or arising out of this Agreement or any other agreement between Contractor and the Engineer.

3.3 FINAL PAYMENT

A. The City shall make final payment to Contractor within thirty (30) calendar days after the Work is finally inspected and accepted by both the City and the Engineer in accordance with Section 3..1 herein provided that Contractor first, and as an explicit condition precedent to the accrual of Contractor's right to final payment, shall have furnished the City with any and all documentation that may be required by the Contract Documents and the City.

B. Contractor's acceptance of final payment shall constitute a full waiver of any and all claims by Contractor against the City arising out of this Agreement or otherwise relating to the Project, except those previously made in writing and identified by Contractor as unsettled at the time of the final Application for Payment. Neither the acceptance of the Work nor payment by the City shall be deemed to be a waiver of the City's right to enforce any obligations of Contractor hereunder or to the recovery of damages for defective Work not discovered by the Engineer at the time of final inspection.

END OF SECTION

SECTION 01045 - CONNECTIONS TO EXISTING SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General Requirements
B. Submittals
C. Scheduling of Shutdown

1.2 RELATED SECTIONS

A. Section 01010 - Summary of Work
B. Section 01500 - Construction Facilities and Temporary Controls
C. Section 01570 – Traffic Regulations and Public Safety
D. Section 02575 - Pavement Repair and Restoration

1.3 GENERAL REQUIREMENTS

A. Be responsible for all connection to existing systems, cutting, fitting and patching, including attendant excavation and backfill, required to complete the work or to:

1. Make its several parts fit together properly.
2. Uncover portions of the work to provide for installation of ill-timed work.
3. Remove and replace defective work.
4. Remove and replace work not conforming to requirements of Contract Documents.

B. Coordination: Before connection is performed, verify and provide for any pipe restraint that may be required for the new connection. Perform all cutting, fitting or patching of the Work that may be required to make the several parts thereof join in accordance with the Contract Documents. Perform restoration with competent workmen skilled in the trade.

C. Improperly Timed Work: Perform all cutting and patching required to install improperly timed work, to remove samples of installed materials for testing, and to provide for alteration of existing facilities or for the installation of new Work in the existing construction.

D. Limitations: Except when the cutting or removal of existing construction is specified or indicated, do not undertake any cutting or demolition, which may affect the structural stability of the Work or existing facilities without the ENGINEER's concurrence.

E. City of Naples Damage Prevention Policy: This policy has been put in place to avoid damage to CITY underground utilities. A minimum distance of five feet (5') horizontally and eighteen inches (18") vertically must be maintained away from CITY utilities. Any and all variations from this order must be approved by the Water or Wastewater Department. **Before commencement of any excavation, the existing underground utilities in the area affected by the work must be marked by Sunshine State One Call after proper notification to them by either calling 800/432-4770 or emailing www.callsunshine.com. Before commencing excavation for the work, potholing of all potential conflicts must be performed.** All lines in conflict must be physically located by the contractor and verified by CITY Locate Department personnel before performing work. Utilities under concrete or pavement may require soft dig vacuum locates which also is the contractor's responsibility to perform. All utilities will be field marked per Sunshine State One Call's statutes and guidelines. For line verification or any other information concerning locates, please call the Locate Department at 239/213-4717 during normal business hours. For line verification or emergency locates after hours, call emergency number 239/213-4717. **In the**

event the potholing and/or vacuum soft dig does not locate the marked utility, work must be stopped and the affected utility owner contacted. Failure to comply with this policy and obtain required signature(s) may result in delay or denial of permit.

The Contractor will be required to take every precaution to guard against any or all damages to existing structures, pipe lines, and equipment of the City water, sewer, or reuse system from any cause whatsoever in the prosecution of the work. All work shall be planned and executed in such a manner by the Contractor as to absolutely insure the regular and continuous operation of the waterworks system insofar as same may be affected by the Contractor's operations; and the sequence of operations of the Contractor in providing for and executing the work shall be at all times subject to the approval of the Engineer of Record and City, insofar as the operation of the above- mentioned system may be affected. Such approval of the EOR shall in no way relieve the Contractor of his responsibility for providing all and adequate means of guaranteeing the continuous, uninterrupted operation of the City utility systems. Any damage done to any City main or facility shall be reported to Public Works immediately by calling (239) 213-4717. Any such damage shall be the direct responsibility of the Contractor and such damage shall be restored, replaced, or repaired per City direction by the Contractor at no expense to the City. See also Section 01500, 1.8.B

1.4 SUBMITTALS

A. Submit a written request to the Engineer well in advance of executing any cutting or alteration which affects:

1. Work of the City or any separate contractor.
2. Structural value or integrity of any element of the project or work.
3. Integrity or effectiveness of weather-exposed or moisture-resistant elements or systems.
4. Efficiency, operational life, maintenance or safety of operational elements.
5. Visual qualities of sight-exposed elements.

B. Include in request:

1. Identification of the work.
2. Description of affected work.
3. The necessity for cutting, alteration or excavation.
4. Effect on work of the CITY or any separate contract, or on structural or weatherproof integrity of work.
5. Description of proposed work:
   a. Scope of cutting, patching, alteration, or excavation.
   b. Trades who will execute the work.
   c. Products proposed to be used.
   d. Extent of refinishing to be done.
6. Alternatives to cutting and patching.
7. Cost proposal, when applicable.
8. Written permission of any separate contractor whose work will be affected.

C. SUBMIT WRITTEN NOTICE TO THE ENGINEER DESIGNATING THE DATE AND THE TIME THE WORK WILL BE UNCOVERED.

PART 2 PRODUCTS

2.1 MATERIALS

A. Comply with specifications and standards for each specific product involved.

PART 3 EXECUTION

3.1 INSPECTION

A. Inspect existing conditions of projects, including elements subject to damage or to movement during cutting and patching.

B. After uncovering work, inspect conditions affecting installation of products, or performance of the work.

C. Report unsatisfactory or questionable conditions to the ENGINEER in writing; do not proceed with work until the ENGINEER has provided further instructions.

3.2 PREPARATION

A. Provide adequate temporary support as necessary to assure structural value or integrity or affected portion of work.

B. Provide devices and methods to protect other portions of project from damage.

C. Provide protection from elements for that portion of the project that may be exposed by cutting and patching work, and maintain excavations free from water.

D. Material Removal: Cut and remove all materials to the extent shown or as required to complete the Work. Remove materials in a careful manner with no damage to adjacent facilities. Remove materials that are not salvageable from the site.

3.3 PERFORMANCE

A. Execute cutting and demolition by methods that will prevent damage to other work, and will provide proper surfaces to receive installation of repairs.

B. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.

C. Employ original installer or fabricator to perform cutting and patching for:
   1. Weather-exposed or moisture-resistant elements.
   2. Sight-exposed finished surfaces.

D. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes.

E. Restore work, which has been cut or removed; install new products to provide completed work in accord with requirements of contract documents.

F. Fit work airtight to pipes, sleeves, ducts, conduit and other penetrations through surfaces.

G. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
   1. For continuous surfaces, refinish to nearest intersection.
   2. For an assembly, refinish entire unit.

3.4 PAVEMENT RESTORATION

A. Restore all pavement or roadway surfaces in accordance with Section 02575 – Repair and Restoration of Pavement, Sidewalk, Etc.

B. Restore, replace or rebuild existing street paving, including underdrains, if any are encountered, where damaged, using the same type of construction as was in the original. Be responsible for restoring all such work, including subgrade, base courses, curb and gutter or other appurtenances where present. The CITY Manager or designee will obtain the permits listed in the Contract Documents. Obtain and pay for at CONTRACTOR's expense any additional local or other governmental permits as may be required for the opening of streets and be satisfied as to any requirements other than those herein set forth which may affect the type, quality and manner of carrying on the restoration of surfaces by reason of jurisdiction of such governmental bodies.

C. This section does not describe the construction of new road surfaces or the complete resurfacing of existing pavements.

D. In all cases, the CONTRACTOR will be required to maintain, without additional compensation, all permanent replacement of street paving, done by him under this Contract for a period of 12 months after the acceptance of the Contract, including the removal and replacement of such work wherever surface depressions or underlying cavities result from settlement of trench backfill.

E. Perform all the final resurfacing or repaving of streets or roads, over the excavations made and be responsible for relaying paving surfaces of roads that have failed or been damaged at any time before the termination of the maintenance period on account of work done by him. Resurface or repave over any tunnel jacking, or boring excavation that settles or breaks the surface, repave.

F. Where pipeline construction crosses paved streets, driveways or sidewalks, the CONTRACTOR may elect, at no additional cost to the CITY, to place the pipe by the jacking and boring, horizontal direction drilling, or tunneling method in lieu of cutting and patching of the paved surfaces. Such work shall be accomplished in accordance with all applicable sections of the Contract Documents.

END OF SECTION

SECTION 01051 - ALIGNMENT AND GRADES

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. General

B. Surveys

C. Datum Plane

D. Protection of Survey Data

1.2 GENERAL

A. Construct all work in accordance with the lines and grades shown on the Drawings. Assume full responsibility for keeping all alignment and grade.

1.3 SURVEYS

A. Reference Points: The CITY will provide reference points for the work as described in the General Conditions. Base horizontal and vertical control points will be designated by the ENGINEER and used as datum for the Work. Perform all additional survey, layout, and measurement work.

1. Keep ENGINEER informed, sufficiently in advance, of the times and places at which work is to be performed so that base horizontal and vertical control points may be established and any checking deemed necessary by ENGINEER may be done, with minimum inconvenience to the ENGINEER and at no delay to CONTRACTOR. It is the intention not to impede the Work for the establishment of control points and the checking of lines and grades set by the CONTRACTOR. When necessary, however, suspend working operations for such reasonable time as the ENGINEER may require for this purpose. Costs associated with such suspension are deemed to be included in the Contract Price, and no time extension or additional costs will be allowed.

2. Provide an experienced survey crew, including a Professional Land Surveyor, an instrument operator, competent assistants, and any instruments, tools, stakes, and other materials required to complete the survey, layout, and measurement of work performed by the CONTRACTOR.

1.4 DATUM PLANE

A. All datum indicated or specified refer to the North American Datum 1983/2011 adjustment (NAD83/11) with values expressed in U.S. survey feet, Florida State Plan Coordinate System (FSPCS) East zone 901, and the North American Vertical Datum of 1988 (NAVD 88), respectively, based on National Spatial Reference System Control Stations:

NAPLES RESET: Recovered in good condition. In Naples, at the intersection of U.S. Highway 41 and Goodland Frank Road, 186.5 m (611.9 ft) North of the center of the westbound lanes of the Highway, 18.4 m (60.4 ft) West of the center of the road, 3.7m (12.1 ft) Northeast of a witness post, 0.7 m (2.3 ft) South of the center of an entrance road to the grand central station shopping center, 0.7 m (2.3 ft) above the level of the road, and the monument is flush with the pavement. Elevation 6.29 feet, FSPCS N: 658,769.28' E: 396,684.54'.

and

V 241: Recovered in good condition. In Naples, at 856 3rd Avenue South, 7.8 m (25.6 ft) Northwest of the Northeast corner of the post office at 856 3rd Avenue South, 7.0 m (23.0 ft) South of and level with the centerline of the avenue, 0.4 m (1.3 ft) North-Northeast of a witness post, 0.3 m (1.0 ft) west of a utility pole, and the disk is encased in a 4-inch metal pipe and is flush with the ground surface.
Elevation 6.43 feet, FSPCS N: 658,801.55' E: 395,120.18'.

With the baseline of survey depicted hereon as being N 83°20'15" E

1.5 PROTECTION OF SURVEY DATA

A. General: Safeguard all points, stakes, grade marks, known property corners, monuments, and benchmarks made or established for the Work. Reestablish them if disturbed, and bear the entire expense of checking reestablished marks and rectifying work improperly installed.

B. Records: Keep neat and legible notes of measurements and calculations made in connection with the layout of the Work. Furnish copies of such data to the ENGINEER for use in checking the CONTRACTOR's layout. Data considered of value to the City Manager or designee will be transmitted to the City Manager or designee by the ENGINEER with other records on completion of the Work.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01090 - REFERENCES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Reference Abbreviations

B. Abbreviations

C. Reference Standards

D. Definitions

1.2 RELATED SECTIONS

A. Information provided in this section is used where applicable in individual Specification Sections.

1.3 REFERENCE ABBREVIATIONS

A. Reference to a technical society, trade association or standards setting organization, may be made in the Specifications by abbreviations in accordance with the following list:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
CMAA	Crane Manufacturers Association of America
CRD	U.S. Corps of Engineers Specifications
CRSI	Concrete Reinforcing Steel Institute
DOH	Department of Health
DOT	Department of Transportation
Fed. Spec.	Federal Specifications
OSHA	Occupational Safety and Health Act
PCI	Prestressed Concrete Institute

1.4 ABBREVIATIONS

A. Abbreviations which may be used in individual Specification Sections are as follows:

alternating current.....ac
American wire gauge.....AWG
ampere(s) ..... amp
ampere-hour(s)..... AH
annual..... ann
Ampere Interrupting Capacity..... AIC
atmosphere(s) ..... atm
average.....avg

biochemical oxygen demand.....BOD
Board Foot.....FBM
brake horsepower..... bhp
Brinell Hardness ..... BH
British thermal unit(s) .....Btu

calorie (s).....cal
carbonaceous biochemical oxygen demand.....CBOD
Celsius (centigrade) C
Center to Center..... C to C
centimeter(s).....cm
chemical oxygen demand..... COD
coefficient, valve flow Cv
condensate return..... CR
cubic .....cu
cubic centimeter(s) cc
cubic feet per day .....cfd
cubic feet per hour.....cfh
cubic feet per minute .....cfm
cubic feet per minute, standard conditions .....scfm
cubic feet per second .....cfs
cubic foot (feet).....cu ft
cubic inch(es) .....cu in
cubic yard(s).....cu yd
decibels dB
decibels (A scale) .....dBa
degree(s) .....deg
dewpoint temperature.....dpt
diameter.....dia

direct current ..... dc
dissolved oxygen..... DO
dissolved solids ..... DS
dry-bulb temperature..... dbt

efficiency ..... eff
elevation ..... el
engineer of record ..... EOR
entering water temperature..... ewt
entering air temperature..... eat
equivalent direct radiation ..... edr

face area ..... fa
face to face..... f to f
Fahrenheit ..... F
feet per day ..... fpd
feet per hour..... fph
feet per minute ..... fpm
feet per second ..... fps
foot (feet) ..... ft
foot-candle..... fc
foot-pound ..... ft-lb
foot-pounds per minute ..... ft-lb/min
foot-pounds per second ..... ft-lb/sec
formazin turbidity unit(s)..... FTU
frequency..... freq
fuel oil ..... FO
fuel oil supply..... FOS
fuel oil return..... FOR

gallon(s) ..... gal
gallons per day ..... gpd
gallons per day per
cubic foot ..... gpd/cu ft
gallons per day per
square foot..... gpd/sq ft
gallons per hour..... gph
gallons per minute ..... gpm
gallons per second ..... gps
gas chromatography and
mass spectrometry ..... GC-MS
gauge..... ga
grain(s)..... gr
gram(s) ..... g
grams per cubic centimeter ..... gm/cc
Heat Transfer
Coefficient..... U
Height ..... hgt
Hertz ..... Hz
Horsepower ..... hp
horsepower-hour ..... hp-hr
hour(s) ..... hr
humidity, relative..... rh
hydrogen ion concentration ..... pH

inch(es) ..... in
inches per second ..... ips
inside diameter ..... ID

Jackson turbidity unit(s)..... JTU

kelvin..... K
kiloamperes ..... kA
kilogram(s) ..... kg
kilometer(s) ..... km
kilovar (kilovolt-amperes
reactive) ..... kvar
kilovolt(s) ..... kV
kilovolt-ampere(s) ..... kVA
kilowatt(s) ..... kW
kilowatt-hour(s) ..... kWh

linear foot (feet) ..... lin ft
liter(s)..... L

megavolt-ampere(s) ..... MVA
meter(s) ..... m
micrograms per liter..... µg/L
miles per hour..... mph
milliampere(s) ..... mA
milligram(s) ..... mg
milligrams per liter ..... mg/L
milliliter(s) ..... mL
millimeter(s) ..... mm

million gallons....MG
million gallons per day....mgd
millisecond(s)....ms
millivolt(s)....mV
minute(s)....min
mixed liquor
suspended solids....MLSS

nephelometric
turbidity unit....NTU
net positive suction head....NPSH
noise criteria....nc
noise reduction coefficient....NRC
number....no

ounce(s)....oz
outside air....oa
outside diameter....OD

parts per billion....ppb
parts per million....ppm
percent....pct
phase (electrical)....ph
pound(s)....lb
pounds per cubic foot....pcf
pounds per cubic foot
per hour....pcf/hr
pounds per day....lbs/day
pounds per day per
cubic foot....lbs/day/cu ft
pounds per day per
square foot....lbs/day/sq ft
pounds per square foot....psf
pounds per square foot
per hour....psf/hr
pounds per square inch....psi
pounds per square inch
absolute....psia
pounds per square
inch gauge....psig
power factor....PF
pressure drop or
difference....dp
pressure, dynamic
(velocity)....vp
pressure, vapor....vap pr

quart(s)....qt

Rankine....R
relative humidity....rh
resistance....res
returnair....ra
revolution(s)....rev
revolutions per minute....rpm
revolutions per second....rps
Right of Way....ROW
root mean squared....rms

safety factor....sf
second(s)....sec
shading coefficient....SC
sludge density index....SDI
Sound Transmission
Coefficient....STC
specific gravity....sp gr
specific volume....Sp Vol
sp ht at constant pressure....Cp
square....sq
square centimeter(s)....sq cm
square foot (feet)....sq ft
square inch (es)....sq in
square meter(s)....sq m
square yard(s)....sq yd
standard....std
static pressure....st pr
supply air....sa
suspended solids....SS

temperature....temp
temperature difference....TD
temperature entering....TE
temperature leaving....TL
thousand Btu per hour....Mbh
thousand circular mils....kcmil
thousand cubic feet....Mcf

threshold limit value ..... TLV
tons of refrigeration ..... tons
torque ..... TRQ
total dissolved solids ..... TDS
total dynamic head ..... TDH
total kjeldahl nitrogen ..... TKN
total oxygen demand ..... TOD
total pressure ..... TP
total solids ..... TS
total suspended solids ..... TSS
total volatile solids ..... TVS

vacuum ..... vac
viscosity ..... visc
volatile organic chemical ..... VOC
volatile solids ..... VS
volatile suspended solids ..... VSS

volt(s) V
volts-ampere(s) ..... VA
volume ..... vol

watt(s) ..... W
watthour(s) ..... Wh
watt-hour demand ..... WHD
watt-hour demand meter ..... WHDM
week(s) ..... .wk
weight ..... wt
wet-bulb ..... WB
wet bulb temperature ..... WBT

yard(s) ..... yd
year(s) ..... yr

1.5 REFERENCE PUBLICATIONS

The following publications are incorporated into this Manual and are made a part of this Manual as is set out verbatim in this Manual. Violations of any provision of every such publication, latest revision, shall be a violation of City Ordinance.

A. Water Environment Federation, Manual of Practice No. 8, Wastewater Treatment Plant Design, W.E.F., 601 Wythe Street, Alexandria, VA, 22314-1994.

B. Water Environment Federation, Manual of Practice No. 9, Design and Construction of Sanitary and Storm Sewers, W.E.F., 601 Wythe Street, Alexandria, VA, 22314-1994.

C. Great Lakes/Upper Mississippi River Board of State Sanitary Engineers. Recommended Standards for Sewage Works, Health Education Service, Inc., P.O. Box 7283, Albany, New York, 12224.

D. Great Lakes/Upper Mississippi River Board of State Sanitary Engineers. Recommended Standards for Water Works, Health Education Service, Inc., P.O. Box 7283, Albany, New York, 12224.

E. Florida Department of Environmental Protection for Water, Wastewater, and Reclaimed Water Systems, latest revisions of F.A.C. Chapters 62-550, 62-555, 62-600, 62-604, 62-610, 64E-6, and 64E-8, 3900 Commonwealth Boulevard M.S. 49, Tallahassee, Florida, 32399.

F. American Water Works Association, Inc., Water Treatment Plant Design, 6666 West Quincy Avenue, Denver, Colorado, 80235.

G. American Water Works Association, Inc., Water Treatment Plant Design, AWWA Standards and Applicable Manuals, 6666 West Quincy Avenue, Denver, Colorado, 80235.

H. Ductile Iron Pipe Research Association, Handbook, Ductile Iron Pipe/Cast Iron Pipe, Ductile Iron Pipe Research Association, 245 Riverchase Parkway East, Birmingham, Alabama, 35244.

I. Uni-Bell Plastic Pipe Association, Handbook of PVC Pipe, Uni-Bell Plastic Pipe Association, 2655 Villa Creek Drive, Suite 164, Dallas, Texas, 75234.

J. American National Standards Institute, latest revisions of applicable standards, 1819 L Street NW, Suite 600, Washington, D.C., 20036.

K. American Society for Testing and Materials, latest revisions of applicable standards, ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, 19428-2959.

L. National Water Research Institute, Treatment Technologies for Removal of MTBE. NWRI, 10500 Ellis Ave., P.O. Box 20865, Fountain Valley, CA, 92728.

M. National Water Research Institute, Valuing Ground Water: Economic Concepts/Approaches. NWRI, 10500 Ellis Ave., P.O. Box 20865, Fountain Valley, CA, 92728.7.3.14.

N. U.S. Environmental Protection Agency, Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability, Supplement to the Federal Guidelines for Design, Operation, and Maintenance of Wastewater Treatment Facilities, Technical Bulletin EPA-430-99-74-001, U.S. EPA, Office of Water Program Operations.

O. Florida Department of Transportation, Standard Specifications for Road and Bridge Construction, Maps & Publications Sales, Mail Station 12, 605 Suwannee Street, Tallahassee, Florida 32399-0450.

P. Plastics Pipe Institute, Handbook of Polyethylene Pipe, 1825 Connecticut Ave., NW, Suite 680, Washington, DC 20009.

Q. National Fire Protection Association, 1995 Edition of NFPA 24 – Standard for the Installation of Private Fire Service Mains and Their Appurtenances, 1 Batterymarch Park, Quincy, MA 02169.

R. City of Naples Utilities Standards and Specifications Manual.

S. National Electrical Code, latest revisions of applicable requirements.

T. Metcalf and Eddy, Wastewater Engineering Treatment and Reuse, 4th Edition, McGraw-Hill, 2002.

U. Water Environment Federation, Manual of Practice No. 11, Operation of Municipal Wastewater Treatment Plants, 601 Wythe Street, Alexandria, VA 22314-1994.

V. American Petroleum Institute, 1801 K Street NW, Washington, DC 20006. W. American Welding Society, 2501 NW 7th St, Miami, FL 33125

X. Factory Mutual Research, 1151 Boston-Providence Turnpike, Norwood, MA 02062

Y. National Association of Corrosion Engineers, P.O. Box 218340, Houston, TX 77218.

Z. National Electrical Manufacturer's Association, 155 East 44th St., NY, NY 10017.

AA. Occupational Safety and Health Act, U.S. Dept. of Labor, Occupational Safety and Health Administration, 299E. Broward Blvd. – Rm 302, Ft. Lauderdale, FL 33301.

BB. Society of Automotive Engineers, 2 Pennsylvania Plaza, NY, NY 10001.

CC. Steel Structures Painting Council, 4400 Fifth Ave., Pittsburgh, PA 15213.

DD. Standard Specification for Public Works, Construction Building News, Inc., 3055 Overland Ave., Los Angeles, CA 90034.

EE. Uniform Building Code, published by ICBO.

FF. Underwriters Laboratories, Inc., 207 East Ohio Street, Chicago, IL 60611.

1.6 REFERENCE STANDARDS

A. Latest Edition: Construe references to furnishing materials or testing, which conform to the standards of a particular technical society, organization, or body, to mean the latest standard, code, or specification of that body, adopted and published as of the date of bidding this Contract. Standards referred to herein are made a part of these Specifications to the extent that is indicated or intended.

B. Precedence: The duties and responsibilities of the CITY, CONTRACTOR or ENGINEER, or any of their consultants, agents or employees are set forth in the Contract Documents, and are not changed or altered by any provision of any referenced standard specifications, manuals or code, whether such standard manual or code is or is not specifically incorporated by reference in the Contract Documents. Any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority, to undertake responsibility contrary to the powers of the ENGINEER as set forth in the Contract Documents cannot be assigned to the ENGINEER or any of the ENGINEER's consultants, agents or employees.

1.7 DEFINITIONS

A. In these Contract Documents the words furnish, install, and provide are defined as follows:

1. Furnish (Materials): to supply and deliver to the project ready for installation and in operable condition.

2. Install (services or labor): to place in final position, complete, anchored, connected in operable condition.

3. Provide: to furnish and install complete. Includes the supply of specified services. When neither furnish, install, or provide is stated, provided is implied.

4. CITY or City: City Council, Naples, Florida , or authorized staff or representatives.

5. ENGINEER: The terms Design Professional, Design Engineer, Engineer, and Engineer of Record are interchangeably used throughout the Contract Documents.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 013233 - PRECONSTRUCTION DIGITAL AUDIO-VIDEO DOCUMENTATION

PART 1 GENERAL

1.01 DESCRIPTION

This section includes materials and performance for preconstruction digital audio-video documentation and generally defines Contractor's responsibilities, unless otherwise stated, for the following:

A. Equipment.

B. Submittals.

C. Technique.

D. Quality assurance.

1.02 VIDEO AND AUDIO QUALITY

A. Documentation shall be performed by a responsible commercial firm skilled and regularly engaged in the preparation of preconstruction color audio-video DVD documentation acceptable to the Owner.

B. Completed documentation shall reproduce bright, sharp pictures with accurate colors and shall be free from distortion or any other significant picture imperfection. The audio portion of the recording shall reproduce the commentary of the camera operator with proper volume, clarity, and be free of distortion.

C. The Owner's Representative will accompany the commercial firm in performing the audio-video documentation. One person will accompany the commercial firm to observe the documentation effort. The accompanying personnel may direct the commercial firm to record certain features observed. Notify the Owner's Representative seven days in advance so that the accompanying personnel can be scheduled.

D. Construction shall not proceed until the Owner and Owner's Representative have reviewed the documentation and notified the Contractor of its acceptability. It is anticipated that such review will be completed within 10 days after submittal.

1.03 MEASUREMENT AND PAYMENT

No separate payment item is provided for this work. The cost of performing this work shall be incorporated into the bid item for mobilization.

PART 2 MATERIALS

2.01 RECORDING EQUIPMENT

Utilize a high-resolution digital video camera with extended still frame capability.

2.02 RECORDING MEDIA

Utilize new, color DVD having:

A. High resolution.

B. Extended still frame capability.

C. American TV Standard DVD playback capability.

PART 3 EXECUTION

3.01 COVERAGE

A. Record coverage of surface features located in the construction's zone of influence including, but not limited to:

1. Roadways, driveways, sidewalks, bicycle paths, shoreline vegetation and pond conditions and railroads.

2. Buildings, walls, retaining walls, fences and seawalls.

3. Ponds, culvert ends, drainage structures, and above ground utility features.

4. Landscaping, trees, shrubbery, fences, and irrigation heads.

B. Record the individual features of each item with particular attention being focused upon the existence of any existing faults, fractures, or defects.

C. Control pan rate, rate of travel, camera height, and zoom rate to maintain a steady clear view.

D. Limit recorded coverage to one side of any street at any one time.

E. Create a single, continuous, unedited recording which begins and ends within each portion of a particular construction area. The recording shall proceed in the direction of ascending baseline stationing.

3.02 AUDIO CONTENT

A. Simultaneously record audio content during videotaping.

B. Audio recording shall assist in viewer orientation and in any needed identification, clarification, or description of features being recorded.

C. Audio recording shall only consist of camera operator commentary.

3.03 INDEXING

A. Permanently label each DVD with a sequential number and the project name.

B. Index each DVD with a digital record of the time and date of the recording which is continuously displayed as the DVD is played.

C. Prepare a written log which describes the contents of each DVD including:

1. Names of streets or easements.

2. Coverage begin/end station and location.

3. Recording date.

3.04 CONDITIONS

A. Record coverage during dry, clear weather and during daylight hours only. B.

Record coverage when the area is free of debris or obstructions.

C. Record coverage no more than 21days prior to mobilization at the site.

END OF SECTION

SECTION 01400 - QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Submittals
B. Inspection Services
C. Inspection of Materials
D. Quality Control
E. Costs of Inspection
F. Acceptance Tests
G. Failure to Comply with Contract

1.2 SUBMITTALS

A. General: Provide all submittals, including the following, as specified in Division 1 and the individual material sections. Submit manufacturer's Certificates of Inspection, descriptive literature, catalog data, illustrations, principle dimensions, materials of construction, specifications, installation instructions, and related information. See Section 01730 for operation manual submittal information.

B. Certificate Submittals: Furnish the ENGINEER authoritative evidence in the form of Certificates of Manufacture that the materials and equipment to be used in the Work have been manufactured and tested in conformity with the Contract Documents and this Manual and Specifications. Include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product or on similar products of the manufacturer.

1.3 TESTS AND INSPECTIONS

A. City's Access: At all times during the progress of the Work, and until the date of final completion, afford the City Manager or designee and ENGINEER every reasonable, safe, and proper facility for inspecting the Work at the site. The observation and inspection of any work will not relieve the CONTRACTOR of any obligations to perform proper and satisfactory work as specified. Replace work rejected due to faulty design, inferior, or defective materials, poor workmanship, improper installation, excessive wear, or nonconformity with the requirements of the Contract Documents, with satisfactory work at no additional cost to the City. Replace as directed, finished or unfinished work found not to be in strict accordance with the Contract, even though such work may have been previously approved and payment made therefore.

The City of Naples, its respective representatives, agents and employees, and governmental agencies with jurisdiction over the Project shall have access at all time to Work, whether the Work is being performed on or off the Project site, for their observation, inspection and testing. Contractor shall provide proper, safe conditions for such access. Contractor shall provide Engineer with timely notice of readiness of the Work for all required inspections, tests or approvals.

If the Contract Documents or any codes, laws, ordinances, rules or regulations of any public authority having jurisdiction over the Project requires any portion of the Work to be specifically inspected, tested or approved, Contractor shall assume full responsibility therefore, pay all costs in connection therewith and furnish Engineer the required certificates of inspection, testing or approval. All inspections, tests or approvals shall be performed in a manner and by organizations acceptable to the Engineer and The City of Naples.

If any Work that is to be inspected, tested or approved is covered without written concurrence from the Engineer, such work must, if requested by Engineer, be uncovered for observation. Such uncovering 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 to respond to such notice. If any Work is covered contrary to written directions from Engineer, such Work must, if requested by Engineer, be uncovered for Engineer's observation and be replaced at Contractor's sole expense.

The City shall charge to Contractor and may deduct from any payments due Contractor all engineering and inspection expenses incurred by the City in connection with any overtime work. Such overtime work consisting of any work during the construction period beyond the regular eight (8) hour day and for any work performed on Saturday, Sunday or holidays.

Neither observations nor other actions by the Engineer nor inspections, tests or approvals by others shall relieve Contractor from Contractor's obligations to perform the Work in accordance with the Contract Documents.

B. Rejection: The City's Manager or designee has the right to reject materials and workmanship which are defective or require correction. Promptly remove rejected work and materials from the site.

C. Inferior Work Discoveries: Failure or neglect on the part of the City Manager or designee to condemn or reject bad or inferior work or materials does not imply an acceptance of such work or materials. Neither is it to be construed as barring the City Manager or designee at any subsequent time from recovering damages or a sum of money needed to build anew all portions of the Work in which inferior work or improper materials were used.

Work not conforming to the requirements of the Contract Documents shall be deemed defective Work. If required by Engineer, Contractor shall as directed, either correct all defective Work, whether or not fabricated, installed or completed, or if the defective Work has been rejected by Engineer, remove it from the site and replace it with undefective Work. Contractor shall bear all direct, indirect and consequential costs of such correction or removal (including, but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby, and shall hold the City harmless for same.

If any portion of the Work is defective, or Contractor fails to supply sufficient skilled workers with suitable materials or equipment, or fails to finish or perform the Work in such a way that the completed Work will conform to the Contract Documents, Engineer may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the Engineer to stop the Work shall not give rise to any duty on the part of the City or Engineer to exercise this right for the benefit of Contractor or any other party.

Should the City determine, at its sole opinion, it is in the City's best interest to accept defective Work, the City may do so. Contractor shall bear all direct, indirect and consequential costs attributable to the City's evaluation of and determination to accept defective Work. If such determination is rendered prior to final payment, a Change Order shall be executed evidencing such acceptance of such defective Work, incorporating the necessary revisions in the Contract Documents and reflecting an appropriate decrease in the Contract Amount. If the City accepts such defective Work after final payment, Contractor shall promptly pay the City an appropriate amount to adequately compensate the City for its acceptance of the defective Work.

If Contractor fails, within a reasonable time after the written notice from the City or Engineer, to correct defective Work or to remove and replace rejected defective Work as required by Engineer, or if Contractor fails to perform the Work in accordance with the Contract Documents, or if Contractor fails to comply with any of the provisions of the Contract Documents, the City may,

after seven (7) days written notice to Contract, correct and remedy any such deficiency. To the extent necessary to complete corrective and remedial action, the City may exclude Contractor from any or all of the Project site, take possession of all or any part of the Work, and suspend Contractor's services related thereto, take possession of Contractor's tools, appliances, construction equipment and machinery at the Project site and incorporate in the Work all materials and equipment stored at the Project site or for which the City has paid Contractor but which are stored elsewhere. Contractor shall allow the City and its respective representatives, agents, and employees such access to the Project site as may be necessary to enable the City to exercise the rights and remedies under the paragraph. All direct, indirect and consequential costs of the City in exercising such rights and remedies shall be charged against Contractor, and al Change Order shall be issued, incorporating the necessary revisions to the Contract Documents, including an appropriate decrease to the Contract Amount. Such direct, indirect and consequential costs shall include, but not be limited to, fees and charges of engineers, architects, attorneys, and other professionals, all court costs and all costs of repair and replacement or work of others destroyed or damaged by Contractor shall not be allowed an extension of the Contract Time because of any delay in performance of the Work attributable to the exercise by the City of The City's rights and remedies hereunder.

D. Removal for Examination: Should it be considered necessary or advisable by the City Manager or designee, at any time before final acceptance of the Work, to make examinations of portions of the Work already completed, by removing or tearing out such portions, promptly furnish all necessary facilities, labor, and material, to make such an examination. If such Work is found to be defective in any respect, defray all expenses of such examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the Contract, the cost of examination and restoration of the Work will be considered a change in the Work to be paid for in accordance with applicable provisions of the Contract.

If the City or Engineer consider it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, Contractor, at the City's or Engineer's request, shall uncover, expose or otherwise make available for observation, inspection or tests as the Engineer may require, that portion of the Work in question, furnishing all necessary labor, material and equipment. If it is found that such Work is defective, Contractor shall bear all direct, indirect and consequential costs of such uncovering, exposure, observation, inspection and testing and of satisfactory reconstruction (including, but not limited to, fees and charges of engineers, architects, attorneys and other professionals), and the City shall be entitled to an appropriate decrease in the Contract Amount. If, however, such Work is not found to be defective, Contractor shall be allowed an increase in the Contract Amount and/or an extension to the Contract Time, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction.

E. Operation Responsibility: Assume full responsibility for the proper operation of equipment during tests and instruction periods. Make no claim, other than provided in the Contract Documents, for damage that may occur to equipment prior to the time when the City Manager or designee accepts the Work.

F. Rejection Prior to Warranty Expiration: If at anytime prior to the expiration of any applicable warranties or guarantees, defective equipment is rejected by the City Manager or designee, repay to the CITY all sums of money received for the rejected equipment on progress certificates or otherwise on account of the Contract lump sum prices, and upon the receipt of the sum of money, City Manager or designee will execute and deliver a bill of sale of all its rights, title, and interest in and to the rejected equipment. Do not remove the equipment from the premises of the CITY until the City Manager or designee obtains from other sources, equipment to take the place of that rejected. The City Manager or designee hereby agrees to obtain other equipment within a reasonable time and the CONTRACTOR agrees that the CITY may use the equipment

furnished by the CONTRACTOR without rental or other charge until the other new equipment is obtained.

1.4 INSPECTION OF MATERIALS

A. Premanufacture Notification: Give notice in writing to the ENGINEER sufficiently in advance of the commencement of manufacture or preparation of materials especially manufactured or prepared for use in or as part of the permanent construction. When required, notice to include a request for inspection, the date of commencement, and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, ENGINEER will arrange to have a representative present at such times during the manufacture or testing as may be necessary to inspect the materials, or will notify CONTRACTOR that the inspection will be made at a point other than the point of manufacture or testing, or that the inspection will be waived. Comply with these provisions before shipping any materials. Such inspection will not constitute a release from the responsibility for furnishing materials meeting the requirements of the Contract Documents.

B. Testing Standards: Conduct tests of electrical and mechanical equipment and appliances in accordance with recognized, applicable test codes.

1.5 QUALITY CONTROL

A. Testing

1. Field and Laboratory

a. Provide personnel to assist the ENGINEER in performing the following periodic observation and associated services.

(1) Soils: Observe and test excavations, placement and compaction of soils. Determine suitability of excavated material. Observe subgrade soils and foundations.

(2) Concrete: Observe forms and reinforcement; observe concrete placement; witness air entrainment tests, facilitate concrete cylinder preparation and assist with other tests performed by ENGINEER.

(3) Masonry: Sample and test mortar, bricks, blocks and grout; inspect brick and block samples and sample panels; inspect placement of reinforcement and grouting.

(4) Structural Steel: Verify that all welders are certified; visually inspect all structural steel welds; mechanically test high-tensile bolted connections.

b. When specified in Divisions 2 through 16 of the Contract Documents, provide an independent laboratory testing facility to perform required testing. Qualify the laboratory as having performed previous satisfactory work. Prior to use, submit to the ENGINEER for approval.

c. Cooperate with the ENGINEER and laboratory testing representatives. Provide at least 24 hours notice prior to when specified testing is required. Provide labor and materials, and necessary facilities at the site as required by the ENGINEER and the testing laboratory.

d. When an independent electrical testing agency is specified in the Contract Documents, provide a member of the National Electrical Testing Association to perform inspections and tests.

2. Equipment: Coordinate and demonstrate test procedures as specified in the Contract Documents and as required during the formal tests.

3. Pipeline and Other Testing: Conform to test procedures and requirements specified in the appropriate Specification Section.

4. Testing of Gravity Sanitary Sewer Lines

    a. Watertight Construction: It is imperative that all sewers and force mains, manholes, and service connections be built watertight and that the CONTRACTOR adhere rigidly to the specifications for material and workmanship. Since all of the water and sewage in the lines will be treated at the treatment plant, special care and attention must be given to securing watertight construction. After completion, the sewers or sections thereof will be tested and gauged. If infiltration or exfiltration is above the limits specified, the sewer construction work will be rejected.

    b. Cleaning: Exercise care during construction of the manhole to see that materials do not enter the sewer line. Keep the invert and shelf of the manhole clean of all mortar, broken brick, sand, or any other materials falling into the manhole. Immediately remove such material. Maintain this condition until final acceptance of the work. Prior to testing of gravity sanitary sewer lines, clean the lines using appropriate tools.

    c. Gravity Sewers - Visual Inspections: On completion of each block or section of sewer, or at such other times as the City Manger or designee may direct, the block or section of sewer is to be cleaned, tested and inspected. Each section of the sewer is to show, on examination from either end, a full circle of light between manholes. Each manhole, or other appurtenance to the system, shall be of the specified size and form, be watertight, neatly and substantially constructed, with the rim set permanently to design position and grade. All repairs shown necessary by the inspection are to be made; broken or cracked pipe replaced, all deposits removed and the sewers left true to line and grade, entirely clean and ready for use.

    d. Infiltration Limits: Provide the equipment necessary to check the lines for infiltration or exfiltration as directed by the City Manager or designee, before they are put in service. Infiltration in excess of fifty (50) gallons per day inch-mile of sewer will result in having the CONTRACTOR go over the lines, ascertain where the leakage exists, and repair the lines to the extent necessary to bring the infiltration down within acceptable limits. Observable inflow is not permitted.

    e. Exfiltration Limits: The length of sewer subject to an exfiltration test shall be the distance between two (2) adjacent manholes. Close the inlets of the upstream and downstream manholes with watertight plugs and the test section filled with water until the elevation of the water in the upstream manhole is two (2) feet above the crown of the pipe in the line being tested, or two (2) feet above the existing groundwater in the trench, whichever is higher. A standpipe may be used instead of the upstream manhole for providing the pressure head when approved by the City Manager or designee. Measure exfiltration by determining the amount of water required to maintain the initial water elevation for one (1) hour period from the start of the test. The maximum allowable leakage, including manholes, shall be 50 gallon per inch for diameter per mile of pipe per day.

    f. Air Testing: Air testing shall be required if, in the opinion of the City Manager or designee, conditions are such that infiltration measurements may be inconclusive. Conduct the test in the presence of the City Manager or designee and conform to the following requirements:

        (1) Test pressure shall be 3.5 psi increased by the groundwater pressure above the top of the sewer.

(2) Pressure loss from shall not exceed 0.5 psi during the required testing time.

(3) Testing time in minutes shall be calculated as 0.625 x nominal pipe size (inches).

B. Reports

1. Certified Test Reports: Where transcripts or certified test reports are required by the Contract Documents, meet the following requirements:

   a. Before delivery of materials or equipment submit and obtain approval of the ENGINEER for all required transcripts, certified test reports, certified copies of the reports of all tests required in referenced specifications or specified in the Contract Documents. Perform all testing in an approved independent laboratory or the manufacturer's laboratory. Submit for approval reports of shop equipment tests within thirty days of testing. Transcripts or test reports are to be accompanied by a notarized certificate in the form of a letter from the manufacturer or supplier certifying that tested material or equipment meets the specified requirements and the same type, quality, manufacture and make as specified. The certificate shall be signed by an officer of the manufacturer or the manufacturer's plant manager.

2. Certificate of Compliance: At the option of the ENGINEER, submit for approval a notarized Certificate of Compliance. The Certificates may be in the form of a letter stating the following:

   a. Manufacturer has performed all required tests
   b. Materials to be supplied meet all test requirements
   c. Tests were performed not more than one year prior to submittal of the certificate
   d. Materials and equipment subjected to the tests are of the same quality, manufacture and make as those specified
   e. Identification of the materials

1.6 COSTS OF INSPECTION

A. CONTRACTOR's Obligation: Include in the Contract Price, the cost of all shop and field tests of equipment and other tests specifically called for in the Contract Documents.

B. Reimbursements to the CITY:

1. Materials and equipment submitted by the CONTRACTOR as the equivalent to those specifically named in the Contract may be tested by the City Manager or designee for compliance. Reimburse the CITY for expenditures incurred in making such tests on materials and equipment that are rejected for noncompliance.

2. Reimburse the CITY for all costs associated with Witness Tests that exceed 5 Calendar Days per kind of equipment.

1.7 ACCEPTANCE TESTS

A. Preliminary Field Tests: As soon as conditions permit, furnish all labor and materials and services to perform preliminary field tests of all equipment provided under this Contract. If the preliminary field tests disclose that any equipment furnished and installed under this Contract does not meet the requirements of the Contract Documents, make all changes, adjustments and replacements required prior to the acceptance tests.

B. Final Field Tests: Upon completion of the Work and prior to final payment, subject all equipment, piping and appliances installed under this Contract to specified acceptance tests to demonstrate compliance with the Contract Documents.

1. Furnish all labor, fuel, energy, water and other materials, equipment, instruments and services necessary for all acceptance tests.

2. Conduct field tests in the presence of the ENGINEER. Perform the field tests to demonstrate that under all conditions of operation each equipment item:

    a. Has not been damaged by transportation or installation
    b. Has been properly installed
    c. Has been properly lubricated
    d. Has no electrical or mechanical defects
    e. Is in proper alignment
    f. Has been properly connected
    g. Is free of overheating of any parts
    h. Is free of all objectionable vibration
    i. Is free of overloading of any parts
    j. Operates as intended

3. Operate work or portions of work for a minimum of 100 hours or 14 days continuous service, whichever comes first. For those items of equipment that would normally operate on wastewater or sludge, plant effluent may be used if available when authorized by ENGINEER. If water cannot properly exercise equipment, conduct 100-hour test after plant startup. Conduct test on those systems that require load produced by weather (heating or cooling) exercise only when weather will produce proper load.

C. Failure of Tests: If the acceptance tests reveal defects in material or equipment, or if the material or equipment in any way fails to comply with the requirements of the Contract Documents, then promptly correct such deficiencies. Failure or refusal to correct the deficiencies, or if the improved materials or equipment, when tested again, fail to meet the guarantees or specified requirements, the City Manager or designee, notwithstanding its partial payment for work and materials or equipment, may reject said materials or equipment and may order the CONTRACTOR to remove the defective work from the site at no addition to the Contract Price, and replace it with material or equipment which meets the Contract Documents.

1.8 FAILURE TO COMPLY WITH CONTRACT

A. Unacceptable Materials: If it is ascertained by testing or inspection that the material or equipment does not comply with the Contract, do not deliver said material or equipment, or if delivered remove it promptly from the site or from the Work and replace it with acceptable material without additional cost to the CITY. Fulfill all obligations under the terms and conditions of the Contract even though the City Manager or designee fail to ascertain noncompliance or notify the CONTRACTOR of noncompliance.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General Requirements
B. Related Sections
C. Temporary Utilities
D. Temporary Construction
E. Barricades and Enclosures
F. Fences
G. Security
H. Temporary Controls
I. Traffic Regulation
J. Field Offices and Sheds

1.2 RELATED SECTIONS

A. Section 01010 - Summary of Work

B. Section 01045 – Connection to Existing Systems

C. Section 01570 – Traffic Regulations and Public Safety

D. Section 02575 - Pavement Repair and Restoration

1.3 GENERAL REQUIREMENTS

A. Plant and Facilities: Furnish, install, maintain and remove all false work, scaffolding, ladders, hoistways, braces, pumping plants, shields, trestles, roadways, sheeting, centering forms, barricades, drains, flumes, and the like, any of which may be needed in the construction of any part of the Work and which are not herein described or specified in detail. Accept responsibility for the safety and efficiency of such works and for any damage that may result from their failure or from their improper construction, maintenance or operation.

B. First Aid: Maintain a readily accessible, completely equipped first aid kit at each location where work is in progress.

C. Safety Responsibility: Accept sole responsibility for safety and security at the site. Indemnify and hold harmless the CITY and the City's Manager or designee, including the ENGINEER, for any safety violation, or noncompliance with governing bodies and their regulations, and for accidents, deaths, injuries, or damage at the site during occupancy or partial occupancy of the site by CONTRACTOR's forces while performing any part of the Work.

D. Hazard Communication: Furnish two copies of the CONTRACTOR's Hazard Communication Program required under OSHA regulations before beginning on site activities. Furnish two copies of amendments to Hazard Communications Program as they are prepared.

1.4 TEMPORARY UTILITIES

A. Water: Provide all necessary and required water without additional cost, unless otherwise specified. If necessary, provide and lay water lines to the place of use; secure all necessary permits; pay for all taps to water mains and hydrants and for all water used at the established rates.

B. Light and Power: Provide without additional cost to the CITY temporary lighting and power facilities required for the proper construction and inspection of the Work. If, in the ENGINEER's opinion, these facilities are inadequate, do NOT proceed with any portion of the Work affected thereby. Maintain temporary lighting and power until the Work is accepted.

C. Heat: Provide temporary heat, whenever required, for work being performed during cold weather to prevent freezing of concrete, water pipes, and other damage to the Work or existing facilities.

D. Sanitary Facilities: Provide sufficient sanitary facilities for construction personnel. Prohibit and prevent nuisances on the site of the Work or on adjoining property. Discharge any employee who violates this rule. Abide by all environmental regulations or laws applicable to the Work.

1.5 TEMPORARY CONSTRUCTION

A. Bridges: Design and place suitable temporary bridges where necessary for the maintenance of vehicular and pedestrian traffic. Assume responsibility for the sufficiency and safety of all such temporary work or bridges and for any damage that may result from their failure or their improper construction, maintenance, or operation. Indemnify and save harmless the CITY and the CITY's representatives from all claims, suits or actions, and damages or costs of every description arising by reason of failure to comply with the above provisions.

1.6 BARRICADES, LIGHTS AND ENCLOSURES

A. Protection of Workmen and Public: Effect and maintain at all times during the prosecution of the Work, barriers, lights and enclosures necessary for the protection of workmen and the public. Perform all work within the City right-of-way in strict accordance with the CITY Maintenance of Traffic Policy and other applicable statutory requirements.

B. Provide suitable barricades, lights, signs and watchmen at excavation sites and all other places where the Work causes obstructions to normal traffic or constitutes in any way a hazard to the public.

1.7 FENCES

A. Existing Fences: Obtain written permission from property owner(s) prior to relocating or dismantling fences that interfere with construction operations. Reach agreements with the fence owner as to the period the fence may be left relocated or dismantled. Install adequate gates where fencing must be maintained. Keep gates closed and locked at all times when not in use.

B. Restoration: Restore all fences to their original or better condition and to their original location on completion of the Work.

1.8 SECURITY

A. Preservation of Property:

1. Preserve from damage, all property along the line of the Work, in the vicinity of or in any way affected by the Work, the removal or destruction of which is not called for by the Drawings. Preserve from damage, public utilities, trees, lawn areas, building monuments, fences, pipe and underground structures, and public streets. Note: Normal wear and tear of streets resulting from legitimate use by the CONTRACTOR are not considered as damage. Whenever damages occur to such property, immediately restore to its original condition. Costs for such repairs are incidental to the Contract.

2. In case of failure on the part of the CONTRACTOR to restore property or make good on damage or injury, the City Manager or designee may, upon 24 hours written notice, proceed to repair, rebuild, or otherwise restore such property as may be deemed necessary, and the cost thereof will be deducted from any moneys due or which may become due the CONTRACTOR under this Contract. If removal, repair or replacement of public or private property is made necessary by alteration of grade or alignment authorized by the City Manager or designee and not contemplated by the Contract Documents, the CONTRACTOR will be compensated, in accordance with the General Conditions, provided that such property has not been damaged through fault of the CONTRACTOR or the CONTRACTOR's employees.

B. Public Utility Installations and Structures:

1. Public utility installations and structures include all poles, tracks, pipes, wires, conduits, vaults, valves, hydrants, manholes, and other appurtenances and facilities, whether owned or controlled by public bodies or privately owned individuals, firms or corporations, used to serve the public with transportation, gas, electricity, telephone, storm and sanitary sewers, water, or other public or private utility services. Facilities appurtenant to public or private property that may be affected by the Work are deemed included hereunder.

2. The Contract Documents contain data relative to existing public utility installations and structures above and below the ground surface. Existing public utility installations and structures are indicated on the Drawings only to the extent such information was made available to, or found by, the ENGINEER in preparing the Drawings. These data are not guaranteed for completeness or accuracy, and the CONTRACTOR is responsible for making necessary investigations to become fully informed as to the character, condition, and extent of all public utility installations and structures that may be encountered and that may affect the construction operations.

3. Before starting construction, identify and mark all existing valves and maintain access to the valves at all times during construction.

4. Contact utility locating service sufficiently in advance of the start of construction to avoid damage to the utilities and delays to the completion date. See Section 01045, 1.3.F for additional information.

5. If existing utilities are damaged during the Work, immediately notify the owner of the affected utility. In coordination with or as directed by the owner, remove, replace, relocate, repair, rebuild, and secure any public utility installations and structures damaged as a direct or indirect result of the Work under this Contract. Costs for such work are incidental to the Contract. Be responsible and liable for any consequential damages done to or suffered by any public utility installations or structures. Assume and accept responsibility for any injury, damage, or loss that may result from or be consequent to interference with, or interruption or discontinuance of, any public utility service. See Section 01045, 1.3.F for additional information.

6. At all times in the performance of Work, employ proven methods and exercise reasonable care and skill to avoid unnecessary delay, injury, damage, or destruction to public utility installations and structures. Avoid unnecessary interference with, or interruption of, public utility services. Cooperate fully with the owners thereof to that end.

7. Provide notice to the City Manager or designee of any proposed connections to existing utilities, interruptions of service or shutdowns in accordance with Section 01045. Give written notice to the owners of all public utility installations and structures affected by proposed construction operations sufficiently in advance of breaking ground in any area or on any unit of the Work, to obtain their permission before disrupting the lines and to allow them to take measures necessary to protect their interests. Advise the Stormwater, Streets and Traffic Department and Police and Emergency Services Department of any excavation in public streets or the temporary shut-off of any water main. Provide at least 24 hours notice to all affected property owners whenever service connections are taken out of service.

C. Work on Private Property: Work on this project will require operations on private property, rights of way or easements. The City Manager or designee has secured the appropriate easements or rights of entry from the affected property owners. Comply with all easement or rights of entry provisions. Conduct operations along rights-of-way and easements through private property to avoid damage to the property and to minimize interference with its ordinary use. Upon completion of the Work through such property, restore the surface and all fences or other structures disturbed by the construction as nearly as possible to the preconstruction conditions. Do not remove any material from private property without the consent of the property owner or responsible party in charge of such property. Hold the CITY harmless from any claim or damage arising out of or in connection with the performance of work across and through private property.

D. Miscellaneous Structures: Assume and accept responsibility for all injuries or damage to culverts, building foundations and walls, retaining walls, or other structures of any kind met with during the prosecution of the Work. Assume and accept liability for damages to public or private property resulting therefrom. Adequately protect against freezing all pipes carrying liquid.

E. Protection of Trees and Lawn Areas:

1. Protect with boxes, trees and shrubs, except those ordered to be removed. Do not place excavated material so as to cause injury to such trees or shrubs. Replace trees or shrubs destroyed by accident or negligence of the CONTRACTOR or CONTRACTOR's employees with new stock of similar size and age, at the proper season, at no additional cost to the CITY. The Contractor shall provide preconstruction audio-video recording of project in accordance with Section 013233.

2. Leave lawn areas in as good condition as before the start of the Work. Restore areas where sod has been removed by seeding or sodding.

1.9 TEMPORARY CONTROLS

A. During Construction:

1. Keep the site of the Work and adjacent premises free from construction materials, debris, and rubbish. Remove this material from any portion of the site if such material, debris, or rubbish constitutes a nuisance or is objectionable.

2. Remove from the site all surplus materials and temporary structures when they are no longer needed.

3. Neatly stack construction materials such as concrete forms and scaffolding when not in use. Store pipe to be incorporated into the Work in accordance with AWWA standards. Promptly remove splattered concrete, asphalt, oil, paint, corrosive liquids, and cleaning solutions from surfaces to prevent marring or other damage.

4. Properly store volatile wastes in covered metal containers and remove from the site daily.

5. Do not bury or burn on the site or dispose of into storm drains, sanitary sewers, streams, or waterways, any waste material. Remove all wastes from the site and dispose of in a manner complying with applicable ordinances and laws.

B. Smoke Prevention:

1. Strictly observe all air pollution control regulations.

2. Open fires will be allowed only if permitted under current ordinances.

C. Noises:

1. In accordance with the CITY's or COUNTY's Noise Ordinance, maintain acceptable noise levels in the vicinity of the Work. Limit noise production to acceptable levels by using special mufflers, barriers, enclosures, equipment positioning, and other approved methods.

2. Supply written notification to the City Manager or designee sufficiently in advance of the start of any work that violates this provision. Proceed only when all applicable authorizations and variances have been obtained in writing.

D. Hours of Operation:

1. Operation of construction equipment is only permitted Monday through Saturday, 7:00 AM to 7:00 PM. Obtain written consent from the City Manager or designee for operation of construction equipment during any other period.

2. Do not carry out non-emergency work, including equipment moves, on Sundays without prior written authorization by the City Manager or designee.

E. Dust Control:

1. Take measures to prevent unnecessary dust. Keep earth surfaces exposed to dusting moist with water or a chemical dust suppressant. Cover materials in piles or while in transit to prevent blowing or spreading dust.

2. Adequately protect buildings or operating facilities that may be affected adversely by dust. Protect machinery, motors, instrument panels, or similar equipment by suitable dust screens. Include proper ventilation with dust screens.

F. Temporary Drainage Provisions:

1. Provide for the drainage of stormwater and any water applied or discharged on the site in performance of the Work. Provide adequate drainage facilities to prevent damage to the Work, the site, and adjacent property.

2. Supplement existing drainage channels and conduits as necessary to carry all increased runoff from construction operations. Construct dikes as necessary to divert increased runoff from entering adjacent property (except in natural channels), to protect the CITY's facilities and the

Work, and to direct water to drainage channels or conduits. Provide ponding as necessary to prevent downstream flooding.

3. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

G. Pollution: Prevent the pollution of drains and watercourses by sanitary wastes, sediment, debris, and other substances resulting from construction activities. Do not permit sanitary wastes to enter any drain or watercourse other than sanitary sewers. Do not permit sediment, debris, or other substances to enter sanitary sewers. Take reasonable measures to prevent such materials from entering any drain or watercourse.

1.10 TRAFFIC REGULATION

A. Parking: Provide and maintain suitable parking areas for the use of all construction workers and others performing work or furnishing services in connection with the Contract, to avoid any need for parking personal vehicles where they may interfere with public traffic or construction activities.

B. Access: Conduct Work to interfere as little as possible with public travel, whether vehicular or pedestrian. Provide and maintain suitable and safe bridges, detours, or other temporary expedients for the accommodation of public and private travel. Whenever it is necessary to cross, obstruct, or close roads, driveways, and walks, whether public or private, give reasonable notice to owners of private drives before interfering with them. Such maintenance of traffic will not be required when the CONTRACTOR has obtained permission from the owner or tenant of private property, or from the authority having jurisdiction over the public property involved, to obstruct traffic at the designated point. The Contractor may be allowed to restrict traffic for short periods of time provided that he first contacts the City Stormwater, Streets and Traffic Department, County, and/or Florida DOT for their restrictions and also provided that adequate traffic control devices are placed in accordance with applicable City, County, and/or State Ordinances.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01570 - TRAFFIC REGULATION AND PUBLIC SAFETY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General Requirements
B. Traffic Control
C. Public Safety

1.2 RELATED SECTIONS

A. Section 01500 – Construction Facilities and Temporary Controls

B. Section 02575 – Pavement Repair and Restoration

1.3 GENERAL REQUIREMENTS

A. Perform all work within CITY rights-of-way in strict accordance with the City's Maintenance of Traffic Policy and other applicable statutory requirements to protect the public safety. The Maintenance of Traffic Plan shall include but not be limited to: placement of signs, timing of phases, transition lengths, hours of traffic interference, and contact person (24 hour availability).

B. Be responsible for providing safe and expeditious movement of traffic through construction zones. A construction zone is defined as the immediate areas of actual construction and all abutting areas which are used by the CONTRACTOR and which interfere with the driving or walking public.

C. Remove temporary equipment and facilities when no longer required. Restore grounds to original or specified conditions.

1.4 TRAFFIC CONTROL

A. Include as necessary precautions, not to be limited to, such items as proper construction warning signs, signals, lighting devices, marking, barricades, channelization, flares, and hand signaling devices. Be responsible for installation and maintenance of all devices and requirements for the duration of the Construction period. All design, application, installation, maintenance and removal of all traffic control devices and all warning devices and barriers which are necessary to protect the public and workmen from hazards within the project limits shall be as specified in the State of Florida, Manual of Traffic and Highway Construction, Maintenance and Utility Operations. The standards established in the aforementioned Manual constitute the minimum requirements for normal conditions. Additional traffic control devices, warning devices, barriers, or other safety devices shall be required where unusual, complex, or particularly hazardous conditions exist.

B. Provide notice, at least five (5) working days prior to construction, to the State or City Stormwater, Streets and Traffic Department of the necessity to close any portion of a roadway carrying vehicles or pedestrians so that the final approval of such closings can be obtained at least 48 hours in advance. At no time will more than one (1) lane of roadway be closed to vehicles and pedestrians. With any such closings make adequate provision for the safe expeditious movement of each.

C. Be responsible for notifying the Stormwater, Streets and Traffic Department, and Police, Fire, and other Emergency Departments at least 48 hours prior to construction whenever construction is within roadways and of the alternate routes.

D. Be responsible for removal, relocation, or replacement of any traffic control device in the construction area that exists as part of the normal pre-construction traffic control scheme.

E. Immediately notify the City Manager or designee of any vehicular or pedestrian safety or efficiency problems incurred as a result of the construction of the project.

F. Be responsible for notifying all residents of any road construction and limited access at least 72 hours in advance.

1.5 PUBLIC SAFETY (DURING CONSTRUCTION, ALTERATION OR REPAIR)

A. In areas of high vehicular traffic, provide a safe walkway around the work area.

B. Use barricades or other barriers to prevent any possibility of injury to the public caused by the CONTRACTOR's work.

C. Keep walk areas around the work areas clean of sand, stones, and any other material that could cause a pedestrian accident.

D. Barricade work areas left overnight. Install flashing warning lights in areas required by the CITY.

E. Unless an approved detour is provided at any open cut crossings, a minimum of one-way traffic will be maintained during the daylight hours and two-way traffic at night. All traffic detours will be restricted to limits of the Right-of-Way with necessary flagmen and/or marking devices. These detours shall be approved by the CITY. Detour of traffic outside of the Right-of-Way will be considered with the approval of local governmental agencies and private concerns involved.

F. Crossing and Intersections: Do not isolate residences and places of business. Provide access to all residences and places of business whenever construction interferes with existing means of access. Maintain access at all times. If pavement is disturbed, a cold mix must be applied at the end of the day.

G. Detours

1. Construct and maintain detour facilities wherever it becomes necessary to divert traffic from any existing roadway or bridge, or wherever construction operations block the flow of traffic. The location of all detours will require prior approval of the CITY.

2. Furnishing of Devices and Barriers: Furnish all traffic control devices (including signs), warning devices and barriers. Costs of such devices shall be incidental to construction and included in unit prices bid.

3. Maintenance of Devices and Barriers: Keep traffic control devices, warning devices and barriers in the correct position, properly directed, clearly visible and clean, at all times. Immediately repair replace or clean damaged, defaced or dirty devices or barriers as necessary.

H. Flagmen: Provide certified flagmen (flaggers) to direct traffic where one-way operation in a single lane is in effect, and in other situations as may be required. Radios may be required if flagmen cannot maintain contact with each other.

I. Utilize all necessary signs, flagmen, and other safety devices during construction.

J. Perform all work with the requirements set forth by the Occupational Safety Health Administration.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01600 - MATERIAL AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Description
B. Substitutions
C. Manufacturer's Written Instructions
D. Transportation and Handling
E. Storage, Protection and Maintenance
F. Manufacturer's Field Quality Control Services
G. Post Startup Services
H. Special Tools and Lubricating Equipment
I. Lubrication

1.2 DESCRIPTION

A. Proposed Manufacturers List: Within 15 calendar days of the date of the Notice to Proceed, submit to the ENGINEER a list of the names of proposed manufacturers, material men, suppliers and subcontractors, obtain approval of this list by the City Manager or designee prior to submission of any working drawings. Upon request submit evidence to ENGINEER that each proposed manufacturer has manufactured a similar product to the one specified and that it has previously been used for a like purpose for a sufficient length of time to demonstrate its satisfactory performance.

B. All material and equipment designed or used in connection with a potable (drinking) water system shall conform to the requirements of the National Sanitation Foundation (NSF) Standard 61, “Drinking Water System Components – Health Effects.”

C. Furnish and install Material and Equipment which meets the following:

1. Conforms to applicable specifications and standards.

2. Complies with size, make, type, and quality specified or as specifically approved, in writing, by ENGINEER.

3. Will fit into the space provided with sufficient room for operation and maintenance access and for properly connecting piping, ducts and services, as applicable. Make the clear spaces that will be available for operation and maintenance access and connections equal to or greater than those shown and meeting all the manufacturers' requirements. If adequate space is not available, the CONTRACTOR shall advise the ENGINEER for resolution.

4. Manufactured and fabricated in accordance with the following:

   a. Design, fabricate, and assemble in accordance with best engineering and shop practices.

   b. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable.

   c. Provide two or more items of same kind identical, by same manufacturer.

   d. Provide materials and equipment suitable for service conditions.

   e. Adhere to equipment capabilities, sizes, and dimensions shown or specified unless variations are specifically approved, in writing, in accordance with the Contract Documents.

f. Adapt equipment to best economy in power consumption and maintenance. Proportion parts and components for stresses that may occur during continuous or intermittent operation, and for any additional stresses that may occur during fabrication or installation.

g. Working parts are readily accessible for inspection and repair, easily duplicated and replaced.

5. Use material or equipment only for the purpose for which it is designed or specified.

1.3 SUBSTITUTIONS

A. Substitutions:

1. Make any CONTRACTOR's requests for changes in equipment and materials from those required by the Contract Documents in writing, for approval by the Engineer of Record. Such requests are considered requests for substitutions and are subject to CONTRACTOR's representations and review provisions of the Contract Documents when one of following conditions are satisfied:

a. Where request is directly related to a “Engineer of Record approved equal” or "City approved equal" clause or other language of same effect in Specifications.

b. Where required equipment or material cannot be provided within Contract Time, but not as result of CONTRACTOR's failure to pursue Work promptly or to coordinate various activities properly.

c. Where required equipment or material cannot be provided in manner compatible with other materials of Work, or cannot be properly coordinated therewith.

2. CONTRACTOR'S Options:

a. Where more than one choice is available as options for CONTRACTOR's selection of equipment or material, select option compatible with other equipment and materials already selected (which may have been from among options for other equipment and materials).

b. Where compliance with specified standard, code or regulation is required, select from among products that comply with requirements of those standards, codes, and regulations.

c. Or City approved Equal: For equipment or materials specified by naming one or more equipment manufacturer(s) as "or City approved equal", submit request for substitution for any equipment or manufacturer not specifically named to the Engineer of Record.

B. Conditions Which are Not Substitution:

1. Requirements for substitutions do not apply to CONTRACTOR options on materials and equipment provided for in the Specifications.

2. Revisions to Contract Documents, where requested by the City Manager or designee or ENGINEER, are "changes" not "substitutions".

3. CONTRACTOR's determination of and compliance with governing regulations and orders issued by governing authorities do not constitute substitutions and do not constitute basis for a Change Order, except as provided for in Contract Documents.

1.4 MANUFACTURER'S WRITTEN INSTRUCTIONS

A. Instruction Distribution: When the Contract Documents require that installation, storage, maintenance and handling of equipment and materials comply with manufacturer's written instructions, obtain and distribute printed copies of such instructions to parties involved in installation, including six copies to ENGINEER.

1. Maintain one set of complete instructions at jobsite during storage and installation, and until completion of work.

B. Manufacturer's Requirements: Store, maintain, handle, install, connect, clean, condition, and adjust products in accordance with manufacturer's written instructions and in conformity with Specifications.

1. Should job conditions or specified requirements conflict with manufacturer's instructions, consult ENGINEER for further instructions.

2. Do not proceed with work without written instructions.

C. Performance Procedures: Perform work in accordance with manufacturer's written instructions. Do not omit preparatory steps or installation procedures, unless specifically modified or exempted by Contract Documents.

1.5 TRANSPORTATION AND HANDLING

A. Coordination with Schedule: Arrange deliveries of materials and equipment in accordance with Construction Progress Schedules. Coordinate to avoid conflict with work and conditions at site.

1. Deliver materials and equipment in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible. Keep product free of dirt and debris.

2. Protect bright machined surfaces, such as shafts and valve faces, with a heavy coat of grease prior to shipment.

3. Immediately upon delivery, inspect shipments to determine compliance with requirements of Contract Documents and approved submittals and that material and equipment are protected and undamaged.

B. Handling: Provide equipment and personnel to handle material and equipment by methods recommended by manufacturer to prevent soiling or damage to materials and equipment or packaging.

1.6 STORAGE, PROTECTION, AND MAINTENANCE

A. On-site storage areas and buildings:

1. Conform storage buildings to requirements of Section 01500.

2. Coordinate location of storage areas with ENGINEER and the CITY.

3. Arrange on site storage areas for proper protection and segregation of stored materials and equipment with proper drainage. Provide for safe travel around storage areas and safe access to stored materials and equipment.

4. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.

5. Store materials such as pipe, reinforcing and structural steel, and equipment on pallets, blocks or racks, off ground.

6. PVC Pipe may be damaged by prolonged exposure to direct sunlight, take necessary precautions during storage and installation to avoid this damage. Store pipe under cover, and install with sufficient backfill to shield it from the sun.

7. Store fabricated materials and equipment above ground, on blocking or skids, to prevent soiling or staining. Cover materials and equipment that are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation.

B. Interior Storage:

1. Store materials and equipment in accordance with manufacturer's instructions, with seals and labels intact and legible.

2. Store materials and equipment, subject to damage by elements, in weathertight enclosures.

3. Maintain temperature and humidity within ranges required by manufacturer's instructions.

C. Accessible Storage: Arrange storage in a manner to provide easy access for inspection and inventory. Make periodic inspections of stored materials or equipment to assure that materials or equipment are maintained under specified conditions and free from damage or deterioration.

1. Perform maintenance on stored materials of equipment in accordance with manufacturer's instructions, in presence of the City Manager or designee or ENGINEER.

2. Submit a report of completed maintenance to ENGINEER with each Application for Payment.

3. Failure to perform maintenance, to notify ENGINEER of intent to perform maintenance or to submit maintenance report may result in rejection of material or equipment.

D. CITY's Responsibility: The CITY assumes no responsibility for materials or equipment stored in buildings or on-site. CONTRACTOR assumes full responsibility for damage due to storage of materials or equipment.

E. CONTRACTOR's Responsibility: For CITY Capital Improvement Projects, the CONTRACTOR assumes full responsibility for protection of completed construction until facilities (or portions of facilities) are accepted for operation and placed in service. Repair and restore damage to completed Work equal to its original condition.

F. Special Equipment: Use only rubber tired wheelbarrows, buggies, trucks, or dollies to wheel loads over finished floors, regardless if the floor has been protected or not. This applies to finished floors and to exposed concrete floors as well as those covered with composition tile or other applied surfacing.

G. Surface Damage: Where structural concrete is also the finished surface, take care to avoid marking or damaging surface.

1.7 MANUFACTURER'S FIELD QUALITY CONTROL SERVICES

A. General:

1. Provide manufacturer's field services in accordance with this subsection for those tasks specified in other sections.

2. Include and pay all costs for suppliers' and manufacturers' services, including, but not limited to, those specified.

B. Installation Instruction: Provide instruction by competent and experienced technical representatives of equipment manufacturers or system suppliers as necessary to resolve assembly or installation procedures that are attributable to, or associated with, the equipment furnished.

C. Installation Inspection, Adjustments and Startup Participation:

1. Provide competent and experienced technical representatives of equipment manufacturers or system suppliers to inspect the completed installation as follows.

   a. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or for other conditions that may cause damage.

   b. Verify that tests meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

   c. Verify that wiring and support components for equipment are complete.

   d. Verify that equipment or system is installed in accordance with the manufacturer's recommendations, approved shop drawings and the Contract Documents.

   e. Verify that nothing in the installation voids any warranty.

2. Provide manufacturer's representatives to perform initial equipment and system adjustment and calibration conforming to the manufacturer's recommendations and instructions, approved shop drawings and the Contract Documents.

3. Start-up of Equipment: Provide prior written notice of proposed start-up to the City Manager or designee and ENGINEER. Obtain ENGINEER's approval before start-up of equipment. CITY's departmental representative must be on-site during start-up. Execute start-up under supervision of applicable manufacturer's representative in accordance with manufacturers' instructions.

4. Furnish ENGINEER with three copies of the following. When training is specified, furnish the copies at least 48 hours prior to training.

   a. "Certificate of Installation, Inspection and Start-up Services" by manufacturers' representatives for each piece of equipment and each system specified, certifying:

      (1) That equipment is installed in accordance with the manufacturers' recommendations, approved shop drawings and the Contract Documents.
      (2) That nothing in the installation voids any warranty.

      (3) That equipment has been operated in the presence of the manufacturer's representative.
      (4) That equipment, as installed, is ready to be operated by others.

   b. Detailed report by manufacturers' representatives, for review by ENGINEER of the installation, inspection and start-up services performed, including:

(1) Description of calibration and adjustments if made; if not in Operation and Maintenance Manuals, attach copy.
(2) Description of any parts replaced and why replaced.
(3) Type, brand name, and quantity of lubrication used, if any.
(4) General condition of equipment.
(5) Description of problems encountered, and corrective action taken.
(6) Any special instructions left with CONTRACTOR or ENGINEER.

D. Field Test Participation: Provide competent and experienced technical representatives of all equipment manufacturers and system suppliers as necessary to participate in field testing of the equipment specified in Section 01400.

E. Trouble-Free Operation: Provide competent and experienced technical representatives of all equipment manufacturers and system suppliers as necessary to place the equipment in trouble-free operation after completion of start-up and field tests.

1.8 SPECIAL TOOLS AND LUBRICATING EQUIPMENT

A. General: Furnish, per manufacturer's recommendations, special tools required for checking, testing, parts replacement, and maintenance. (Special tools are those which have been specially designed or adapted for use on parts of the equipment, and which are not customarily and routinely carried by maintenance mechanics.)

B. Time of Delivery: Deliver special tools and lubricating equipment to the CITY when unit is placed into operation and after operating personnel have been properly instructed in operation, repair, and maintenance of equipment.

C. Quality: Provide tools and lubricating equipment of a quality meeting equipment manufacturer's requirements.

1.9 LUBRICATION

A. General: Where lubrication is required for proper operation of equipment, incorporate in the equipment the necessary and proper provisions in accordance with manufacturer's requirements. Where possible, make lubrication automated and positive.

B. Oil Reservoirs: Where oil is used, supply reservoir of sufficient capacity to lubricate unit for a 24-hour period.

1.10 WARRANTY

A. Provide copies of any warranties of materials or equipment to the City Manager or designee with documentation showing compliance with warranty requirements.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

CERTIFICATE OF INSTALLATION, INSPECTION AND START-UP SERVICES

Project

_____

Equipment

_____

Specification Section

_____

Contract

_____

I hereby certify that the named equipment has been inspected, adjusted and operated by the Manufacturers' Representative and further certify:

1. That the equipment is installed in accordance with the manufacturer's recommendations, approved shop drawings and the Contract Documents.
2. That nothing in the installation voids any warranty.
3. That equipment has been operated in the presence of the manufacturer's representative.
4. That equipment, as installed, is ready to be operated by others.

MANUFACTURERS' REPRESENTATIVE

Signature _____ Date _____

Name (print) _____

Title _____

Representing _____

CONTRACTOR

Signature _____ Date _____

Name (print) _____

Title _____

Attach the detailed report called for by Specification Section 01600.

Complete and submit three copies of this form with the detailed report to ENGINEER as specified.

CERTIFICATE OF POST START-UP SERVICES

Project _____

Equipment

_____

Specification Section

_____

Contract _____

I hereby certify the Manufacturers' Representative has inspected this equipment, made adjustments and calibrations, and that it is operating in conformance with the design, specifications, and manufacturer's requirements. Detailed notation of improper operation with corresponding recommendations, if any, are made and attached to this form.

MANUFACTURERS' REPRESENTATIVE

Signature _____ Date _____

Name (print) _____

Title_____

Representing_____

CONTRACTOR

Signature _____ Date _____

Name (print) _____

Title_____

ENGINEER

Signature _____ Date _____

Name (print) _____

Title_____

Complete and submit three copies of this form to the City Manager or designee upon completion of 6 to 11 months reinspection as required by Specification Section 01600.

END OF SECTION

SECTION 01710 - CLEANING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General Requirements
B. Disposal Requirements

1.2 GENERAL REQUIREMENTS

A. Execute cleaning during progress of the work and at completion of the work.

1.3 DISPOSAL REQUIREMENTS

A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 DURING CONSTRUCTION

A. Execute daily cleaning to keep the work, the site, and adjacent properties free from accumulations of waste materials, rubbish, and windblown debris, resulting from construction operations.

B. Provide onsite containers for the collection of waste materials, debris and rubbish.
All waste materials including containers, food debris and other miscellaneous materials must be disposed of daily in onsite containers.

C. Remove waste materials, debris and rubbish from the site periodically and dispose of at legal disposal areas away from the site.

3.2 FINAL CLEANING

A. Requirements: At the completion of work and immediately prior to final inspection, clean the entire project as follows:

1. Thoroughly clean, sweep, wash, and polish all work and equipment provided under the Contract, including finishes. Leave the structures and site in a complete and finished condition to the satisfaction of the ENGINEER.

2. Direct all subcontractors to similarly perform, at the same time, an equivalent thorough cleaning of all work and equipment provided under their contracts.

3. Remove all temporary structures and all debris, including dirt, sand, gravel, rubbish and waste material.

4. Should the CONTRACTOR not remove rubbish or debris or not clean the buildings and site as specified above, the OWNER reserves the right to have the cleaning done at the expense of the CONTRACTOR.

B. Employ experienced workers, or professional cleaners, for final cleaning.

C. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

D. In preparation for substantial completion or occupancy, conduct final inspection of sight-exposed interior and exterior surfaces, and of concealed spaces.

E. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces. Polish surfaces so designated to shine finish.

F. Repair, patch, and touch up marred surfaces to specified finish, to match adjacent surfaces.

G. Replace air-handling filters if units were operated during construction.

H. Clean ducts, blowers, and coils, if air-handling units were operated without filters during construction.

I. Vacuum clean all interior spaces, including inside cabinets.

J. Handle materials in a controlled manner with as few handlings as possible. Do not drop or throw materials from heights.

K. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly-painted surfaces.

L. Clean interior of all panel cabinets, pull boxes, and other equipment enclosures.

M. Wash and wipe clean all lighting fixtures, lamps, and other electrical equipment that may have become soiled during installation.

N. Perform touch-up painting.

O. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.

P. Remove erection plant, tools, temporary structures and other materials.

Q. Remove and dispose of all water, dirt, rubbish or any other foreign substances.

3.3 FINAL INSPECTION

A. After cleaning is complete the final inspection may be scheduled. The inspection will be done with the OWNER and ENGINEER.

END OF SECTION

SECTION 01730 – OPERATION AND MAINTENANCE MANUALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Description
B. Quality Assurance
C. Format and Contents

1.2 DESCRIPTION

A. Scope: Furnish to the ENGINEER three (3) printed copies and one (1) electronic copy of an Operation and Maintenance Manual for all equipment and associated control systems furnished and installed.

1.3 QUALITY ASSURANCE

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

1.4 FORMAT AND CONTENTS

A. Prepare and arrange each copy of the manual as follows:

1. One copy of an equipment data summary (see sample form) for each item of equipment.

2. One copy of an equipment preventive maintenance data summary (see sample form) for each item of equipment.

3. One copy of the manufacturer's operating and maintenance instructions specific to the model number furnished. Operating instructions include detailed assembly drawings including a list of all parts and materials with catalog number, and instructions for equipment start-up, normal operation, adjusting, overhauling, shutdown, emergency operation, troubleshooting. Maintenance instructions include equipment installation, calibration and adjustment, preventive and repair maintenance, lubrication schedule, lubricant types and grades, troubleshooting, parts list and recommended spare parts. Include Manufacturer’s telephone numbers for Technical Support.

4. List of electrical relay settings and control and alarm contact settings.

5. Electrical interconnection wiring diagram for equipment furnished including all control and lighting systems.

6. Furnish all O&M Manual material in bound 8-1/2 by 11 commercially printed or typed forms or an acceptable alternative format.

B. Organize each manual into sections paralleling the equipment specifications. Identify each section using heavy section dividers with reinforced holes and numbered plastic index tabs. Use 3-ring, hard-back binders. Punch all loose data for binding. Arrange composition and printing so that punching does not obliterate any data. Print on the cover and binding edge of each manual the project title, and manual title, as furnished and approved by the ENGINEER.

C. Leave all operating and maintenance material that comes bound by the equipment manufacturer in its original bound state. Cross-reference the appropriate sections of the CONTRACTOR's O&M manual to the manufacturers' bound manuals.

D. Label binders Volume 1, 2, and so on, where more than one binder is required. Include the table of contents for the entire set, identified by volume number, in each binder.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

City Utilities

Equipment Data Summary

Equipment Name:	Specification Reference:	
Manufacturer:		
Name:		
Address:		
Telephone:		
Number Supplied:	Location/Service:	
Model No:	Serial No:	
Type:		
Size/Speed/Capacity/Range (as applicable):		
Power Requirement (Phase/Volts/Hertz):		
Local Representative:		
Name:		
Address:		
Telephone:		
NOTES:		

City Utilities

Preventive Maintenance Summary

Equipment Name:		Location:	
Manufacturer:			
	Name:		
	Address:		
	Telephone:		
Model No:		Serial No:	
Maintenance Task	Lubricant/Part	D W M Q SA A	O&M Manual Reference
NOTES:			

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

END OF SECTION

SECTION 01750 – PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

Requirements for preparation, maintenance and submittal of project record documents. The Contractor's attention is specifically directed to Part 3.2.B. of this Section, which requires use of a Florida licensed surveyor to sign and seal all record drawings.

1.2 RELATED SECTIONS

A. Section 01051 – Alignment and Grades
B. Section 01400 - Quality Control

1.3 SUBMITTALS

A. General: Provide all submittals as specified. Final disbursement of project monies shall not occur until or unless said “record drawings” are submitted to the satisfaction of the City.

B. At Contract close out, two (2) sets of signed and sealed Record Drawings for the potable water system, non-potable irrigation water system, and/or wastewater system to be conveyed shall be submitted to the City.

C. Provide electronic submittal as specified in Part 3.2.B of this Section.

1.4 REQUIREMENTS

A. Contractor shall maintain at the site for the City one record copy of:

1. Drawings
2. Specifications
3. Addenda
4. Change orders and other modifications to the Contract
5. Design Engineer’s field orders or written instructions
6. Approved shop drawings, working drawings and samples
7. Field test records

B. Additional Requirements for City Capital Projects Only

1. CAD and GIS Turn-Over Documents (see City of Naples GIS and CAD Record Standards and Requirements)

PART 2 PRODUCTS (not used)

PART 3 EXECUTION

3.1 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Project record documents shall be stored in Contractor's field office or other location approved by the City apart from documents used for construction.

B. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

C. Make documents and samples available at all times for inspection by the City.

3.2 RECORDING

A. General

1. Record Drawings shall accurately depict the constructed configuration of all potable water, non-potable irrigation water and/or wastewater systems or portion(s) thereof. All revisions to City staff approved construction drawings shall be precisely identified and illustrated on the Record Drawings. All Record Drawings of utility systems or portion(s) thereof that are not being conveyed to the Board shall bear, on the cover sheet, a prominently displayed DISCLAIMER, in bold lettering at least one-quarter (1/4) inch high, stating: "All on-site potable water, non-potable irrigation and/or wastewater systems shall be owned, operated and maintained by the private owner(s) and/or the master condominium/homeowners' association, successors or assigns" (or other comparable private ownership).

2. Label each document "PROJECT RECORD" or similar text in neat, large printed letters.

3. Survey information can be obtained as needed by the use of 2-inch PVC labeled pipes installed over underground improvements by the contractor during construction. This method is an adequate process for obtaining record information.

4. Record information in red ink

B. Record Drawings

1. The Record Drawings require signed and sealed as-built information, including above and below ground improvements including underground piping, valves and ductbanks, by a Florida Licensed Land Surveyor.

2. The Record Drawings shall identify the entity that provided the record data.

3. All datum indicated or specified refer to the North American Datum 1983/2011 adjustment (NAD83/11) with values expressed in U.S. survey feet, Florida State Plan Coordinate System (FSPCS) East zone 901, and the North American Vertical Datum of 1988 (NAVD 88), respectively, based on National Spatial Reference System Control Stations:

NAPLES RESET: Recovered in good condition. In Naples, at the intersection of U.S. Highway 41 and Goodland Frank Road, 186.5 m (611.9 ft) North of the center of the westbound lanes of the Highway, 18.4 m (60.4 ft) West of the center of the road, 3.7m (12.1 ft) Northeast of a witness post, 0.7 m (2.3 ft) South of the center of an entrance road to the grand central station shopping center, 0.7 m (2.3 ft) above the level of the road, and the monument is flush with the pavement.
Elevation 6.29 feet, FSPCS N: 658,769.28' E: 396,684.54'.

and

V 241: Recovered in good condition. In Naples, at 856 3rd Avenue South, 7.8 m (25.6 ft) Northwest of the Northeast corner of the post office at 856 3rd Avenue South, 7.0 m (23.0 ft) South of and level with the centerline of the avenue, 0.4 m (1.3 ft) North-Northeast of a witness post, 0.3 m (1.0 ft) west of a utility pole, and the disk is encased in a 4-inch metal pipe and is flush with the ground surface. Elevation 6.43 feet, FSPCS N: 658,801.55' E: 395,120.18'.

With the baseline of survey depicted hereon as being N 83°20'15" E

4. Files shall be also submitted in Drawing File (DWG) format in AutoCAD Release 2004 or later version and a red-lined "field" hardcopy.

5. Record drawings shall be submitted to the City staff within 60 days of the final construction completion date.

6. The following items shall be accurately depicted in vertical and horizontal directions on the Record Drawings:

   a) All associated rights-of-way and utility easements whether shown on the Contract Drawings, found during construction or added during the Work.
   b) Horizontal and vertical cross sections spaced every 50' within the Lake to accurately represent the proposed dredged bottom.
   c) Stormwater modifications lengths, inverts, slopes, and geographic locations of the inlet filters, mitered end sections, and proposed pipes.
   d) Public Amenities locations of all installed trees and lighting and centerline alignment and elevations of the trail.

7. Each pipe elevation shall be clearly identified as to whether it is top of pipe, centerline of pipe or invert of pipe.

8. Record Drawings shall indicate all deviations from Contract Drawings including:

   a) Field changes.
   b) Changes made by Change Order.
   c) Details, utilities, piping or structures not on original Contract Drawings.
   d) Equipment and piping relocations.

C. Specifications and Addenda

1. Legibly mark each Section to record:

2. Manufacturer, trade name, catalog number and supplier of each product and item of equipment actually installed.

3. Changes made by Field Order or Change Order.

D. Shop Drawings

1. Keep one copy of the final, approved shop drawing with the Record Documents.

2. Record documents should include all shop drawing information submitted. Additional information submitted during the review process should be filed with the appropriate submittal.

END OF SECTION

SECTION 02050 - DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: All work necessary for the removal and disposal of structures, foundations, piping, equipment and roadways, or any part thereof including masonry, steel, reinforced concrete, plain concrete, electrical facilities, large lake bottom debris and any other material or equipment shown or specified to be removed.

B. Basic Procedures and Schedule: Carry out demolition so that adjacent structures, which are to remain, are not endangered. Schedule the work so as not to interfere with the day-to-day operation of the existing facilities. Do not block doorways or passageways in existing facilities.

C. Additional Requirements: Provide dust control and make provisions for safety.

D. Related Work Specified in Other Sections Includes:

1. Section 01045 – Connection to Existing Systems

2. Section 02110 – Site Clearing

1.2 SUBMITTALS

A. Site Inspection: Visit the site and inspect all existing structures. Observe and record any defects that may exist in buildings or structures adjacent to but not directly affected by the demolition work. Provide the City Manager or designee with a copy of this inspection record and obtain the ENGINEER's and the City's Manager or designee approval prior to commencing the demolition.

1.3 QUALITY ASSURANCE

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

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 EXAMINATION OF EXISTING DRAWINGS

A. Available drawings of existing structures and equipment will be available for inspection at the office of the ENGINEER.

3.2 PROTECTION

A. General Safety: Provide warning signs, protective barriers, and warning lights as necessary adjacent to the work as approved or required. Maintain these items during the demolition period.

B. Existing Services: Undertake no demolition work until all mechanical and electrical services affected by the work have been properly disconnected. Cap, reroute or reconnect interconnecting piping or electrical services that are to remain in service either permanently or temporarily in a manner that will not interfere with the operation of the remaining facilities.

C. Hazards: Perform testing and air purging where the presence of hazardous chemicals, gases, flammable materials or other dangerous substances is apparent or suspected, and eliminate the hazard before demolition is started.

3.3 DEMOLITION REQUIREMENTS

A. Explosives: The use of explosives will not be permitted.

B. Protection: Carefully protect all mechanical and electrical equipment against dust and debris.

C. Removal: Remove all debris from the structures during demolition and do not allow debris to accumulate in piles.

D. Access: Provide safe access to and egress from all working areas at all times with adequate protection from falling material.

E. Protection: Provide adequate scaffolding, shoring, bracing railings, toe boards and protective covering during demolition to protect personnel and equipment against injury or damage. Cover floor openings not used for material drops with material substantial enough to support any loads placed on it. Properly secure the covers to prevent accidental movement.

F. Lighting: Provide adequate lighting at all times during demolition.

G. Closed Areas: Close areas below demolition work to anyone while removal is in progress.

H. Chemicals: All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with manufacturer's instructions or government regulations as applicable.

3.4 DISPOSAL OF MATERIALS

A. Final Removal: Dispose of AC pipe in accordance with CITY special handling requirements and coordination with City Solid Waste Management Department. Remove all other debris, rubbish, scrap pieces, equipment, and materials resulting from the demolition. Take title to all demolished materials and remove such items from the site.

END OF SECTION

SECTION 02110 - SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Requirements for clearing of all areas within the Contract limits and other areas shown, including work designated in permits and other agreements.

B. Related Work Specified in Other Sections Includes:

1. Section 02050 – Demolition
2. Section 02222 - Excavation - Earth and Rock
3. Section 02223 – Backfilling

1.2 DEFINITIONS

A. Clearing: Clearing is the removal from the ground surface and disposal, within the designated areas, of trees, brush, shrubs, down timber, decayed wood, other vegetation, rubbish and debris as well as the removal of fences.

B. Grubbing: Grubbing is the removal and disposal of all stumps, buried logs, roots larger than 1-1/2 inches, matted roots and organic materials.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 PROTECTION OF EXISTING UTILITIES

A. Prior to site clearing, locate and mark all existing utilities in coordination with the CITY and other affected owners. Protect all existing utilities and markings from damage. In case of damage to existing utilities caused by construction activities, contact the owner of the utility or appropriate CITY department (Water or Wastewater) immediately. Repair any damage to existing utilities or markings caused by construction activities in coordination with or as directed by the owner of the utility.

3.2 TREE REMOVAL

A. Tree Removal Within Right-of-Way Limits: Remove trees and shrubs within the right-of-way unless otherwise indicated.

1. Remove trees and shrubs to avoid damage to trees and shrubs designated to remain.

2. Grub and remove tree stumps and shrubs felled within the right-of-way to an authorized disposal site. Fill depressions created by such removal with material suitable for backfill as specified in Section 02223.

B. Tree Removal Outside Right-of-Way Limits: Do not cut or damage trees outside the right-of-way unless plans show trees to be removed or unless written permission has been obtained from the

property owner. Furnish three copies of the written permission before removal operations commence.

C. If the landowner desires the timber or small trees, cut and neatly pile it in 4 ft. lengths for removal by the owner; otherwise, dispose of it by hauling it away from the project site. If hauled timber is of merchantable quality, credit shall accrue to the CONTRACTOR.

3.3 TREES AND SHRUBS TO BE SAVED

A. Protection: Protect trees and shrubs within the work limits that are so delineated or are marked in the field to be saved from defacement, injury and destruction.

1. Work within the limits of the tree drip line with extreme care using either hand tools or equipment that will not cause damage to trees.

    a. Do not disturb or cut roots unnecessarily. Do not cut roots 1-1/2 inches and larger unless approved.

    b. Immediately backfill around tree roots after completion of construction in the vicinity of trees.

    c. Do not operate any wheeled or tracked equipment within drip line.

2. Protect vegetation from damage caused by emissions from engine-powered equipment.

3. During working operations, protect the trunk, foliage and root system of all trees to be saved with boards or other guards placed as shown and as required to prevent damage, injury and defacement.

    a. Do not pile excavated materials within the drip line or adjacent to the trunk of trees.

    b. Do not allow runoff to accumulate around trunk of trees.

    c. Do not fasten or attach ropes, cables, or guy wires to trees without permission. When such permission is granted, protect the tree before making fastening or attachments by providing burlap wrapping and softwood cleats.

    d. The use of axes or climbing spurs for trimming will not be permitted.

    e. Provide climbing ropes during trimming.

4. Remove shrubs to be saved, taking a sufficient earth ball with the roots to maintain the shrub.

    a. Temporarily replant if required, and replace at the completion of construction in a condition equaling that which existed prior to removal.

    b. Replace in kind if the transplant fails.

5. Have any tree and shrub repair performed by a tree surgeon properly licensed by the State of Florida and within 24 hours after damage occurred.

3.4 CLEARING AND GRUBBING

A. Clearing: Clear all items specified to the limits shown and remove cleared and grubbed materials from the site.

1. Do not start earthwork operations in areas where clearing and grubbing is not complete, except that stumps and large roots may be removed concurrent with excavation.

2. Comply with erosion, sediment control and storm management measures.

B. Grubbing: Clear and grub areas to be excavated, areas receiving less than 3 feet of fill, all existing vegetation in Lake 31 and areas upon which structures are to be constructed.

1. Remove stumps and root mats in these areas to a depth of not less than 18 inches below the subgrade of sloped surfaces.

2. Fill all depressions made by the removal of stumps or roots with material suitable for backfill as specified in Section 02223.

C. Limited Clearing: Clear areas receiving more than 3 feet of fill by cutting trees and shrubs as close as practical to the existing ground. Grubbing will not be required.

D. Dispose of all material and debris from the clearing and grubbing operation by hauling such material and debris away to an approved dump. The cost of disposal (including hauling) of cleared and grubbed material and debris shall be considered a subsidiary obligation of the CONTRACTOR; include the cost in the bid for the various classes of work.

3.5 TOPSOIL

A. Stripping: Strip existing topsoil from areas that will be excavated or graded prior to commencement of excavating or grading and place in well-drained stockpiles in approved locations.

END OF SECTION

SECTION 02222 - EXCAVATION - EARTH AND ROCK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Requirements for performing open cut excavations to the widths and depths necessary for constructing pipelines, including excavation of any material necessary for any purpose pertinent to the construction of the Work.

B. Related Work Specified In Other Sections Includes:

1. Section 02110 - Site Clearing
2. Section 02223 – Backfilling

1.2 DEFINITIONS

A. Earth: "Earth" includes all materials which, in the opinion of the ENGINEER, do not require blasting, barring, wedging or special impact tools for their removal from their original beds, and removal of which can be completed using standard excavating equipment. Specifically excluded are all ledge and bedrock and boulders or pieces of masonry larger than one cubic yard in volume.

B. Rock: "Rock" includes all materials which, in the opinion of the ENGINEER, require blasting, barring, wedging and/or special impact tools such as jack hammers, sledges, chisels, or similar devices specifically designed for use in cutting or breaking rock for removal from their original beds and which have compressive strengths in their natural undisturbed state in excess of 300 psi. Boulders or masonry larger than one cubic yard in volume are classed as rock excavation.

1.3 SUBMITTALS

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

B. Engage the services of a Professional Engineer who is registered in the State of Florida to design all cofferdam and sheeting and bracing systems which the CONTRACTOR feels necessary for the execution of his work. Submit to the ENGINEER a signed statement that he has been employed by the CONTRACTOR to design all sheeting and bracing systems. After the systems have been installed, furnish to the ENGINEER an additional signed statement that the cofferdams and sheeting and bracing systems have been installed in accordance with his design.

C. If a detour is required, submit a traffic control plan for approval to City Manager or designee and/or the Florida Department of Transportation as described in Section 01570.

1.4 SITE CONDITIONS

A. Geotechnical Investigation: The geotechnical investigation report is not part of the Contract Documents.

B. Actual Conditions: Make any geotechnical investigations deemed necessary to determine actual site conditions.

C. Underground Utilities: Locate and identify all existing underground utilities prior to the commencement of Work.

D. Quality and Quantity: Make any other investigations and determinations necessary to determine the quality and quantities of earth and rock and the methods to be used to excavate these materials.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL

A. Clearing: Clear opencut excavation sites of obstructions preparatory to excavation. Clearing in accordance with Section 02110, includes removal and disposal of vegetation, trees, stumps, roots and bushes, except those specified to be protected during trench excavation.

B. Safety: Whenever an excavation site or trench is left unattended by the CONTRACTOR or when an area is not within 100 feet of observation by the CONTRACTOR, the excavation site or trench shall be filled and/or, at the City Manager's or designee discretion, protected by other means to prevent accidental or unauthorized entry. Include barricades and other protection devices requested by the ENGINEER or City Manager or designee, including temporary fencing, or temporary "structure" tape. Such safety items shall not relieve the CONTRACTOR of any site safety requirements or liabilities established by Federal, State and local laws and agencies, including OSHA, but is intended as additional safety measures to protect the general public.

C. Hazardous Materials: If encountered, take care of hazardous materials not specifically shown or noted in accordance with Section 01500.

D. During excavation and any site work, take storm water pollution prevention measures to ensure that water quality criteria are not violated in the receiving water body and all state and local regulatory requirements are met.

3.2 STRUCTURE EXCAVATION

A. Excavation Size: Provide excavations of sufficient size and only of sufficient size to permit the Work to be economically and properly constructed in the manner and of the size specified.

B. Excavation Shape: Shape and dimension the bottom of the excavation in earth or rock to the shape and dimensions of the underside of the structure or drainage blanket wherever the nature of the excavated material permits.

C. Compaction: Before placing foundation slabs, footings or backfill, proof roll the bottom of the excavations to detect soft spots and correct deficiencies.

1. For accessible areas, proof roll with a ten wheel tandem axle dump truck loaded to at least 15 tons or similarly loaded construction equipment.

2. For small areas, proof roll with a smooth-faced steel roller filled with water or sand, or compact with a mechanical tamper.

3. Make one complete coverage, with overlap, of the area.

4. Overexcavate soft zones and replace with compacted select fill.

3.3 TRENCH EXCAVATION

A. Preparation: Properly brace and protect trees, shrubs, poles and other structures which are to be preserved. Unless shown or specified otherwise, preserve all trees and large shrubs. Hold damage to the root structure to a minimum. Small shrubs may be preserved or replaced with equivalent specimens.

B. Adequate Space: Keep the width of trenches to a minimum, however provide adequate space for workers to place, joint and backfill the pipe properly and safely.

1. The minimum width of the trench shall be equal to at least 3.5 feet or the outside diameter of the pipe at the joint plus 8-inches for unsheeted trench or 12 inches for sheeted trench, whichever is greater. Conform the trench walls to OSHA Regulations.

2. In sheeted trenches, measure the clear width of the trench at the level of the top of the pipe to the inside of the sheeting.

C. Depth:

1. Excavate trenches to a minimum depth of 8 inches, but not more than 12 inches, below the bottom of the pipe so that bedding material can be placed in the bottom of the trench and shaped to provide a continuous, firm bearing for pipe barrels and bells.

2. Standard trench grade shall be defined as the bottom surface of the utility to be constructed or placed within the trench. Trench grade for utilities in rock or other non-cushioning material shall be defined as additional undercuts backfilled with crushed stone compacted in 6-inch lifts, below the standard 8-inches minimum trench undercut. Backfill excavation below trench grade not ordered in writing by the ENGINEER with acceptable USCS Class I, II or III (see Section 02223, 2.1.C) embedment material to trench grade and compact to density equal to native soil.

3. In stable trenches, where the soil is neither wet, yielding, nor mucky, trench bottom may be either native undisturbed soils of USCS Class II, III, or IV, or thoroughly compacted USCS Class I, II, or III material from three inches (3”) to six inches (6”) depth to provide a stable, continuous support for the pipe bedding system. In USCS Class V soil areas, foundation bedding is required. All foundation bedding shall be USCS Class I material. In no case shall pipe be bedded on solid rock. See Section 02223, subsections 3.2 and 2.4 for more information on bedding.

D. Unstable or Unsuitable Materials: If unstable or unsuitable material is exposed at the level of the bottom of the trench excavation, excavate the material in accordance with the subsection headed "Authorized Additional Excavation".

1. Remove material for the full width of the trench and to the depth required to reach suitable foundation material.

2. When in the judgment of the ENGINEER the unstable or unsuitable material extends to an excessive depth, the ENGINEER may advise, in writing, the need for stabilization of the trench bottom with additional select fill material, crushed stone, washed shell, gravel mat or the need to provide firm support for the pipe or electrical duct by other suitable methods.

3. Crushed stone, washed shell and gravel shall be as specified in Section 02223.

4. Payment for such trench stabilization will be made under the appropriate Contract Items or where no such items exist, as a change in the Work.

E. Length of Excavation: Keep the open excavated trench preceding the pipe laying operation and the unfilled trench, with pipe in place, to a minimum length which causes the least disturbance. Provide ladders for a means of exit from the trench as required by applicable safety and health regulations.

F. Excavated Material: Neatly deposit excavated material to be used for backfill at the sides of the trenches where space is available. Where stockpiling of excavated material is required, obtain the sites to be used and maintain operations to provide for natural drainage and not present an unsightly appearance.

G. Water: Allow no water to rise in the trench excavation until sufficient backfill has been placed to prevent pipe flotation.

3.4 ROCK EXCAVATION

A. Rock Excavation: Excavate rock within the boundary lines and grades as shown, specified or required. Use of explosives will not be permitted unless written approval is obtained from the Engineer of Record.

1. Rock removed from the excavation becomes the property of the CONTRACTOR. Transport and dispose of excavated rock at an off site disposal location. Obtain the off site disposal location.

2. Remove all shattered rock and loose pieces.

B. Structure Depths: For cast-in-place structures, excavate the rock only to the bottom of the structure, foundation slab, or drainage blanket.

C. Trench Width: Maintain a minimum clear width of the trench at the level of the top of the pipe of the outside diameter of the pipe barrel plus 2 feet, unless otherwise approved.

D. Trench Depth: For trench excavation in which pipelines are to be placed, excavate the rock to a minimum depth of 8 inches below the bottom of the pipe or duct encasement. Provide a cushion of sand or suitable crushed rock. Refill the excavated space with pipe bedding material in accordance with Section 02223. Include placing, compacting and shaping pipe bedding material in the appropriate Contract Items.

E. Over-excavated Space: Refill the excavated space in rock below structures, pipelines, conduits and manholes, which exceeds the specified depths with 2,500 psi concrete, crushed stone, washed shell, or other material as directed. Include refilling of over-excavated space in rock as part of the rock excavation.

F. Other Requirements: Follow, where applicable, the requirements of the subsections on "Trench Excavation" and "Structure Excavation".

G. Payment: Rock excavation, including placing, compacting and shaping of the select fill material, will be paid for under the appropriate Contract Items or where no such items exist, as a change in the Work.

3.6 FINISHED EXCAVATION

A. Finish: Provide a reasonably smooth finished surface for all excavations, which is uniformly compacted and free from irregular surface changes.

B. Finish Methods: Provide a degree of finish that is ordinarily obtainable from blade- grade operations and in accordance with Section 02223.

3.7 PROTECTION

A. Traffic and Erosion: Protect newly graded areas from traffic and from erosion.

B. Repair: Repair any settlement or washing away that may occur from any cause, prior to acceptance. Re-establish grades to the required elevations and slopes.

C. It shall be the CONTRACTOR's responsibility to acquaint himself with all existing conditions and to locate all structures and utilities along the proposed utility alignment in order to avoid conflicts. Where actual conflicts are unavoidable, coordinate work with the facility owner and perform work so as to cause as little interference as possible with the service rendered by the facility disturbed in accordance with Section 01045. Repair and/or replace facilities or structures damaged in the prosecution of the work immediately, in conformance with current standard practices of the industry, or according to the direction of the owner of such facility, at the CONTRACTOR's expense.

D. Other Requirements: Conduct all Work in accordance with the environmental protection requirements specified in Division 1.

3.8 AUTHORIZED ADDITIONAL EXCAVATION

A. Additional Excavation: Carry the excavation to such additional depth and width as authorized in writing, for the following reasons:

1. In case the materials encountered at the elevations shown are not suitable.

2. In case it is found desirable or necessary to go to an additional depth, or to an additional depth and width.

B. Refill Materials: Refill such excavated space with either authorized 2500 psi concrete or compacted select fill material, in compliance with the applicable provisions of Section 02223.

C. Compaction: Compact fill materials to avoid future settlement. As a minimum, backfill layers shall not exceed 6-inches in thickness for the full trench width and compaction shall equal 95% of maximum density, or 98% if under paved area of roadway, as determined by using ASTM D 1557. Perform compaction density tests at all such backfill areas with spacing not to exceed 100 feet apart and on each 6-inch compacted layer.

D. Payment: Additional earth excavations so authorized and concrete or select fill materials authorized for filling such additional excavation and compaction of select fill materials will be paid for under the appropriate Contract Items or where no such items exist, as a change in the Work.

3.9 UNAUTHORIZED EXCAVATION

A. Stability: Refill any excavation carried beyond or below the lines and grades shown, except as specified in the subsection headed "Authorized Additional Excavation", with such material and in such manner as may be approved in order to provide for the stability of the various structures.

B. Refill Materials: Refill spaces beneath all manholes, structures, pipelines, or conduits excavated without authority with 2500 psi concrete or compacted select fill material, as approved.

C. Payment: Refill for unauthorized excavation will not be measured and no payment will be made therefore.

3.10 SEGREGATION STORAGE AND DISPOSAL OF MATERIAL

A. Stockpiling Suitable Materials: Stockpile topsoil suitable for final grading and landscaping and excavated material suitable for backfilling or embankments separately on the site in approved locations.

B. Stockpile Locations: Store excavated and other material a sufficient distance away from the edge of any excavation to prevent its falling or sliding back into the excavation and to prevent collapse of the wall of the excavation. Provide not less than 2 feet clear space between the edge of any stockpile and other material and the edge of any excavation or the lake.

C. Excess Materials: Be responsible for transport and disposal of surplus excavated material and excavated material unsuitable for backfilling or embankments at an off site disposal location secured by the CONTRACTOR. Contractor shall be responsible for the proper disposal of all AC pipe/couplings and shall comply with all Federal, State, and local regulatory agencies accordingly.

3.11 REMOVAL OF WATER

A. Water Removal: At all times during the excavation period and until completion and acceptance of the WORK at final inspection, provide ample means and equipment with which to remove promptly and dispose of properly all water entering any excavation or other parts of the WORK.

B. Dry Excavations: Keep the excavation dry

C. Water Contact: Allow no water to rise over or come in contact with masonry and concrete until the concrete and mortar have attained a set and, in any event, not sooner than 12 hours after placing the masonry or concrete.

D. Discharge of Water: Dispose of water pumped or drained from the Work in a safe and suitable manner without damage to adjacent property or streets or to other work under construction.

E. Protection: Provide adequate protection for water discharged onto streets. Protect the street surface at the point of discharge.

F. Sanitary Sewers: Discharge no water into sanitary sewers.

G. Storm Sewers: Discharge no water containing settleable solids into storm sewers.

H. Repair: Promptly repair any and all damage caused by dewatering the Work.

END OF SECTION

SECTION 02223 – BEDDING AND BACKFILLING

PART 1 GENERAL

1.1 SUMMARY

A. General Requirements: Backfill all excavation to the original surface of the ground or to such other grades as may be shown or required. For areas to be covered by topsoil, leave or stop backfill (12) inches below the finished grade. Obtain approval for the time elapsing before backfilling against masonry structures. Remove from all backfill, any compressible or destructible rubbish and refuse and all lumber and braces from the excavated space before backfilling is started. Leave sheeting and bracing in place or remove as the work progresses.

B. Equipment Limitations: Do not permit construction equipment used to backfill to travel against and over cast-in-place concrete structures until the specified concrete strength has been obtained, as verified by concrete test cylinders. In special cases where conditions warrant, the above restriction may be modified providing the concrete has gained sufficient strength, as determined from test cylinders, to satisfy design requirements for the removal of forms and the application of load.

C. Related Work Specified In Other Sections Includes:

1. Section 02110 - Site Clearing
2. Section 02222 – Excavation – Earth and Rock

1.2 REFERENCES

A. Codes and standards referred to in this Section are:

1. ASTM D 1557 - Standard Test Methods for Moisture-Density Relations of Soil and Soil-Aggregate Mixtures Using 10 lb Rammer and 18 in Drop

PART 2 PRODUCTS

2.1 BACKFILL MATERIAL - GENERAL

A. General: Whenever trenches are in or across driveways, paved areas or streets, the Contractor shall be responsible for any settlement which occurs within one (1) year of preliminary acceptance. Backfill with sound materials, free from waste, organic matter, rubbish, boggy or other unsuitable materials. Acceptable backfill shall not contain rocks or stones larger than 2 inches in size.

B. General Materials Requirements: Conform materials used for backfilling to the requirements specified. Follow common fill requirements whenever drainage or select fill is not specified. Determine and obtain the approval of the appropriate test method where more than one compaction test method is specified.

C. Classification of Approved Embedment Materials: Embedment materials listed here include a number of processed materials plus the soil types defined according to the Unified Soil Classification System (USCS) in ASTM D2487. These materials are grouped into 5 broad categories according to their suitability for this application.

1. Class I: Angular, 0.25 inch to 1.5 inch (6 to 40 mm) graded stone, including a number of fill materials that have regional significance such as coral, slag, cinders, crushed shells and crushed stone. (Note: The size range and resulting high void ratio of Class I material makes it suitable for

use to dewater trenches during pipe installation. This permeable characteristic dictates that its use be limited to locations where pipe support will not be lost by migration of fine grained natural material from the trench walls and bottom or migration of other embedment materials into the Class I material. When such migration is possible, the material's minimum size range should be reduced to finer than 0.25 inch (6 mm) and the gradation properly designed to limit the size of the voids. An alternative to modifying the gradation is to use a geotextile fabric as a barrier to migration to fines.)

2. Class II: Coarse sands and gravels with maximum particle size of 1.5 inches (40 mm), including variously graded sands and gravels containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Soil Types GW, GP, SW and SP are included in this class. (Note: Sands and gravels, which are clean or borderline between clean and with fines, should be included. Coarse-grained soils with less than 12 percent, but more than 5 percent fines are neglected in ASTM D2487 and the USCS, but should be included. The gradation of Class II material influences its density and pipe support strength when loosely placed. The gradation of Class II material may be critical to the pipe support and stability of the foundation and embedment, if the material is imported and is not native to the trench excavation. A gradation other than well graded, such as uniformly graded or gap graded, may permit loss of support by migration into void spaces of a finer grained natural material from the trench wall and bottom. An alternative to modifying the gradation is to use a geotextile fabric as a barrier to migration of fines.)

3. Class III: Fine sand and clayey (clay filled) gravels, including fine sands, sand-clay mixtures and gravel-clay mixtures. Soil Types GM, GC, SM and SC are included in this class.

4. Class IV: Silt, silty clays and clays, including inorganic clays and silts of medium to high plasticity and liquid limits. Soil Types MH, ML, CH and CL are included in this class. (Note: Use caution in the design and selection of the degree and method of compaction for Class IV soils because of the difficulty in properly controlling the moisture content under field conditions. Some Class IV soils with medium to high plasticity and with liquid limits greater than 50 percent (CH, MH, CH-MH) exhibit reduced strength when wet and should only be used for bedding, haunching and initial backfill in arid locations where the pipe embedment will not be saturated by groundwater, rainfall or exfiltration from the pipe. Class IV soils with low to medium plasticity and with liquid limits lower than 50 percent (CL, ML, CL-ML) also require careful consideration in design and installation to control moisture content, but need not be restricted in use to arid locations.)

5. Class V: This class includes the organic soils OL, OH and PT as well as soils containing frozen earth, debris, rocks larger than 1.5 inches (40 mm) in diameter and other foreign materials. Do not use these materials for bedding, haunching or backfill.

2.2 SELECT BACKFILL

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

1. Allowed Materials: Grade select backfill between the following limits:

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

2. Unallowed Materials: Very fine sand, uniformly graded sands and gravels, sand and silt, soft earth, or other materials that have a tendency to flow under pressure when wet are unacceptable as select backfill.

2.3 COMMON ON-SITE BACKFILL

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

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

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

C. Cohesive Materials On-Site: Cohesive site material may be used as common fill.

1. The gradation requirements do not apply to cohesive common fill.

2. Use material having a liquid limit less than or equal to 40 and a plasticity index less than or equal to 20.

D. Material Approval: All material used as common fill is subject to approval. If there is insufficient on-site material, import whatever additional off-site material is required which conforms to the specifications and at no additional cost.

2.4 UTILITY PIPE BEDDING

A. Gradation for all Piping: Bedding material shall be FDOT No. 57 stone if below the seasonal low groundwater table; or FDOT No. 89 stone, FDOT No. 131 screenings, or No. 132 screenings if above the seasonal low groundwater table. Provide a minimum of 6 inches of bedding material under all piping.

PART 3 EXECUTION

3.1 PIPE BEDDING AND INITIAL BACKFILL

A. Placement: Place backfill for initial pipe backfill from top of bedding to 1 foot over top of pipes in uniform layers not greater than 8 inches in loose thickness. Tamp under pipe haunches and thoroughly compact in place the backfill with suitable mechanical or pneumatic tools to not less than 98 percent of the maximum dry density as determined by ASTM D 1557.

B. Foundation Bedding: Place bedding, to a depth specified by the City Manager or designee, as a foundation in wet, yielding or mucky locations. Construct foundation bedding by removal of the wet, yielding or mucky material and replacement with sufficient Class I material to correct soil instability.

C. Stone Placement: Do not place large stone fragments in the pipe bedding or backfill within 2 feet over or around pipelines, or nearer than 2 feet at any point from any casing pipe, conduit or concrete wall.

D. Machine Compaction: Machine Compaction of initial backfill is prohibited unless adequate cover as deemed by the City Manager or designee is provided. In no case shall adequate cover be less than 12 inches.

E. Unallowed Materials: Pipe bedding containing very fine sand, uniformly graded sands and gravels, sand and silt, soft earth, or other materials that have a tendency to flow under pressure when wet is unacceptable.

3.2 TRENCH BACKFILL

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

B. Materials: All backfill material shall be acceptable dry materials, and shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rocks, or stones, or other deleterious material which in the opinion of the City Manager or designee is unsuitable.

C. Depth of Placement - Place trench backfill in uniform layers not greater than 12 inches in loose thickness and that can be thoroughly compacted in place using suitable mechanical or pneumatic equipment to not less than 98 percent of the maximum dry density as determined by ASTM D 1557.

D. Depth of Placement - Undeveloped Areas: In nondeveloped areas and where select fill material or hand-placed backfill are not specified or required, place suitable job-excavated material or other approved backfill in lifts not exceeding 12 inches in loose thickness. Lifts of greater thickness may be permitted by the City Manager or designee if the CONTRACTOR demonstrates compliance with required densities. When the trench is full, consolidate the backfill by jetting,

spading, or tamping to ensure complete filling of the excavation. Mound the top of the trench approximately 12 inches to allow for consolidation of backfill.

E. Compaction: Compact backfill as a percentage of the maximum density at optimum moisture content as determined by the standard proctor test, ASTM D698 as demonstrated in the following table:

Area	(Mod.) ASTM D1557
Around and 1' (Min) above top of pipe	98
Remaining Trench	98
Pavement Sub-Grade and Shoulders (Last 3' of Fill)	98
Base Material and Pavement	98
Adjacent to Structures (Areas not Paved)	98
Under Structures	98
Sub-Base	98

F. Density Tests: Density tests will be made at the request of the City Manager or designee. Deficiencies will be corrected at the expense of the CONTRACTOR.

G. Dropping of Material on Work: Do trench backfilling work in such a way as to prevent dropping material directly on top of any conduit or pipe through any great vertical distance.

H. Distribution of Large Materials: Break lumps up and distribute any stones, pieces of crushed rock or lumps which cannot be readily broken up, throughout the mass so that all interstices are solidly filled with fine material.

3.3 STRUCTURE BACKFILL

A. Use crushed stone underneath all structures, and adjacent to structures where pipes, connections and structural foundations are to be located within this fill. Use crushed stone beneath all pavements, walkways, and railroad tracks, and extend to the bottom of pavement base course or ballast.

1. Place backfill in uniform layers not greater than 8 inches in loose thickness and thoroughly compact in place with suitable approved mechanical or pneumatic equipment.

2. Compact backfill to not less than 95 percent of the maximum dry density as determined by ASTM D 1557.

B. Use of Common Fill: Use common granular fill adjacent to structures in all areas not specified above. Select fill may be used in place of common granular fill at no additional cost.

1. Extend such backfill from the bottom of the excavation or top of bedding to the bottom of subgrade for lawns or lawn replacement, the top of previously existing ground surface or to such other grades as may be shown or required.

2. Place backfill in uniform layers not greater than 8 inches in loose thickness and thoroughly compact in place with suitable equipment, as specified above.

3. Compact backfill to not less than 90 percent of the maximum dry density as determined by ASTM D 1557.

3.4 COMPACTION EQUIPMENT

A. Equipment and Methods: Carry out all compaction with suitable approved equipment and methods.

1. Compact clay and other cohesive material with sheep's-foot rollers or similar equipment where practicable. Use hand held pneumatic tampers elsewhere for compaction of cohesive fill material.

2. Compact low cohesive soils with pneumatic-tire rollers or large vibratory equipment where practicable. Use small vibratory equipment elsewhere for compaction of cohesionless fill material.

3. Do not use heavy compaction equipment over pipelines or other structures, unless the depth of fill is sufficient to adequately distribute the load.

3.5 FINISH GRADING

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

1. Leave all finished grading surfaces smooth and firm to drain.

2. Bring finish grades to elevations within plus or minus 0.10 foot of elevations or contours shown.

B. Surface Drainage: Perform grading outside of building or structure lines in a manner to prevent accumulation of water within the area. Where necessary or where shown, extend finish grading to ensure that water will be carried to drainage ditches, and the site area left smooth and free from depressions holding water.

3.6 RESPONSIBILITY FOR AFTER SETTLEMENT

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

3.7 INSPECTION AND TESTING OF BACKFILLING

A. Sampling and Testing: Provide sampling, testing, and laboratory methods in accordance with the appropriate ASTM Standard Specification. Subject all backfill to these tests.

B. Correction of Work: Correct any areas of unsatisfactory compaction by removal and replacement, or by scarifying, aerating or sprinkling as needed and recompaction in place prior to placement of a new lift.

C. Testing Schedule:

1. Compaction Schedule

2. Optimum Moisture Content (Proctor Test)

END OF SECTION

SECTION 02250 - DREDGING

PART 1 GENERAL

1.1 DESCRIPTION:

A. The work of this Section consists of furnishing all labor, equipment, supplies, and materials necessary for the proper dredging, treatment, placement and handling of dredging material required by the Contract Documents.

1. SECTION 01010 Summary of Work
2. SECTION 01500 Construction Facilities and Temporary Controls
3. SECTION 02110 Site Clearing
4. SECTION 02222 Excavation – Earth and Rock
5. SECTION 02275 NPDES Requirements
6. SECTION 02276 Erosion and Sediment Control

1.2 MATERIAL TO BE REMOVED:

A. Lake 11 material to be removed is generally comprised of filamentous algae and vegetation debris (leaves, twigs and alike) in the north portion of the Lake. The sediment also had some leaves and filamentous algae (which turned black) in the north portion of the Lake as well as some fibrous peat in it. The sediment was very dark and appeared to be organic rich with often some sand in it. The sediment was highly heterogenous at some locations in both thickness and strata characteristics. The sediment was most often sitting on a layer of sand of various grain size but mostly fine sand of various tints. Spatially, there is more floc from north to south but with less floc in the canal connecting lake 11 to 31. The sediment thickness shows roughly the same trend as for the floc but with especially less sediment on the center east of the pond as well as in its upper north portion. The canal had little sediment whilst the mouth of it had more. Lake 31 had minor sediment accumulation which consisted of vegetation debris and, when available, the sediment also held not well decomposed leafy materials. Fine sand was underlying the sediment at all sites.

B. Lake 19 material to be removed is generally comprised of filamentous algae and vegetation debris (leaves, twigs and alike) in the central portion of the Lake. The sediment also had some leaves and filamentous algae (which turned black) in the Lake as well as some fibrous peat in it. The sediment was very dark and appeared to be organic rich with often some sand in it. The sediment was highly heterogenous at some locations in both thickness and strata characteristics. The sediment was most often sitting on a layer of sand of various grain size but mostly fine sand of various tints. Fine sand was underlying the sediment at all sites.

The physical and chemical results for each of the Lakes are included within sediment assessment reports completed by Florida Gulf Coast University.

1.3 ARTIFICIAL OBSTRUCTIONS:

A. The CONTRACTOR shall identify all existing utilities on site before construction commencement to ensure no impacts.

1.4 QUANTITY OF MATERIAL:

A. The Contractor shall independently estimate the quantities necessary to be removed based on the proposed Drawings provided and Contractor site investigation of existing conditions. An initial estimate shown on the plans are based on limited soil borings, however this figure should be used as guidance only, actual volume determination will be the responsibility of the Contractor.

1.5 PERMIT:

A. The Contractor shall comply with all permit conditions. The City shall provide the permits for dredging and disposal of material.

1.6 ENVIRONMENTAL PROTECTION REQUIREMENTS:

A. The Contractor shall provide and maintain during the life of the contract, all necessary environmental protective measures. Additionally, the Contractor shall provide environmental protective measures required to correct unforeseen environmentally hazardous conditions that occur during the dredging operations. The Contractor will comply with Federal, State, and local regulations pertaining to water, air, and noise pollution. The Contractor will be responsible for implementing erosion and pollution control devices and practices, as specified in SECTION 01500 Construction Facilities and Temporary Controls, SECTION 02276 Erosion and Sediment Control, the Drawings and the Permit Documents.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 INSPECTION:

A. The Contractor shall inspect the work, keep records of work performed, and ensure that gages, targets, ranges, and other markers are in place and usable for the intended purpose. Furnish, at the request of the City, boats, boatmen, laborers, and materials necessary for inspecting, supervising, and surveying the work. When required, the Contractor shall provide transportation for the City and inspectors between the dredge and adjacent points on shore.

3.2 CONDUCT OF DREDGING WORK:

A. Order of Work

1. The Contractor will direct the sequence of the work as specified and shown on the Drawings or SECTION 01010 Summary of Work. The City reserves the right to change the order of work at any time.

B. Compensation for Interruption of Operations

1. There will be no compensation to the Contractor for interruption of operations due to expected and/or unforeseen occurrences. Expected interruption of operations that should be taken into account during the bid process include the halting of operations due to sediment dewatering area size restrictions, which would effectively limit the amount of dredge material removed at any given time.

C. Ranges, Gages, and Lines

1. The Contractor shall furnish, set, and maintain ranges, buoys, and markers needed to define the work and to facilitate inspection. Establish and maintain gages in locations observable from each part of the work so that the depth may be determined. Suspend dredging when the gages or

ranges cannot be seen or followed. The City will furnish, upon request by the Contractor, survey lines, points and elevations necessary for the setting of ranges, gages and buoys.

D. Dredge Equipment

1. The Contractor shall utilize hydraulic and mechanical dredge equipment to remove the muck and sand deposits to elevations shown on the drawings. The Contractor shall be aware that pumping rate may be constrained by the sediment dewatering rate, sediment dewatering area and polymer dosing equipment, and shall implement the appropriate equipment accordingly.

2. The Contractor shall maintain the plant, scows, coamings, barges, pipelines, and associated equipment to meet the requirements of the work. Immediately repair leaks or breaks along pipelines. Immediately remove dredged material discharged in wetlands or other areas outside of the identified project area due to leaks and breaks. Removal of material shall bring the impacted area back to original condition and shall be conducted at Contractor's expense. Operations shall be immediately halted if a pipeline breaks or a leak occurs.

3. Except where authorized in the plans and specifications, dredge pipelines or open ditches shall not block roads or rights of way or otherwise interfere with access unless approved.

E. Polymer

1. The Contractor is required to use the chemical amendment, Flopam C-6267 and A-6350or equivalent, specified in the Drawings

2. The Contractor shall submit evidence and references from at least three projects in which the Contractor has successfully implemented and operated a cationic polymer dosing system to provide water quality treatment of dredge material. Project descriptions shall include total volume of sediment removed, type of sediment removed, type of polymer used, type and operation of the dosing equipment and Contractor's qualified chemical amendment personnel. A list of any difficulties encountered in the project and resolutions shall also be included. Submit project description, client project managers and qualified employee overseeing the application with the bid. If past experience cannot be adequately demonstrated, the Contractor shall hire, at the expense of the Contractor, a qualified chemical amendment technician to be on-site at all times of dredge operation. Qualifications and references of requirements of said technician shall be the same as previously described.

3. The Contractor is responsible for installing and operating polymer mixing and dosing equipment that is capable of delivering a constant feed of polymer to the dredge transfer line when dredge material is being pumped. Mixing and dosing equipment must operate according to the following manufacturer specifications (also included in the Drawings and Permit Documents):

F. Dewatering of Excavated Material

1. The Contractor shall utilize woven geotextile filter bags (US #50 Sieve Pore Size or equivalent) for sediment dewatering purposes. Geotextile filter bags shall be housed in temporary, portable containers that can be hauled to and from the temporary dewatering area on a daily basis. The Contractor may choose a geotextile filter bag size and/or a portable container size that is different from the Design Engineer's recommendation of a 20 CY capacity for each, however final hauling weight of each load (load = sediment + truck + trailer) is not to exceed Florida Highway Patrol – Office of Commercial Vehicle Enforcement Manual, Eight Edition, Dated April 2013, maximum single axle weight of 22,000 lbs. The contractor is responsible for preparing and providing the City for approval a hauling plan that follows all weight limits along the approved hauling alignment.

2. The Contractor shall allow each geotextile filter bag to dewater within the designated temporary dewatering basin until an approximately 40 percent solids has been reached or a final gross haul weight of 22,000 lbs/axle, whichever is less.

G. Disposal of Excavated Material

1. The Contractor shall provide for safe transportation and disposal of dredged materials according to specifications and guidelines set forth in the Drawings and Permit Document. The deposit of dredged materials in unauthorized places is forbidden. Spoil material inadvertently spilled on roads, public rights of way and private property shall be promptly removed and the area restored by the Contractor.

H. Method of Communication

1. The Contractor shall provide a system of communication between the dredge crew and the crew at the dewatering area at all times. A portable two-way radio is acceptable.

I. Safety of Structures

1. The prosecution of the work shall ensure the stability subaqueous utility crossings, buried and overhead utilities, parallel runs, utility poles and lines, guys and anchors, culverts, pipes and other structures or trees and vegetation or existing slope protection lying on or adjacent to the site of the work, insofar as structures may be jeopardized by dredging operations. The Contractor shall be responsible for repair of damage resulting from construction operations, insofar as such damage may be caused by variation in locations or depth of dredging, or both, from that indicated or permitted under the contract or pipelines spraying.

J. Plant Removal

1. Upon completion of the work, promptly remove the plant, including ranges, buoys, piles, silt screens or silt barriers, rope, line, cable and artificial anchors, signage and other markers or obstructions and return the site to its original condition.

3.3 MEASUREMENT:

A. Surveys during Progress of Work

1. Preliminary checks of design depth will be determined by soundings or sweepings taken behind the dredge as the work progresses. The Contractor shall take progress soundings or sweepings to verify compliance with contract requirements.

2. Contract Depth will be confirmed via bathymetric survey after conclusion of each zone. The bathymetric survey shall be signed and sealed by a Florida Registered Professional Surveyor and follow all guidelines set by the City.

B. Monthly Estimates

1. Monthly estimates of work completed will be based on the result of soundings taken during the progress of the work. Deductions will be made for dredging and disposal not in accordance with the specifications.

3.4 FINAL EXAMINATION AND ACCEPTANCE:

A. On completion of dredging of a section or an area, the Contractor shall engage a licensed surveyor to provide as-built cross sections to provide certified drawings of the section. Cross sections shall be taken at the same locations used for the contract unless specified otherwise. The City may take additional cross sections and soundings as necessary. The Contractor shall provide to the City signed and sealed certified as-built drawings indicating the existing cross section superimposed on the dredged cross sections as the final submittal, with a plus or minus 2" tolerance between the cross sections. Signed and Sealed as-built cross sections of the re-sloped shoreline shall also be provided.

END OF SECTION

SECTION 02275 – NPDES REQUIREMENTS

PART 1 GENERAL

1.1 DESCRIPTION

A. This Section describes the required documentation to be prepared and signed by the CONTRACTOR before conducting construction operations, in accordance with the terms and conditions of the National Pollutant Discharge Elimination System (NPDES) Stormwater Permit, as required by Florida Administrative Code (F.A.C.) Chapter 62-621.

B. The CONTRACTOR shall be responsible for implementation, maintenance and inspection of stormwater pollution prevention control measures in accordance with F.A.C. Chapter 62-621 including, but not limited to, erosion and sediment control, stormwater management plans, waste collection and disposal, off-site vehicle tracking, and other practices shown on the Drawings and/or specified elsewhere in this or other specifications. The stormwater pollution prevention control measures shall include protection of offsite public and private storm sewer facilities potentially impacted during construction. Stormwater facilities include streets, inlets, pipes, ditches, swales, canals, culverts, control structures, and detention/retention areas.

C. The CONTRACTOR shall prepare and review implementation of the Stormwater Pollution Prevention Plan (SWPPP) in a meeting with the City Manager or designee prior to start of construction.

1.2 UNIT PRICES

A. Unless indicated in the Unit Price Schedule as a pay item, no separate payment will be made for work performed under this Section. Include cost of work to be performed under this Section in pay items of which this work is a component.

1.3 REFERENCE DOCUMENTS

A. ASTM D3786 – Standard Test Method for Hydraulic Bursting Strength for Knitted Goods and Nonwoven Fabrics

B. ASTM D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 NOTICE OF INTENT (NOI)

A. Fill out, sign and date a Notice of Intent to Use Generic Permit for Stormwater Discharge from Large and Small Construction Activities, (FDEP Form 62-621.300(4)(b)). Submit the signed copy of the NOI to the City Manager or designee. The City Manager or designee will submit the completed form to the FDEP along with the required permit fee.

3.2 CERTIFICATION REQUIREMENTS

A. On the attached OPERATOR'S INFORMATION form, fill out the name, address and telephone number for the CONTRACTOR, persons or firms responsible for maintenance and inspection of erosion and sediment control measures, and all Subcontractors.

B. The CONTRACTOR and Subcontractors named in the Operator's Information form shall read, sign and date the attached CONTRACTOR'S/SUBCONTRACTOR'S CERTIFICATION form.

C. The persons or firms responsible for maintenance and inspection of erosion and sediment control measures shall read, sign and date the attached EROSION CONTROL CONTRACTOR'S INSPECTION AND MAINTENANCE CERTIFICATION form.

D. Submit all forms to the City Manager or designee before beginning construction.

3.3 RETENTION OF RECORDS

A. Retain a copy of the SWPPP at the construction site and at the Contractor's office from the date that it became effective to the date of project completion.

B. At project closeout, submit to the City Manager or designee all NPDES forms and certifications, as well as a copy of the SWPPP. Stormwater pollution prevention records will be retained by the City Manager or designee for a period of three (3) years from the date of project completion.

3.4 REQUIRED NOTICES

A. The following notices shall be posted from the date that the SWPPP goes into effect until the date of final site stabilization:

1. A copy of the submitted NOI and a brief project description, as given in the SWPPP, shall be posted at the construction site and at the CONTRACTOR's office in a prominent place for public viewing.

2. Notice to drivers of equipment and vehicles, instructing them to stop, check and clean tires of debris and mud before driving onto traffic lanes. Post such notices at every stabilized construction exit area.

3. Post a notice of waste disposal procedures in an easily visible location on site.

4. Notice of hazardous material handling and emergency procedures shall be posted with the NOI on site. Keep copies of Material Safety Data Sheets at a location on site that is known to all personnel.

5. Keep a copy of each signed certification at the construction site and at the CONTRACTOR's office.

REQUIRED FORMS FOLLOW

OPERATOR'S INFORMATION

Owner's Name and Address: City Utilities Department

380 Riverside Circle
Naples, Florida 34102
(239) 213-4717

Contractors' Names and Addresses:

General Contractor: _____

Telephone: _____

Site Superintendent: _____

Telephone: _____

Erosion Control and Maintenance Inspection: _____

Telephone: _____

Subcontractors' Names and Addresses:

_____ _____

Phone: _____ Phone: _____

CONTRACTOR'S / SUBCONTRACTOR'S CERTIFICATION

I certify under penalty of law that I understand the terms and conditions of Florida's National Pollutant Discharge Elimination System (NPDES) Construction General Permit that authorizes storm water discharges associated with activity from the construction site identified as part of this certification, and that I have received a copy of the SWPPP.

Signature: _____

Name: (printed or typed)

Title: _____

Company: _____

Address: _____

Signature: _____

Name: (printed or typed)

Title: _____

Company: _____

Address: _____

Signature: _____

Name: (printed or typed)

Title: _____

Company: _____

Address: _____

EROSION CONTROL CONTRACTOR'S
INSPECTION AND MAINTENANCE CERTIFICATION

I certify under penalty of law that I understand the terms and conditions of Florida's National Pollutant Discharge Elimination System (NPDES) Construction General Permit that authorizes storm water discharges associated with activity from the construction site identified as part of this certification, and that I have received a copy of the SWPPP.
.

Signature: _____

Name: (printed or typed)

Title: _____

Company: _____

Address: _____

_____

Date: _____

STORM WATER POLLUTION PREVENTION PLAN
INSPECTION AND MAINTENANCE REPORT

Project: _____

Contractor: _____

Inspector: _____

Date: _____

CONTROLS	LOCATION	SEDIMENT HEIGHT	PROBLEM DESCRIPTION	MAINTENANCE REQUIRED	REPAIRED BY / DATE

END OF SECTION

SECTION 02276 – EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.1 DESCRIPTION

A. The work specified in this Section consists of designing, providing, maintaining and removing temporary erosion and sedimentation controls as necessary. The Contractor shall exercise extreme care to minimize contamination of rainfall run-off from the site. All necessary provisions and care shall be taken to insure compliance with the Water Quality Standards of the State of Florida, more particularly the South Florida Water Management District (SFWMD). The Contractor shall make himself familiar with Chapter 17-3, "Water Quality Standards," of the Florida Administrative Code (F.A.C.). Compliance for protection of State Waters and/or jurisdictional areas require the use of hay bales, temporary swales, settling ponds, silt screens, and other appropriate methods as necessary to prevent soils and sediment from entering such areas. Prior to commencement of work, the Contractor shall submit a plan of action and a list of materials he plans to use for sedimentation/erosion control to the City for approval.

B. Temporary sedimentation controls include, but are not limited to; silt fence, floating turbidity barriers, hay bales, public and private on- and off-site storm sewer inlets protectors, and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by the CITY.

C. If required by regulation or CITY, CONTRACTOR is responsible for providing an approved Erosion Control Plan for effective temporary erosion and sediment control measures during construction or until final controls become effective.

1.2 REFERENCE DOCUMENTS

A. South Florida Building Code and Standard Building Code.

PART 2 PRODUCTS

2.1 EROSION CONTROL

A. Sodding and Seeding is specified in Section 02400.
B. Rip Rap Apron
C. Road Stabilization.

2.2 SEDIMENTATION CONTROL

A. Floating Turbidity Barriers
B. Sediment Fence.
C. Bales - clean, seed free pine needle or cereal hay type.

PART 3 EXECUTION

3.1 EROSION CONTROL

A. Minimum procedures for grassing are:

1. Scarify slopes to a depth of not less than six inches and remove large clods, rock, stumps, roots larger than 1/2 inch in diameter and debris.

2. Sow seed within twenty-four (24) hours after the ground is scarified with either mechanical seed drills or rotary hand seeders.

3. Apply mulch loosely and to a thickness of between 3/4 inch and 1-1/2 inches.

4. Apply netting over mulched areas on sloped surfaces.

5. Roll and water seeded areas in a manner which will encourage sprouting of seeds and growing of grass. Reseed areas that exhibit unsatisfactory growth (less than 70 percent coverage). Backfill and seed eroded areas, removing eroded material from effected drainage facilities.

B. Minimum procedures for rip rap aprons are:

1. Clear the foundation of all trees, stumps, and roots.

2. Install extra strength filter fabric on the bottom and sides of the channel foundation, placing the upstream fabric over the downstream fabric with at least a 1 foot overlap on all joints. The fabric is to be securely held in place with metal pins.

3. Place riprap evenly to the lines and grades shown on the drawings and staked in the field. Place riprap immediately following the installation of the filter fabric.

4. Riprap shall meet the specification for FDOT Class 2 Riprap.

5. Restore all disturbed areas in accordance with a vegetation plan submitted in advance and approved by the City Manager or designee.

C. Minimum Procedures for road stabilization are:

1. Clear roadbed and parking areas of all vegetation, roots and other objectionable material.

2. Provide surface drainage.

3. Spread 6 inch course of lime rock evenly over the full width of road and parking area and smooth to avoid depressions.

4. After grading, seed or resod all disturbed areas adjoining roads and parking areas conforming to existing conditions prior to construction.

3.2 SEDIMENTATION CONTROL

A. Install and maintain silt dams, traps, barriers, and appurtenances as required. Replace deteriorated hay bales and dislodged filter stone.

B. Minimum requirements for sediment fence:

1. Construct sediment fence on low side of topsoil stockpile to prevent sediment from being washed into the drainage system. Fence to extend around approximately 70 percent of the perimeter of the stockpile. Fence must be unobstructed so as to maintain a minimum of 75 percent of its design flow rate.

2. Locate posts down slope of fabric to help support fencing.

3. Bury toe of fence approximately 8 inches deep to prevent undercutting.

4. When joints are necessary, securely fasten the fabric at a support post with overlap to the next post.

5. Filter fabric shall be of nylon, polyester, propylene or ethylene yarn with extra strength – 50 pounds per linear inch (minimum) - and with a flow rate of at least 0.30 gallons per foot per minute. Fabric should contain ultraviolet ray inhibitors and stabilizers.

C. Minimum Requirement for stormwater facilities protection

1. Public and private storm sewer facilities, both on and offsite shall be protected at all inlets affected by construction. Storm sewer facilities include streets, inlets, pipes, ditches, swales, canals, culverts, control structures, and detention/retention areas.

2. Grated drop inlets shall be wrapped with filter fabric in a manner that allows removal of accumulated sediment from the fabric before removing the grate.

3. Curb inlets shall be protected from sediment, turbid water from stormwater or dewatering activities; also construction debris, concrete mix and rinsate, and any other pollution.

4. Stormwater runoff entering such storm sewer inlets and stormwater detention/retention facilities with a turbidity greater than 50 NTU shall be considered to be in non-compliance with these regulations.

3.3 PERFORMANCE

A. Should any of the temporary erosion and sediment control measures employed fail to produce results which comply with the requirements of the State of Florida, immediately take steps necessary to correct the deficiency at no expense to the CITY. Sedimentation or turbid water violations to stormwater facilities on or offsite shall require the contractor to remove all sediment from the affected facilities.

END OF SECTION

SECTION 02370 – RIPRAP SYSTEM

PART 1 – GENERAL

1.1 SCOPE:

A. Summary of Work: The CONTRACTOR shall provide all labor, materials, and equipment necessary for the construction of riprap systems for the mitered end sections as indicated in the construction drawings. All material must be prewashed and clean from metals, concrete and fines.

1.2 APPLICABLE PUBLICATIONS: The following standard specification shall apply to the work of this section:

A. Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition, (FDOT)

1.3 SUBMITTALS:. The CONTRACTOR shall furnish testing certificates from either the pit of the rock source or a quality testing agency prior to acceptance of the rock source to verify the conformity to the requirements.

A. Filter Fabric: The CONTRACTOR shall submit manufacturer's data for filter fabric demonstrating compliance with specified material properties, and including manufacturer's recommendations for storage, handling, installation, and anchoring fabric.

PART 2 - MATERIALS

2.1 The CONTRACTOR has the option of using either limestone or natural stone for the rock riprap as long as the selected stone meets the size requirements. All stone used shall be pre-washed, and free from organic material, dirt, clay, sand, rock fines, metals and other materials not meeting the gradation limits.

2.2 RIPRAP - Limestone: The CONTRACTOR shall furnish stone for riprap (gradation B and C only) that shall be limestone, and shall be sound, durable and angular in shape. No more than 10% of the stone for any gradation shall have an elongation (ratio of greatest dimension to least dimension) greater than 3:1, and no stone shall have an elongation greater than 4:1. The riprap material shall conform to the following additional requirements.

2.3 RIPRAP – Local Native Stone: The CONTRACTOR shall provide local native stones for riprap from other sources. The native stone riprap shall be durable stones graded to provide a dense mass. Native stone riprap shall conform to the following requirements.

A. Local Native stones for riprap shall be graded in size to produce a dense mass. Riprap shall consist of dense, natural rock fragments. Stones shall be resistant to weathering and to water action; free from overburden, spoil, shale and organic material; and shall meet the gradation requirements below. Shale and stones with shale seams are not acceptable.

B. The greatest dimension of 50 percent of the stones shall be at least two-thirds but not more than 1-1/2 times the diameter of the average size. Neither the breadth nor thickness of any piece of riprap shall be less than one-third its length. Material shall be of shapes that will form a stable protection structure of required depth. Rounded boulders or cobbles shall not be used.

C. The acceptability of the stones will be determined by the CITY'S representative prior to placement.

2.4 FILTER FABRIC: The CONTRACTOR shall provide and install filter fabric conforming to the requirements of FDOT Section 985 for riprap filter.

PART 3 - PERFORMANCE

3.1 FIELD QUALITY CONTROL:

A. Field control of riprap gradation will be by visual inspection. Arriving loads not meeting specifications will be rejected.

B. Material shall be placed not dropped to minimize impacts to the filter fabric.

3.2 SUBGRADE PREPARATION:

A. Dry Installation: The CONTRACTOR shall prepare the subgrade to the lines, slopes and elevations indicated. The CONTRACTOR shall clear the subgrade of sticks, stones, debris and other materials that could puncture the overlying filter fabric. The finished subgrade shall not vary from design grade by more than 2" at any location.

3.3 FILTER FABRIC: The CONTRACTOR shall provide and install filter fabric in accordance with the requirements of FDOT Section 514. Filter fabric shall be placed only on subgrade approved by the CITY'S representative.

3.4 GRANULAR BEDDING: The CONTRACTOR shall place bedding material beneath those areas to receive gradation C riprap, to a nominal depth of six inches.

A. Bedding material shall be spread uniformly over filter fabric material. Placement shall not commence until the CITY has approved subgrade preparation and filter fabric installation.

B. Placement methods, which segregate the bedding particles, will not be permitted.

C. Compaction of the bedding material will not be required, but material shall be finished to a reasonably even surface.

D. Tolerance shall be + three-tenths foot provided this tolerance is not continuous over an area greater than 200 square feet when placed in the dry, or greater than 400 square feet when placed sub aqueous.

E. CONTRACTOR shall maintain the bedding material until the riprap is in place.

3.5 RIPRAP: The CONTRACTOR shall proceed placing the riprap upon completion of filter fabric and bedding material (where required) and after receiving approval of the CITY'S representative to proceed. The CONTRACTOR shall place riprap in accordance with the following.

A. Stone shall be placed in such a manner as to produce a reasonably well-graded mass with the minimum practicable percentage of voids.

1. Place to full course thickness in one operation in a manner to avoid displacing or puncturing filter fabric.

    a. Stone shall not be dropped from a height greater than two feet above the fabric.

2. Finished riprap shall not be free from objectionable pockets of small stones and clusters of larger stones. Hand place or adjust if necessary to secure the desired results.

B. Surface Tolerances:

1. Dry Installation: The finished stone surface shall not vary from design grade by more than three inches at any location, except that any extreme of the tolerance shall not be continuous over an area greater than 100 square feet.

3.6 MAINTENANCE: The CONTRACTOR shall maintain riprap until the project is completed. The CONTRACTOR shall replace riprap displaced by any cause prior to completion of work.

3.7 REMOVAL: The CONTRACTOR shall remove all riprap and filter fabric utilized for temporary purposes, such as flow attenuation from the discharge area, upon completion of the project

END OF SECTION

SECTION 02400 – RESTORATION BY SODDING OR SEEDING

PART 1 GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. The work in this section consists of furnishing all labor, material and equipment to restore all areas disturbed during construction to match preconstruction conditions. Establish a stand of grass within the areas disturbed by furnishing and placing grass sod where required, or by seeding and mulching areas not requiring sod.

1.2 REFERENCE DOCUMENTS

A. Use materials conforming to the requirements of Florida Department of Transportation Standard Specifications for Road and Bridge Construction as follows:

1. Section 570 – Grassing (by Seeding)
2. Section 575 – Sodding
3. Section 981 – Grassing and Sodding Materials
4. Section 982 – Commercial Fertilizer
5. Section 983 – Water for Grassing

1.3 SUBMITTALS

A. Submit certifications and identification labels for all sodding supplied in accordance with General Conditions.

PART 2 PRODUCTS

2.1 SODDING

A. Types: Sod may be of either St. Augustine or Argentine Bahia grass or as that disturbed, as established prior to construction. Use well matted sod with roots. When replacing sod in areas that are already sodded, use sod of the same type as the existing sod.

B. Provide sod as required in accordance with Florida Department of Transportation Specifications 575 and 981. Furnish sod equal to and similar in type as that disturbed. Place and water in accordance with FDOT Specifications Section 575.

C. Use sod in commercial-size rectangles, preferably 12-inch by 24-inch or larger, except where 6-inch strip sodding is called for.

D. Use sod that is sufficiently thick to secure a dense stand of live grass. Use sod that is live, fresh and uninjured at the time of planting, having a soil mat of sufficient thickness adhering firmly to the roots to withstand all necessary handling. It shall be reasonably free of weeds and other grasses. Plant sod as soon as possible after being dug, and shade and keep moist from the time it is dug until it is planted.

E. Handle sod in a manner to prevent breaking or other damage. Do not handle by dumping from trucks or other vehicles. Use care at all times to retain the native soil on the roots of each sod roll during stripping and handling. Sod that has been damaged by handling during delivery, storage or installation will be rejected.

F. Swales: Place sod to the proper grade and cross section in all flow areas to ensure the design flow of water in the ditch. In excavating for the placement of sod, provide a minimum of 3 inches of undercut.

2.2 FERTILIZER

A. Supply chemical fertilizer in suitable bags with the net weight certification of the shipment. Fertilizer shall be 12-8-8 and comply with Section 982 of the FDOT Standard Specification for Road and Bridge Construction.

B. The numerical designations for fertilizer indicate the minimum percentages (respectively) of (1) total nitrogen, (2) available phosphoric acid and (3) water soluble potash, contained in the fertilizer.

C. The chemical designation of the fertilizer shall be 12-8-8, with at least 50 percent of the nitrogen from a nonwater-soluble organic source. The nitrogen source may be a unreaformaldehyde source provided it is not derived from a waste product of the plastic industry.

2.3 EQUIPMENT

A. Spread fertilizer uniformly at the specified rate.

2.4 SEEDING

A. Seed all unpaved areas disturbed during construction that do not require sod. Complete all seeding in conformance with FDOT Specifications Sections 570 and 981. Mulch and fertilize the grassed areas shall be mulched and fertilized in accordance with FDOT Specifications.

B. Provide mulch material free of weeds. Mulch shall be oat straw or rye, Pangola, peanut, Coastal Bermuda, or Bahia grass hay.

C. All seeds must have been tested within 6 months of planting. Submit a seed bag tag with final payment requests from each type or mixture of seed used. Seed mixtures shall be chosen to insure the development of the planting during the season or planting, and to insure future growth and permanence.

2.5 TOPSOIL

A. Topsoil stockpiled during excavation may be used. If additional topsoil is required to replace topsoil removed during construction, it shall be obtained off site at no additional cost to the CITY. Topsoil shall be fertile, natural surface soil, capable of producing all trees, plants, and grassing specified herein.

2.6 MULCH

A. Furnish small grain straw mulch. Apply mulch at a rate of 1.5 tons per acre, corresponding to a depth not less than 1-inch or more than 3-inches according to texture and moisture content of mulch material. Apply asphalt emulsion at a rate of 150 gallons per ton of straw to anchor the straw applied.

2.7 WATER

A. It is the CONTRACTOR'S responsibility to supply all water to the site, as required during seeding and sodding operations and through the maintenance period and until the work is accepted. Make whatever arrangements may be necessary to ensure an adequate supply of water to meet the

needs for the work. Furnish all necessary hose, equipment, attachments, and accessories for the adequate irrigation of lawns and planted areas as may be required. Water shall be suitable for irrigation and free from ingredients harmful to plant life.

2.8 SOIL IMPROVEMENTS

A. Apply lime at the rate of 1 to 1.5 tons per acre. Apply 10-10-10 commercial fertilizer at the rate of 800 pounds per acre and work well into the top inch of topsoil.

PART 3 EXECUTION

3.1 SOD BED PREPARATION

A. Clear areas to be sodded and/or seeded of all rough grass, weeds, and debris, and bring soil to an even grade.

B. Thoroughly till soil to a minimum 4-inch depth.

C. Bring area to proper grade, free of sticks, stones, or other foreign matter over 1- inch in diameter or dimension. The surface shall conform to finish grade, less the thickness of sod, free of water-retaining depressions, the soil friable and of uniformly firm texture.

3.2 INSPECTION

A. Verify that soil preparation and related preceding work has been completed.
B. Do not start work until conditions are satisfactory.

3.3 SOD HANDLING AND INSTALLATION

A. During delivery, prior to planting, and during the planting of sod areas, protect the sod panels at all times from excessive drying and unnecessary exposure of the roots to the sun. Stack sod during construction and planting so as not to be damaged by sweating or excessive heat and moisture.

B. After completion of soil conditioning as specified above, lay sod panels tightly together so as to make a solid sodded lawn area. On mounds and other slopes, the long dimension of the sod shall be laid perpendicular to the slope. Immediately following sod laying, roll the lawn areas with a lawn roller customarily used for such purposes, and then thoroughly water.

C. Place sod at all areas where sod existed prior to construction, on slopes of 3 horizontal to 1 vertical (3:1) or greater, in areas where erosion of soils will occur, and as directed by the ENGINEER. On areas where the sod may slide, due to height and slope, the ENGINEER may direct that the sod be pegged, with pegs driven through the sod blocks into firm earth, at suitable intervals.

3.4 SOD MAINTENANCE

A. The sod shall produce a dense, well-established growth. Repair and re-sod all eroded or bare spots until project acceptance. Repair to sodding shall be accomplished as in the original work.

B. Perform sufficient watering to maintain adequate moisture for optimum development of the seeded and sodded areas, and no less than 1.5 inches of water per week for at least 2 weeks.

Thereafter, apply water for a minimum of 60 days as needed until the sod takes root and starts to grow or until final acceptance, whichever is latest.

3.5 GUARANTEE

A. Guarantee a live and vigorous stand of permanent grass at the time of acceptance of the work consisting of 80 percent minimum coverage for seeded grass areas with no bare spots greater than 5 square feet.

3.6 CLEANING

A. Remove debris and excess materials from the project site.

END OF SECTION

SECTION 02513 – PERVIOUS PAVMENT

PART 1 GENERAL

1.1 SUMMARY

A. This specification provides requirements for the construction of porous asphalt sidewalk.

1. In case the requirements of this specification conflict with the contract documents, this document shall govern.

1.2 DESCRIPTION OF WORK

A. 8’ Wide 3” Thick Open Graded Porous Asphalt Mix

B. 12’ Wide 3” Thick Bedding Course No 57 Stone

C. 12’ Wide 6” Thick Subbase Course No 2 Stone

D. Non Woven Geotextile Fabric

E. 2- 2’ Wide 3” Thick Unpaved No 57 Stone Edge for overflow drainage

1.3 QUALITY ASSURANCE

A. The Contractor shall provide process control and/or QC test results to the Engineer or the Engineer’s designee. The QC plan may be altered at the discretion of the Engineer and based on feasible testing as suggested by the asphalt producer. Certain QC testing requirements during production may not be feasible for small projects in which limited asphalt is generated. Some testing methods cannot be completed during the time needed during small batch production. The feasibility should be assessed with the Engineer and producer.

B. The mixing plant shall employ a Quality Control Technician (QCT). The QCT will perform QC testing and will be certified in the discipline of HMA Plant Technician by the relevant certifying. The Contractor shall sample, test and evaluate the mix in accordance with the methods and minimum frequencies in Table below and the Post-Blended SBR Binder Quality Control Plan (if applicable).

Test	Min. Frequency	Test Method
Temperature in truck at plant	6 times per day	
Gradation	Greater of either (a) 1 per 500 tons, (b) 2 per day, or (c) 3 per job	AASHTO T30
Binder Content	Greater of either (a) 1 per 500 tons, (b) 2 per day, or (c) 3 per job	AASHTO T164
Air Void Content	Greater of either (a) 1 per 500 tons, (b) 2 per day, or (c) 3 per job	ASTM D6752
Binder Draindown	Greater of either (a) 1 per 500 tons, (b) 1 per day, or (c) 1 per job	ASTM D6390

C. If an analyzed sample is outside the testing tolerances immediate corrective action will be taken by the contractor. After the corrective action has been taken the resulting mix will be sampled and tested. If the re-sampled mix test values are outside the tolerances the Engineer will be immediately informed. The Engineer may determine that it is in the best interest of the project that production is ceased. The Contractor will be responsible for all mix produced for the project.

D. Testing of the QC requirements shall be within the limits set in Table above. The paving mixture produced should not vary from the design criteria for aggregate gradation and binder content by more than the tolerances in Table below.

Sieve Size (inch/mm)	Percent Passing
0.75/19	-
0.5/12.5	± 6.0
0.375/9.5	± 6.0
0.187/4.75	± 5.0
0.093/2.36	± 4.0
0.0029/0.075	± 2.0
% PGAB	± 0.3

E. Should the porous asphalt mix not meet the tolerances specified in this section upon repeat testing, the Engineer may reject further loads of mix. Mix that is loaded into trucks during the time that the plant is changing operations to comply with a failed test shall not be accepted, and should be recycled at the plant.

F. Below summarizes the QA/QC requirements for porous media bed construction.

G.

Activity	Schedule
Contractor to notify engineer for approval	24 hours in advance of start of work
Contractor to employ soil inspector acceptable to engineer	NA

Contractor to employ staking and layout control inspector acceptable to engineer	NA
Contractor to employ site grading inspector acceptable to engineer	NA
Contractor to employ pavement work inspector acceptable to the engineer	NA
Contractor to notify engineer for approval	after subgrade preparation, before construction of porous media bed
Contractor to notify engineer for approval	after filter course placement, before placement of choker course and pavement to verify proper compaction of filter course by ASTM D3385

PART 2 PRODUCTS

2.1 BATCHING AND MIXING

A. Mixing plants shall meet the requirements of hot mix asphalt plants as specified in the state DOT or regional equivalent unless otherwise approved by the Engineer.

Sieve Size (inch/mm)	**Percent Passing (%)**
0.75/19	100
0.50/12.5	85-100
0.375/9.5	55-75
No.4/4.75	10-25
No.8/2.36	5-12
No.200/0.075 (#200)	2-4
Binder Content (AASHTO T164)	5.8 - 6.5%
Air Void Content (ASTM D6752)	16.0-22.0%
Draindown (ASTM D6390)*	$\leq$ 0.3 %
Retained Tensile Strength (AASHTO 283)**	$\geq$ 80 %
Cantabro abrasion test on unaged samples	$\leq$ 20%
Cantabro abrasion test on 7 day aged samples	$\leq$ 30%

* Either method is acceptable

**Cellulose, mineral, or polyester fibers may be used to reduce draindown.

***If the TSR (retained tensile strength) values fall below 80% when tested per NAPA IS 131 (with a single freeze thaw cycle rather than 5), then in Step 4, the contractor shall employ an antistrip additive, such as hydrated lime (ASTM C977) or a fatty amine, to raise the TSR value above 80%.

B. The asphalt material shall be heated to the temperature specified in the state DOT specification (if using a DOT spec for the mix) in a manner that will avoid local overheating. A continuous supply of asphalt material shall be furnished to the mixer at a uniform temperature.

C. The aggregate for the mixture shall be dried and heated at the mixing plant before being placed in the mixer. Flames used for drying and heating shall be properly adjusted to avoid damaging the aggregate and depositing soot or unburned fuel on the aggregate.

Mineral filler, if required to meet the grading requirements, shall be added in a manner approved by the Engineer after the aggregates have passed through the dryer.

The above preparation of aggregates does not apply for drum-mix plants.

D. The dried aggregate shall be combined in the mixer in the amount of each fraction of aggregate required to meet the job-mix formula and thoroughly mixed prior to adding the asphalt material.

The dried aggregates shall be combined with the asphalt material in such a manner as to produce a mixture that when discharged from the pugmill is at a target temperature in the range that corresponds to a recommended range supplied by the PGAB supplier.

The asphalt material shall be measured or gauged and introduced into the mixer in the quantity determined by the Engineer for the particular material being used and at the temperature specified in the relevant specification.

After the required quantity of aggregate and asphalt material has been introduced into the mixer, the materials shall be mixed until a complete and uniform coating of the particles and a thorough distribution of the asphalt material throughout the aggregate is secured and there is no residual moisture in the coated aggregate.

All plants shall have a positive means of eliminating oversized and foreign material from being incorporated into the mixer.

PART 3 EXECUTION

3.1 GRADE CONTROL

A. Establish and maintain required lines and elevations. The Engineer shall be notified for review and approval of final stake lines for the work before construction work is to begin. Finished surfaces shall be true to grade and even, free of roller marks, and free of puddle-forming low spots. All areas must drain freely. Excavation elevations should be within +/- 0.1 ft (+/- 3 cm).

B. If, in the opinion of the Engineer, based upon reports of the testing service and inspection, the quality of the work is below the standards which have been specified, additional work and testing will be required until satisfactory results are obtained.

C. General criteria for watershed area to treatment area ratios for permeable pavements are defined by the state. Hybrid designs (dense-mix drive-lanes with permeable pavement parking stalls) have been used to address diminished strength of permeable asphalt materials in high traffic volume/load locations. A 1:1 watershed area to permeable pavement area is preferred (implying no runon). Improvements to materials and designs have addressed many of the strength deficiencies associated with older designs and materials specifications.

3.2 NOTIFICATION

A. The Engineer shall be notified at least 24 hours prior to all porous media bed and porous pavement work.

3.3 SUBGRADE PREPARATION

A. The existing native subgrade material under all bed areas shall NOT be compacted or subject to excessive construction equipment traffic prior to stone bed placement.

B. Where erosion of the native material subgrade has caused accumulation of fine materials and/or surface ponding at the base of the excavation, this material shall be removed with light equipment and the underlying soils scarified to a minimum depth of 6 inches (15 cm) with a York rake or equivalent and light tractor.

C. Bring subgrade of stone porous media bed to line, grade, and elevations indicated. Fill and lightly regrade any areas damaged by erosion, ponding, or traffic compaction before the placing of the stone. For parking lots all bed bottoms are level grade to promote uniform infiltration. For road applications, typically the slope of the bottom of excavation parallels that of the road surface.

3.4 POROUS MEDIA BED INSTALLATION

A. Upon completion of subgrade work, the Engineer shall be notified and shall inspect at his/her discretion before proceeding with the porous media bed installation.

B. Side slope geotextile (when used) and porous media bed aggregate shall be placed immediately after approval of subgrade preparation. Any accumulation of debris or sediment which has taken place after approval of subgrade shall be removed prior to installation of geotextile or porous media at no extra cost to the Owner.

C. Place side slope geotextile in accordance with manufacturer's standards and recommendations. Adjacent strips of geotextile shall overlap a minimum of sixteen inches (16" or 41 cm). Secure geotextile at least four feet (1.2 m) outside of the bed excavation and take any steps necessary to prevent any runoff or sediment from entering the storage bed.

D. Install coarse aggregate in lifts no greater than 8-inches (20 cm). Lightly compact each lift with equipment, keeping equipment movement over storage bed subgrades to a minimum. Install aggregate to grades indicated on the drawings.

E. The infiltration rate of the compacted filter course shall be determined by ASTM D3385 or an approved alternate at the discretion of the supervising engineer. The infiltration rate shall be no less 5-30 ft/day or 50% of the hydraulic conductivity (D2434) at 95% standard proctor compaction

F. Following placement of bed aggregate, the side slope geotextile shall be folded back along all bed edges to protect from sediment washout along bed edges. At least a four-foot (1.2 m) edge strip shall be used to protect beds from adjacent bare soil. This edge strip shall remain in place until all bare soils contiguous to beds are stabilized and vegetated. In addition, take any other necessary steps to prevent sediment from washing into beds during site construction. When the site is fully stabilized, temporary sediment control devices shall be removed.

3.4 POROUS ASPHALT PAVEMENT INSTALLATION

A. The mixing plant, hauling and placing equipment, and construction methods shall be in conformance with NAPA IS 131 and applicable sections of the state DOT’s specification for asphalt mixes.

B. The use of surge bins shall not be permitted.

C. The open graded mix shall be transported in clean vehicles with tight, smooth dump beds that have been sprayed with a non-petroleum release agent or soap solution to prevent the mixture from adhering to the dump bodies. Mineral filler, fine aggregate, slag dust, etc. shall not be used to dust truck beds. The open graded mix shall be covered during transportation with a suitable material of such size sufficient to protect the mix from the weather and also minimize mix cooling and the prevention of lumps. When necessary, to ensure the delivery of material at the specified temperature, truck bodies shall be insulated, and covers shall be securely fastened. Long hauls, particularly those in excess of 25 miles (40 km), may result in separation of the mix and its rejection.

D. The paver shall be a self-propelled unit with an activated screed or strike-off assembly, capable of being heated if necessary and capable of spreading and finishing the mixture without segregation for the widths and thicknesses required. In general, track pavers have proved superior for Porous Asphalt placement. The screed shall be adjustable to provide the desired cross-sectional shape. The finished surface shall be of uniform texture and evenness and shall not show any indication of tearing, shoving, or pulling of the mixture. The machine shall, at all times, be in good mechanical condition and shall be operated by competent personnel.

   Pavers shall be equipped with the necessary attachments, designed to operate electronically, for controlling the grade of the finished surface.

   The adjustments and attachments of the paver will be checked and approved by the Engineer before placement of asphalt material.

E. Rollers shall be in good mechanical condition, operated by competent personnel, capable of reversing without backlash, and operated at speeds slow enough to avoid displacement of the asphalt mixture. The mass (weight) of the rollers shall be sufficient to compact the mixture to the required density without crushing of the aggregate. Rollers shall be equipped with tanks and sprinkling bars for wetting the rolls.

F. Rollers shall be two-axle tandem rollers with a gross mass (weight) of not less than 7 metric tons (8 tons) and not more than 10 metric tons (12 tons) and shall be capable of providing a minimum compactive effort of 44 kN/m (250 pounds per inch) of width of the drive roll. All rolls shall be at least 1.1 m (42 inches) in diameter.

G. A rubber tired roller is not required on the open graded asphalt friction course surface.

H. The temperature of the asphalt mixture, at the time of discharge from the haul vehicle and at the paver, shall be between 135-163°C (275 to 325°F), within 6 °C (10 °F) of the compaction temperature for the approved mix design.

I. The Porous Asphalt should be placed in two lifts at 1.5 to 2 inches (4 - 6 cm). One lift is not recommended because uniform compaction is difficult to achieve. Great care must be taken to insure that the porous asphalt layers join completely. This means: keeping the time between layer placements minimal; keeping the first layer clear from dust and moisture, and minimizing traffic on the first layer. However care should be taken to allow sufficient time for the asphalt placement to set, generally the following day or when the surface temperature of the first lift cools to 38°C (100 °F). Two lifts affords better compaction of the entire lift, especially in colder weather and for large sites. It also provides access to the site for finish work such as curbing. Care must be taken to not

damage or impair permeability of the base course if a multiple lift scenario is chosen. If significant site work will take place between placement of base and wearing courses higher durability mixes should be used for both layers.

The Contractor shall protect all exposed surfaces that are not to be treated from damage during all phases of the pavement operation.

The asphalt mixture shall be spread and finished with the specified equipment. The mixture shall be struck off in a uniform layer to the full width required and of such depth that each course, when compacted, has the required thickness and conforms to the grade and elevation specified. Pavers shall be used to distribute the mixture over the entire width or over such partial width as practical. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture shall be spread and raked by hand tools.

No material shall be produced so late in the day as to prohibit the completion of spreading and compaction of the mixture during daylight hours, unless night paving has been approved and established for the project.

No traffic will be permitted on material placed until the material has been thoroughly compacted and has been permitted to cool to below 38 ℃ (100 ℉). The use of water to cool the pavement is not permitted. The Engineer reserves the right to require that all work adjacent to the pavement, such as guardrail, cleanup, and turf establishment, is completed prior to placing the wearing course when this work could cause damage to the pavement. On projects where traffic is to be maintained, the Contractor shall schedule daily pavement operations so that at the end of each working day all travel lanes of the roadway on which work is being performed are paved to the same limits.

J. Immediately after the asphalt mixture has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling. The compaction objective is 16% - 19% in place void content.
Breakdown rolling shall occur when the mix temperature is between 135-163℃ (275 to 325℉). This is typically achieved with 1-2 passes with a 7.5 – 10 ton vibratory roller.

Finish rolling shall occur when the mix temperature is between 66-93℃ (150 to 200℉). This is typically achieved with a 1-ton roller with no vibratory compaction. Finish rolling is largely aesthetic and done for a smooth finished surface. Care should be taken so as to not continually roll the same location for instance back and forth to a water source.

The cessation temperature occurs at approximately 79℃ (175℉), at which point the mix becomes resistant to compaction. If compaction has not been performed at temperatures greater than the cessation temperature, the pavement will not achieve adequate durability. The temperatures referenced here are guidelines and have been used in the field to oversee successful porous asphalt installations.

The surface shall be rolled when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking, or shoving.

Rollers or oscillating vibratory rollers, ranging from 7.5 – 10 tons, shall be used for breakdown compaction. The number, mass (weight), and type of rollers furnished shall be sufficient to obtain the required compaction while the mixture is in a workable condition. Generally, one breakdown roller will be needed for each paver used in the spreading operation.

To prevent adhesion of the mixture to the rollers, rollers shall be kept moist with water or water mixed with very small quantities of detergent or other approved material. Excess liquid will not

be permitted.

Along forms, curbs, headers, walls, and other places not accessible to the rollers, the mixture shall be thoroughly compacted with hot or lightly oiled hand tampers, smoothing irons or with mechanical tampers. On depressed areas, either a trench roller or cleated compression strips may be used under the roller to transmit compression to the depressed area.

Other combinations of rollers and/or methods of compacting may be used if approved in writing by the Engineer, provided the compaction requirements are met.

The speed of the roller shall be slow and uniform to avoid displacement of the mixture, and the roller should be kept in as continuous operation as practical. Finish rolling shall continue below the threshold temperature until all roller marks and ridges have been eliminated.

Rollers will not be stopped or parked on the freshly placed porous asphalt.

It shall be the responsibility of the Contractor to conduct whatever process control the Contractor deems necessary. Acceptance testing will be conducted by the Engineer using cores provided by the Contractor.

Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective shall be removed and replaced with fresh hot mixture. The mixture shall be compacted to conform to the surrounding area. Any area showing an excess or deficiency of binder shall be removed and replaced. These replacements shall be at the Contractor's expense.

If the Engineer determines that unsatisfactory compaction or surface distortion is being obtained or damage to highway components and/or adjacent property is occurring using vibratory compaction equipment, the Contractor shall immediately cease using this equipment and proceed with the work in accordance with the sixth paragraph of this subsection.

K. Joints between old and new pavements or between successive day's work shall be made to ensure a thorough and continuous bond between the old and new mixtures. Whenever the spreading process is interrupted long enough for the mixture to attain its initial stability, the paver shall be removed from the mat and a joint constructed.
Butt joints shall be formed by cutting the pavement in a vertical plane at right angles to the centerline, at locations approved by the Engineer. The Engineer will determine locations by using a straightedge at least 3 m (10 feet) long. The butt joint shall be thoroughly coated with Type RS-1 or equivalent emulsified asphalt just prior to depositing the pavement mixture when pavement resumes.

Longitudinal joints that have become cold shall be coated with Type RS-1 or equivalent emulsified asphalt before the adjacent mat is placed. If directed by the Engineer, joints shall be cut back to a clean vertical edge prior to applying the emulsion.

L. The surface will be tested by the Engineer using a straightedge at least 3 m (10 feet) in length at selected locations parallel with the centerline. Any variations exceeding 9.5 mm (3/8 inch) between any two contact points shall be satisfactorily eliminated. A straightedge at least 3 m (10 feet) in length may be used on a vertical curve. The straightedges shall be provided by the Contractor.

M. Work shall be done expertly throughout, without staining or injury to other work. Transition to adjacent impervious asphalt pavement shall be merged neatly with flush, clean line. Finished pavement shall be even, without pockets, and graded to elevations shown on drawing.

END OF SECTION

SECTION 02575 - REPAIR AND RESTORATION OF PAVEMENT, SIDEWALK, ETC.

PART 1 GENERAL

1.1 SCOPE OF WORK

A. Furnish all labor, materials, equipment, and incidentals required and remove and replace pavements over trenches excavated for installation of pipelines as shown on the drawings and/or specified herein and repair areas where equipment has damaged the roads.

1.2 GENERAL

A. Repair all damage, as a result of work under this project, done to existing pavement, driveways, paved areas, curbs and gutters, sidewalks, shrubbery, grass, trees, fences, utility poles, utility pipe lines, conduits, drains, catch basins, or stabilized areas or driveways and including all obstructions not specifically named herein, in a manner satisfactory to the ENGINEER. Include in the bid price, the furnishing of all labor, materials, equipment, and incidentals necessary for the cutting, repair, and restoration of the damaged areas unless pay items for specific types of repair are included in the Bid Form.

B. Keep the surface of the backfilled area of excavation in a safe condition and level with the remaining pavement until the pavement is restored in the manner specified herein. All surface irregularities that are dangerous or obstructive to traffic are to be removed. Conform the repair to applicable CITY or State requirements for pavement repair and as described herein.

C. The CITY reserves the right to require soil bearing or loading tests or materials tests, should the adequacy of the foundation or the quality of materials used be questionable. Costs of these tests shall be the responsibility of the CITY, if found acceptable; the costs of all failed tests shall be the responsibility of the CONTRACTOR.

D. Make all street and road repair in accordance with the details indicated on the drawings and in accordance with the applicable requirements of these Specifications and meeting the permit requirements and approval of the governing Department of Transportation agencies.

E. Replace pavement or roadway surfaces cut or damaged in equal or better condition than the original, including stabilization, base course, surface course, curb and gutter or other appurtenances. Obtain the necessary permits prior to any roadway work. Provide advance notice to the appropriate authority, as required, prior to construction operations.

1. Roadway Restoration (within City Department of Transportation & Engineering jurisdiction): Perform restoration in accordance with the requirements set forth in the “Right-of-Way Utility Construction Activities Policy” and these Standards. Obtain prior approval from the City Stormwater, Streets and Traffic Department for the materials of construction and method of installation, along with the proposed restoration design for items not referred or specified herein.

    a. Where existing pavement is to be removed, mechanical saw cut the surface prior to trench excavation, leaving a uniform and straight edge parallel or perpendicular to the roadway centerline with minimum disturbance to the remaining adjacent surfacing. Provide minimal width of cut for this phase of existing pavement removal. Limerock from a FDOT approved pit shall be on the job site during open cutting. When the specified compacted limerock base is greater than six inches (6”), the base shall be constructed in two (2) or more lifts.

    b. Immediately following the specified backfilling and compaction, apply a temporary sand seal coat surface to the cut areas. For this temporary surfacing, provide a smooth traffic surface

with the existing roadway and maintain until final restoration. Ensure that surfacing remains for a minimum of ten (10) days in order to assure the stability of the backfill under normal traffic conditions. Thirty (30) days following this period and prior to sixty (60) days after application: remove the temporary surfacing and perform final roadway surface restoration.

c. In advance of final restoration, remove the temporary surfacing and mechanically saw the existing pavement straight and clean to the stipulated dimensions, if needed. Following the above operation, proceed immediately with final pavement restoration in accordance with the requirements set forth by the City.

d. No layer shall be greater than two inches (2") when compacted. Where a surface course is constructed to a thickness greater than two inches (2"), construct it in approximately equal layers, each not exceeding two inches (2").

e. Where necessitated by traffic conditions, lay mixture in strips in such manner as to provide for the passage of traffic. Where the road is closed to traffic, mixture may be laid to the full width, by machines traveling in parallel.

2. Roadway Restoration (outside City jurisdiction) – Conform work within the rights-of-way of public thoroughfares which are not under jurisdiction of City to the requirements of the Governmental agency having jurisdiction or the Florida Department of Transportation, if no governmental agencies have jurisdiction. Work within State Highway right-of-way shall be in full compliance with all requirements of the permit drawings, and to the satisfaction of the Florida Department of Transportation.

1.3 QUALITY ASSURANCE

A. Applicable provisions of the latest version of the Florida Department of Transportation "Standard Specifications for Road and Bridge Construction", and Supplemental Specifications hereunder govern the work under this Section. The Florida Department of Transportation will hereafter be referred to as FDOT.

PART 2 PRODUCTS

2.1 MATERIALS

A. Use materials for flexible base pavement and base course as specified in the latest version of the Florida Department of Transportation "Standard Specifications for Road and Bridge Construction".

PART 3 EXECUTION

3.1 CUTTING PAVEMENT

A. Cut and remove pavement to straight edges, 6 inches outside each edge of proposed trench to avoid pavement damage during installation of the new pipelines and appurtenances and for making connections to existing pipelines.

B. Before removing pavement, mark the pavement for cuts nearly paralleling pipelines and existing street lines. Cut asphalt pavement along the markings with a jackhammer, rotary saw, or other suitable tool.

C. No pavement shall be machine pulled until completely broken and separated along the marked cuts.

D. The pavement adjacent to pipeline trenches shall neither be disturbed nor damaged. If the adjacent pavement is disturbed or damaged, irrespective of cause, remove the damaged pavement replace it at CONTRACTOR's expense.

3.2 GENERAL RESTORATION

A. Restore, replace or rebuild existing street paving, driveways, sidewalks, etc., using the same type of construction as was in the original. Be responsible for restoring all such work, including sub-grade and base courses where present. Obtain and pay for such local or other governmental permits as may be necessary for the opening of streets. Meet any requirements other than those herein set forth which may affect the type, quality and manner of carrying on the restoration of surfaces by reason of jurisdiction of such governmental bodies.

B. In all cases, maintain, without additional compensation, all permanent replacement of street paving, done by him under this Contract until accepted by the City Manager or designee, including the removal and replacement of such work wherever surface depressions or underlying cavities result from settlement of trench backfill.

C. Complete all the final resurfacing or re-paving of streets or roads, over the excavations and relay paving surfaces of roadbed that have failed or been damaged prior to acceptance by the City Manager or designee. Conform backfilling of trenches and the preparation of sub-grades to the requirements of Section 02223.

D. Do all re-paving or resurfacing in accordance with Florida Department of Transportation Specifications, to which the following requirement of trench backfill will be added: Where pipeline construction crosses paved areas such as streets, backfill the top 24 inches of trench below the road bases or concrete slabs with compacted A-4 or better material that will provide a bearing value of not less than 75 when tested by the Florida Department of Transportation Soil Bearing Test Methods. All open cuts through paved areas shall be repaved within 48 hours at least with cold patch.

3.3 PRIME AND TACK COATS

A. Apply bituminous prime and tack coats on the previously prepared base course in accordance with Section 300 of the FDOT Specifications.

3.4 WEARING COURSE

A. Use plant-mixed hot bituminous pavement to the thickness indicated in the drawings conforming to Type III asphaltic concrete in accordance with Section 333 of the FDOT Specifications. The requirements for plant and equipment are specified in Section 320 and the general construction requirements for asphaltic concrete pavement are contained in Section 330 of the FDOT specifications.

3.5 TESTING

A. Perform all field-testing at an independent laboratory employed by the CITY. Test and certify all materials by the producer. Repeat tests of sub-grade or base not meeting specified compaction at the CONTRACTOR's expense.

3.6 MISCELLANEOUS RESTORATION

A. Restore sidewalks, cut or damaged by construction, in full sections or blocks to a minimum thickness of four inches. Restore concrete curb or curb gutter to the existing height and cross section in full sections or lengths between joints. Concrete shall be as specified on the drawings. Restore grassed yards, shoulders and parkways to match the existing sections with grass seed or sod of a type matching the existing grass.

3.7 CLEANUP

A. After all repair and restoration or paving has been completed, remove all excess asphalt, dirt, and other debris from the roadways. Check and clean all existing storm sewers and inlets of any construction debris.

END OF SECTION

SECTION 02580 - PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. This Section specifies the furnishing and application of thermoplastic, glass beads, and reflective pavement markings.

1.2 QUALITY ASSURANCE

A. Thermoplastic, glass beads and reflective pavement markings shall be applied in accordance with the most recently published edition of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, the 2014 Roadway and Traffic Design Standards and the Florida Manual on Traffic Control and Safe Practices for Street and Highway Construction.

1.3 SUBMITTALS

A. Submit certificates stating that materials meet Florida Department of Transportation Specifications Sections 706 and 711.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Thermoplastic: The Thermoplastic compound used shall meet the requirements set of Section 711 of the 1999 FDOT Standard Specification for Road and Bridge Construction.

B. Glass Beads: Glass beads shall meet the requirements of Section 711-6 of the 1999 FDOT Standard Specification for Road and Bridge Construction.

C. Type 4 Mono-Directional Amber Reflective Pavement Markers: The markers shall meet the requirements of Section 706-2 of the 1999 FDOT Standard Specification for Road and Bridge Construction.

PART 3 - EXECUTION

3.1 APPLICATION

A. Equipment shall conform with FDOT Standard Specification for Road and Bridge Construction Section 711-4.

B. Dimensions and alignment tolerances shall conform with FDOT Standard Specifications Section 711-5 and 710-5.

C. Application of thermoplastic compound and glass beads for traffic striping, arrows, messages, and markings shall conform with FDOT Standard Specification Section 711.

D. Application of reflective pavement markers shall conform with FDOT Standard Specification Section 706.

E. Protection of newly applied thermoplastic, and newly applied markers from traffic shall conform with FDOT Standard Specification Sections 710-7 and 711-8.

3.2 PERFORMANCE

A. Temporary Striping of the Centerline of the Road and Stop Bars shall be installed after the leveling course is applied, by the following day. In addition, if the surface course has not started within two (2) weeks, temporary Edge Lines will also be installed over the leveling course. Temporary Striping of the Centerline of the Road, Stop Bars, and Edge Lines shall then be installed on the surface course. The Striping Contractor shall be on-site the day the surface course is applied to begin temporary striping lay out, otherwise, the paving operation will be suspended. All temporary striping shall be completed within one (1) week.

END OF SECTION

SECTION 02830 - CHAIN LINK FENCING AND GATES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Requirements for providing black vinyl coated galvanized steel chain link fencing and gates.

1.2 REFERENCES

A. Codes and standards referred to in this Section are:

1. ASTM 1043 - Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework

2. ASME B36.10M - Welded and seamless wrought steel pipe

3. FS RR-F-191 - Fencing, Wire and Post, Metal

1.3 DESIGN

A. General: Provide fencing of the chain-link black vinyl coated type and six (6) feet high with six (6) feet of diamond mesh woven wire fabric topped by extension arms with a vertical height of approximately one foot above the top of the fabric. Design the extension arms slanted out at an angle of 45 degrees and provide the arms to carry three double strands of barbed wire when specifically required. Locate the fence as shown.

B. Fabric, Supports and Fittings: Provide steel fabric, supports and fittings except as specified.

C. Fabric, Supports and Fittings: Provide black vinyl coated steel fabric, supports and fittings. Coat the framework, posts and hardware except hinges and latches to match the fabric with thermoplastic or thermoset resins and provide oven-baked materials to a minimum dry coating of seven mils. Color coat all accessories except hinges and latches to match the fence. Provide aluminum hinges and latches.

D. Pipe Sizes and Weights: Provide pipe sizes and weights meeting the requirements of ASME B 36.10, Table 2 and ASTM A 53, Table 1. All pipe sizes listed are nominal, unless otherwise indicated.

PART 2 PRODUCTS

2.1 MANUFACTURERS

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

1. Fences
   a. Chain Link Fence Co. of Pennsylvania

   b. U.S. Steel-Cyclone

2.2 FABRIC

A. Provide fabric that is a one piece woven 2-inch mesh chain link of 6-gauge steel wire with a minimum breakload of 1800 lbs/ft. and which is interwoven to form a continuous fabric with no splices and is coated after weaving. Provide the top selvage knuckled for fabric 60 inches high and under, and the bottom selvage twisted and barbed for fabric over 60 inches high. Clean the fabric of all grease and foreign matter before coating and shipping. Stretch the fabric tightly approximately two inches above grade level and attach the fabric to the terminal or gateposts using beveled tension bands and tension bars.

1. Provide galvanized fabric that is fusion coated with a minimum seven-mil coating of black polyvinyl chloride (PVC) applied over a thermoset plastic bonding agent. Conform the PVC to Federal Specification RR-F-191.

2. Vinyl coat all cut ends.

3. Conform aluminum fabric to Fed. Spec. RR-F-191.

2.3 TENSION WIRE

A. For the tension wire for the fence bottom use minimum 6-gauge galvanized coil spring steel fusion color coated as specified for the fabric.

2.4 TOP AND BRACE RAILS

A. General: Furnish the top rail in approximately 20-foot lengths with couplings approximately 6 inches long for each joint. Provide one coupling in each 5 with an expansion spring. Provide the rail continuous from end-to-end for each run of fence. Provide brace rails at all terminal posts, locate the rails midway between the top and bottom of the fabric and extend from the terminal post to the first adjacent line post. Securely fasten rails at both ends. Provide top and brace rails that are galvanized steel fusion color coated as specified for framework in Subsection 1.03 C.

B. Pipe Type: 1-1/4-inch, Schedule 40 pipe or a 1.625- by 1.25-inch roll-formed section with minimum bending strength of 192 pounds on 10-foot span.

2.5 POSTS

A. General: Provide all posts that are coated as specified for vinyl-coated framework, posts and hardware in Subsection 1.03 C.

B. Pipe Posts: Provide pipe posts as follows:

1. For end, corner and pull posts use 2-1/2-inch, Schedule 40 pipe

2. For line posts use 2-inch, Schedule 40 pipe

3. For gate posts use the following pipes for different leaves:

a. For leaves up to 6 feet wide, use 2-1/2-inch Schedule 40 pipe

b. For leaves over 6 feet to 12 feet wide, use 3-1/2-inch Schedule 40 pipe c.

For leaves over 12 feet to 18 feet wide, use 6-inch Schedule 40 pipe

C. Bending Strength: Provide materials with the minimum bending strength based on a 6-foot cantilever for rolled formed or tube posts as follows:

		Galvanized Steel
1. End, Corner and Pull Posts:		
	2.875" O.D. roll formed or	444
	2-1/2-inch square tube	547
	2-1/2-inch square, heavy wall extrusion	
2. Line Posts:		
	For fences 8 feet maximum height 1.875- by 1.625-inch C-Section	245
	For fences over 8 feet high 2.25- by 1.703-inch C-Section	347
3. Gate Posts:		
	For leaves up to 6 feet wide (2.875-inch O.D. roll formed or	444
	2-1/2-inch square tube	645

2.6 GATES

A. General: For the perimeter construction of gates with leaves up to 6 feet wide, use 1-1/2-inch Schedule 40 pipe or 1-1/2-inch square steel tube, and for gates with leaves greater than 6 feet wide, use 2-inch Schedule 40 pipe or 2-inch square steel tube.

B. Braces: Provide the gates with sufficient horizontal and vertical members and bracing to ensure structural stability to prevent sagging and to provide for the attachment of fabric, hardware and accessories. Provide gates with diagonal cross bracing consisting of 3/8-inch diameter adjustable length truss rods where necessary to provide frame rigidity without sag or twist.

C. Cantilever Sliding Gates: Furnish cantilever overhang as follows:

Gate Leaf Size	Overhang
6'-0" to 10'-0"	6'-6"
11'-0" to 14'-0"	7'-6"
15'-0" to 22'-0"	10'-0"
12'-0" to 30'-0"	12'-0"

1. For gates leaf sizes 23'-0" to 30'-0", add one additional 2-inch square lateral support rail welded adjacent to the top horizontal rail. Make the bottom rail of 2" x 4" tubing weighing 1.71 pounds per foot.

2. Provide all cantilever overhang frames having 3/8-inch (galvanized steel) (aluminum) brace rods.

3. Provide the enclosed track made of a combined track and rail aluminum extrusion having a total weight of 3.72 pounds per foot and designed to withstand a reaction load of 2,000 pounds.

4. Provide each gate leaf with two swivel type zinc die cast trucks having four sealed lubricant ball-bearing wheels, 2-inch in diameter by 9/16-inch in width, with two side rolling wheels to insure alignment of the truck in the track. Hold trucks to post brackets by 7/8-inch diameter ball bolts with 1/2-inch shank. Design truck assemblies to take the same reaction load as the track.

5. Install gates on 4-inch OD Schedule 40 (aluminum) (black vinyl coated) posts weighing 9.1 pounds per foot. Use three posts for single slide gate and four posts for double slide gate.

6. Provide guide wheel assemblies for each supporting post. Provide each assembly consisting of two rubber wheels 4 inches in diameter attached to a post so that the bottom horizontal member will roll between the wheels which can be adjusted to maintain gate frames plumb and in proper alignment.

D. Gate Accessories: Equip gates with hinges, latches, center stops, hasps, holdbacks, and padlocks. Provide hinges, latches, center stops, hasps, and holdbacks that are aluminum. Provide double gates with a center drop bar and gate holdbacks.

E. Latches: Provide gate latches that are positive locking, pivoting type with the padlocking arrangement accessible from either side of the gate.

F. Hinges: Hang all gates on offset hinges to permit swinging the gate through a 180-degree arc to lie, when not obstructed, along and parallel to the line of the fence.

2.7 ATTACHMENTS

A. General: Provide all attachments fabricated of coated to match the fabric as specified for framework, posts and hardware in Subsection 1.03, except provide aluminum hinges and latches.

B. Tension Bars: Provide 3/16-inch by 3/4-inch galvanized carbon steel tension bars attached to the terminal posts by means of beveled edge bands.

C. Truss Rods: Provide 3/8-inch diameter galvanized carbon steel truss rods. Securely mount truss rods between the line post end of the brace rail and the base of the terminal post.

D. Post Tops: Provide post tops of galvanized pressed steel or malleable iron to form weathertight caps for post or tube posts. Make provisions for installation or passage of the top rail.

E. Brace and Tension Bands: Provide galvanized steel brace bands and tension bands, of the "unclimbable" beveled edge type with 3/8-inch diameter square shouldered aluminum carriage bolts, nonremovable from outside of the fence.

F. Rail Couplings: Provide rail couplings of the outside sleeve type, not less than six inches long, self-centering, which allows for expansion and contraction. Provide aluminum galvanized steel rail couplings.

G. Fabric Ties: Provide 11-gauge galvanized steel fabric ties.

H. Hog Rings: Provide 11-gauge wire, aluminum alloy, Type 6061-T6 hog rings.

I. Extension Arms: Provide galvanized pressed steel extension arms for supporting the barbed wire where used. Design the arms with an adequate cross section to withstand without failure or permanent deflection a perpendicular force of 250 pounds applied at the end of the arm when the arm is securely attached to the post. Construct extension arms to be slanted out.

PART 3 EXECUTION

3.1 INSTALLATION

A. General: Install all fencing and accessories according to the manufacturer's recommendations. Do not begin installation and erection before final grading is completed, unless otherwise approved.

B. Excavation: Drill or hand excavate (using post hole digger) holes for posts to the diameter

and spacing indicated, in firm, undisturbed or compacted soil.

1. If not indicated, excavate holes for each post to the minimum diameter recommended by the fence manufacturer, but not less than four times the largest cross-section of the post.

2. Unless otherwise indicated excavate the hole depths approximately 3 inches lower than the post bottom, with the bottom of posts set not less than 36 inches below the finished grade surface.

C. Barbed Wire: When specifically required, firmly install the barbed wire in slots in the extension arms, anchored to the terminal extension arms after removal of all sag from the wire.

D. Tension Wire: Attach the tension wire to the bottom of the fabric by hog rings spaced at 24-inch intervals and to terminal posts by brace bands.

E. Posts: Set posts plumb in concrete encasement at not more than 10-foot centers in the line of the fence with the tops properly aligned. Extend concrete encasement for line posts a minimum of three feet below finish grade with a minimum diameter of ten inches. Extend concrete encasement for terminal, corner and gate posts 40 inches below finished grade, except gate posts for leaves greater than 6 feet, for which extend the encasement 54 inches below grade. Provide the minimum diameter of encasement for terminal, corner and gateposts to be sufficient to provide not less than four inches between any part of the post and the face of the concrete and in no case provide the diameter to be less than 12 inches. Set line posts 32 inches into the concrete and set all other posts 36 inches, except gate posts for leaves greater than 6 feet wide, which are to be set 48 inches into the concrete. Slope the top exposed surface of the concrete to shed water and provide a neat appearance.

1. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment and hold posts in position during placement and finishing operations.

   a. Unless otherwise indicated, extend the concrete footing 2 inches above grade and trowel to a crown to shed water.

F. Fabric Ties: Space fabric ties approximately 14 inches apart on the line posts and 24 inches apart on the rails. (For clips used with C-section posts, use galvanized 11-gauge steel wire.)

G. Fabric: Leave approximately 2 inches between finished grade and the bottom selvage, unless otherwise indicated. Pull the fabric taut and tie to posts, rails, and tension wires. Install the fabric on the security side of the fence, and anchor the fabric to the framework so that the fabric remains in tension after the pulling force is released.

H. Fasteners: Install nuts for tensions bands and hardware bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent nut removal.

END OF SECTION

SECTION 02910 - LANDSCAPING

PART 1 GENERAL

1.1 Section Includes

A. Materials, installation, maintenance of trees, ground cover, and shrubs

1.2 Related Sections

A. Section 002920 - Lawns and Grasses

1.3 General Requirements

A. Furnish all labor, materials, equipment, and incidentals required to install trees, ground cover, and shrubs, to place accessory planting materials and to maintain and guarantee all planted areas, in areas as shown on the Drawings. All work shall be in strict adherence with sound nursery practice and shall include maintenance and watering of all the work of this Contract until final completion and acceptance by the Owner. The landscaping shall be performed by a subcontractor who is fully experienced in projects of this scope and whose main business is landscaping. The subcontractor shall be subject to the approval of the Landscape Architect.

B. Provide under this Section all landscaping appurtenances as shown on the landscaping drawings and specifications.

1.4 Submittals

A. Submit to the Landscape Architect for approval, complete written maintenance instructions for each type of plant furnished under the Contract.

B. Submit representative samples of any or all of required accessory planting materials as ordered by the Landscape Architect.

C. The Landscape Architect will inspect the material at the nursery and again when delivered to the site to make sure they are healthy, not root bound, of satisfactory height for the size purchased.

1.5 Warranty

A. All plant materials shall be guaranteed for one (1) year from the time of final inspection and interim acceptance shall be alive and in satisfactory growth for each specific kind of plant at the end of the guaranteed period.

B. At the end of the guarantee period, any plant required under this contract that is dead or not in satisfactory growth, as determined by the Landscape Architect, shall be removed and replaced. Replacement plants shall have an extended guarantee, as noted above, from time of replacement.

1.6 Maintenance

A. Maintenance shall commence after each plant is planted and the maintenance period shall continue until the job or specific phase of the job is accepted by the Landscape Architect. Extreme care shall be taken to instruct the Owner or his representatives in general maintenance procedures.

B. The contractor shall water all trees and palms regularly. The contractor shall provide schedules for all watering performed at least one week prior to commencement. The contractor shall notify the City

prior to watering at the time outlined herein and must adhere to the schedule. The City will have the right to alter said schedules due to events or projects that may conflict or require immediate attention. In the first two weeks, watering should occur 4 times a week. The saucers around the trees and palms should be filled with a minimum of three inches of water. From the third week through the eight-week watering should be done 3 times a week. From the ninth week through the 52nd week watering should be done twice a week or more if needed. This is the minimum-watering schedule desired. If site conditions require more water, it is the responsibility of the contractor to make those scheduling changes. The City has the right at anytime during the maintenance period to require additional watering. The contractor shall keep the watering saucers free of weeds during the maintenance period.

C. The contractor shall be responsible for all pest control, including but not limited to ants, aphids, Royal Palm bug, mealy bugs, scales, caterpillars and beetles. The contractor shall also treat for fungus problems on the tree leaves and palm fronds.

D. The contractor shall remove any damaged fronds or tree limbs as they may occur from storms or vandalism. The stakes and ties should always be in good condition. Stakes and ties will be removed in the eighth month of the maintenance program or within 30 days of request of the City. All sucker growth shall be removed when it occurs on specific trees.

E. Plant maintenance shall include daily watering, as needed pruning, weekly weeding and cultivating, mulching to maintain 4" depth, tightening and repairing of guys as needed, replacement of sick or dead plants upon discovery, resetting plants to proper grades or upright positions upon discovery and restoration of the planting saucer and all other care needed for proper growth of the plants.

F. During the maintenance period and up to the date of final acceptance, the Landscape Contractor shall do all seasonal spraying and/or dusting of trees and shrubs. Upon completion of all planting, an inspection for acceptance of work will be held. The Landscape Contractor shall notify the Landscape Architect for scheduling of the inspection 10 days prior to the anticipated date.

G. At the time of the inspection, if all of the materials are acceptable, a written notice will be given by the Landscape Architect to the Landscape Contractor Stating the date when the Maintenance Period ends.

PART 2 PRODUCTS

2.1 Materials

A. Plant species and size shall conform to those indicated in the Plant List and in plant locations shown on the Drawings. All plants shall be Florida Grade No. 1, or better. The CITY or ENGINEER will inspect the plants at the nursery and after delivered to the site for conformance to the standards.

B. Plants shall be sound, healthy, vigorous, free from plant diseases, insects, pest, or their eggs, and shall have healthy normal root systems. Plants shall be nursery grown stock, freshly dug. No heeled in, cold storage or collected stock will be acceptable.

C. Shape and Form:

1. Plant material shall be symmetrical, typical for the variety and species, and shall conform to the measurements specified in the Plant List.
2. Plants used where symmetry is required shall be matched as nearly as possible.
3. Plants shall not be pruned prior to delivery except as authorized.
4. All plants shall have been transplanted or root pruned at least once in the past 3 years.
5. Unless otherwise noted, street trees shall be free of branches up to 6 feet, with the single leader well branched, and with straight trunks.

6. Shrubs shall have been twice transplanted, have fully developed root systems, be heavily canned with foliage to base, fulfill dimensions required, and be typical of the species.
7. Ground covers shall have sturdy fibrous root systems and shall be heavily leafed.

D. Measurement: The height and/or width of trees shall be measured from the ground or across the normal spread of branches with the plants in their normal position. The measurement shall not include the immediate terminal growth.
E. Substitutions in plant species or size shall be made only with the written approval of the Landscape Architect and approval by the CITY.
F. Ground cover plants shall be planted in beds which receive 12 inches of approved topsoil, thoroughly disked into the soil. The finished surface, compacted and settled, shall conform generally with and at all points to the required grade. Plants shall be spaced as shown, and in accordance with the best practices of the trade.

G. Planting Soil/Topsoil:

1. Verify amount stockpiled if any, and supply additional as needed from naturally well-drained sites where topsoil occurs at least 12 inches deep in planting beds and 6 inches deep in turf areas. Do not obtain topsoil from bogs or marshes.
2. Soil for backfilling around plants and planting beds shall be a good grade of garden loam as approved. Soil shall be free of heavy clay, coarse sand, stones, lumps, sticks or other foreign material. The soil shall not be delivered or used in a muddy condition.
3. There shall be a slight acid reaction to the soil with no excess of calcium or carbonate. The soil shall be free from excess weeds or other objectionable material.
4. Soil for trees and shrubs shall be delivered in a loose, friable condition. All trees should average approximately 1 cubic yard per tree. There will be 12-inches of planting soil in ground cover areas and 1/8 cubic yard per shrub or vine.
5. No marl shall be used in ground cover planting beds.

H. Any required landscaping stone shall be inert, nonleaching material as specified on the Drawings. Provide physical samples for approval before purchase. No crushed limerock shall be used.

I. Soil mixture should be the following mixture:

1. 25% Perlite or Course Sand
2. 25% Vamiculite
3. 25% Canadian peat Moss
4. 25% Organic Compost
5. Incorporate Terra Sorb at the rate of 1 lb. per 100 sq. ft. per mandatory instructions.

J. Fertilizer:

A. Deliver fertilizer, mixed as specified, in original unopened standard size bags showing weight, analysis and name of manufacturer. Containers shall bear manufacturer's guaranteed statement of analysis, or manufacturer's certificate of compliance covering analysis shall be furnished to Owner. Store fertilizer in such manner that it shall be kept dry.

B. Base percentages of nitrogen, phosphorus, and potash on laboratory test recommendations as approved by Owner. For bidding assume 10 percent nitrogen, 6 percent phosphorus, and 4 percent potash by weight. At least 50 percent of total nitrogen shall contain no less than 3 percent water-insoluble nitrogen. At least 60 percent of nitrogen content shall be derived from super-phosphate containing not less than 18 percent phosphoric acid or bone meal containing 25 - 30 percent phosphoric acid and 2 - 3 percent nitrogen. Potash shall be derived from muriate of potash containing 55 - 60 percent potash.

K. Peat Moss:

A. Peat moss shall be Michigan peat moss or approved equal in color and consistency.
B. Peat moss shall be moss peat, finely shredded to pass 1/2-inch mesh and shall be no less than 90 percent organic material by weight, with ash content by ignition of no more than 10 percent.
C. Material shall contain 35 - 66 percent moisture by weight, but shall have water-holding capacity of 150 - 200 percent.
D. Material shall have pH value of 4 to 5.
E. Material may be imported supplied in bales or domestic furnished in bulk. If furnished in bulk, material and its source shall be acceptable to Owner.

L. Mulch:

A. Shredded hardwood mulch shall be used as mulching material.

PART 3 EXECUTION

3.1 Planting Procedures

A. Plant Locations: All plants shall be located as shown on the Drawings, to dimensions if shown, to scale if not dimensioned. Large areas or beds shall be scaled and the plants spaced evenly. Layout of the trees and shrub beds shall be approved by the Landscape Architect is required before any plants may be installed. Field adjustments may be recommended prior to planting for utility or aesthetic purposes by the Landscape Architect without additional costs. If the contractor does not call the Landscape Architect to approve the layout of the plant material prior to planting, the cost to relocate plant material for utilities or aesthetic purposes shall be covered by the contractor.

B. Tree Staking: All tree staking and bracing shall be included herein in accordance with sound nursery practice and shall generally be in accordance with the details shown. Furnish all materials required for staking and bracing as approved.

C. Tree Pits: Pits for trees shall be at least 2 feet greater in diameter than the specified diameter of the root ball. Other specifications for tree pits shall be as shown on the tree planting detail.

D. Digging and Handling:

1. Plants shall be handled at all times so that roots or balls are adequately protected from sun or drying winds. Tops or roots of plants allowed to dry out will be rejected.
2. Balled or burlapped plants shall be moved with firm, natural balls of soil, in sizes specified by Florida Grading and Standard for nursery stock. No plant shall be accepted when the ball of earth surrounding its roots has been cracked or broken. All trees, except palm and seedling pines, shall be dug with ball and burlapped. Root pruning shall have been done a minimum of four weeks before planting at the job.
3. Plants too large for 2 persons to lift in and out of holes shall be placed with sling. Do not rock trees in holes to rise.

E. When balled and burlapped plants are set, planting soil shall be carefully tamped under and around the base of the balls to prevent voids. All burlap, rope, wires, etc., shall be removed from the sides and tops of balls, but no burlap shall be pulled from underneath. Roots of bare rooted plants shall be properly spread out and planting soil carefully worked in among them.
F. Before plants are backfilled with planting soil, fertilizer tables, Agriform 20-10-5 or equal, shall be placed in each pit. Provide three tablets for each tree and one for each shrub or vine.

G. All plants shall be set straight or plumb, in locations shown on the Drawings. Except as otherwise specified, plants shall be planted in pits and shall be set at such level that, after settlement, they bear the same relation of the finished grade or surrounding ground as they bore to the grade of the soil from which they are taken, unless otherwise indicated in the planting details.

H. Pruning shall be carefully done by experienced plantsmen. Prune immediately upon acceptance by the Landscape Architect, including any broken branches, thinning all small branches and tipping back main branches (except main leaders).

I. Excess soil and debris shall be disposed of off the project site unless ordered stockpiled by the Landscape Architect.

3.2 Obstructions Below Ground

A. If underground construction utilities or obstructions are encountered in excavation of the planting areas, or pits, other locations for the plant material may be selected by the Landscape Architect.

B. Such changes shall be done without additional compensation.

3.3 Tree and Plant Protection

A. The Contractor shall remove only those trees selected for removal by the Landscape Architect. Prior to removal of said trees, the Contractor shall obtain a tree removal permit, if required. All other trees in the vicinity of the work shall be protected against damage by the Contractor until all work under the Contract has been completed. Removal of any unapproved trees shall result in a fine to the Contractor of $500/inch trunk diameter of that tree that is removed.

B. Consult with the Landscape Architect, and remove agreed-on roots and branches which interfere with construction. Employ qualified tree surgeon to remove, and to treat cuts.

C. Provide temporary barriers in accordance with the provided detail, around each, or around each group of trees and plants.

D. Protect root zones of trees and plants:
   1. Do not allow vehicular traffic or parking.
   2. Do not store materials or products.
   3. Prevent dumping of refuse or chemically injurious materials or liquids.
   4. Prevent puddling or continuous running water.

E. Carefully supervise excavating, grading and filling, and subsequent construction operations, to prevent damage.

F. In case of inadvertent damage to any tree, by the Contractor or any of his subcontractors or employees, the Contractor shall provide replacement of each size tree with a new tree of acceptable type, size and quality, subject in each case to the approval of the Owner.

G. Completely remove barricades, including foundations, when construction has progressed to the point that they are no longer needed, and when approved by the Landscape Architect.

H. Clean and repair damage caused by installation, fill and grade the areas of the site to required elevations and slopes, and clean the area, in accordance with the tree protection notes.

I. Cover plants transported to project in open vehicles with tarpaulins or other suitable covers securely fastened to body of vehicle to prevent injury to plants. Closed vehicles shall be adequately ventilated to prevent overheating of plants. Evidence of inadequate protection following digging, carelessness while in transit, or improper handling or storage shall be cause for rejection. Plants shall be kept moist, fresh, and protected. Such protection shall encompass entire period during which plants are in transit, being handled, or are in temporary storage.

3.4 Clean Up

During landscape work, store materials and equipment where directed. Keep pavements clean and work area in an orderly condition.
Protect plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged planting.
Keep all planted areas free of debris, weeds, and insects. Cultivate, weed, and water until final substantial completion of the work.
Upon completion, remove all excess subsoil, cordage, wrappings, and other extraneous materials from the site.
Remove all tools, equipment, and other materials, except those necessary for maintenance work.
Remove litter or other debris occurring from maintenance operations.

3.5 Acceptance

Inspection of the entire project or designated portions thereof shall be made upon written request of the Contractor.
A substantial completion inspection shall be conducted with all deficiencies noted and given to the Contractor as a list of items to be corrected. Substantial completion acceptance will not be issued until all punch list items have been completed and a re-inspection by the Owner done.
For the purpose of establishing an “Acceptance” standard, all plant material shall be healthy, well rooted, evenly colored, variable, and free of weeds and disease.
Perform other operations necessary to complete maintenance and ensure that plants are healthy, vigorous, visually pleasing and undamaged.
Perform all maintenance tasks as specified in this Section.
Once the re-inspection for compliance with the punch list requirements has been conducted and barring any new deficiencies being noted during the re-inspection, written acceptance will be given for all work of this Section, exclusive of possible replacement of plant material subject to warranty.
If any deficiencies of requirements exist, they will be noted in writing.
Upon written notice of final completion, the Owner will assume all responsibilities for maintenance of landscape work. The Contractor is responsible for all maintenance as specified in this Section until the date of substantial completion.
At the conclusion of the warranty period, an inspection will be made to determine the condition of warranted plant material.
Remove all plant material noted as not being in a healthy growing condition.
At no additional cost, replace plant material during the following season with material of like kind and size, in accordance with specification for original plant materials.
Warranty period also applies to replaced material.
Remove all tree staking and guys and dispose of the material off-site.

3.6 Replacement

A. At the end of the warranty period, any plant required under this Contract that is dead or not in satisfactory growth as determined by the Landscape Architect shall be removed. Plants replaced shall be guaranteed for 90 days after date of replacement.
B. Replacement of plants necessary during the guarantee period shall be the responsibility of the Contractor, except for possible replacements of plants resulting from removal, vandalism, acts of neglect on the part of others, or acts of nature.
C. All replacements shall be plants of the same kind and size as specified in the landscape drawings. They shall be furnished and planted as herein specified. The cost shall be the responsibility of the Contractor.

END OF SECTION

SECTION 02920 – LAWNS AND GRASSES

PART 1 GENERAL

1.1 Section Includes

A. Soil preparation, sodding, fertilizing, watering, and maintenance of grassed areas.

1.2 References

A. Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest implemented edition.

1.3 Warranty

A. All seeding and sod shall be warrantied by the General Contractor to be true to name and in a vigorous growing condition through one growing cycle including one summer and one winter season.

1.4 Maintenance During Construction

A. Begin maintenance immediately after planting. Plants shall be watered, mulched, weeded, pruned, sprayed, fertilized, cultivated, and otherwise maintained and protected until acceptance by Owner. Settled plants shall be reset to proper grade and position, planting saucer restored, and dead material removed and replaced. Tighten and repair stakes and wires. Correct defective work as soon as possible after it becomes apparent and weather and season permit. Maintain lawns for at least 30 days after sodding and 60 days after seeding, or as long as is necessary to establish uniform stand of the specified grasses until acceptance of lawns by Owner. In the event that lawn operations are completed too late in Fall for adequate germination and/or growth, maintenance shall continue into following growing season or until uniform stand of specified grasses has been established. Make weekly inspections to determine moisture content of soil and adjust watering schedule established by irrigation system installer to fit conditions. After grass growth has started, areas that fail to show uniform stand of grass for any reason whatsoever shall be re-sodded in accordance with Construction Drawings and as specified herein. Such areas shall be re-sodded repeatedly until areas are covered with satisfactory growth of grass at no additional cost to Owner. Topsoil conditioning or removal and replacement shall be performed if required to facilitate establishment of grass at no cost to Owner. Watering shall be done in such manner and as frequently as is deemed necessary by Owner to assure continued growth of healthy grass. Water areas of site in such a manner as to prevent erosion due to excessive quantities applied over small areas and to avoid damage to finished surface due to watering equipment. Water for execution and maintenance will be provided by Contractor at no expense to Owner. Contractor shall furnish portable tanks, pumps, hose, pipe, connections, nozzles, and any other equipment required to transport water from available outlets and apply it to sodded areas in approved manner. Initiate mowing of sodded areas when grass has attained height of 2 ½ inches. Maintain grass height 1 ½" to 2" for Zoysia and 1 ½" to 2" at subsequent cuttings depending on time of year. Not more than 1/3 of grass leaf shall be removed at any cutting and cutting shall not occur less than 10 days apart. I heavy cuttings shall be removed to prevent destruction of underlying turf. If weeds or other undesirable vegetation threatened to smother planted species, such vegetation shall be mowed, or in case of rank growths, shall be uprooted, raked and removed from area by methods approved by Owner. Protect sodded area from pedestrian or vehicular trespassing while grass is germinating. Furnish and install fences,, signs, barriers, or other necessary temporary protective devices. Contractor shall repair damage resulting from trespass,

erosion, washout settlement, or other causes at their expense. Remove fences, signs, barriers or other temporary protective devices after final acceptance. If substantial number of plants are diseased, distressed, or dead at time of inspection, acceptance will not be granted and Contractor's responsibility for maintenance of plants shall be extended until replacements are made and plants are accepted.

PART 2 PRODUCTS

2.1 Lime

A. Lime shall be agricultural grade dolomitic limestone, ground sufficiently fine so that at least 80 percent will pass through a No. 8 sieve, and it shall contain not less than 80 percent calcium carbonate equivalent. Moisture content at time of delivery shall not exceed 8 percent.

2.2 Fertilizer

A. Refer to Section 02400

2.3 Water

A. Water shall be free from oil, acid, alkali, salts, and other harmful substances.

2.4 Sod

A. Sod shall be either field or nursery grown sod true to the species specified on the drawings. The Contractor shall obtain Landscape Architect's approval of the source of the sod prior to cutting the sod.
B. Sod grown on soil high in organic matter, such as peat, will not be acceptable. The consistency of sod shall be such that it will not break, crumble or tear during handling and placing. Sod shall be reasonably free of stones, crab grass, noxious weeds, and other objectionable plants or substances injurious to plant growth.
C. Sod shall have at least 1 inch of soil adhering firmly to the roots and cut in rectangular pieces with the shortest side not less than 12 inches. At the time of cutting sod the grass shall be mowed to a height not less than 2 inches nor more than 4 inches.
D. Sod cut for more than 48 hours shall not be used without the approval of the Landscape Architect.

2.5 Seeding and Mulching

A. Permanent grass seed shall be as identified on the drawings.
B. Temporary grass seed shall be annual rye grass in accordance with FDOT specification 981.
C. Mulch shall be dry mulch in accordance with FDOT specification 981.

PART 3 EXECUTION

3.1 Regrading of Topsoil

A. Topsoil shall be graded reasonably smooth and level after final settlement. All humps shall be removed and depressions or eroded areas filled in with additional topsoil before proceeding with seeding or sodding.

3.2 Preparation for Sodding or Seeding

A. Preparation shall not be started until all other site and utility work and finished grading within the areas to be seeded have been completed.
B. Loosen topsoil by tilling it to a depth of at least 3 inches and smooth out all surface resulting irregularities. Leave area free of rocks or hard soil clods that will not pass through the tines of a standard garden rake. Locate and protect irrigation heads from damage from filling operations.
C. At least 7 days before applying fertilizer, spread lime uniformly in sufficient quantity to produce a soil pH of 6.5. Work lime thoroughly into topsoil to a depth of 3 inches.
D. Apply fertilizer uniformly at a rate of 20 pounds per 1000 square feet. Work fertilizer into soil prior to seeding or sodding.

3.3 Sodding

A. Provide sod in areas indicated on the Drawings. Sodding shall also be used in ditches and drainage swales and on all embankment slopes steeper than 3 to 1 unless protection is provided against erosion of seeding.
B. Place sod with the edges in close contact and alternate courses staggered. Lightly tamp or roll to eliminate air pockets. On slopes 2 to 1 or steeper, stake sod with not less than 4 stakes per square yard and with at least one stake for each piece of sod. Stakes shall be driven with the flat side parallel to the slope. Do not place sod when the ground surface is frozen or when air temperature may exceed 90 degrees F. Water the sod thoroughly within 8 hours after placement and as often as necessary to become well established.
C. In ditches, the sod shall be placed with the longer dimension perpendicular to the flow of water in the ditch. On slopes, starting at the bottom of the slope, the sod shall be placed with the longer dimension parallel to the contours of the ground.
D. All exposed edges of sod shall be buried flush with the adjacent turf.

3.5 Watering

A. Immediately begin watering and continually keep moist until the sod has firmly knit itself to the topsoil.

3.6 Protection of Work

A. Protect newly seeded and sodded areas from all traffic by erecting temporary fences and signs. Protect slopes from erosion. Properly and promptly repair all damaged work when required.

3.7 Application of Fertilizer

A. Apply fertilizer to grass or sodded areas in 2 applications with thorough watering immediately following. First application shall be 1 week before sodding at rate of 35 pounds per 1,000 square feet harrowed into top 2 inches of soil. Second application shall be done at rate of 25 pounds per 1,000 square feet, immediately following second mowing. Peg sodded slopes greater than 3:1 to hold in place.

3.8 Clean-Up

A. At the time of final inspection of work, but before final acceptance, remove from seeded and sodded areas all debris, rubbish, excess materials, tools, and equipment.
B. Refer to section 02910.

3.9 Lawn Replacement

A. Lawns not showing a close uniform stand of healthy specified grasses at the end of the guaranty period shall be replaced and maintained until acceptance. Scattered bare spots, none of which is larger than one square foot, will be allowed up to a maximum of 3% of the total area.

END OF SECTION

SECTION 03100 CONCRETE FORMWORK

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Provide concrete formwork for architectural concrete and structural concrete as specified to form concrete to profiles shown.

1. Provide concrete with smooth rubbed finish.

2. Structural concrete is defined as all concrete that is not architectural concrete.

B. Related Work Specified in Other Sections Includes:

1. Section 03200 - Concrete Reinforcement

1.2 REFERENCES

A. Codes and standards referred to in this Section are:

1. ACI 318 - Building Code Requirements for Reinforced Concrete

2. ACI SP-4 - Formwork for Concrete

1.3 SUBMITTALS

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

1. CONTRACTORS Shop Drawings: Proposed form layout drawings and tie pattern layout drawings for Concrete. Review of these drawings does not relieve the CONTRACTOR of responsibility for adequately designing and constructing forms.

2. Samples: Pieces of each type of sheeting, chamfer strips, form ties, form liners and rustication strips

1.4 QUALITY ASSURANCE

A. Formwork Compliance: Use formwork complying with ACI SP-4, ACI 347 and ACI 303R.

PART 2 PRODUCTS

2.1 MANUFACTURER

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

1. Release Agent
   Magic Kote VOC by Symons Corporation

2. Form coating

A.C. Horn Corporation, Brooklyn, NY

3. Form liners
   Dura-Tex by Symons Corporation, Des Plaines, IL

4. Rustications
   Symons Corporation, Des Plaines, IL

2.2 MATERIALS

A. Structural Concrete: Provide structural concrete form materials as follows:

1. Obtain approval for form material before construction of the forms.

2. Use a barrier type form release agent.

3. Use form ties, hangers, and clamps of such type that, after removal of the forms, no metal will be closer than one inch from concrete surface. Wire ties will not be permitted.

4. Provide ties with swaged washers or other suitable devices to prevent seepage of moisture along the ties. Leave the ties in place.

5. Use lugs, cones, washers, or other devices that do not leave holes or depressions greater than 7/8-inch in diameter.

PART 3 EXECUTION

3.1 DESIGN

A. Design Responsibility: Be responsible for the design, engineering and construction of the architectural concrete formwork and the structural concrete formwork. Conform the work to the recommendations of ACI SP-4 and ACI 303R.

B. Setting Time and Slag Use: The presence of fly ash or ground granulated blast furnace slag in the concrete mix for architectural concrete and structural concrete will delay the setting time. Take this into consideration in the design and removal of the forms.

C. Responsibility During Placement: Assume and take sole responsibility for adequate design of all form elements for support of the wet concrete mixtures specified and delivered.

D. Consistency: Design forms to produce concrete members identical in shape, lines and dimensions to members shown.

3.2 CONSTRUCTION DETAILS FOR FORMWORK

A. Structural Concrete Details: Follow the following details for all structural concrete:

1. Provide forms that are substantial, properly braced, and tied together to maintain position and shape and to resist all pressures to which they may be subjected. Make forms sufficiently tight to prevent leakage of concrete.

2. Determine the size and spacing of studs and wales by the nature of the work and the height to which concrete is placed. Make forms adequate to produce true, smooth surfaces with not more than 1/8-inch variation in either direction from a geometrical plane. Provide horizontal joints that are level, and vertical joints, which are plumb.

3. Supply forms for repeated use in sufficient number to ensure the required rate of progress.

4. Thoroughly clean all forms before reuse and inspect forms immediately before concrete is placed. Remove deformed, broken, or defective forms from the work.

5. Provide temporary openings in forms at convenient locations to facilitate cleaning and inspection.

6. Coat the entire inside surfaces of forms with a suitable form release agent just prior to placing concrete. Form release agent is not permitted on the reinforcing steel.

7. Assume and take responsibility for the adequacy of all forms and remedying any defects resulting from their use.

3.3 FORM REMOVAL

A. Structural Concrete Form Removal: Do not remove forms for structural concrete until the concrete has hardened sufficiently to support its own load safely, plus any superimposed load that might be placed thereon.

3.4 TOLERANCES

A. Tolerance Limits: Design, construct and maintain concrete form and place the concrete to provide completed concrete work within the tolerance limits set forth in ACI SP-4.

END OF SECTION

SECTION 03200 CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Requirements for providing concrete reinforcement as shown and specified herein. Reinforcement includes all steel bars, wire and welded wire fabric as shown and specified.

B. Related Work Specified in Other Sections Includes:

1. Section 03100 - Concrete Formwork

1.2 REFERENCES

A. Codes and standards referred to in this Section are:

1.	ACI SP66	-	ACI Detailing Manual
2.	ACI 318	-	Latest edition "Building Code Requirements for Reinforced Concrete"
3.	ASTM A 185	-	Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
4.	ASTM A 615/A615M	-	Deformed and Plains Billet-Steel Bars for Concrete
5.	ASTM A 706/A706M	-	Low Alloy Steel Deformed Bars for Concrete Reinforcement
6.	ASTM A 775/A775M	-	Epoxy Coated Reinforcing Steel Bars
7.	AWS D1.4	-	Structural Welding Code - Reinforcing Steel

1.3 SUBMITTALS

A. Provide all submittals, including the following:

1. Product Data and Information: Submit manufacturers literature with product data, and material description of fusion bonded epoxy coating for reinforcement and reinforcement accessories, including manufacturer's recommendations for field touch-up of mars and cut ends when epoxy coated reinforcement is specified to be used.

2. CONTRACTORS' Shop Drawings: Submit checked Working Drawings, including bar lists, schedules, bending details, placing details and placing plans and elevations for fabrication and placing reinforcing steel conforming to "ACI Detailing Manual SP-66".

a. Do not bill wall and slab reinforcing in sections. Show complete elevations of all walls and complete plans of all slabs, except that, when more than one wall or slab are identical, only one such elevation or plan is required. These plans and elevations need not be true views of the walls or slabs shown. Bill every reinforcing bar in a slab on a plan. Bill every reinforcing bar in a wall on an elevation. Take sections to clarify the arrangement of the steel reinforcement. Identify all bars, but do not bill on such sections.

b. For all reinforcing bars, unless the location of a bar is clear, give the location of such bar or bars by a dimension to some structural feature that will be readily distinguishable at the time bars are placed.

c. Make the reinforcing steel placing drawings complete for placing reinforcement including the location of support bars and chairs, without reference to the design drawings.

d. Submit Detailer certification that every reinforcing steel placing drawing and bar list is completely checked and corrected before submittal for approval.

e. If, after reinforcing steel placing drawings and bar lists have been submitted for approval, a review reveals that the drawings and lists obviously have not been checked and corrected they will be returned for checking and correcting by the Detailer.

3. Samples: Submit the following samples when epoxy coated reinforcement is specified to be used.

a. 12-inch long epoxy-coated steel reinforcing bar, of any size typical to this Project

b. One of each type of epoxy-coated reinforcement accessory used on this Project

c. 12-inch long, nylon coated tie wire

4. Certificates: Test certificates of the chemical and physical properties covering each shipment of reinforcing steel bars. Test for bars 3/4 inches in diameter and larger shall consist of the bar being bent cold to 90 degrees around a pin 3 times the diameter of the test bar without evidence of cracking. For bars under three-fourths (3/4") in diameter, the bend test requirements shall be that the bar shall be bent cold one hundred and eighty (180) degrees around a pin having a diameter three (3) times that of the bar under test, without evidence of breaking.

1.4 DELIVERY, STORAGE AND HANDLING

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

1. Delivery Requirements: Have reinforcing steel delivered to the work in strongly tied bundles. Identify each group of both bent and straight bars with a metal tag giving the identifying number corresponding to the reinforcing steel placing drawings and bar lists.

2. Storage: Properly store all bars in an orderly manner, with all bars completely off the ground. Keep bars clean after delivery to the site of the work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. The brand of manufacturer shall be legibly rolled on all bars, and when loaded for mill shipment, all bars shall be properly separated and tagged with manufacturer's test identification number.

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

1. Mechanical connections

a. Dowel Bar Splicer/Dowel-In System and Coupler Splice System of the Richmond Screw Anchor System

b. Cadweld Rebar Splice by Erico Products Inc. c.

Bar Grip Splice by Barsplice Products Inc.

2.2 MATERIALS

A. Steel Bars: Use new billet steel bars, deformed bars, meeting the requirements of ASTM A 615/A625M Grade 60 for reinforcing steel bars.

1. Roll all reinforcing steel bars with special deformations or identifying marks indicating the ASTM Specification and Grade.

2. Use bars free from defects, kinks and from bends that cannot be readily and fully straightened in the field.

3. Supply reinforcing bars in lengths that will allow convenient placement in the work and provide the required length of at least 40 diameters of lap of joints as shown. Provide dowels of proper length, size and shape for tying walls, beams, floors, and the like together.

B. Epoxy Coating: Conform fusion bonded epoxy coated reinforcing steel bars to ASTM A 775/A775M when used. Leave portions of the reinforcing steel bars uncoated where mechanical connections are shown.

C. Welded Wire Fabric: Use welded wire fabric of the electrically welded type, with wires arranged in rectangular patterns, of the sizes shown or specified and meeting the requirements of ASTM A 185.

D. Supports and Accessories: Provide bar supports and other accessories and, if necessary, additional supports to hold bars in proper position while concrete is being placed.

1. Use side form spacers against vertical or sloping forms to maintain prescribed side cover and cross position of bars.

2. Use individual hi-chairs with welded cross ties or circular hoops to support top bars in slabs thicker than 8 inches.

3. Bolsters, chairs and other accessories:

   a. Use hot-dipped galvanized or provide plastic coated legs when in contact with forms for surfaces of concrete other than architectural surfaces.

   b. Use stainless steel when in contact with forms for architecturally exposed surfaces.

   c. Use epoxy coated bolsters, chairs and accessories including wire ties for epoxy coated reinforcing bars.

   d. Use chairs of an approved type and space them properly to support and hold reinforcing bars in position in all beams and slabs including slabs placed directly on the subgrade or work mat. Do not use continuous hi-chairs for supporting of top bars in slabs over 8 inches in thickness.

E. Mechanical Connections: Provide mechanical connections that develop at least 125 percent of the specified yield strength of the bar in tension.

F. Stirrups and Ties: Provide stirrups and ties as shown and specified and meeting the requirements of ASTM A 185.

2.3 FABRICATION

A. Drawing Review Prior to Fabrication: Do not fabricate any material before final review and approval of shop drawings.

B. Bending and Cutting: Cut bars to required length and bend accurately before placing. Bend bars in the shop unless written approval for field bending is obtained. If field bending is permitted, do it only when the air temperature, where the bending operation is performed, is above 30 degrees F. Do not field bend bars that have been partially embedded in concrete.

C. Splices: Use lapped splices for tension and compression splices unless otherwise noted.

D. Cleaning: Clean and bend reinforcement in accordance with ACI 315 and ACI318.

PART 3 EXECUTION

3.1 INSTALLATION

A. Placement: Place all bars in accordance with CRSI "Recommended Practice for Placing Reinforcing Bars".

B. Tolerances: Place bars used for top reinforcement in slabs to a vertical tolerance of plus

or minus 1/4-inch. Place all other reinforcement to the tolerances given to ACI 318.

C. Cleaning: Have reinforcing steel delivered without rust other than that accumulated during transportation to the work. At all times, fully protect reinforcing steel from moisture, grease, dirt, mortar and concrete. Before being placed in position, thoroughly clean reinforcing steel of all loose mill scale and rust and of any dirt, oil, grease coatings, or other material that might reduce the bond. If there is a delay in depositing concrete, inspect and satisfactorily clean the steel immediately before the concrete is placed.

D. Bar Positioning: Place bars in the exact positions shown with the required spacing and cross wire bars securely in position at intersections to prevent displacement during the placing of the concrete. Fasten the bars with annealed wire of not less than 17 gauge or other approved devices.

E. Bar Extension Beyond Formwork: On any section of the work where horizontal bars extend beyond the length of the forms, perforate the form or head against which the work ends or at the proper places to allow the bars to project through a distance at least equal to the lap specified.

F. Unacceptable Materials: Do not place reinforcing steel with damaged, unsuitably bonded epoxy coating or rusting. If approved, mars, exposed threads of mechanical connections and cut ends may be field coated with approved epoxy coating material.

G. Review of Placement: Have reinforcing placement reviewed by the ENGINEER before concrete is placed.

H. Welding - Not Approved: Do not use reinforcing bar assemblies made by welding of any kind, or accessories of any kind which require field welding to reinforcing bars.

I. Welding - Approved: Where welding of reinforcing steel is shown, AWS D1.4 "Structural Welding Code - Reinforcing Steel" applies.

J. Tension and Compression Lap Splices: Conform tension and compression lap splices to ACI 318 with all supplements. Avoid splices at points of maximum tensile stress wherever possible. Provide temperature bars with the clear spacing shown. Stagger all bar splices in hoop tension bars in circular tanks with not more than 50 percent of the bars spliced in any one direction. Have welded splices made by certified welders in accordance with AWS D1.4.

K. Welded Wire Fabric: Place welded wire fabric in the positions shown, specified or required to fit the work. Furnish and place suitable spacing chairs or supports, as specified for bars, to maintain the fabric in the correct location. Where a flat surface of fabric is required, provide flat sheets, when available. Otherwise reverse roll the fabric or straighten to make a perfectly flat surface before placing. Obtain approval for the length of laps not indicated.

L. Concrete Cover: Place reinforcing steel and welded wire fabric and hold in position so that the concrete cover, as measured from the surface of the bar or wire to the surface of the concrete, is as shown or specified.

END OF SECTION

SECTION 03410 - PRECAST CONCRETE STRUCTURES

PART 1 GENERAL

1.1 SCOPE OF WORK

A. Furnish all materials, labor, and equipment and construct nutrient separating boxes and accessory items, consisting of precast sections as shown on the Drawings and as specified herein.

B. The forms, dimensions, concrete, and construction methods shall be approved by the ENGINEER in advance of construction.

C. These specifications are intended to give a general description of what is required, but do not purport to cover all of the structural design details which will vary in accordance with the requirements of the equipment as offered. It is, however, intended to cover the furnishing, shop testing, delivery, and complete installation of all precast structures whether specifically mentioned in these specifications or not.

D. The supplier of the precast nutrient separating boxes and accessory items shall coordinate his work with that of the CONTRACTOR to the end that the unit will be delivered and installed in the excavation provided by the CONTRACTOR, in accordance with the CONTRACTOR's construction schedule.

1.2 SUBMITTALS

A. Submit to the ENGINEER, as provided in the General Conditions, shop drawings showing details of construction, reinforcing and joints.

B. Shop Drawings

1. Content

   a. Dimensions and Finishes

   b. Estimated camber
   c. Reinforcing and connection details
   d. Anchors

   e. Lifting and erection inserts

   f. Other items cast into members

2. Show location of unit by same identification mark placed on member.

3. Include design calculations.

C. Manufacturer's Literature: Manufacturer's recommended installation

instructions.

D. Manufacturer's certificates of material conformance with specifications.

E. Test Reports: Reports of tests on concrete.

F. Testing

1. Certification: The supplier shall provide the certified results of testing (7 day, 28 day) for the test cylinders stated herein. Random test cylinders may be taken at any time by the ENGINEER at the CITY's expense.

1.3 INSPECTION

A. The quality of all materials, the process of manufacture, and the finished sections shall be subject to inspection and approval by the ENGINEER, or the City Manager or designee. Such inspection may be made at the place of manufacture, or at the site after delivery, or at both places, and the sections shall be subject to rejection at any time on account of failure to meet any of the Specification requirements; even though sample sections may have been accepted as satisfactory at the place of manufacture. Sections rejected after delivery to the job shall be marked for identification and shall be removed from the job at once. All sections which have been damaged after delivery will be rejected, and if already installed, shall be repaired, if permitted and accepted by ENGINEER, or removed and replaced, entirely at the CONTRACTOR's expense.

B. At the time of inspection, the sections will be carefully examined for compliance with ASTM C478 designation and these Specifications, and with the approved manufacturer's drawings. All sections shall be inspected for general appearance, dimension, "scratch-strength", blisters, cracks, roughness, soundness, etc. The surface shall be dense and close-textured.

C. Imperfections may be repaired, subject to the approval of the ENGINEER, after demonstration by the manufacturer that strong and permanent repairs result. Repairs shall be carefully inspected before final approval. Cement mortar used for repairs shall have a minimum compressive strength of 4,000 psi at the end of 7 days and 5,000 psi at the end of 28 days, Epoxy mortar may be utilized for repairs subject to the approval of the ENGINEER.

PART 2 PRODUCTS

2.1 PRECAST NUTRIENT SEPERATING BOXES

A. Pre-cast Concrete pipe shall be reinforced concrete culvert pipe conforming to ASTM Designation C -76. Pipe joints shall be rubber gasket joints, and the pipe joint shall be manufactured to meet the requirements of the approved type of gasket to be used. Pipe joints and rubber gaskets shall conform to the requirements of Sections 941 and 942 of the FDOT Standard Specifications.

PART 3 EXECUTION

3.1 INSTALLATION

A. Control ground water to provide firm, dry subgrade for the structure, and prevent water rising on new poured in place concrete or grouted joint sections within 24 hours after placing. Guard against flotation or other damage resulting from ground water or flooding.

B. Provide backfill material for the nutrient separating boxes as specified in Section 02223.

G. Set the precast concrete structure sections so as to be vertical and with sections in true alignment with a 3 inch maximum tolerance to be allowed. Fill the outside and inside joint with a non-shrink grout and finish flush with the adjoining surfaces. Allow joints to set for 24 hours before backfilling. Backfill in a careful manner, bringing the fill up evenly on all sides. If leaks appear in the structures, caulk the inside joints with lead wool to the satisfaction of the ENGINEER. Install the precast sections in a manner that will result in a watertight joint.

H. Plug holes in the concrete sections required for handling or other purposes with a non-shrinking grout or by grout in combination with concrete plugs.

I. Where holes must be cut in the precast sections to accommodate pipes, cutting shall be done by core drilling prior to setting them in place to prevent any subsequent jarring which may loosen the mortar joints.

END OF SECTION