

APPENDIX C
**STANDARD SPECIFICATIONS FOR
WATER & SEWER SYSTEM CONSTRUCTION**

APPENDIX C
**STANDARD SPECIFICATIONS FOR
WATER & SEWER SYSTEM CONSTRUCTION**

<u>SECTION</u>	<u>SPECIFICATION TITLE</u>	<u>PAGE(S)</u>
<u>DIVISION 1 - GENERAL REQUIREMENTS</u>		
01025	MEASUREMENT AND PAYMENT	01025-1:11
01300	SUBMITTALS	01300-1:7
01400	QUALITY CONTROL	01400-1:3
01530	CONSTRUCTION BARRIERS	01530-1:2
01540	SECURITY	01540-1:1
01560	TEMPORARY ENVIRONMENTAL CONTROLS	01560-1:3
01570	TRAFFIC REGULATION	01570-1:4
01600	MATERIAL HANDLING, STORAGE AND PROTECTION	01600-1:2
01655	STARTING OF SYSTEMS	01655-1:4
01656	DISINFECTION OF WATER MAINS	01656-1:6
01666	TESTING OF WATER MAINS	01666-1:4
01700	CONTRACT CLOSEOUT	01700-1:9
01710	PROJECT CLEANUP	01710-1:2
01720	PROJECT RECORD DOCUMENTS	01720-1:1
<u>DIVISION 2 - SITE CONSTRUCTION</u>		
02055	REMOVAL & ABANDONMENT OF EXISTING FACILITIES	02055-1:3
02151	SHORING	02151-1:2
02221	TRENCHING, BACKFILLING & COMPACTING	02221-1:14
02270	SLOPE PROTECTION AND EROSION CONTROL	02270-1:10
02314	BORED PIPE	02314-1:7
02500	PAVING AND SURFACING	02500-1:14
02510	OVERLAY PAVING	02510-1:5
02601	MANHOLES	02601-1:16
02611	SEWER PIPE AND FITTINGS	02611-1:22
02713	WATER SYSTEM	02713-1:20
02937	GRADING AND SEEDING	02937-1:7
<u>DIVISION 3 - CONCRETE</u>		
03300	CAST-IN-PLACE CONCRETE	03300-1:4
03600	GROUT	03600-1:3

DIVISION 11 - EQUIPMENT

11300	PACKAGE GRINDER PUMPING STATION	11300-1:11
11400	COMBINATION AIR VALVE	11400-1:3

SECTION 01025 - MEASUREMENT AND PAYMENT**PART 1 - GENERAL****1.01 MEASUREMENT**

- A. All work completed under the Contract shall be measured by ENGINEER according to the standards of weights and measures recognized by the U.S. Bureau of Standards.
- B. The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the Contract will be those methods generally recognized as conforming to good engineering practice.
- C. Unless otherwise specified, measurements for area computations will be made on the surface. Pay measurements for area computations will not exceed the neat dimensions shown on the Drawings, unless otherwise ordered in writing by the ENGINEER.
- D. All pipes will be measured on a linear foot basis along the centerline of the pipe unless otherwise specified.
- E. In computing volumes of excavation, the average end area method, based on horizontal measurements, or other acceptable methods, will be used.
- F. The term "each", when used as an item of payment, will mean complete payment for the Work described in the Contract.
- G. The term "lump sum", when used as an item of payment, will mean complete payment for the Work described in the Contract, including all necessary fittings and accessories.
- H. The term "complete in place", means the completion of the Contract item or portions thereof as determined by the ENGINEER including the furnishing of all materials, equipment, tools, labor, and work incident thereto, unless otherwise specified.
- I. Structures will be measured according to neat lines shown on the Drawings or as altered to fit field conditions. No payment will be made for length, width, or depth, in excess of that shown on the Drawings or specified in the Specifications for any construction, unless otherwise approved by the ENGINEER in writing.

1.02 SCOPE OF PAYMENT

- A. Payments shall be made at the Unit Prices and Lump Sum Price or Prices bid in the Bid Form, and in accordance with the General Conditions, Article 14 – Payments to Contractor and Completion; and Paragraph 9.10 – Determination of Unit Prices.
- B. The CONTRACTOR will receive and accept compensation provided for in the Contract as full payment for furnishing all materials, labor, tools, and equipment and for performing all Work under the Contract in a complete and acceptable manner and for all risk, loss, damage, or expense of whatever character arising out of the nature of the Work or the prosecution thereof, subject to the provisions of the General Conditions.
- C. If any Unit Price in the bid schedule requires that the said Unit Price cover and be considered compensation for certain work or material essential to the item, this same work or material will not also be measured or paid for under any other pay item which may appear elsewhere in the Contract Documents.

1.03 PROPOSAL ITEMS

- A. General: The Unit and Lump Sum Prices bid in the Bid Form constitute complete payment for the Work of the Contract which Work is as specified in the Project Manual.
 - 1. The Work of the Bid Form Items includes the work of the Specifications Section referenced in the following Item Descriptions and as indicated on the Drawings. Such work also includes the referenced incidental construction of said Sections.
 - 2. Work of Specification Sections not referenced in the following Bid Form Item Descriptions is considered incidental to the Work of the Contract and no additional payment will be made for such.
 - 3. Where applicable, the disposal of spoil material shall be included in the Unit and Lump Sum Prices bid. No additional payment will be made for such.

1.04 INTERPRETATION OF APPROXIMATE QUANTITIES

- A. The estimate of quantities shown on the Bid Form and in the Contract is approximate and is shown only as a basis for the calculation upon which the Contract Award is to be made. The OWNER does not assume any responsibility that the quantities will actually be required in the Project construction, nor will the CONTRACTOR be allowed to plead misunderstanding or deception because of the quantity estimates or because of the character of the work, the location, or other conditions. The OWNER reserves the right to increase, to decrease or to omit any of the quantities of work. An

increase or decrease of the quantities of the items will not be sufficient grounds for granting an increase in the Unit Prices bid.

1.05 GENERAL DESCRIPTIONS

A. Scope for Pipe

1. Payment for pipe and appurtenances under the various items of work shall include furnishing of all labor, tools, equipment, and materials required to acceptably construct the various units, layout, pipe bedding, initial backfill, backfill of materials specified to sub-grade of final restoration, laying and joining pipe, compaction testing, line testing, traffic control, erosion control, repairing leaks, providing couplings and adapters as necessary to make final connections to existing pipe, and all other items necessary to complete the work. No payment shall be approved for pipe until the line has been tested and approved.

B. Scope for Excavation And Backfill

1. Payment for excavation and backfill under the various items of work shall include furnishing of all labor, tools, equipment and materials required to acceptably construct the various units, including locating underground utilities, test pits, layout, excavation, trenching, proper disposal of excess material, pumping, compaction testing, backfilling (including furnishing of suitable and/or aggregate backfill), compliance with Erosion and Sediment Control Plan and all other items necessary to complete the work.
2. All trench excavation shall be considered Unclassified as defined in Section 02221 – Trenching, Backfilling and Compacting. No additional compensation shall be made to CONTRACTOR for rock or other difficulties encountered.

C. Scope for Final Restoration

1. Payment for final restoration under the various items of work shall include furnishing of all labor, tools, equipment and materials required to acceptably construct the various units, per the requirements of Section 02500 – Paving and Surfacing and 02937 – Finish Grading, Seeding and Sodding, and any required testing. Payment shall be made on a linear foot basis along the centerline of pipe, and shall include all work necessary to restore all areas disturbed as a result of the CONTRACTORS work.

PART 2 - ITEM DESCRIPTIONS

2.01 MOBILIZATION

- A. Mobilization shall consist of the assembling and setting up for the project, the CONTRACTORS necessary general plant, including CONTRACTORS offices, ENGINEERS field office, signs, shops, plants, storage areas, sanitary and any other facilities, as required by the Contract Documents, as well as by local or State law and regulations. Mobilization shall also include CONTRACTORS overhead costs, such as bonding and insurance. Payment for this item of work shall be on a lump sum basis. The determination of the adequacy of the CONTRACTORS facilities, except as noted above, shall be made by the CONTRACTOR. The cost of required insurance and bonds and/or any other initial expense required for the start of Work will be included in this item.
- B. Mobilization will be paid for at the lump sum bid price for mobilization. The lump sum bid price for this item shall be payable to the CONTRACTOR in accordance with the following schedule:
 - 1. On the first monthly application for progress payment, the amount bid for mobilization or 5% of the total contract price excluding the bid price for this item, whichever is less, will be paid.
 - 2. Whenever work performed equals 25% of the total Contract price excluding the bid price for this item, any remaining amount bid for mobilization, or an additional 2% of the total contract price excluding the bid price for this item, whichever is less, will be paid.
- C. Upon completion of the project, any remaining amount bid for mobilization will be paid.

2.02 GRAVITY SEWERS WITH NATIVE SOIL BACKFILL

- A. Payment for gravity sewers shall include all those items of work under "Scope for Pipe" and shall be based on the actual number of linear feet of pipe installed using acceptable native soil backfill and tested between manholes. A combination of acceptable native backfill and aggregate backfill shall be used to make up any shortfall of native material.
- B. Measurements for lengths will be taken along the grade line between the inside walls of the manholes and shall include the total length of pipe in sewer lines. Measurements of depths for various depth classifications will be taken as the actual depth of cut from the surface grade to the invert of the sewer pipe.

- C. No payment for this item shall be made until the sewer lines have been tested and passed in accordance with the requirements of the applicable specifications. Payment will be made only for complete manhole runs. Surface restoration shall be paid for as a separate item.

2.03 GRAVITY SEWERS WITH EARTH BACKFILL

- A. Payment for gravity sewers shall include all those items of work under "Scope for Pipe" and shall be based on the actual number of linear feet of pipe installed using Earth Backfill and tested between manholes.
- B. Measurements for lengths will be taken along the grade line between the inside walls of the manholes and shall include the total length of pipe in sewer lines. Measurements of depths for various depth classifications will be taken as the actual depth of cut from the surface grade to the invert of the sewer pipe.
- C. No payment for this item shall be made until the sewer lines have been tested and passed in accordance with the requirements of the applicable specifications. Payment will be made only for complete manhole runs. Surface restoration shall be paid for as a separate item.

2.04 PRE-CAST MANHOLES

- A. Payment for pre-cast concrete manholes up to eight (8) feet in depth will be made for the actual number installed. Measurement shall be from the lowest invert to the top of the frame. Payment shall include excavation, backfill, stone base, concrete base, channel, cone sections, grade rings, steps, joint sealing compound, installation, and testing. Payment shall not be made until manhole is tested and passed.
- B. Payment for each vertical foot of manhole wall exceeding 8 feet of depth described above shall be based on the actual number of vertical feet installed. Payment shall include all related items.

2.05 MANHOLE DROP CONNECTION AND DROP PIPE

- A. Payment for manhole drop connections will be made for the actual number installed. Payment shall include all related items. Payment shall not be made until manhole is tested and passed.
- B. Payment for each vertical foot of manhole drop connection shall be based on the actual number of vertical feet installed. Payment shall include all related items.

2.06 MANHOLE FRAME AND COVER

- A. Payment for this item shall be based on the actual number of manhole frames and covers furnished and installed. Payment shall include furnishing, placement, and sealing of the frame and cover for a complete installation. Payment will not be made until manhole is tested and passed in accordance with the requirements of the Contract Documents.

2.07 5 FOOT STUB & PLUG

- A. Measurement of stub will be on the basis of the number installed.
- B. Payment for stub and plug will be made at the unit price bid for each bid complete in place including excavation, bedding, pipe, fittings and backfill. (It is intended that the excavation for the manhole will be sufficiently enlarged to accommodate the stub.)

2.08 6" LATERAL SEWER PIPE

- A. Payment for lateral sewers shall include all those items of work under "Scope for Pipe" plus backfill of whatever kind and final restoration of whatever kind, regardless of depth of installation. Payment shall be based on the actual number of lateral fittings and linear feet of pipe.
- B. Measurements for lengths will be taken along the grade line between the wye fitting and end of lateral.
- C. No payment for this item shall be made until the lateral sewers have been tested and passed in accordance with the requirements of the applicable specifications.

2.09 FORCE MAIN WITH NATIVE SOIL BACKFILL

- A. Payment for force mains shall include all those items of work under "Scope for Pipe" and shall be based on the actual number of linear feet of pipe installed using a combination of acceptable native soil backfill and Aggregate Backfill to make up any shortfall of native material, and tested, regardless of depth of installation.
- B. No payment for this item shall be made until the force mains have been tested and passed in accordance with the requirements of the applicable specifications. Surface restoration shall be paid for as a separate item.
- C. For Item no. 16, the force main is located in the same trench which will have already been excavated and backfilled for a gravity sewer line.

2.10 FORCE MAIN WITH EARTH BACKFILL

- A. Payment for force mains shall include all those items of work under "Scope for Pipe" and shall be based on the actual number of linear feet of pipe installed using Earth Backfill and tested, regardless of depth of installation.
- B. No payment for this item shall be made until the force mains have been tested and passed in accordance with the requirements of the applicable specifications. Surface restoration shall be paid for as a separate item.

2.11 AIR RELEASE MANHOLE

- A. Measurement of air release manholes will be on the basis of the number of units installed.
- B. Payment for air release manholes will be made at the unit price bid for each unit complete in place including valve, pre-cast concrete valve vault, excavation, backfill and compaction, all associated piping, tap into the force main, piping and valves as shown on the Details on Drawings, and other incidental work. Payment will be made in addition to the payment per linear foot for pipelines.

2.12 STREAM CROSSINGS

- A. Measurement of stream crossings will be along the centerline of the pipeline between the limits of the concrete encasement shown on the Drawings.
- B. Payment for stream crossings will be made at the unit price bid per linear foot for each crossing, complete in place. Payment shall include all those items of work under "Scope of Pipe", concrete encasement, excavation, backfill and compaction, safety provisions, and all other work incidental to the stream crossing.
- C. **NOTE: The bid price for stream crossing shall be for unclassified. There shall be no separate or additional payment for rock.**

2.13 TRENCH REPAIR PAVING OF MUNICIPAL ROADS

- A. Payment for this item shall include the trench paving restoration of paved municipal road surfaces disturbed by the sewer construction including affected shoulders, driveways, and parking lots. Payment shall be made on a linear foot basis for surfaces restored coinciding with linear feet of pipe installed regardless of width of top of trench

2.14 FINAL RESTORATION

- B. Payment for this item shall include the restorations of surfaces disturbed by the sewer construction including vegetated areas, roads, shoulders, driveways, and parking lots.

Payment shall be made on either the linear foot basis for surfaces restored coinciding with linear feet of pipe installed in lawn and field areas regardless of width of top of trench, or on a square yard basis for municipal roadway reconstruction utilizing a two step process of reclamation and overlay paving.

- C. Payment shall include saw-cutting and cutting back existing paved surfaces, surface preparation, placing restoration materials as shown in Restoration Schedules in Sections 02500, 02501 and 02937 and detailed on the Drawings, compaction and sealing. Item shall also include maintenance of final surface restoration for one (1) year acceptance or two (2) years acceptance if work is within PADOT right of ways.

2.15 MISCELLANEOUS TRENCH EXCAVATION

- A. Payment for additional trench excavation, when directed by the ENGINEER, will be by the cubic yard. Measurement will be made as the product of $\frac{L \times W \times D}{27}$ where:

L is the length in feet between stations

W is the maximum trench width based upon Table A in Section 02221– Trenching Backfilling and Compacting.

D is the average depth between stations.

This item is intended to pay for excavations made through no fault of the CONTRACTOR. It shall include the cost of excavating whatever materials encountered.

2.16 AGGREGATE BACKFILL

- A. Payment for Aggregate Backfill, will be by the ton. Measurement will be made as the product of $\frac{L \times W \times H \times 150\text{lbs.}}{2,000\text{\#/ton}}$ = tons,

Where:

L is the length in feet between stations

W is the **maximum trench width** based upon Table A in Section 02221– Trenching Backfilling and Compacting.

H is the average depth between stations

150lbs. is the approximated density of compacted aggregate

- B. This item is intended to pay for aggregate backfill of excavations when sufficient native soil is unavailable, and for the top 9" of the trench sub-base area. It shall include the cost of backfilling with Aggregate Backfill as defined in Section 02221 – Trenching Backfilling and Compacting.

2.17 MISCELLANEOUS EARTH BACKFILL

- A. Payment for additional Earth Backfill, when directed by the ENGINEER, will be by the cubic yard. Measurement will be made as the product of $\frac{L \times W \times H}{27}$ where:

L is the length in feet between stations

W is the maximum trench width based upon Table A in Section 02221-- Trenching Backfilling and Compacting.

H is the average depth between stations

- B. This item is intended to pay for backfilling miscellaneous excavations made through no fault of the contractor. It shall include the cost of backfilling with Earth Backfill as defined in Section 02221-- Trenching Backfilling and Compacting..

2.18 UNCLASSIFIED CONCRETE

- A. This item shall be paid by the cubic yard. Measurement will be made as the product of

$\frac{L \times W \times D}{27}$ where:

L is the length in feet of the pour

W is **maximum trench width** based upon Table A in Section 02221-- Trenching Backfilling and Compacting.

D is depth in feet

- B. This item is intended for use in payment of any concrete required in addition to that shown on the Drawings due to unforeseen field conditions. This item shall not include cast-in manhole bases or thrust blocks.

2.19 FORMED CONCRETE SIDEWALK OR DRIVEWAY

- A. Measurement for sidewalk or driveway replacement will be made for sidewalk or driveway disturbed as a result of sewer crossing underneath sidewalk.

- B. This item shall be paid by the square foot. Measurement will be made as the product of

L x W where:

L is the length in feet of the pour

W is **maximum trench width plus 2'**, based upon Table A in Section 02221-- Trenching Backfilling and Compacting.

- C. Payment for sidewalk will be made at the unit price bid per square foot complete in place, including excavation, formwork, reinforcement, concrete, finishing, and backfilling.

2.20 FORMED CURBING

- A. Measurement for curb replacement will be made for curb disturbed as a result of sewer crossing underneath curb. Payment shall be will be made along the top of the curb to the first joint beyond the centerline of the pipeline on each side of trench unless determined otherwise by ENGINEER
- B. Payment for curb will be made at the unit price bid per linear foot complete in place, including excavation, formwork, reinforcement, concrete, finishing, and backfilling.

2.21 PRIVATE GRINDER PUMPING STATION

- A. Measurement of private grinder pumping stations will be on the basis of the number of units delivered.
- B. Payment for private grinder pumping stations will be made at the unit price bid for each unit complete and delivered to any one of the buildings which will be connecting to the sewer system. The contractor will not be required to install the grinder pumping stations. Payment will be made in addition to the payment per linear foot for pipelines

2.22 SMALL DIAMETER LOW PRESSURE SEWERS

- A. Payment for low pressure sewer mains and laterals shall include all those items of work under "Scope for Pipe" and shall be based on the actual number of linear feet of pipe installed and tested, regardless of depth of installation.
- B. No payment for this item shall be made until the low pressure sewer mains and laterals have been tested and passed in accordance with the requirements of the applicable specifications.
- C. Surface restoration shall be paid for as a separate item.

2.23 SMALL DIAMETER LOW PRESSURE SEWERS

- A. Measurement of low pressure cleanout manholes, connections and air relief manholes will be on the basis of the number of units installed.
- C. Payment for low pressure cleanout manholes, connections and air relief manholes will be made at the unit price bid for each unit complete in place including excavation, backfill and compaction, all associated piping, tap into the low pressure sewer main and piping as shown on the Details on Drawings, and other incidental work. Payment will be made in addition to the payment per linear foot for pipelines.

2.24 CLAY DIKES

- A. Measurement for clay dikes will be based on a lump sum method for each dike installed.
- B. Payment for clay dikes will be made at the unit price bid per each clay dike installed, complete in place to the limits shown on Drawing Details.

END OF SECTION

SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Submittal procedures and actions
- B. Construction progress schedules.
- C. Proposed products list.
- D. Shop drawings.
- E. Product data.
- F. Samples.
- G. Manufacturers' instructions.
- H. Manufacturers' certificates.
- I. Steel Products Certification
- J. Shop Drawing Work

1.02 SUBMITTAL PROCEDURES

- A. Submit three copies of complete schedule of all anticipated submittal dates to ENGINEER within 14 days of Notice to Proceed. Update schedule at time of submission of each Application for Payment.
- B. Transmit each submittal to ENGINEER in accordance with schedule.
- C. Sequentially number the transmittals. Re-submittals are to have original number with an alphabetic suffix.
- D. Identify Project, CONTRACTOR, Contract No., subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate.
- E. Apply CONTRACTOR's stamp, signed or initialed certifying that review, verification of products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the

Work and Contract Documents. Submittals not containing CONTRACTOR's stamp shall be returned.

- F. Schedule submittals to expedite the Project, and deliver to ENGINEER at business address. Coordinate submission of related items.
- G. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- H. Provide space for CONTRACTOR and ENGINEER review stamps.
- I. Revise and resubmit submittals as required, clearly identify all changes made since previous submittal.
- J. ENGINEER shall review submittal and first revision without charge to CONTRACTOR. For all subsequent resubmissions, CONTRACTOR may be charged, by OWNER, for the time and expenses of ENGINEER at ENGINEER's normal charges. Such charge shall be deducted from CONTRACTOR's subsequent payment application.
- K. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.03 ACTION ON SUBMITTALS

- A. ENGINEER's Action: Where action and return is required or requested, ENGINEER will review each submittal, mark with the action taken, and return within a reasonable time period. Where submittal must be held for coordination, CONTRACTOR will be so advised by ENGINEER.
- B. Submittals returned with "APPROVED" action indicates that the information submitted was found to be in conformance with the design concept and in compliance with the requirements of the Contract Documents. CONTRACTOR may proceed with performance of the work covered by the submittal.
- C. Submittals returned with "APPROVED AS CORRECTED" action indicates that the information submitted was found to be in conformance with the design concept and in compliance with the requirements of the Contract Documents, provided the noted clarifications or corrections are completed. Submission of a corrected submittal indicating the changes noted by ENGINEER is not required. CONTRACTOR may proceed with performance of the work covered by the submittal.
- D. Submittals returned with "REVISE AND RESUBMIT" action indicate that: (1) information submitted is at least partially not in conformance with the design concept, (2) information submitted is at least partially not in compliance with the

requirements of the Contract Documents, (3) submittal is incomplete and does not include all items required by the individual specification Sections, or (4) certifications or computations required by the individual specification Sections have not been included in the submittal. Submittal will be returned to CONTRACTOR noting the reasons for noncompliance. CONTRACTOR shall not proceed with the performance of the work covered by submittal until corrected information is submitted and approved.

- E. Submittals returned with "NOT APPROVED" action indicate that the ENGINEER interprets the information submitted to be not in conformance with the design concept or not in compliance with the Contract Documents. Performance of the work shall not proceed until submittal is revised, resubmitted and approved.

1.04. CONSTRUCTION PROGRESS SCHEDULES

- A. Submit three copies of initial progress schedule to ENGINEER for review and comments within 15 days after date Notice to Proceed.
- B. Revise and resubmit as required based on ENGINEER's review.
- C. Submit revised schedule with each Application for Payment, identifying changes since previous version.
- D. Submit a horizontal bar chart with separate line for each major section of Work or operation, identifying first work day of each week. Chart shall indicate anticipated starting and completion date, as well as the actual starting and completion date for each activity.
- E. Indicate estimated percentage of completion for each item of Work at each submission.
- F. Indicate submittal dates required for shop drawings, Product data, samples, and Product delivery dates.

1.05 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Notice to Proceed, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product. Submit number of copies CONTRACTOR requires plus three copies to be retained by ENGINEER.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.06 SHOP DRAWINGS

- A. Submit the number of opaque reproductions which CONTRACTOR requires, plus three copies which will be retained by ENGINEER.
- B. Each submission of shop drawings must be accompanied by a letter of transmittal listing the items in the submission. Each shop drawing must be marked with the name of the project, the name of the Contractor, and numbered consecutively.

1.07 PRODUCT DATA

- A. Submit the number of copies which the CONTRACTOR requires, plus three copies which will be retained by the ENGINEER.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.
- C. After review, distribute in accordance with Submittal Procedures, above.

1.08 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for ENGINEER's selection.
- C. Include identification on each sample, with full Project information.
- D. Submit the number or samples specified in individual specification Sections; two of which will be retained by ENGINEER.
- E. Reviewed samples which may be used in the Work are indicated in individual specification Sections.

1.09 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.
- B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.10 MANUFACTURER'S CERTIFICATES

- A. When specified in individual specification Sections, submit manufacturers' certificate to ENGINEER for review, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to ENGINEER.

1.11 PENNSYLVANIA STEEL PRODUCTS ACT CERTIFICATION

- A. Use form attached to this Section.

1.12 SHOP DRAWING WORK

- A. All work which is related to shop drawing approval shall not be initiated until approved shop drawings have been received from ENGINEER.
- B. All work initiated by CONTRACTOR prior to receipt of approved shop drawings shall be at the sole risk of CONTRACTOR. Any and all rework, modifications, reinstallations, etc. necessitated by changes in the Work due to changes required by subsequently approved shop drawings will be done by CONTRACTOR at no increase in Contract Price.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

STEEL PRODUCTS PROCUREMENT CERTIFICATION: Contractors

This form must be executed by the Contractor and delivered to the Engineer before any item containing steel may be incorporated into any public works project in the Commonwealth of Pennsylvania. Execute and present this form for each type of steel product to be incorporated as provided above.

A. TO BE COMPLETED BY ALL CONTRACTORS:

1. Name of Contractor's firm: _____ 2. Date Submitted: _____
3. Firm's address: _____ 4. Phone Number: () _____
5. Contract No. _____ 6. Contract title: _____
7. Steel Product: _____
8. Name and address of supplier: _____

B. TYPE OF STEEL PRODUCT (check and complete applicable category)

1. Identifiable steel product: 100% of the steel in a product is identifiably marked as manufactured in the United States.
 - a. Other documentation required: NONE
 - b. Manner in which steel product is identifiable: _____
2. Non-identifiable structural steel: Less than 100% of the steel contained in the product is identifiable as provided above. Structural steel is defined as steel products used as a basic structural element of a project (i.e. steel beams, columns, decking, stairways, reinforcing bars, structural lintels, pipes, etc.)
 - a. Other documentation required: Bills of lading, invoices and mill certificates that certify that the steel contained in the product was melted or manufactured in the United States.
3. Non-identifiable non-structural steel: all other steel products including door and window frames, machines, equipment, etc.
 - a. Other documentation required: i.e. certification from supplier/fabricator.

- C. CERTIFICATION:** I, the undersigned officer of the above named firm, do certify that, to the best of my knowledge, the steel product listed above complies with the provisions of the Steel Products

Procurement Act (73 P.S. , 1881 et seq, as amended). I understand that by signing this document I certify that the facts contained herein are true. I further understand that this document is subject to the provisions of the Unsworn Falsification to Authorities Act (18 P.S. 4904) and the Steel Products Procurement Act, which provide penalties including, but not limited to, debarment from bidding on any Commonwealth of Pennsylvania public works project for a period of five years.

Witness:

Secretary or Treasurer

(Corporate Seal)

_____ (SEAL)

President or Vice President

END OF SECTION

SECTION 01400 - QUALITY CONTROL

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Quality assurance and control of installation.
- B. References.
- C. Inspection and testing laboratory services.
- D. Manufacturers' field services and reports.

1.02 QUALITY ASSURANCE AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from ENGINEER before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
 - 1. Perform work by persons qualified to produce workmanship of specified quality.
 - 2. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.03 REFERENCES

- A. Conform to reference standards by date of issue current on date for receiving bids.
- B. Should specified reference standards conflict with Contract Documents, request clarification for ENGINEER before proceeding.
- C. The contractual relationship of the parties to the Contract shall not be altered from

the Contract Documents by mention or inference otherwise in any reference document.

1.04 INSPECTION AND TESTING LABORATORY SERVICES

- A. The CONTRACTOR shall employ and pay for an independent firm which will perform inspections, tests, and other services specified in individual Specifications sections and as required by the ENGINEER.
- B. Reports will be submitted by the independent firm to ENGINEER, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents. CONTRACTOR shall be responsible to insure reports are submitted to ENGINEER within three days of completion of the test procedures.
- C. Cooperate with independent firm; furnish samples of materials, equipment, tools, storage and assistance as requested.
 - 1. Notify ENGINEER and independent firm 24 hours prior to expected time for operations requiring services.
 - 2. Make arrangements with independent firm and pay for additional samples and tests required for CONTRACTORS use.
- D. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the ENGINEER. Payment for retesting will be responsibility of the CONTRACTOR.

1.05 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified in individual Specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, startup of equipment, testing, adjusting, and balancing of equipment as applicable, and to initiate instructions when necessary or required by the individual Specification section. Such individual shall provide a written statement indicating that the equipment or product has been installed within the manufacturer's instructions and recommendations, and is functioning properly.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Submit report in duplicate within 14 days of observation to ENGINEER for review.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01530 - CONSTRUCTION BARRIERS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Temporary fencing, barricades and other protective devices required during construction.

1.02 TEMPORARY FENCING

- A. Provide temporary fencing as required to fence off excavation, storage and operating areas. Temporary fences to be substantially constructed, neat in appearance, and unless otherwise indicated be six (6) feet high.

1.03 TREE AND PLANT PROTECTION

- A. Protect trees and plants outside Authority's property lines, right-of-way lines and construction easements. Replace in kind, trees or plants located on private property that are damaged by construction activities.
- B. Protect trees and plants within Authority's property lines, right-of-way lines and construction easements which are not marked or otherwise designated for removal. Conduct operation of equipment, storage of materials, disposition of excavated material, and construction so as not to injure tree trunks, branches or roots. Protect trees and plants designated to remain by use of temporary fencing.
 - 1. When excavating within limits of limb spread of trees, proceed with extreme care using hand tools or equipment that will not cause damage to trees. Wrap exposed roots, two inches and larger in diameter in burlap or other approved material and keep moist at all times. Do not cut roots two inches and larger outside the actual space occupied by pipe. Excavate by tunneling under these roots.
 - 2. Tree branches that interfere with construction may be trimmed in advance of excavation. Trim branches to clear final grade by a minimum of 10 feet. Trim these branches back to the trunk of the tree. Trim branches 10 feet above final grade as necessary. Trim branches and cut roots in accordance with accepted horticultural practices by experienced personnel.
- C. Replace trees within property line of Authority or within right-of-ways and construction easements which are designated to remain and are damaged beyond repair at no additional expense to Authority.

1.04 BARRICADES

- A. Barricade or close all openings in roadways, floors, walls, or other parts of structures or walkways while openings are not in use.
- B. Size, type and location of barricades to conform to OSHA, PennDOT, or other jurisdictional Authority requirements.
- C. Provide, erect, and maintain necessary barricades, suitable and sufficient lights, danger signals, signs and reflective markers and take necessary precautions for protection of work and safety of public. Streets closed or partially closed to traffic to be protected by effective barricades, and obstructions illuminated during hours of darkness. Provide suitable warning signs to properly control and direct traffic.
- D. Erect warning signs in advance of any location where operations may interfere with use of a street by traffic and at intermediate points where new work crosses or coincides with an existing street.
- E. All barricades, warning signs, lights, temporary signals and other protective devices to conform with Bulletin 43, Maintenance and Protection of Traffic on Construction Projects, published by the Pennsylvania Department of Transportation.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Provide temporary fencing of type approved by Authority .
- B. Paint for tree wounds to be antiseptic, waterproof, black in color and have an asphaltic base.
- C. Provide barricades, warning signs, lights and other protective devices conforming to Pennsylvania Department of Transportation Standards.

PART 3 - EXECUTION

3.01 CLEANING

- A. Dismantle and remove all barricades, warning signs, lights and other protective devices upon completion of construction work in a particular area.

END OF SECTION

SECTION 01540 - SECURITY

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: General requirements for providing security at the Project site(s) during construction.

1.02 PROTECTION OF WORK AND PROPERTY

- A. Take positive measures to prevent entry to site of work and storage areas by children, animals and unauthorized adults.
 - 1. Provide temporary fencing as required to fence off excavation, storage and operating areas.
 - 2. Except as otherwise specified in Contract Documents, Contractor is authorized to refuse admission to Project site to any person whose admission is not specifically authorized in writing by Authority.
 - 3. Provide night security, if problems arise at construction sites relating to public safety, etc. Vandalism connected with construction of Project is sufficient grounds for requiring security.
 - 4. Costs related to security and vandalism is considered incidental to Contract and included under appropriate bid price.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01560 - TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Project Construction Facilities
- B. Temporary Control
- C. Project Identifications
- D. Field Offices

1.02 REGULATORY REQUIREMENTS

- A. Comply with all applicable laws and regulations of authorities having jurisdiction, including, but not limited to, building codes, health and safety regulations, utility company regulations, and environmental protection regulations.
- B. Provide electrical equipment which is UL listed.

1.03 CONTRACTOR RESPONSIBILITIES

- A. CONTRACTOR shall furnish, install, and pay for his own field office(s), facilities within his own field office(s), and storage facilities, and shall be responsible for removing these facilities upon completion of the Work.
- B. CONTRACTOR shall be responsible for all project construction facilities and temporary controls as required by the Contract Documents for the site. Project construction facilities shall include, but not be limited to, temporary heat, ventilation, water service, sanitary facilities, barriers, parking, security, pedestrian control, and maintenance and protection of traffic. Cost of temporary electrical, heat, telephone service, sewer service, and water shall be paid by CONTRACTOR.
- C. Temporary controls shall include dust control, sediment and erosion control, stormwater control, flood prevention, wastewater, traffic control, temporary fencing/security and progress cleaning.
- D. Storm Water Control
 - 1. CONTRACTOR shall be responsible for the Sediment and Erosion Control measures and procedures described in the Contract Documents.

2. Maintain flow of site stormwater. Grade site to drain. Maintain excavations free of water. Provide, operate and maintain pumping facility.
3. Protect site from puddling or running water. CONTRACTOR shall be responsible for flood damages to the Work. All flood damages shall be repaired to the satisfaction of ENGINEER.
4. CONTRACTOR assumes responsibility for damages to property caused by flooding due to blocking or restriction of storm water passages, natural waterways, and wastewater facilities.

1.04 PROJECT IDENTIFICATION

- A. A project sign identifying the project is not required.
- B. No other signs are allowed without OWNERS permission except those required by law.

1.05 ENGINEER'S FIELD OFFICE

- A. A field office for the ENGINEER is not required for this project.

1.06 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary above-grade or buried utilities, equipment, facilities, materials, prior to Final Application for Payment inspection.
- B. Clean and repair damage caused by installation or use of temporary work.
- C. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

1.07 SITE ACCESS

The CONTRACTOR is responsible for establishing access to the site of his work. The property and the right-of-way shown on the construction drawings are being provided by the OWNER. Any requirements for additional land required during construction for storage of material, locating trailers, or other temporary facilities, shall be provided by the CONTRACTOR at his cost. The CONTRACTOR shall obtain and provide for all necessary access to the property and rights-of-way shown on the plans. This may include the acquisition of temporary rights-of-way, as well as the construction of roadways which are driveable by the RPR and engineering staff. CONTRACTOR shall be responsible for acquiring, constructing, maintaining, and the restoration of any temporary access facilities required for construction.

In the event that the designated site access is also to be utilized for the construction

access, the CONTRACTOR shall be responsible for providing the temporary access, including earthwork, surface and groundwater control, and erosion and sediment requirements, including stabilized entrance. Near the completion of construction, the CONTRACTOR will be responsible for grading or excavation as may be necessary, and the construction of the permanent finished access roadway as provided for in the plans and project manual. In the event that it becomes necessary to utilize completed roadways or partially completed roadways for the delivery of construction material, such as aggregate fill or concrete, the CONTRACTOR shall be responsible for the degradation or damage that may result from this use.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01570 - TRAFFIC REGULATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: General guidelines for control of traffic while Project work within street or highway Right-of-Way is being performed. Goal is to help ensure safe and efficient traffic movement through work areas and provide safety for Contractor's work force.

1.02 SYSTEM DESCRIPTION

- A. Performance Requirements:
 - 1. The Contractor shall exercise careful control of traffic in work areas in order to protect the public and workmen, while at the same time minimizing the inconvenience to the public.
 - 2. The traffic regulation shall follow the standards and specifications established for the Pennsylvania Department of Transportation and shall be responsive to requirements as may be stipulated by The Local Municipality.
 - 3. The Contractor shall be prepared to discuss work area traffic control and shall, if required by the Authority, submit detailed plans for traffic control.

1.03 QUALITY ASSURANCE

- A. Requirements of Regulatory Agencies:
 - 1. Furnish, erect and maintain at closures, intersections, and throughout Project, necessary approved barricades, suitable and sufficient red lights, torches, approved reflectors, danger signals, warning, detour and closure signs. Provide a sufficient number of watchpersons and take necessary and legal precautions for protection of work and safety of public. Provide illuminated barricades, danger signals, signs and obstructions at night and keep lights burning from sunset until sunrise. Materials and safety devices (i.e., barricades, flashing warning lights, torches, reflectors and signs) to conform to State Department of Transportation Specifications.
 - 2. Perform traffic regulation on streets other than State Highways in accordance with requirements of local government.
 - 3. State Highways:
 - a. Provide traffic control in complete compliance with rules and regulations of Pennsylvania Department of Transportation (PDT), including but not necessarily limited to following:
 - 1) PA Code Title 67, Transportation: Chapter 203 - Work Zone Traffic Control.

- 2) PA Code Title 67, Transportation: Chapter 441 - Access to and Occupancy of Highways by Driveways and Local Roads.
- 3) PA Code Title 67, Transportation: Chapter 459 - Occupancy of Highways by Utilities.
- 4) Section 901 "Maintenance and Protection of Traffic During Construction" of Commonwealth of Pennsylvania Department of Transportation Specifications Publication 408/90, as supplemented.
- b. Requirements for traffic control specified in this Section are for convenience of Contractor and is not to be construed as a release from PDT requirements previously referenced.
- c. Pay fines and related costs resulting from failure to provide adequate traffic control.

B. Traffic Control Figures:

1. Traffic control requirements of construction site within State Highway Right-of-Way are attached to and made part of this Section by way of figures taken from Chapter 203 of PDT regulations.
2. Traffic control figures attached are to be used in conjunction with Project Manual to establish minimum requirements for Project and in no way preclude installation of additional control measures.

1.04 PROJECT CONDITIONS

A. Accommodation of Traffic:

1. When the construction will occur in streets owned and maintained by the local municipality, the streets shall not be unnecessarily obstructed, unless the appropriate municipality, in writing, authorizes the complete closing of a street. The Contractor shall take such measures at his own expense as may be necessary to keep the street open and safe for traffic.
2. The local municipalities reserve the sole right to close streets to traffic, and will not close a municipal street for the convenience of the Contractor or to expedite construction. The local municipality will consider closing a street to traffic when conditions in a specific area along the street justifies closing the street during the construction operations in that particular area. The Contractor shall contact the appropriate municipal Authority prior to starting work on the project and establish the procedure he is to follow in submitting a request to close a street in each municipality.
3. The Contractor shall construct and maintain such adequate and proper bridges over excavations as may be required for safe accommodation of pedestrians or vehicles. The Contractor shall furnish and erect, substantial barricades, auxiliary barriers, channelizing devices, hazard warning lights, flares and reflective markers at crossings of trenches, or along the trench, to protect the traveling public.
4. The Contractor shall not obstruct fire hydrants.
5. The roadway on one side of the line of work shall be kept open at all times.
6. The streets, crosswalks, and sidewalks shall be kept clean, clear and free for the passage of vehicles or pedestrians unless otherwise authorized in writing by the

Municipality. A straight and continuous passageway on sidewalks and over crosswalks, at least 3 feet in width, shall be preserved free from all obstruction.

7. All material piles, equipment, and pipe which may serve as obstructions to traffic shall be protected by proper lights, lanterns, torches, or guards as is necessary or required by the Authority or governing agencies having jurisdiction in the areas of construction.
8. Care shall be taken so that driveways to private properties and business establishments are not unnecessarily obstructed.
9. At the end of the workday or in event work is shutdown, all streets shall be left in such condition whereby they can be readily opened and safely traveled in cases of emergency, such as fire or for ambulance service. If so directed by the Authority, the Contractor shall either backfill the trench or place steel plate bridging over the end of the trench.

B. Maintenance of Traffic:

1. All traffic control devices shall be fabricated and installed according to the manual, "Maintenance and Protection of Traffic on Construction Projects," published by the Pennsylvania Department of Transportation. All traffic control devices shall be inspected at least weekly. Maintaining the control devices shall include keeping them in good condition, correct position, unobstructed by weeds, brush trees, construction material or equipment. Cleaning of all traffic control devices, when directed by the Authority, shall consist of hand cleaning with a mild detergent followed by a thorough rinse with clear water.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Provide materials and safety devices, including as barricades, flashing warning lights, torches, reflectors and signs, provided for purpose of protecting work and safety of the public and for maintaining and protecting traffic. Conform to the requirements specified in Section 901 of the current edition of the Commonwealth of Pennsylvania Department of Transportation Specifications Publication 408, as supplemented, and to the requirements specified in the current edition of Bulletin No. 43 complementing Section 901.
- B. Provide orange colored danger signals and warning signs

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install traffic control devices immediately before the beginning of construction and keep in place as long as they are needed and remove immediately thereafter.

3.02 REMOVAL

- A. Remove, cover, or turn traffic control device that does not apply to the existing condition so as not to be readable by oncoming traffic.

END OF SECTION

SECTION 01600 - MATERIAL HANDLING, STORAGE AND PROTECTION

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Products
- B. Transportation and handling
- C. Storage and protection

1.02 PRODUCTS

- A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
- B. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.
- C. Provide interchangeable components of the same manufacturer, for similar components.

1.03 TRANSPORTATION AND HANDLING

- A. Transport and handle Products in accordance with manufacturer's instructions.
- B. Promptly inspect shipments to assure that Products comply with requirements, quantities are correct, and Products are undamaged.
- C. Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.04 STORAGE AND PROTECTION

- A. Store and protect Products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive Products in weather-tight, climate controlled enclosures.
- B. For exterior storage of fabricated Products, place on sloped supports, above ground.

Fredericksburg Sewer & Water Authority

- C. Provide offsite storage and protection when site does not permit onsite storage or protection.
- D. Cover Products subject to deterioration when site does not permit onsite storage or protection.
- E. Store loose granular materials on solid flat surfaces in a well drained area. Prevent mixing with foreign matter.
- F. Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.
- G. Arrange storage of Products to permit access for inspection. Periodically inspect to assure Products are undamaged and are maintained under specified conditions.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not used.

END OF SECTION

SECTION 01655 - STARTING OF SYSTEMS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Starting equipment systems.
- B. Demonstration and instructions.
- C. Initial and final mechanical performance tests.

1.02 RELATED SECTIONS

- A. Section 01400 - Quality Control: Manufacturers' field reports.

1.03 STARTING SYSTEMS

- A. Coordinate schedule for start-up of various equipment and systems upon completion of equipment installation.
- B. Provide three (3) copies of a written start-up schedule to ENGINEER ten days prior to initiation of this phase of the Work. Schedule shall include:
 - 1. Plan for coordination with all subcontractors and other prime CONTRACTORS (if applicable), and OWNER's operations.
 - 2. Dates and items for starting each system or equipment item.
 - 3. Dates and times for completion of the demonstrations and instruction requirements for each system or equipment item.
 - 4. Source of water to be used for testing, if applicable, to system or equipment being tested.
 - 5. Method for disposing of water used for testing, if applicable, to system or equipment being tested.
- C. Prior to initiating mechanical performance tests specified herein this Section, CONTRACTOR shall complete the following.
 - 1. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, or other conditions which may cause damage.

2. Verify that tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.
3. Verify wiring and support components for equipment are complete and tested.
4. Verify that instrumentation, control, alarm, annunciation, and automatic shutdown systems are operating properly.
5. Check water containment structures, piping, and equipment for leaks.
6. Verify that equipment items are operating without excess vibration.
7. Verify that all valves and gates will open and close without binding.
8. Correct any items requiring verification prior to initiating the testing or operation of the system or equipment.
9. When specified in individual Specification sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to start-up, and to supervise placing equipment or system in operation.
10. Submit manufacturer's installation certificate according to Section 01400 - Quality Control that equipment or system has been properly installed and is functioning correctly.

1.04 INITIAL MECHANICAL PERFORMANCE TEST

- A. Perform mechanical performance testing where indicated in individual Specification sections or when requested by ENGINEER.
- B. CONTRACTOR with his own personnel including manufacturer's authorized representative as required (hereinafter collectively referred to as CONTRACTOR's Personnel) shall place equipment in operation and commence mechanical performance testing.
- C. CONTRACTOR's personnel with OWNER's personnel observing shall place equipment in operation. Correct any deficiencies detected prior to continuing operation.
- D. Upon correction of deficiencies and at ENGINEER's approval, place equipment in operation for continuous 24-hour period without assistance from OWNER's personnel.

1.05 DEMONSTRATION AND INSTRUCTIONS

- A. During initial mechanical performance test, demonstrate operation and maintenance of

products to OWNER's personnel.

- B. Provide qualified manufacturer's representative to complete demonstrations and instructions where required by individual Specification sections.
- C. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with OWNER's personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled times, at equipment location.
- E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.

1.06 FINAL MECHANICAL PERFORMANCE TEST

- A. Upon satisfactory completion of the initial mechanical performance test and training of OWNER's personnel as indicated by ENGINEER, commence the final mechanical performance test. Test shall cover 48-hour period with plant in continuous, normal operation.
- B. OWNER's personnel shall assume day to day operation of the equipment under the direct supervision of the CONTRACTOR's personnel. CONTRACTOR's personnel shall demonstrate to the satisfaction of the ENGINEER that equipment is coordinated and that installation complies with the applicable Drawings and Specifications. Performance tests shall be considered concluded at the end of the 48-hour period designated for the final test if the ENGINEER is satisfied with the test results, or if deficiencies are found, then when the deficiencies have been corrected to the satisfaction of the ENGINEER.

1.07 START-UP AND PERFORMANCE TEST COSTS

- A. Include in Contract Price the following operating costs for equipment Start-Up and Initial Mechanical Performance Tests.
 - 1. Electrical power.
 - 2. Lubricating grease.
 - 3. Lubricating oils.
 - 4. Chemicals.
 - 5. Water
 - 6. Such other materials or utilities not specifically identified herein, but required to conduct the initial mechanical performance tests.
- B. OWNER shall pay operating costs for final Mechanical Performance Tests.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01656 - DISINFECTION OF WATER MAINS**PART 1 - GENERAL****1.01 SUMMARY**

- A. Section Includes: Requirements for disinfection of water mains.
- B. Related Sections:
 - 1. Section 01666 – Testing of Piping
 - 2. Section 02610 – Pipe and Fittings

1.02 SYSTEM DESCRIPTION

- A. The Contractor is responsible for all testing of water. Perform tests in a DEP Certified Laboratory and shall be at Contractor's expense. The Authority reserves the right to test the water in its DEP certified laboratory, or have the Contractor test the water, at any time prior to final acceptance of the work and if found unsafe bacteriologically, to require the Contractor to re-chlorinate the system at Contractors expense.

- 1. Bacteria samples to be taken from copper service only.

1.02 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI/NSF Standard 60, Listing of Certified Drinking Water Treatment Chemicals – Health Effects.
- B. American Water Works Association:
 - 1. AWWA B300, Standard for Hypochlorites.
 - 2. AWWA B301, Standard for Liquid Chlorine.
 - 3. AWWA C600, Standard for Installation of Ductile Iron Water Mains and Their Appurtenances.
 - 4. AWWA C651, Standard for Disinfecting Water Mains.
 - 5. AWWA Manual M12, Simplified Procedure for Water Examination.

1.03 SUBMITTALS

- A. Bacteriological Test Results: See Bacteriological Tests below.

- B. Wastewater Disposal Plan: See Subparagraph 3.01 D. 8.

1.04 QUALITY ASSURANCE

- ### A. Bacteriological Tests:

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Transport, handle, and store specified disinfection products in manner recommended by respective manufacturers to prevent contamination and deterioration of products.

- B. When handling disinfection products, due caution is advisable. Wear gloves, apron, goggles, and suitable vapor mask.

1.06 PROJECT CONDITIONS

- A. Environmental Requirements:

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Hypochlorites: AWWA Standard B300.

- B. Liquid Chlorine: AWWA Standard B301.

- C. Provide NSF Standard 60 certified products per Listing of Certified Drinking Water Treatment Chemicals – Health Effects.

PART 3 - EXECUTION

3.01 WATER MAIN DISINFECTION

- A. Disinfect water main installed before placing in service.
- B. Form of Chlorine for Disinfection: With Authority's approval, follow either of these two designated methods of procedure.
 - 1. Liquid Chlorine: Apply chlorine gas-water mixture with solution feed chlorinating device in combination with booster pump for injecting chlorine gas-water mixture into main to be disinfected. Use only if Contractor can demonstrate to Authority that person supervising operation is thoroughly familiar and experienced in handling chlorine gas, suitable equipment is used, and proper safety equipment is available.
 - 2. Calcium Hypochlorite Solution: Prepare chlorine-water solution of 1 percent available chlorine using granular calcium hypochlorite. Inject or pump solution into pipeline. Prepare chlorine-water solution of 1 percent available chlorine by mixing approximately 1 pound of calcium hypochlorite with 8 gallons of water.
- C. Preparation:
 - 1. Preliminary Flushing: Prior to disinfection, thoroughly flush section of water main being disinfected with available water pressure and outlets.
 - 2. Flush after pressure and leakage tests are complete.
- D. Chlorination:
 - 1. Chlorine Application: Apply hypochlorite solution to water main with gasoline or electrically-powered chemical feed pump. For smaller applications, prepare solution in a barrel and pump into main with hand pump, such as a hydraulic test pump. Apply at dosage rate resulting in chlorine concentration in water in pipe is a minimum of 25 mg/l free chlorine. Table below gives amount of calcium hypochlorite and quantity of 1 percent hypochlorite solution required to produce 25 mg/l chlorine concentrate in 100 feet of pipe:

**Calcium Hypochlorite And Chlorine Solution Required
To Produce 25 Mg/L Concentration In 100-Feet Of Pipe**

Pipe Size Inches	Contents in 100-ft.		Section Gals.	Quantity of Calcium Hypochlorite		1% Chlorine Solution Gallons
	Cu. Ft.	Lbs.		Ounces	Pounds	
6	19.65	1,227	147	3/4	0.046	0.36
8	34.90	2,178	261	1-3/8	0.083	0.65
10	54.28	3,388	406	2-1/8	0.131	1.02
12	78.48	4,899	587	3-0	0.185	1.44
16	139.98	8,738	1,047	5-3/8	0.334	2.60
20	218.06	13,611	1,631	7-3/4	0.486	4.08
24	314.16	19,603	2,350	11-5/32	0.698	5.88
30	490.87	30,630	3,672	16-3/32	1.090	9.19

**Feet Of Pipe In Which 1 Ounce Of Calcium Hypochlorite
Will Produce 25 Mg/L Available Chlorine**

6"	8"	10"	12"	16"	20"	24"	30"
144	79	51	36	20	13	9	6

2. Point of Application: Apply chlorinating agent at high end of pipeline section being chlorinated and through a corporation stop inserted in top of new pipe. If water for preparation of chlorine solution is supplied from tap on existing pipeline, provide a physical break between injector supply and injector or pump.
3. Rate of Application: Pump chlorine solution slowly into new pipeline. Do not cease chlorine application until entire main is filled with chlorine solution. If required by Authority, measure chlorine residual at several points along section of main being disinfected to ensure that proper dosage and distribution of chlorine solution is obtained.
4. Prevention of Reverse Flow: Exercise great care in manipulating valves, so strong chlorine solution in line being treated will not flow back into adjoining water distribution system.
5. Retention Period and Chlorine Concentration: Retain chlorinated water in main for at least 24 hours. Operate all valves and hydrants in section in order to disinfect appurtenances. At end of this 24 hour period, maintain 10 mg/l chlorine residual throughout length of main.
6. Final Flushing: Following chlorination, thoroughly flush heavily chlorinated water from main at its extremities until replacement water throughout its length, is tested comparable to quality of water in existing distribution system.
7. Flushing Water: Authority will provide water for flushing; however, do not operate valves on water distribution system without presence of duly qualified representative of Authority.
8. Wastewater Disposal Plan:

- a. The Contractor shall develop a plan for safe disposal of chlorinated wastewater from disinfection/testing of pipelines, structures, etc. Submit the Plan to the Authority for review and to Pennsylvania Department of Environmental Protection for review and approval at least two weeks in advance of disinfection/testing activities. Do not perform disinfection/testing prior to receipt of approval from Pennsylvania Department of Environmental Protection.
 - b. The disposal plan shall include provisions for neutralizing chlorine and any other contaminants to levels acceptable to Pennsylvania Department of Environmental Protection.
 - c. Specific methods and devices designed to prevent erosion and subsequent sedimentation at the point(s) of discharge shall also be included in the Contractor's Plan.
- E. Bacteriological Tests: After final flushing and before each treated water main is placed in service, collect samples from end of line. Test samples for bacteriological quality in accordance with Standard Methods to show absence of coliform organisms. Take samples of water that has been standing in main for at least 16 hours after final flushing has been completed. When length of a water main exceeds 1,200 feet, Authority reserves right to require that water main be tested in sections. Lengths of each section will be determined by Authority.
- F. Redisinfection: If initial disinfection fails to produce satisfactory bacteriological samples, reflush and resample main. If check samples show presence of coliform organisms, rechlorinate main as specified previously.
- G. Water required for one disinfection and one flushing of main will be furnished by Authority at no cost to Contractor. If main requires additional disinfecting or flushing, Contractor is responsible for associated costs.
- H. Include costs for disinfection of water main in unit or lump sum prices bid for Work. No separate payment will be made for disinfection.

3.02 WATER MAIN CONNECTION DISINFECTION

- A. General: If not possible to disinfect piping, valves, and fittings installed at certain connections in manner specified in Article 3.01, Contractor will proceed as follows:
- B. Installation of Connections: During installation, observe every precaution to prevent foreign material and trench water from entering piping connections, fittings, and valves.

- C. Disinfection: Swab interior of piping connections, fittings, and valves with 5 percent hypochlorite solution. Obtain 5 percent hypochlorite solution by mixing approximately 3 pounds of granulated calcium hypochlorite with 5 gallons of water.

- D. Flushing: After pipe, fittings, and valves have been swabbed, thoroughly flush with water in a manner to be addressed in the Wastewater Disposal Plan. During installation, use extreme care to ensure foreign material is kept out of pipe.

END OF SECTION

SECTION 01666 - TESTING OF WATER PIPING

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Provisions for hydrostatic and leakage testing for water piping systems.

1.02 REFERENCES

- A. American Water Works Association:
 - 1. AWWA C600, Installation of Ductile-Iron Water Mains and their Appurtenances.

1.03 SYSTEM DESCRIPTION

- A. Design Requirements for Testing Water Mains: In accordance with AWWA C600 unless indicated otherwise within these specifications.
 - 1. Required Test Pressures: Test water main at a pressure of 150 psi (measured at low point of particular section of piping being tested).
 - 2. Pressure is not to vary by more than plus or minus 5 psi from required test pressure.
 - 3. Pressure test duration is 2 hours.
 - 4. Limit testing of new water mains to 2,500 feet maximum.
 - 5. Allowable leakage is as specified in paragraph 3.02 D.

1.04 SUBMITTALS

- A. Schedules:
 - 1. Prepare and submit schedules and procedures to Authority for testing water mains making up different parts of Project. Submit schedule and procedure a minimum of seven (7) days prior to each test.

1.05 PROJECT CONDITIONS

- A. Environmental Requirements:

1. Where any section of water main is provided with concrete thrust blocking, do not make the hydrostatic pressure test until at least five (5) days after concrete is placed.
 2. When temporary blocking is employed, tests may proceed 2 days (48 Hours) after placing H.E.S. concrete.
- B. Operational Requirements:
1. An Authority's representative must be present for operating valves required to fill mains for pressure and leakage tests. Valves may only be operated by Authority's personnel.
 2. Schedule pressure and leakage test at least 48 hours in advance of day that test is to be made with Authority.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.01 INSPECTION

- A. Inspect each section of pipe and each pipe fitting before installation in conformance with inspection requirements of appropriate standard.
- B. Remove rejected pipe and/or fittings from Project.

3.02 HYDROSTATIC TESTING

- A. General: Conduct pressure and leakage tests specified so that each pipeline installed in Project is tested to Authority's satisfaction.
 1. Provide test pump, pipe connection to main, and all necessary tools, materials and equipment, except the gauge, required for the main testing.
 2. The Authority will furnish the test gauge.
 3. Hydrostatic testing equipment and testing installation is subject to Authority's approval.
 4. Conduct hydrostatic pressure and leakage tests in presence of and to satisfaction of Authority.
 5. When length of a water main exceeds 1,200 feet, Authority reserves right to require that water main be tested in sections. Lengths of each section will be determined by Authority.

B. Preparation:

1. For underground pipe, either completely backfill trench or partially backfill trench over center section of each pipe length prior to carrying out pressure test. Authority reserves right, however, to direct that entire trench be backfilled, if traffic or other local conditions require such action.
2. Section of water main being tested must be filled with water a minimum of 24 hours before main is tested.
3. Extreme care must be exercised to ensure that all air is expelled from pipeline during filling of pipe with water.
4. If necessary, tap main and install corporation stops on main at points of highest elevation so that air can be expelled as pipe is filled with water.
5. After completion of tests, remove corporation stops and tightly plug taps, unless Authority elects to leave corporation stops in place.
6. Installation of corporation stops for release of air or water from main will be at Contractor's expense, unless they are retained by Authority for other use.

C. Pressure Test:

1. After pipeline has been filled with water for 24 hours, conduct a pressure test of at least two (2) hours duration. Test pressures for each section of water main to be tested as specified in Paragraph 1.02 A.1.
2. Apply the specified test pressure by means of a pump connected to the pipe in a manner satisfactory to the Authority.
3. Carefully examine all exposed pipes, joints, fittings, and valves during test, and tighten all joints showing visible leakage. Remove all defective pipe, fittings, and valves from line and replace at no additional expense.
4. Where trench has been completely backfilled, whether at Contractors option or as required by Authority, and pressure gauge fails to hold required specified pressure, open the trench at no additional expense to repair any leaks.

D. Leakage Test:

1. Conduct concurrently with pressure test.
2. Provide suitable means to measure leakage during pressure test. Keep a record of water added to pipeline to maintain pressure for a period of at least 2 hours.

3. Define leakage as quantity of water that must be supplied into newly laid pipe, or any valved section of it, to maintain pressure within 5 psi of specified test pressure after air in pipeline has been expelled and pipe filled with water.
4. No leakage is allowed for inside piping. No section of outside pipeline being tested will be accepted if leakage is greater than that determined by the formula

$$L = \frac{S D (P)^{1/2}}{133,200}$$

in which L is the allowable leakage, in gallons per hour; S is the length of the pipe tested in feet; D is the nominal diameter of the pipe, in inches; and P is the average test pressure during the leakage test, in pounds per square inch gauge.

5. Should any test of a section of pipeline disclose leakage greater than that permitted, locate and repair the defective joints and/or pipe at no additional expense. Repair all visible leaks regardless of amount of leakage.
- E. Repair and Retest: If a water main or section of water main fails to meet specified test requirements, and needs repaired, retest to demonstrate it meets specified test requirements. When water mains must be cut due to pressure test failure, only ductile iron long sleeves may be used to make pipe closures.
- F. Authority will furnish water required for one hydrostatic test of water main at no cost to Contractor. Water for additional tests, if required, will be paid for by Contractor.
- G. Include costs for above stated tests in unit or lump sum price or prices bid for Work. No separate payment will be made for pressure or leakage testing.

END OF SECTION

SECTION 01700 - CONTRACT CLOSEOUT

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Final cleaning.
- B. Adjusting.
- C. Project Record Documents.
- D. Warranties.
- E. Spare parts and Maintenance Materials.
- F. Certificate of Substantial Completion and Notice of Acceptability.
- G. Closeout Documents

1.02 FINAL CLEANING

- A. Complete final cleaning prior to final inspection.
- B. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains and foreign substances; polish transparent and glossy surfaces; vacuum carpeted and soft surfaces.
- C. Clean all equipment, remove excess lubrication.
- D. Replace filters of operating equipment.
- E. Clean debris from roofs, gutters, downspouts, and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from the site.
- H. Remove paint splatters from all equipment and exposed surfaces.
- I. Remove paint from all nameplates on mechanical and electrical equipment.
- J. Remove debris from limited-access spaces including manholes, valve pits, roofs, plenums, shafts, and equipment vaults.

- K. Clean light fixtures and lamps.

1.03 ADJUSTING

- A. Adjust operating products and equipment to ensure smooth and unhindered operation.

1.04 PROJECT RECORD DOCUMENTS

- A. Maintain on site, one set of the following Record Documents. Record revisions to the Work:
 - 1. Drawings
 - 2. Project Manuals
 - 3. Addenda.
 - 4. Change Orders, Work Change Directives, Written Amendments, and Field Orders.
 - 5. Reviewed Shop Drawings, Product Data, and Samples.
- B. Store Record Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Specifications: Legibly mark and record at each Product section description of actual Products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and Change Orders.
- E. Record Documents and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Measured depths of foundations of buildings and tankage in relation to plant datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to plant datum.
 - 3. Measured locations of internal utilities and appurtenances concealed in

construction, referenced to visible and accessible features of the Work.

4. Field changes of dimension and detail.
 5. Details not on original Drawings.
- F. Cross out ENGINEER's title block and seal from all documents and stamp all sheets "Record Document by NAME Contractor.
- G. Submit documents to ENGINEER with request for final inspection. Final inspection request will not be considered until Project Record Documents acceptable to ENGINEER are received.

1.05 WARRANTIES

- A. Provide duplicate copies for each set of submissions.
- B. Execute and assemble documents from subcontractors, suppliers, and manufacturers.
- C. Provide Table of Contents and assemble in three (3) ring binder with durable plastic cover.
- D. Submit prior to Final Application for Payment.
- E. No warranty shall start earlier than the date of Substantial Completion, unless approved by the OWNER.
- F. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.

1.06 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual Specification sections.
- B. Deliver to Project site and place in location as directed; obtain receipt prior to Final Application for Payment.

1.07 CERTIFICATE OF SUBSTANTIAL COMPLETION AND NOTICE OF ACCEPTABILITY

- A. Enclosed at the end of this section is the Certificate of Substantial Completion form which will be used by the ENGINEER for preparing both the Tentative and Definitive Certificates of Substantial Completion, and the Notice of Acceptability form which ENGINEER will use to give written notice to OWNER and

CONTRACTOR.

1.08 CLOSEOUT DOCUMENTS

- A. Submit the following documents with final Application for Payment. Statement of Surety Company and Contractor's Affidavit forms are located at end of this Section.
 - 1. Statement of Surety Company:
 - a. Completed by Surety and submitted by CONTRACTOR.
 - 2. Contractor's Affidavit:
 - a. Completed and submitted by CONTRACTOR.
 - 3. Evidence of Completed Operations Insurance:
 - a. Completed by Insurer on Insurer's form and submitted by CONTRACTOR..

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

CERTIFICATE OF SUBSTANTIAL COMPLETION

OWNERS Project No.

ENGINEER's Project No.

PROJECT:

CONTRACTOR:

Contract Date:

This Certificate of Substantial Completion applies to all Work under the Contract Documents or to the following specified parts thereof:

To:

OWNER

And to:

CONTRACTOR

The Work to which this Certificate applies has been inspected by authorized representatives of OWNER, CONTRACTOR and ENGINEER, and that Work is hereby declared to be substantially complete in accordance with the Contract Documents on

DATE OF SUBSTANTIAL COMPLETION

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

Certificate of Substantial Completion (Continued)

The responsibilities between OWNER and CONTRACTOR for security, operation, safety, maintenance, heat, utilities, insurance and warranties shall be as follows:

RESPONSIBILITIES:

OWNER: _____

CONTRACTOR:

The following documents are attached hereto and made a part of this Certificate:

This certificate does not constitute an acceptance of Work not in accordance with the Contract Documents nor is it a release of CONTRACTOR's obligation to complete the Work in accordance with the Contract Documents. CONTRACTOR shall have a continuing obligation under paragraph 13.07 of the General Conditions, to satisfactorily correct or remove and replace any defective work within a period of one year after the date of Substantial Completion or as may be required by specific provisions of the Contract Documents.

Executed by ENGINEER ON _____, 2005.

STECKBECK ENGINEERING & SURVEYING, INC.
ENGINEER

By: _____ P.E.

STATEMENT OF SURETY COMPANY

In accordance with the Provisions of Contract No. _____,
 _____ (Name of Contract)
 for _____ dated _____
 _____ (Name of Owner)
 between the _____ and
 _____ (Owner's Name)
 _____ and
 _____ (Contractor's Name and Address)
 (Surety) _____
 _____ (Surety's Name and Address)
 as surety on the bond of after a careful examination of the books and records
 _____ (Contractor's Name)
 of said Contractor or after receipt of an affidavit from the said Contractor, which examination or affidavit satisfied this
 Surety Company that all claims for labor, materials, and equipment have been satisfactorily settled, hereby approves of
 the final payment to the said and by these
 _____ (Contractor's Name)
 presents witnesseth that payment to the Contractor of the final construction cost invoices shall not relieve the Surety
 Company of any of its obligations to the as set forth in the said
 _____ (Owner's Name)
 Surety Company's Bonds.

IN WITNESS WHEREOF the said Surety Company has hereunto set its hand and seal this day of
 _____, 2000.

Attested:

(SEAL)

By: _____

Title: _____

NOTE: This statement, if executed by any person other than the President or Vice President of the Surety Company, must be accompanied by a certificate of even date showing authority conferred upon the person so signing to execute such instruments on behalf of the Surety Company represented.

CONTRACTOR'S AFFIDAVIT

COMMONWEALTH OF _____:

COUNTY OF _____:

Before _____ me, _____ the _____ undersigned, _____ a

(Notary Public or District Justice)

in _____ and _____ for _____ said _____ County _____ and _____ State _____ personally _____ appeared

who, being duly sworn according to law, deposes and says that the cost of all labor, material, and equipment and outstanding claims and indebtedness of whatever nature arising out of the performance of Contract No.

_____ between _____ the _____ and
_____ of _____

(Owner) _____ (Contractor) _____
_____, Pennsylvania _____ for _____ the _____ -

(Contract) _____ (Name of Contract) _____
(Contractor's Address) _____ (Name of Contract) _____

dated _____, have been paid in full.
(Date of Contract)

(Signature of Duly Authorized Representative of Corporation Named
Above)

Sworn to and subscribed before me, this
_____ day of _____, 2003.

NOTICE OF ACCEPTABILITY OF WORK

PROJECT:

OWNER:

CONTRACT NUMBER AND NAME:

CONTRACTOR:

CONSTRUCTION CONTRACT DATE:

ENGINEER: STECKBECK ENGINEERING & SURVEYING, INC.

The undersigned hereby gives notice to the above OWNER and CONTRACTOR that the completed Work furnished and performed by CONTRACTOR under the above Contract is acceptable, expressly subject to the provisions of the related Contract Documents and the terms and conditions stated below.

By:

Title:

Dated:

CONDITIONS OF NOTICE OF ACCEPTABILITY OF WORK

The Notice of Acceptability of Work ('Notice') above is expressly made subject to the following terms and conditions to which all persons who receive said Notice and rely thereon agree:

1. Said Notice is given with the skill and care ordinarily used by members of the engineering profession practicing under similar conditions at the same time and in the same locality.
2. Said Notice reflects and is an expression of the professional judgment of ENGINEER.
3. Said Notice is given as to the best of ENGINEER's knowledge, information, and belief as of the date hereof.
4. Said Notice is based entirely on and expressly limited by the scope of services. ENGINEER has been employed by OWNER to perform or furnish during construction of the Project (including observation of the CONTRACTOR's work) under ENGINEER's Agreement with OWNER and under the Contract referenced above, and applies only to facts that are within ENGINEER's knowledge or could reasonably have been ascertained by ENGINEER as a result of carrying out the responsibilities specifically assigned to ENGINEER under ENGINEER's Agreement with OWNER and the Contract referenced above.
5. Said Notice is not a guarantee or warranty of CONTRACTOR's performance under the Contract nor an assumption of responsibility for any failure of CONTRACTOR to furnish and perform the Work thereunder in accordance with the Contract Documents.

END OF SECTION

SECTION 01710 - PROJECT CLEANUP

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: Requirements for final cleanup and restoration of Project.

1.02 CLEANUP

- A. Before work is considered as being complete, clean site and remove evidence of construction activities.
- B. Construction site cleanup consists of removal of mud, oil, grease, dust, trash, scrap, debris, and surplus excavated material.
- C. Do not discard items on site or adjoining private property. Remove discarded items to an authorized public landfill.

1.03 RESTORATION AND RESTABILIZATION

- A. Restore and restablize areas disturbed by construction operations, including storage and stockpiling areas, access roads, stream crossing sites and areas within acquired right-of-way.
- B. Proceed with final restoration and restabilization, including fine grading, landscaping, seeding and paving immediately after construction activity is completed in a given area (when season permits). Dismantle and remove temporary construction facilities and leave site in a neat and orderly condition.
- C. Preserve and maintain public and private signs, markers, guard rails and fences in original condition. If authorized, remove conflicting facilities, preserve, store, protect and reerect upon completion of construction. Replace damaged items at no cost to Authority.
- D. Protect and guard trees, repair damaged trees or replace trees damaged beyond repair as specified elsewhere in Contract Documents.
- E. Reseed damaged lawn areas and seed areas used for access roads, parking and storage as specified elsewhere in Contract Documents.
- F. Restore gravel surfaces and shoulders to original condition. Remove and replace existing gravel contaminated by foreign material. Methods of construction to conform

to jurisdictional requirements and applicable permits issued for work. Stabilize areas adjacent to shoulders with gravel if left unstable by construction.

- G. Restore pavement, curbs, and other paved areas as specified elsewhere in Contract Documents.

1.04 DISPOSAL OF WASTE MATERIALS

- A. Dispose of construction waste material in authorized disposal areas, including municipal facilities if available.
- B. Remove waste material disposed in unauthorized area and restore to original condition, at no cost to Authority.

1.05 REMOVAL OF CONDEMNED MATERIAL

- A. Promptly remove material brought on site that is determined by Authority to be unsuitable or not in conformity with Specifications .
- B. Failure to remove condemned material from site within 72 hours after receipt of notice from Authority, may cause Authority to have condemned material removed and cost of removal deducted from monies due Contractor.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION

SECTION 01720 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes: General requirements for maintaining a record copy of Contract Documents.

1.02 RECORD DRAWINGS

- A. Keep one record copy of Contract Documents, reference documents, and technical Submittals on site, in order and annotated to show all changes made during construction process. Keep annotations current. Make record copy available to Authority during life of Project.
 - 1. If the Project is contracted by the Authority, at completion of Project and before final payment is made, furnish Authority one set of reproducible documents reflecting all changes described. Record drawings will include changes made to locations of buried and exposed piping, equipment changes, substitutions and variations from Contract Documents. Upon request, Authority will provide one set of sepia of original Contract Drawings, at cost to Contractor.
 - 2. If the Project is contracted by the Applicant, at completion of Project and before the system is accepted by the Authority, the Applicant will furnish the Authority one set of reproducible documents reflecting all changes herein described. Record Drawings will include changes made to locations of buried and exposed piping, equipment changes, substitutions and all variations from the General Specifications.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION