

SPECIFICATIONS
AND
CONTRACT DOCUMENTS

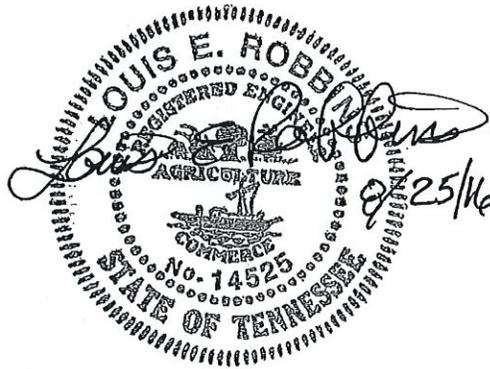
SEWER SYSTEM IMPROVEMENTS
MADISON CREEK & WYNRIDGE WAY
INTERCEPTOR ADDITIONS
(GOODLETTSVILLE RFB 1608-0035)

FOR THE

CITY OF GOODLETTSVILLE, TENNESSEE

GRW PROJECT NO. 7732-04

August 2016



Prepared By:

GRW Engineers, Inc.
404 BNA Drive, Suite 201
Nashville TN 37217
(615-366-1600)

**CITY OF GOODLETTSVILLE
MADISON CREEK GRAVITY SEWER
ADDENDUM ONE (1)**

Bid Date & Time: Thursday, January 11, 2018 at 2:00 p.m. local time
Addendum Date: December 5, 2017

This Addendum is issued to make certain additions, revisions, clarifications and alterations to the Plans, Specifications, Contract Documents, and requirements for the project. Each Bidder should acknowledge receipt of this Addendum on the Bid form; however, failure to do so does not relieve the Bidder from the requirements contained herein.

I. PROCUREMENT AND CONTRACTING REQUIREMENTS

A. All Sections

1. *Clarification: The Wynridge Way gravity sewer (Contract B) has been completed therefore all references within the specifications are not in contract. The project includes the Madison Creek Gravity Sewer (Contract A) only.*

B. Section 00100 Request for Bids

1. REPLACE in its entirety with the attached "Advertisement for Bids".

C. Section 00200 Instructions to Bidders

1. Page 00200-2, Paragraph 5.1, DELETE and REPLACE "Engineer" with City Engineer, Mr. Greg Edrington, P.E. (615.851.3461, gedrington@goodlettsville.gov)

D. Section 00410 Bid

1. REPLACE Page 00410-3 in its entirety with the attached.
2. Page 00410-4, DELETE "Bid Schedule – Contract B: Wynridge Way Gravity Sewer" in its entirety. Delete sections "DEDUCTIVE ALTERNATE" and "TOTAL BID – BOTH CONTACTS LESS DEDUCTIVE ALTERNATE:
\$_____."

II. SPECIFICATIONS

A. Section 01 2113 Allowances

1. ADD in its entirety with the attached.

B. Section 33 0130 Sewer Flow Control

1. ADD in its entirety with the attached.

III. DRAWINGS

- A. SHEET C-01 thru C-05** *Clarification: The Wynridge Way gravity sewer (Contract B) has been completed therefore all references within the drawings are not in contract. The project includes the Madison Creek Gravity Sewer (Contract A) only.*

- B. SHEET C-02 Clarification:** Gravity sewer pipe shall be 16" DIP (with Protecto 401 interior lining) outside of the casing pipe between manholes A-5 and A-6. Carrier pipe within the steel casing shall be 16" RJDIP gravity sewer. The existing 6" forcemain shall be abandoned by excavating and capping an existing tee fitting located adjacent to 2014 Crencor Drive not shown on the plans.
- C. SHEET C-02** The ARAP creek crossing between manholes A-3 and A-4 shall be installed via open cut with concrete encasement per the attached General Permit for Utility Line Crossings. The casing pipe between manholes A-5 and A-6 shall be 30" steel casing.

IV. PERMITS

A. General Permit for Utility Line Crossings

- 1. ADD in its entirety with the attached. Per the attached permit no blasting will be permitted in the excavation of trenches that parallel or lie within 50 feet of a stream or wetland, including all stream crossings. Flowable fill trench plugs will be placed throughout any trench running parallel within 50 feet of a stream channel, spaced at a maximum of 200 linear feet apart, or halfway between stream crossings, if less than 400 feet. Trench plugs will be at least ten feet in length, and extend to approximately 6 inches below normal elevations. All dewatering activities shall be conducted in such a manner as to prevent the discharge of sediment-laden water into waters of the state. Excavation and fill activities and shall be separated from flowing waters and all contours must be returned to pre-project conditions. All disturbed areas must be revegetated or otherwise stabilized upon completion of construction. All ARAP permit requirements shall be followed. No separate payment allowed for ARAP items listed herein except as provided on the bid schedule.

B. TDOT Road Boring Permit

- 1. ADD in its entirety with the attached.

ADVERTISEMENT FOR BIDS

Madison Creek Gravity Sewer

City of Goodlettsville
(Owner)

Separate sealed Bids for furnishing of all materials, labor, tools, equipment, and appliances necessary for the construction of the Madison Creek Gravity Sewer will be received by Charlie Ballard, 105 South Main Street, Goodlettsville, TN 37072 until 2:00 PM, local time, on Thursday, January 11, 2018, and then at said office publicly opened and read aloud.

The Project consists of the following major elements: installation of approximately 585 linear feet of 15" PVC gravity sewer via open cut; 70 linear feet of 8" PVC gravity sewer via open cut, ARAP creek crossing with concrete encasement via open cut, 228 linear feet of 30" steel casing with 16" DIP carrier pipe installed via bore and jack, 6 standard 4 ft. diameter manholes, abandonment of a sanitary sewer pumping station, and all necessary items for a complete project as shown or specified in the Contract Documents.

Copies of the Contract Documents and Specifications, including bidding documents and requirements and Contract Drawings may be obtained from the Owner at the address listed above, upon payment of \$75 for each set. This payment is not refundable. Copies may be examined at the following locations:

City of Goodlettsville City Hall, 105 South Main Street, Goodlettsville, TN 37072

Builders Exchange of Tennessee (Nashville Office), 2322 Winford Ave. Nashville, TN 37211

Builders Exchange of Tennessee (Knoxville Office), 300 Clark Street Knoxville, TN 37921

Bidders must be listed on City's list of plan holders who have purchased the Contract Documents, Specifications, and Drawings.

No bid may be withdrawn within 60 days after the scheduled time for receipt of bids.

Owner shall be provided with the following information: mailing address for U.S. Postal Service, physical delivery address, telephone number, email address, and name of contact person.

All sealed bid envelopes should be clearly marked "RFB # 1608-0035" on the face.

The City of Goodlettsville does not discriminate on the basis of age, race, sex, color, national origin, religion or disability in admission to, access to, or operation of its programs, services or activities, nor does it discriminate in its hiring, employment or purchasing practices.

City of Goodlettsville

Tim Ellis, City Manager

**SECTION 00410
 BID SCHEDULE
 CITY OF GOODLETTSVILLE
 MADISON CREEK GRAVITY SEWER
 GOODLETTSVILLE, TENNESSEE**

Note: Unless otherwise stated, all bid items shall be a complete installation as Specified and/or shown on Drawings.

Item No.	Description	Unit	Estimated Quantity	Unit Price	Item Total
Contract A: Madison Creek Gravity Sewer					
1	15" SDR 35 PVC Gravity Sewer	LF	732	\$	\$
2	16" DIP Gravity Sewer (with Protecto 401 interior lining)	LF	55	\$	\$
3	8" SDR 35 PVC Gravity Sewer	LF	70	\$	\$
4	30" Steel Casing (0.375" wall thickness) Bore & Jack - Highway and Creek Crossing w/ 16" RJDIP carrier pipe (with Protecto 401 interior lining)	LF	228	\$	\$
5	Concrete Encasement - ARAP Creek Crossing	LF	148	\$	\$
6	Standard 4 ft. Diameter Manhole w/Watertight Frame and Cover	EA	6	\$	\$
7	Extra Depth for Standard 4ft. Diameter Manholes (in excess of 6' depth)	VLF	32	\$	\$
8	Manhole Vent	EA	1	\$	\$
9	Service Stub-out	EA	1	\$	\$
10	6" Service Line to Cleanout	LF	10	\$	\$
11	Goodlettsville Standard Cleanout Assembly	EA	1	\$	\$
12	8" Connection to existing Manholes	EA	1	\$	\$
13	Plug and Grout Abandoned Sewer Lines	EA	2	\$	\$
14	Asphalt Base Mix & Surface Course (Overlay) Replacement	SY	200	\$	\$
15	Salvage equipment, remove electrical back to service pole, demolish and fill in structures, remove fencing, grade, topsoil, fertilize and sod existing Madison Creek Pump Station	LS	1	\$	\$
Allowances					
16	Allowances as specified in Section 01 2113	LS	1	\$10,000	\$10,000
TOTAL BID					
TOTAL BID _____			Dollars & Cents		
			(Words)		

SECTION 01 2113

ALLOWANCES

1. GENERAL

1.1. ALLOWANCES IN CONTRACT SUM

- A. Include allowances stated in the Contract Documents in the Contract Sum.
- B. Use of the allowances shall be authorized in writing by the Engineer and approved by the Owner.

1.2. ADMINISTRATION OF ALLOWANCES

- A. Contractor's duties in selection of products or provision of services under allowances.
 - 1. Assist the Engineer and Owner in determining qualified suppliers or installers.
 - 2. Obtain bids from suppliers and installers when requested by the Engineer.
 - 3. Make appropriate recommendations for consideration of the Engineer.
- B. Adjustment of Costs
 - 1. Should the net cost be more or less than the specified amount of the allowance, the Contract Sum will be adjusted accordingly by Change Order.
 - 2. At Contract Close Out, reflect approved changes to the Contract Sum in the final application for payment.
 - 3. The Contractor will be limited to a maximum mark-up for overhead and profit of 15 percent on allowance items.

1.3. SPECIFIED ALLOWANCES

- A. Owner specified miscellaneous items not covered in contract documents.
 - 1. Include lump sum allowance of \$10,000.
 - 2. This allowance is provided to cover the cost of unspecified and necessary repairs to existing equipment and appurtenances discovered during the work.

END OF SECTION

SECTION 33 0130

SEWER FLOW CONTROL

1. GENERAL

1.1. SCOPE

- A. Furnish, install and maintain sewer flow control devices required for the construction of the project. The contractor shall use either by-pass pumping units or other methods which have been approved by the Engineer.

2. EXECUTION

2.1. PLUGGING OR BLOCKING

- A. When using bypass pumping, insert a sewer line plug into the line at the manhole upstream from the proposed relocation. The plug shall be designed so that no sewage flow is released. The plug shall remain in place until the invert construction is complete.

2.2. BYPASS PUMPING

- A. Install a bypass pump of sufficient capacity to transport all of the sewers flow around the proposed invert construction. Install sewer plugs as required to isolate the construction area. Pumps shall be installed upstream of the construction area and shall discharge into the sewer downstream of the construction. No flow shall be discharged on the surface or in natural waterways. The bypass pumping shall continue until the construction is complete.

2.3. CONTRACTORS RESPONSIBILITY

- A. It shall be the Contractor's responsibility to install, operate, and maintain the bypass pumps during all operations. It shall also be the Contractor's responsibility to have a standby pump of equal size available on-site during the entire pumping operation.
- B. The Contractor shall submit to Engineer a bypass pumping plan for review and approval prior to commencement of bypass pumping operations. This plan shall include at a minimum, but not limited to, pump curves, hydraulic calculations, coordination and staffing requirements, and locations of suction and discharge.
- C. If full flow-thru sewer plugs are used, no pumps are required to be on site, Engineer approval required.
- D. The use of wheel ramps are required for piping where such crosses areas and entrances/exits subject to vehicular traffic. The use of "lay flat" hose shall be used where necessary.

- E. The Contractor shall notify the Engineer and/or his representative at least 24 hours in advance of all bypass pumping operations. The Contractor shall obtain approval prior to commencement of bypass pumping operations.

2.4. LIABILITY

- A. Damages to private or public property that result from sewer flow control operations are Contractor's responsibility.
- B. Any sewage spills shall be cleaned and limed as expeditiously as possible, but in no event more than 4 hours after the occurrence. Immediately notify the Engineer and Owner of all sewage spills.

END OF SECTION



Under the Aquatic Resource Alteration
General Permit for Utility Line Crossings

Tennessee Department of Environment and Conservation
Division of Water Resources
William R. Snodgrass Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville TN 37243

ARAP - NR1704.248

Under authority of the Tennessee Water Quality Control Act of 1977 (TWQCA, T.C.A. 69-3-101 et seq.) the Division of Water Resources has determined the activity described below would not violate applicable water quality standards.

This activity is governed by the *General Permit for Utility Line Crossings* issued pursuant to the TWQCA. The work must be accomplished in conformance with accepted plans, specifications, data and other information submitted in support of application NR1704.248 and the terms and conditions set forth in the above referenced general permit.

PERMITTEE: City of Goodlettsville

AUTHORIZED WORK: Installation of two crossings with one 15-inch PVC gravity sewer via open cut and one 26-inch steel casing pipe with 16-inch ductile iron carrier pipe by jack and bore

LOCATION: Madison Creek Rd. & Long Hollow Pk., Sumner County

Latitude: 36.34261 Longitude: -86.68106

WATERBODY NAME: Madison Creek, Willis Branch

EFFECTIVE DATE: 20-NOV-17

EXPIRATION DATE: 06-APR-20

This does not preclude requirements of other federal, state or local laws. In particular, work shall not commence until the applicant has received the federal §404 permit from the U. S. Army Corps of Engineers, a §26a permit from the Tennessee Valley Authority or authorization under a Tennessee NPDES Storm Water Construction Permit where necessary. This permit may also serve as a federal §401 water quality certification (pursuant to 33 U.S.C. §1341) since the planned activity was reviewed and the division has reasonable assurance that the activity will be conducted in a manner that will not violate applicable water quality standards (T.C.A. § 69-3-101 et seq. or of § § 301, 302, 303, 306 or 307 of *The Clean Water Act*).

The state of Tennessee may modify, suspend or revoke this authorization should the state determine that the activity results in more than an insignificant degradation of applicable water quality standards or violation of the TWQCA. Failure to comply with permit terms may result in penalties in accordance with T.C.A. §69-3-115.



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
NASHVILLE ENVIRONMENTAL FIELD OFFICE
DIVISION OF WATER RESOURCES
711 R.S. GASS BOULEVARD
NASHVILLE, TN 37216

November 21, 2017

Mr. Tim Ellis
City Manager
City of Goodlettsville
e-copy: tellis@cityofgoodlettsville.org
105 S. Main St.
Goodlettsville, TN 37072

Subject: **General Permit for Utility Line Crossings**
Aquatic Resource Alteration Permit (ARAP) NR1704.248
Madison Creek Sewer
City of Goodlettsville
Goodlettsville, Sumner County, Tennessee

Dear Mr. Ellis:

We have reviewed your application for the proposed Installation of two crossings with one 15-inch PVC gravity sewer via open cut and one 26-inch steel casing pipe with 16-inch ductile iron carrier pipe by jack and bore. Pursuant to the *Tennessee Water Quality Control Act of 1977* (T.C.A. § 69-3-101 et seq.) and supporting regulations the Division of Water Resources is required to determine whether the activity described in the attached notice of coverage will violate applicable water quality standards. This permit may also serve as a federal §401 water quality certification (pursuant to 40 C.F.R. §121.2).

This activity is governed by the *General Permit for Utility Line Crossings*. The work must be accomplished in conformance with accepted plans and information submitted in support of application NR1704.248 and the limitations and conditions set forth in the *General Permit for Utility Line Crossings* (enclosed). It is the responsibility of the permittee to ensure that all contractors involved with this project have read and understand the permit conditions before the project begins.

Please note that no blasting will be permitted in the excavation of trenches that parallel or lie within 50 feet of a stream or wetland, including all stream crossings. Excavation and fill activities shall be separated from flowing waters and all contours must be returned to pre-project conditions. All disturbed areas must be revegetated or otherwise stabilized upon completion of construction.

Annual Maintenance and Coverage Termination

Permittees will be assessed an annual maintenance fee of \$350 for coverages that exceed one year. Please note that this maintenance fee does not grant the right to extend coverage past the expiration date of the General Permit itself.

Permittees may terminate coverage prior to the expiration date by submitting a completed notice of termination form (NOT), which is available on the division's webpage at http://tdec.tn.gov/etdec/DownloadFile.aspx?row_id=CN-1450. A complete NOT should include

photodocumentation of the finished project area. The division will notify the permittee that either the NOT was received and accepted, or that the permit coverage is not eligible for termination (due to existing deficiencies) and has not been terminated.

We appreciate your attention to the terms and conditions of this general permit for aquatic resource alteration. If you have any questions, please contact Ms. Leanna Littler at (615) 687-7024 or by e-mail at *Leanna.Littler@tn.gov*.

Sincerely,

Brandon Yates for

April Grippo
Environmental Program Manager

Encl: NOC and copy of general permit
CC: Nashville EFO Permit File
Mr. Dudley Fox, Project Manager, Trestles, LLC, dudneyfox@trestlesllc.com

Tennessee Department of Environment and Conservation

General Aquatic Resource Alteration Permit for

Utility Line Crossings



Effective Date: April 7, 2015

Expiration Date: April 6, 2020

Activities Covered by this Permit

This general permit authorizes the construction, maintenance, repair, rehabilitation or replacement of utility line crossings of streams and wetlands, including subsurface crossings by directional drill or bore. The cumulative number of crossings that may be authorized under this general permit is dependent on the trenching technique, and line alignment in relation to water resources. For example, a greater number of crossing points may be authorized for utility line types that typically involve directional drilling and do not follow surface topography, such as fiber optic, gas transmission, and electric lines, than for gravity sewer lines utilizing traditional blasting or hoe-ramming trenching techniques.

In addition, certain activities may be performed without submittal of an application or written authorization from the division prior to the commencement of work, provided the work is performed in accordance with the applicable terms and conditions of this general permit:

- a) Utility line activities employing non-invasive technologies such as pipe bursting, or slip-lining.
- b) Up to 3 crossings (boreholes) utilizing horizontal directional drilling, provided no Federal or State-listed deemed in need of management, threatened, or endangered aquatic species are located within one-mile of the project location, and all special conditions, including subparts of condition #4 are met.
- c) Utility lines suspended from a culvert, bridge, or similar structure.

Certain activities due to size, location or potential water quality impacts are not covered under this general permit, as described in both the Special and General Conditions sections. Activities not qualifying for authorization under this general permit may be authorized by a standard (individual) permit provided that all requirements of the *Tennessee Water Quality Control Act of 1977* (the *Act*) are met.

Special Conditions

1. No blasting will be permitted in the excavation of trenches that parallel or lie within 50 feet of a stream or wetland, including all stream crossings.
2. In the case of proposed utility lines that follow the stream gradient or otherwise parallel the stream channel, the number of crossings shall be minimized to the maximum extent practicable
3. Flowable fill trench plugs will be placed throughout any trench running parallel within 50 feet of a stream channel, spaced at a maximum of 200 linear feet apart, or halfway between stream crossings, if less than 400 feet. Trench plugs will be at least ten feet in length, and extend to approximately 6 inches below normal surface elevation
4. Crossings that utilize horizontal directional drilling are authorized, provided that:
 - a. Entry and exit locations are at least 50 feet from the stream bank or wetland margin.
 - b. The depth of bore below the streambed is sufficient to reasonably prevent release of drilling fluid, based on the parent material.

- c. A site-specific contingency and containment plan for inadvertent release of drilling fluid must be established prior to commencement of work. This plan must include notification to the division upon release to surface waters.
5. For open trenching techniques, jack and bore, and auger boring, up to 5 crossings may be authorized. For gravity sewer lines, groundwater loss will be prevented by backfilling all open trench stream crossings with flowable fill or concrete between manholes on either side of the stream. Manholes shall not be located in wetlands.
6. For gravity sewer line installations, as-builts or record drawings of the line installation will be submitted to the division 45 days after completion of the project.
7. The alignment of new utility line crossings shall intersect the stream channel as close to 90 degrees or as perpendicular as possible. Alignment shall be no less than 45 degree angle from the centerline of the stream.
8. New utility line crossings shall be located such as to avoid permanent alteration or damage to the integrity of the stream channel or wetland. Large trees, steep banks, rock outcroppings etc., should be avoided.
9. The crossing shall be designed to prevent the impoundment or loss of normal or base flows. Base flow is the usual or normal flow of the stream that is supplied primarily by groundwater from springs and seeps, but not affected by rapid runoff during and after rainfall. In the case of streams with bedrock streambeds, special provisions shall be made to prevent the loss of stream flow due to fracturing of the bedrock.
10. The excavation and fill activities associated with the utility line crossing of non-navigable streams shall be kept to a minimum and shall be separated from flowing waters. The crossing shall be constructed in the dry to the maximum extent practicable, by diverting flow utilizing cofferdams, berms, temporary channels or pipes. Temporary diversion channels shall be protected by non-erodible material and lined to the expected high water level. For navigable streams as defined by §10 of the *Rivers and Harbors Act of 1899*, the excavation and fill activities associated with utility line crossing may be accomplished within the flowing water.
11. Maintenance, repair and rehabilitation of existing utility lines in wetlands are authorized provided that all of the following special provisions are met.
 - a. the total amount of excavation or fill within wetlands, including temporary equipment access roads does not exceed 50 cubic yards;
 - b. the wetlands alteration is located within the right of way of the existing utility line; and
 - c. Temporary impacts to wetlands shall be mitigated by the removal and stockpiling of the first 12 inches of topsoil, prior to construction. Upon completion of construction activities, all temporary wetland impact areas are to be restored to pre-construction contours, and the stockpiled topsoil spread to restore these areas to pre-construction elevation. Other side-cast material shall not be placed within the temporary impact locations. Permanent vegetative stabilization using native species of all disturbed areas in or near the wetland must be initiated within 14 days of project completion (see also *Landscaping with Natives* at tneppc.org). Non-native, non-invasive annuals may be used as cover crops until native species can be established
12. All spoil material from trench excavation, bore pits and other earth disturbing activities shall be deposited in an upland location and stabilized within 7 days in order to prevent erosion into waters of the state.

13. All dewatering activities shall be conducted in such a manner as to prevent the discharge of sediment-laden water into waters of the state.

General Conditions

1. All activities must be accomplished in conformance with the approved plans, specifications, data and other information submitted in support of the ARAP application (form CN-1091) and the limitations, requirements and conditions set forth herein. Failure to comply with the terms and conditions of this permit is a violation of the Tennessee Water Quality Control Act of 1977 (the Act), and is subject to penalty in accordance with T.C.A. §69-3-115.
2. Activities, either individually or cumulatively, that may result in greater than *de minimis* degradation to waters of the state are not covered. This general permit shall not be used incrementally to combine with other activities resulting in a net loss of water resource values.
3. Clearing, grubbing, and other disturbance to riparian vegetation shall be kept at the minimum necessary for slope construction and equipment operations. Unnecessary riparian vegetation removal, including trees, is prohibited. Non-native, non-invasive annuals may be used as cover crops until native species are established. Native riparian vegetation must be reestablished after work is completed. Coverage under this permit does not serve to waive any local riparian buffer protection requirement, and permittees are responsible for obtaining any necessary local approval.
4. This activity may not result in the permanent disruption to the movement of fish or other aquatic life.
5. Activities that adversely affect wetlands, or impair surface water flow into or out of any wetland areas are prohibited.
6. Activities located in a component of the National Wild and Scenic River System or waters designated as Outstanding National Resource Waters are not covered.
7. Activities occurring in known or likely habitat of state or federally listed threatened, endangered, deemed in need of management, or species of special concern may not be authorized without prior coordination with the Tennessee Wildlife Resources Agency (TWRA) and TDEC Division of Natural Areas (DNA) to determine if any special conditions are required to avoid and/or minimize harm to the listed species or their habitat. Adverse effects to federally listed threatened and endangered species are not permitted without prior authorization from the United States Fish and Wildlife Service (USFWS) as required by Section 7 or Section 10 under the Endangered Species Act.
8. Work shall not commence until the permittee has obtained all necessary authorizations pursuant to applicable provisions of §10 of The Rivers and Harbors Act of 1899; §404 of The Clean Water Act and §26a of The Tennessee Valley Authority Act, as well as any other federal, state or local laws.
9. Backfill activities must be accomplished in a manner that stabilizes the streambed and banks to prevent erosion. All contours must be returned to pre-project conditions to the extent practicable, and the completed activities may not disrupt or impound stream flow.
10. The use of monofilament-type erosion control netting or blanket is prohibited.
11. This permit does not authorize impacts to cultural, historic or archaeological features or sites.
12. This permit does not authorize access to private property. Arrangements concerning the use of private property shall be made with the landowner.
13. Where practicable, all activities shall be accomplished in the dry. All surface water flowing towards this work shall be diverted using cofferdams and/or berms constructed of sandbags, clean rock

(containing no fines or soils), steel sheeting, or other non-erodible, non-toxic material. All such diversion materials shall be removed upon completion of the work.

14. All activities must be carried out in such a manner as will prevent violations of water quality criteria as stated in TDEC Rule 0400-40-03. This includes, but is not limited to, the prevention of any discharge or use of materials that may be harmful to humans, terrestrial or aquatic life, or causes a condition in which visible solids, bottom deposits or turbidity impairs the designated uses of waters of the state.
15. Erosion prevention and sediment control measures must be in place and functional before any earth moving operations begin, and shall be designed according to the department's *Erosion and Sediment Control Handbook* (www.tn.gov/environment/wpc/sed_ero_controlhandbook/). Permanent vegetative stabilization using native species of all disturbed areas in or near the stream channel must be initiated within 15 days of project completion (see also *Landscaping with Natives* at tneppc.org). Non-native, non-invasive annuals may be used as cover crops until native species can be established.
16. The permittee is responsible for obtaining coverage under the National Pollutant Discharge Elimination System (NPDES) *General Permit for Storm Water Discharges from Construction Activities* where clearing, grading or excavation results in an area of disturbance of one or more acres, or activities that result in the disturbance of less than one acre if it is part of a larger common plan of development or sale.
17. Stream beds shall not be used as linear transportation routes for construction equipment. Temporary stream crossings shall be limited to one point in the construction area and erosion control measures shall be utilized where stream bank vegetation is disturbed. The crossing shall be constructed so that stream or wetland flow is not obstructed. Following construction, all materials used for the temporary crossing shall be removed and disturbed stream banks shall be restored and stabilized if needed.

Obtaining Permit Coverage

Utility Line Crossing activities requiring written notification and authorization may obtain coverage by submitting a signed and completed application (form CN-1091), along with any other required information, to the division. Work shall not commence until a written Notice of Coverage (NOC) from the division is received. As noted above, not all activities may be eligible for coverage under this general permit and coverage may be denied when appropriate.

Each Notice of Coverage under this general permit is valid until the expiration date specified on the NOC. If the expiration date on an NOC extends beyond the date the General Permit is modified, reissued, or revoked, and the permittee has commenced or is under contract to commence this activity before the expiration date, the permittee may have up to twelve (12) months from the date of the modification, reissuance, or revocation of the General Permit to complete the activity under the present terms and conditions of the general permit.

An application fee as established in Rule 0400-40-11-.02 will be assessed to applicants intending to receive an NOC to conduct activities under this general permit. An annual maintenance fee will be assessed to those individuals holding general permit coverage unless a Notice of Termination (NOT) form is received prior to the one-year anniversary of the issuance date of the NOC, or the NOC was issued for less than a one-year term. An NOT form can be downloaded from the division's ARAP webpage (<http://www.tn.gov/environment/permits/arap.shtml>).

APPROVED: _____


Tisha Calabrese Benton
Director, Division of Water Resources

DATE: _____

10/8/15



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION**

**RIGHT OF WAY DIVISION
SUITE 600, JAMES K. POLK BUILDING
505 DEADERICK STREET
NASHVILLE, TENNESSEE 37243-1402
(615) 741-3196**

**JOHN C. SCHROER
COMMISSIONER**

**BILL HASLAM
GOVERNOR**

Authorization Date: SEPTEMBER 13, 2016

Goodlettsville, City of

PERMIT NO.: GA-2007046825-2016

BOND: \$0.00

DESCRIPTION: By bore only to emplace encased 16" sewer under SR 174 @ mm # 1.57 in Sumner Co. See docs.

Route	Begin LM		Start Long/Lat	End Long/Lat
174	1.57	Sumner	-86.677565, 36.344903	-86.677565, 36.344903

Dear: Greg Edrington/City of Goodlettsville

Enclosed is an approved drawing covering the installation of the above referenced facilities. This permit was approved . The performance of this work will be covered under terms of the enclosed permit or general agreement between the utility and the Department of Transportation and the attached Permit Notes.

Please make sure your work forces have a copy of this approved drawing on hand at all times while working on the state rights-of-way. The attached notes are approval conditions to this permit and drawings.

In accordance with the State's Rules and Regulations, the Utility shall provide appropriate signing at all times during the construction and maintenance of facilities; therefore, signs must be in place before construction begins.

Please notify the District Utility Inspector at least three working days prior to the proposed date to begin work, of the date construction will begin in order to determine if a preconstruction conference is needed and to arrange proper inspection.

DISTRICT UTILITY CONTACT:

Name: Nathan Gregory
Address: 1215 Hartsville Pike Gallatin TN 37066
Phone: 615-451-5822
Fax:
Cell

The Utility must notify the District Utility Inspector upon completion of the installation in order that a final inspection can be made to facilitate the release of the bond. This permit expires one year from date of issuance.

Regards,

David E. Smith

David E Smith
TDOT Region 3 Utility Office

Enclosure:

CC: Nathan Gregory

Conditions:

- 1 APPROVED AS NOTED
BY: David E. Smith TDOT REGION 3 UTILITY DEPARTMENT
DATE: September 13, 2016
Comments:
- 2 Note: Utility Poles to be installed behind Guardrail, where Right-of-Way exists, requires a minimum clearance of 4 feet for Clear-Zone.
Comments:
- 3 Note: The permit proprietor will be responsible for the repair of any damage to the roadway or TDOT appurtenances caused by utility construction.
Comments:
- 4 Note: The Permit Proprietor is to ensure that all Parties associated with this project complies with all "Rules and Regulations for Accommodating Utilities within Highway Rights-of-Ways."
Comments:
- 5 Note: All installations and repairs are to be installed in compliance to TDOT'S "Rules and Regulations for Accommodating Utilities within Highway Rights-of Ways".
Comments:
- 6 Note: The Permit Proprietor is responsible for all erosion and sediment control required for the Utility installation
Comments:
- 7 Note: The T.D.O.T. inspector must be notified at least three (3) days before the commencement of the work to arrange proper inspection to insure a valid permit.
Comments:
- 8 Note: T.D.O.T. approved drawings and permit must be present at the job site while work is in progress.
Comments:
- 9 Tennessee 811. Dial 811 for Utility locates
Comments:
- 10 Note: Flaggers and workers in work zones shall wear Safety apparel meeting the requirements of ISEA "American National Standard for High Visibility Apparel" Refer to the latest edition of the "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES." (MUTCD), Section 6E.02
Comments:
- 11 Note: Delineator cones or barrels required along with the proper signage to close shoulders or lanes for Work-Zones or Buffer-Zones according to the latest edition of the "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES." (MUTCD)
Comments:
- 12 Note: Signing and Traffic Control Must be in conformance with the latest edition of the "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES." (MUTCD)
Comments:
- 13 Note: Machinery, materials and workers are not to be located in the roadway, shoulders or in the clear-zones without proper traffic control measures in compliance with the MUTCD requirements. D)
Comments:
- 14 Note: Stay Out Of Wetlands.
Comments:
- 15 Note: All logs, stumps, and other construction related debris must be removed from the Right-of-Ways.
Comments:
- 16 Note: The highway shoulder must not be disturbed.
Comments:
- 17 Note: The highway fill slopes must not be disturbed.
Comments:
- 18 Note: Rule 1680-6-1-.06,(f) Pedestals, fire hydrants, markers, or other above Ground utility appurtenances

installed as a part of Underground utility facilities shall be located at or as near the highway Right-of-Way lines as practical. In all cases they must be outside the Clear-Zone.

Comments:

- 19 Note: Underground Pneumatic Piercing tools (Hammerhead Mole, Hole-Hog, etc..) shall not be used for boring under State Routes.

Comments:

- 20 Note: All casings and conduits installed under State Routes shall meet or exceed the minimum AASHTO requirements.

Comments:

- 21 Note: All steel casings must have continuous welds around every joint.

Comments:

- 22 Note: The Utility installation must be installed with 36" or more of cover where installed within 5 feet of the drainage ditch.

Comments:

- 23 Note: Buried installation shall not go over culverts or other TDOT structures.

Comments:

- 24 Note: All side roads must be bored where installation is within the state Right-of-Way.

Comments:

- 25 Note: The Pipeline or Transmission line shall be identified by a permanent marker at the Right-of-Way lines or as near thereto as possible.

Comments:

- 26 Note: Stub poles or guy wires to ground anchors shall not be placed between a pole and the traveled way where they encroach upon the Clear-Zone.

Comments:

- 27 Note: All vertical road crossings must meet the minimum requirements of the latest edition Of the National Electrical Safety Code or maintain a minimum clearance of 18 feet.

Comments:



**TDOT/Region 3/Utilities Office.
Guidelines for submission of Utility Permit Requests**

The Application must include plans or sketches in support of the application

- A. Three (3) sets of plans are required for all applications (4 -5) for Consultant involvement except Roadway lighting, culvert and bridge encroachments where five (5) copies are required. "E"mail is acceptable but **Regular Mail** is the preferred method.
- B. All plans must have a letter from the Utility requesting permit to be issued; the letter must be **signed by someone who can legally obligate the Utility**. Permits requested by individuals not operating under a general agreement with the State need to route their request through the gaining utility or become a recognized utility by the State of Tennessee. The permit will be issued **TO** the utility and they will be responsible for the installation.
- C. Plans or sketches must be color coded as follows:
a. **Red – Proposed**
b. **Green – Existing facilities to be removed**
c. **Yellow – Existing facilities to remain**
d. **Blue – Temporary facilities**
- D. Plans must contain the following information:
a. Location within right-of-way, referenced numerically to outside driving edge of roadway (white line) **and** right-of-way
b. Buried facilities must show amount of cover (Minimum 36" cover required)
c. Necessary encroachment forms.
d. **Environmental compliance forms.**
- E. New above ground appurtenances must be located as close to the Right of Way line as possible and referenced above/below the adjoining traveled way and below ground structures must be structurally compliant to support machinery/vehicle travel across their axis without collapse or snag hazard.
- F. All plans must show location of project (Street address, log mile if available, Longitude and Latitude show in decimal of degree). **Google "Earth"** is especially helpful with this and can be set under tools-options then select decimal of degrees.
- G. All plans should show State Highway numbers  , Federal Highway numbers  , County and if Applicable, town or city.
- H. Pencil and Paper drawings are allowed **Provided** they legibly show all necessary information.
- I. Useful TDOT Utility reference information can be found beginning here:
<http://www.tn.gov/tdot/topic/row-utilities-office>
- J. **All utility installations MUST be in accordance with the "State's Rules and Regulations for Accommodation of Utilities within the Highway Rights of Way."**





TDOT/Region 3 Utilities Office
6601 Centennial Blvd.
Nashville, TN 37243 - 0360

REGION 3 UTILITIES PERMIT

ALL UTILITY WORK PERFORMED SHALL BE IN ACCORDANCE WITH THE "STATE RULES AND REGULATIONS FOR ACCOMODATING UTILITIES WITH HIGHWAY RIGHTS OF WAY", INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

- If a permit has been issued that requires a lane or traffic alteration that **MUST BE OBTAINED BEFORE THE WORK GRANTED BY THE PERMIT CAN INITIATE**. All lane closures need to be turned into this office 10 days before Project to allow for approvals and media release. **Aerial X-ing's/Lane Closures require coordination beyond the normal permit process. ADEQUATE/APPROPRIATE** safety measures, i.e., police presence, signs, cones, etc., must be utilized as needed/directed. Detour information/notifications must be disseminated as appropriate. Coordinate with local authorities/Law Enforcement for traffic control as appropriate/needed. Coordinate all utility work with businesses/homeowners 24 hours before work is started. Do not block homeowners/businesses.
- BLASTING** is not permitted via this permit. Obtain all necessary permissions/permits for such activity before requesting TDOT Utility Permit. **Consult TDOT Utility manual and all other applicable agencies for specifics on Blasting. Attach copies of blasting and all other required documents (TDOT, TDEC, FIRE MARSHALL, etc.) With TDOT permit application.**
- Replace original markings on roadway upon project completion. Restripe Temporarily if needed.
- Driveways that are concrete or asphalt surface, **1st choice** is to be bored, **2nd choice** is to be open-cut and replaced **in-kind** and brought to a neat line by mechanical sawing. Gravel Driveways can be open cut and replaced **in-kind**. Existing pavement bases such as curbs, gutters, and sidewalks shall be cut and brought to a neat line by mechanical sawing.
- New installations shall be run as close to the outer edge of Right-of-Way as possible.
- Locate underground facilities per law: **Tennessee One Call 1-800-351-1111.**



- ☒ Installation of buried/trenched utilities trenches shall be backfilled daily and mulched or sodded no later than 7 days after trenching. Stabilize slopes and take all necessary measures to prevent erosion. Permit proprietor is responsible for all erosion control measures and seed/sod deployment as needed.
- ☒ Repair all open cuts by milling 25' beyond disturbed area, full width, and re-surface with minimum of 9" inches of binder and a minimum of 2" inches of surface mix **unless otherwise directed by utility permit.** Open cuts will be backfilled with a minimum of 30" of Flowable Fill material. Use steel plates if needed. Plates must be stabilized by staking and bordered by tapered asphalt.
- ☒ Open-cut trenching, backfilling, and replacement paving to be done at night after evening rush hour.
- ☒ All surface roadwork will be done between the hours of 09:00 A.M. - 3:00 P.M. Road shall be cleared of all equipment and steel plates in place for traffic flow no later than 3:00 P.M. **Work requiring lane closures by specific permission only and time restricted. (See SPECIAL NOTES) Individual permits may require altered hours. See permit.**
- ☒ All bore pits shall be placed outside of the current right-of-way and a minimum of 5' from toe of slopes with appropriate protections in place at all times.
- ☒ 3 days' notice shall be given to the SEE PERMIT AS NOTED District Maintenance Engineer before work is started.

SPECIAL NOTES THIS PERMIT: Exercise all necessary/prudent traffic safety measures. Coordinate as needed with City/County & Law Enforcement for traffic control. Lane closure request must be received in this office and acted upon before work begins..

NOTE: NOTIFICATION TO THIS OFFICE FOR TRAFFIC ALTERATION APPROVALS ASSOCIATED WITH THE UTILITY PERMIT MUST BE RECEIVED NO LESS THAN TEN DAYS PRIOR TO THE EVENT. IT IS THE RESPONSIBILITY OF THE UTILITY TO OBTAIN THE NECESSARY SUPPORT FOR TRAFFIC CONTROL OPERATIONS.

THE UTILITY MUST PROVIDE TO THE REGIONAL OFFICE A NOTARIZED STATEMENT AFFIRMING COMPLIANCE WITH THE PROVISIONS OF TDOT CONSTRUCTION SPECIFICATION 712.04 BY THE TRAFFIC CONTROL ENTITY WITH EACH PERMIT REQUEST REQUIRING SUCH TRAFFIC ALTERATIONS.

THE AFFORMENTIONED SPECIFICATION CAN BE FOUND HERE IN THE 2015 STANDARD SPECIFICATIONS:

<https://www.tn.gov/tdot/section/tdot-construction-division>

See TDOT Website: <https://www.tn.gov/tdot/article/row-utilities-office-forms>
for appropriate forms to accompany permit application, i.e. Environmental,
Encroachments, etc,. Environmental forms must now accompany permit applications.

A COPY OF THE PERMIT AND CHECKLIST IS REQUIRED TO BE KEPT ON-SITE.

Consult the following URL's for questions and call if questions persist.

URL for guidance/permit requests:

Utilities Office Home

<https://www.tn.gov/tdot/topic/row-utilities-office>

REGION 3/ROW/UTILITIES OFFICE #'s:

(615) 350-4229 ~ David E. Smith

(615) 350-4230 (615) 476-8921 (Cell) ~ Tim Ross

REVISED 5/24/2016
SUPERCEDES ALL PREVIOUS

RECEIVED

SEP 08 2016

R-3 UTILITIES



August 31, 2016

Mr. David E Smith
TDOT Region 3 Utilities
6601 Centennial Blvd
Nashville TN, 37243

Re: REINSTATEMENT OF BORE PERMIT UNDER SR 174 AT MILE MARKER 1.57

Dear Mr. Smith:

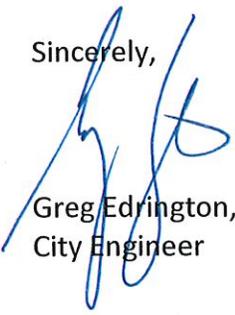
The City of Goodlettsville wishes to receive a permit from TDOT to cross under the right of way of SR 174 at mile marker 1.57. The bore will be for gravity sewer flow and will consist of 228 linear feet of a 26 inch diameter steel case housing with a 16 inch diameter ductile iron sanitary sewer carrier pipe. The depth of the bore will be approximately 15 feet below the road centerline and will be installed by a bore and jack method.

This permit was prepared, submitted and approved previously in 2013, however, the project was delayed due to easement issues and the permit expired. It is now being resubmitted to you for consideration. The attached documentation further details the requested work for permit.

Bids for the work are due to be received on September 21, 2016 and the work will be done before July 2017 provided funds set aside in the budget are available to complete the project.

Should you have any questions or concerns feel free to contact me at 615-851-3461.

Sincerely,


Greg Edrington, PE
City Engineer

105 South Main Street • Goodlettsville, TN 37072 • Phone (615) 851-3461 • Fax (615) 851-2212

E-mail: gedrington@goodlettsville.gov www.goodlettsville.gov

A government committed to operating with efficiency and integrity in all we do as we strive to enhance the quality of life for the community we serve.



Application and Utility Use and Occupancy Agreement

Agreement No.	_____
State Route No.	_____
Project No.	_____
County	_____
Type of Surety	_____
Bond / Check No.	_____

Application is hereby made by Name : City of Goodlettsville

Address : 215 Cartwright Street, Goodlettsville, TN 37072

for permission to install and maintain the following described utility facilities on the right-of-way of State Highway No. 174 in Sumner County

Description: 26" Steel Casing w/16" D.I.P. carrier crossing State Route 174 by Bore & Jack

At the following described location Intersection of State Route 174 and Madison Creek Road

Location: GPS = N 731723.397 E 1768133.408 Log Mile = Start 1.57 (approx.) End _____

in accordance with the attached plan and subject to *RULES AND REGULATIONS FOR ACCOMMODATING UTILITIES WITHIN HIGHWAY RIGHTS-OF-WAY* hereto issued by the Department of Transportation, and made a part hereof by reference thereto, and particularly to those provisions shown on this agreement and any special provisions set forth herein.

Special Provisions: _____

- A) Applicant is to deliver a bond, acceptable to the Department of Transportation, in the sum of \$ _____ to guarantee installation of facilities consistent with provisions of this agreement and maintenance of the highway right-of-way for a period of _____ months after acceptance of the condition of the highway right-of-way by an authorized representative of the Department of Transportation.

OR

- B) An active, fully executed General Agreement is in effect for this utility dated: N/A

This agreement is to be strictly construed and no work other than that specifically described above is hereby authorized.

The applicant in applying for this agreement agrees to the following:

- Applicant shall design, install and maintain its facilities in accordance with *RULES AND REGULATIONS FOR ACCOMMODATING UTILITIES WITHIN HIGHWAY RIGHTS-OF-WAY* hereto issued by the TDOT.
- Applicant, before commencing any work or installing any facilities shall submit to TDOT's regional office plans showing the location, type and scope of all work to be done or appliances to be installed in order that the Regional Utilities Coordinator may recommend approval of the proposed work.
- Applicant agrees that it will be responsible for any damages caused by any negligence on its part, including but not limited to the improper placing of or failure to display construction signs, danger signs, and other required signing and will bear any expense proximately caused by its operation on the right-of-way.
- Applicant shall pay the salary and expenses of any Inspector(s) that TDOT may see fit to place upon the work while such Inspector(s) is/are assigned to this work. TDOT before incurring any expenses expected to be charged to the Applicant shall advise the Applicant in writing of this fact.
- Applicant shall replace or repair any portion of the pavement, shoulders, bridges, private driveways or any part of said highway which may be disturbed or damaged. Replacements and repairs shall be made in accordance with the TDOT Standard Specifications For Road and Bridge Construction and any additional instructions which may be issued. Applicant agrees that TDOT may accomplish further replacements or repairs in the event those made by the applicant are not satisfactory, in which event the Applicant will reimburse TDOT for the cost of such other replacements or repairs. Except in cases of emergency TDOT shall notify the Applicant of the nature and extent of such further replacements or repairs to be accomplished prior to undertaking the work.
- If, at any future time, it should become necessary in the maintenance, construction, or reconstruction of said highway to have Applicant's appliances and facilities removed in order that said highway may be properly maintained, constructed or reconstructed or in the event said appliances and facilities should, at any time, interfere with the use of said highway, the Applicant agrees upon being requested so to do by TDOT to remove said appliances and facilities as promptly as the magnitude of the work to be accomplished will permit, at its own expense and without cost to TDOT, unless any requested removal should be contrary to any law of the State.
- Applicant shall be responsible for any conflicts with other utilities or appurtenances that are on the highway right-of-way and shall notify the respective owner(s) of any conflicts and secure the owners permission for any alterations.
- The Utility agrees to indemnify and hold harmless TDOT as well as its employees, officers and agents from and against any and all claims, liabilities, losses, and causes of action which may arise, accrue, or result to any person, firm, corporation, or other entity which may be injured or damaged as a result of acts, omissions, or negligence on the part of the Utility, its employees, its contractors, or any person acting for or on its or their behalf in the performance of the Utility Work relating to this Agreement. The Utility further agrees it shall be liable for the reasonable cost of attorneys for TDOT in the event such services are necessitated to enforce the terms of this Agreement or otherwise enforce the obligations of the Utility to TDOT. In the event of any such suit or claim, the Utility shall give TDOT immediate notice thereof and shall provide all assistance required by TDOT in TDOT's defense. TDOT shall give the Utility written notice of any such claim or suit, and the Utility shall have full right and obligation to conduct the Utility's own defense thereof. Nothing contained herein shall be deemed to accord to the Utility, through its attorney(s), the right to represent TDOT in any legal matter, such rights being governed by Tennessee Code Annotated, Section 8-6-106.
- TDOT does not grant the Applicant any right, title or claim on any highway right-of-way and in granting this permission to go upon the right-of-way does not, in any way, assume the maintenance of the Applicant's facility.
- This agreement shall become void if work is not commenced within a year from the date of execution of this Agreement.

By: _____ 8-31-16
 Signature Date
CITY ENGINEER
 Title

State of Tennessee Department of Transportation

By: _____
 Regional Utility Coordinator Date
 By: _____
 Regional Engineering Director Date

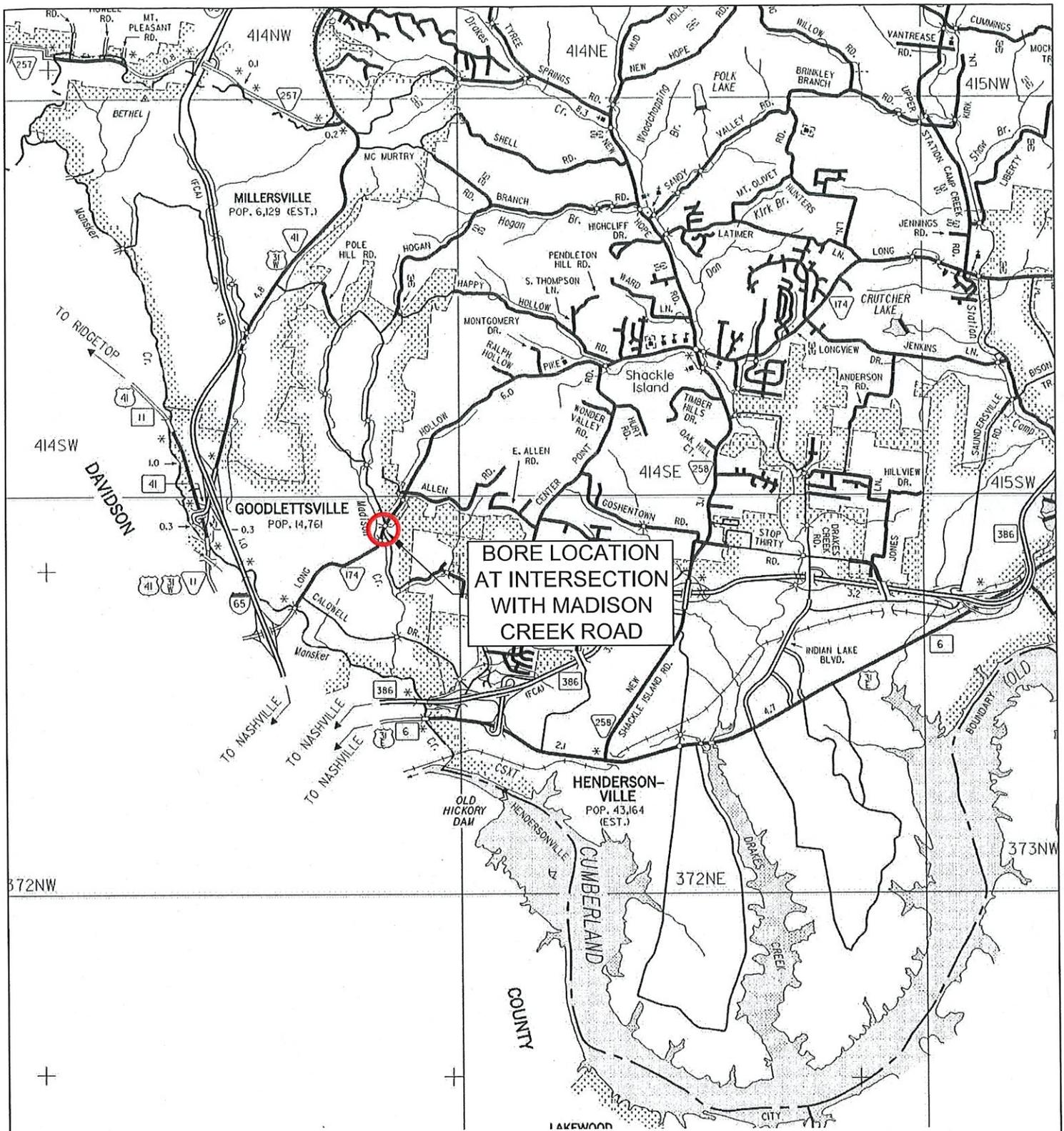
Agreement granted to make the above described installation in accordance with the applicable sections of the Rules and Regulations, Regulations shown herein of this agreement and Special Provisions made a part of this agreement, this _____ day of _____.



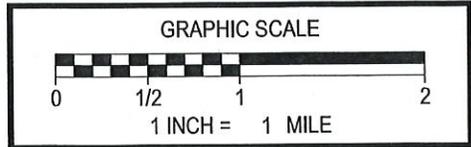
Pipeline Encroachments

The following information is required to accompany all plans for pipeline encroachments.

	Carrier Pipe	Casing Pipe
1. Contents to be handled	<u>wastewater</u>	<u>N/A</u>
2. Outside Diameter	<u>17.40"</u>	<u>26.75"</u>
3. Pipe material	<u>ductile iron</u>	<u>steel</u>
4. Pipe Specification and grade	<u>CL 250</u>	<u>ASTM A252 Grade 2</u>
5. Wall thickness	<u>0.30"</u>	<u>0.375"</u>
6. Design Pressure	<u>250 p.s.i.</u>	<u>35,000 p.s.i.</u>
7. Actual Working Pressure	<u>N/A</u>	<u>N/A</u>
8. Type of joint	<u>slip-joint (restrained)</u>	<u>welded</u>
9. Coating	<u>asphaltic coating (factory)</u>	<u>bituminous</u>
10. Method of installation	<u>push through casing</u>	<u>Bore and Jack</u>
11. Protection at end of casing	<u>N/A</u>	<u>watertight wrap</u>
	Both Ends <u>X</u> One end _____ Type <u>watertight wrap</u>	
12. Cover: Finished grade to top of casing or carrier	<u>4'-0" min. under Hwy / 3'-0" in R-O-W</u>	
Bottom of ditch or toe of slope to top of carrier to casing	<u>3'-0" min. cover</u>	
<hr/>		
13. Cathodic protection	<u>none</u>	
14. Size and height of casing vent	<u>N/A</u>	
15. Distance from casing vent to edge of nearest traffic lane	<u>N/A</u>	



**BORE LOCATION
AT INTERSECTION
WITH MADISON
CREEK ROAD**



GRW PROJECT NO. 7732-04				DESIGNED	ACH
REVISIONS				DRAWN	DM
NO	DESCRIPTION	DATE	BY	REVIEWED	ACH
				APPROVED	ACH
SCALE CHECK				[THIS MARK SHOULD MEASURE EXACTLY 1/2" WHEN PLOTTED]	

**HIGHWAY BORE
LOCATION MAP**
ENCROACHMENT PERMIT
CITY OF GOODLETTSVILLE, TENNESSEE

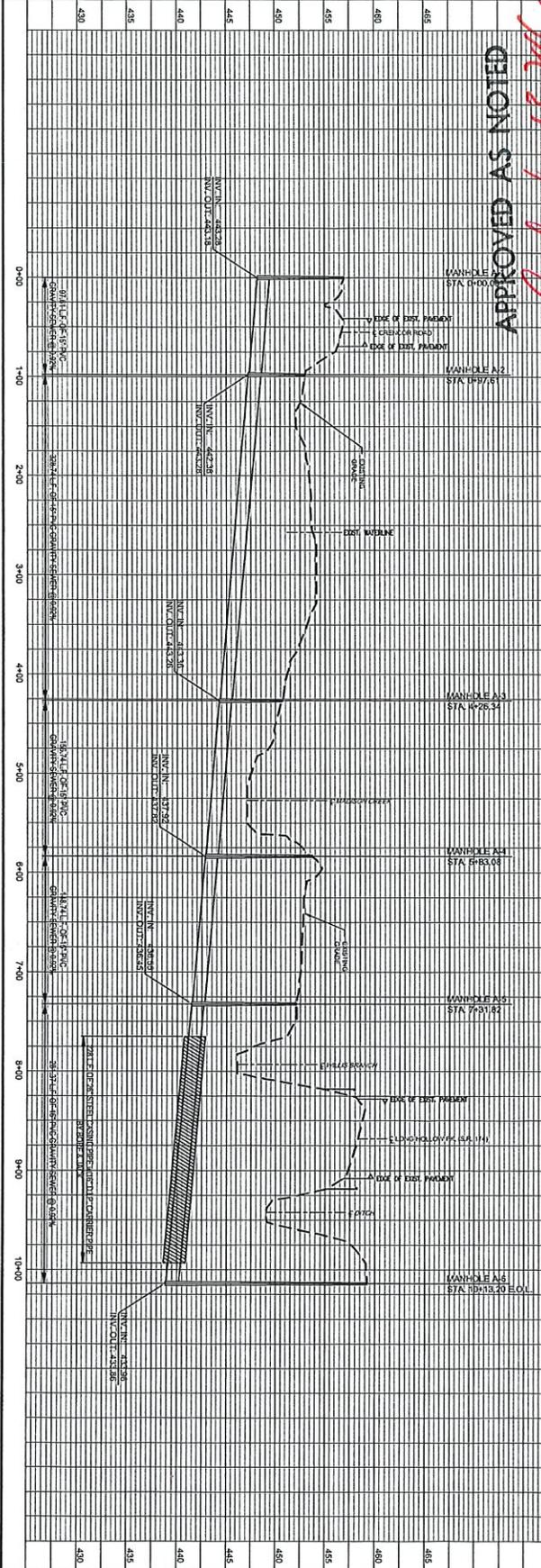
GRW
ENGINEERS - ARCHITECTS - PLANNERS
www.grvinc.com

ALL RIGHTS RESERVED
THIS DOCUMENT IS THE PROPERTY OF GRW ENGINEERS, INC. AND SHALL
NOT BE REPRODUCED IN WHOLE OR IN PART OR USED FOR CONSTRUCTION
OF OTHER THAN THIS SPECIFIC PROJECT WITHOUT WRITTEN PERMISSION

DATE
APRIL 2013

SCALE
1" = 1 MILE

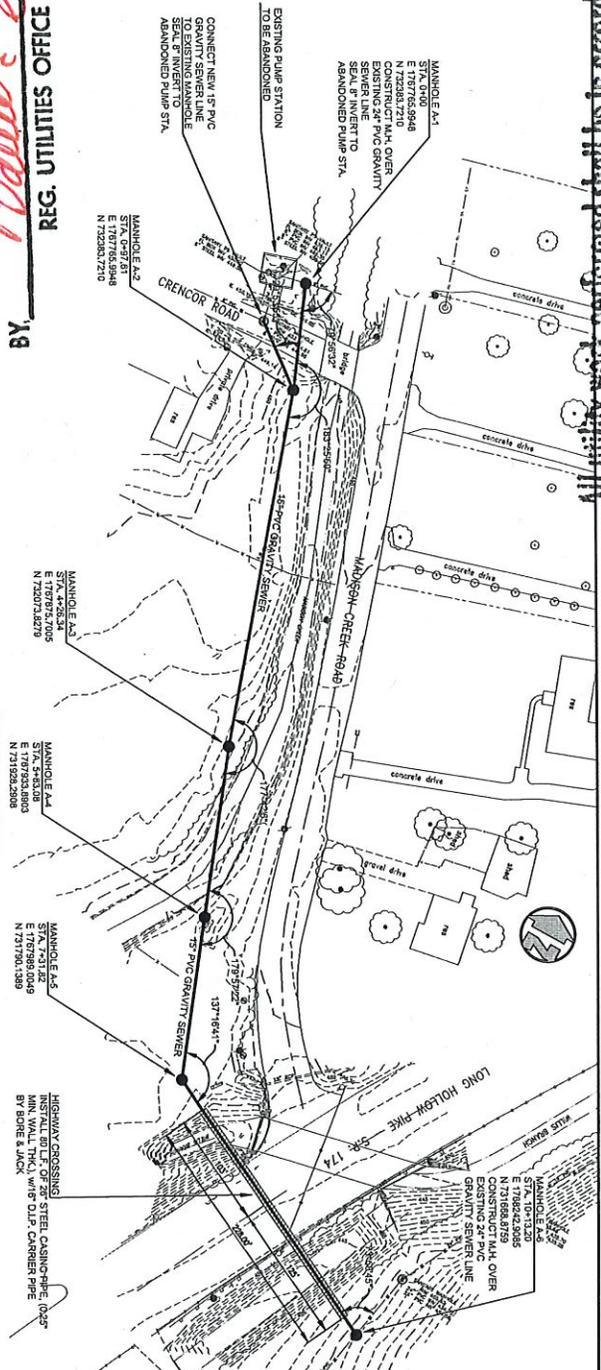
SHEET NO.
1 OF 4



APPROVED AS NOTED

DATE: September 11, 2013
 BY: David S. Gidycz

REG. UTILITIES OFFICE



All utility work performed shall be in accordance with State Rules and Regulations for accommodating Utilities within Highway Rights-of-way

- REVISIONS**
- | NO. | DATE | DESCRIPTION |
|-----|------------|-------------|
| 1 | APRIL 2013 | AS NOTED |
- REVISIONS**
- | NO. | DATE | DESCRIPTION |
|-----|------------|-------------|
| 1 | APRIL 2013 | AS NOTED |
- CONSTRUCTION NOTES:**
- ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE TOWN WATER POLLUTION PREVENTION PLAN (SWPPP).
 - CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5 FEET CLEARANCE FROM ALL EXISTING UTILITY LINES AND STRUCTURES.
 - CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5 FEET CLEARANCE FROM ALL EXISTING UTILITY LINES AND STRUCTURES.
 - CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5 FEET CLEARANCE FROM ALL EXISTING UTILITY LINES AND STRUCTURES.
 - CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5 FEET CLEARANCE FROM ALL EXISTING UTILITY LINES AND STRUCTURES.
 - CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5 FEET CLEARANCE FROM ALL EXISTING UTILITY LINES AND STRUCTURES.
 - CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5 FEET CLEARANCE FROM ALL EXISTING UTILITY LINES AND STRUCTURES.
 - CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5 FEET CLEARANCE FROM ALL EXISTING UTILITY LINES AND STRUCTURES.
 - CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5 FEET CLEARANCE FROM ALL EXISTING UTILITY LINES AND STRUCTURES.
 - CONTRACTOR SHALL MAINTAIN A MINIMUM OF 5 FEET CLEARANCE FROM ALL EXISTING UTILITY LINES AND STRUCTURES.

NO.	DATE	DESCRIPTION
1	APRIL 2013	AS NOTED

MADISON CREEK RD. 8" GRAVITY SEWER
 STA. 0+00 TO STA. 10+13.20 E.O.L.
 SEWER SYSTEM IMPROVEMENTS
 CITY OF GOODSLETTVILLE, TENNESSEE



GRVPROJECT NO 7332-04
 HIGHWAY ENCROACHMENT

Table of Contents

Bidding and Contracting Requirements

00100 - Request for Bids.....	1 - 1
00200 - Instruction to Bidders	1 - 7
00410 - Bid.....	1 - 5
00430 - Proposed Subcontractors	1 - 1
00431 - Bid Bond	1 - 2
00500 - Agreement.....	1 - 5
00510 - Notice Of Award	1 - 2
00550 - Notice To Proceed.....	1 - 3
00610 - Construction Performance Bond	1 - 2
00611 - Construction Payment Bond.....	1 - 2
00620 - Certificate Of Insurance	1 - 2
00625 - Certificate Of Owner's Attorney	1 - 1
00630 - Application For Payment.....	1 - 1
00700 - EJCDC General Conditions.....	1 - 39
00800 - Supplemental General Conditions.....	1 - 5
00940 - Change Order	1 - 1

DIVISION 1

Section 02400 - Boring and Jacking.....	1 - 4
---	-------

DIVISION 2

Goodlettsville Standard Sewer Specifications.....	1 - 102
---	---------

REQUEST FOR BIDS – RFB 1608-0035

CITY OF GOODLETTSVILLE

105 South Main Street

GOODLETTSVILLE, TENNESSEE 37072

Sealed Bids for the WASTEWATER SYSTEM IMPROVEMENTS, MADISON CREEK & WYNRIDGE WAY INTERCEPTOR ADDITIONS consisting of Contracts A & B with approximately 1,468 LF of 8", 15" and 16" gravity sewer which includes approximately 378 LF 16" gravity sewer jack and bore (26" steel encasement), 80 ft of 8" gravity sewer jack and bore (16" encasement), 9 manholes, salvage & demolition of two (2) sewage pump stations and appurtenances together with all related work as specified in the drawings & specifications as needed for this project and approved by the Owner will be received by the CITY OF GOODLETTSVILLE, TN at the City Hall office of the Purchasing Agent (Charlie Ballard at 615-851-2239) until 2:00 PM, CDST, Wednesday, September 21, 2016, and then at said office opened and publicly read aloud.

The CONTRACT DOCUMENTS, consisting of Advertisement for Bids, Information for Bidders, Bid, Bid Bond, Agreement, General Conditions, Supplemental General Conditions, Payment Bond, Performance Bond, Notice of Award, Notice to Proceed, Change Order, Drawings, Specifications, and Addenda, may be examined at the following locations:

- GRW Engineers, Inc., 404 BNA Drive, Suite 201, Nashville, TN 37217
- City of Goodlettsville, Department of Public Works, 215 Cartwright Street, Goodlettsville, TN 37072
- City of Goodlettsville, Office of City Engineer, 105 South Main Street, Goodlettsville, TN 37072
- Builders Exchange of Tennessee, 2322 Winford Avenue, Nashville, TN 37211
- Dodge Scan.

Copies of the CONTRACT DOCUMENTS may be obtained at the office of GRW Engineers, Inc., 404 BNA Drive, Suite 201, Nashville, TN 37217 upon payment of \$ 75.00 for each set. Payment is **not refundable**. Bidders must be listed on the official Plans & Spec holders list and Bids must be submitted on the official bid forms (no copies allowed) or the Bid will be rejected.

Bids shall be accompanied by a bid bond or a certified check in an amount equal to five percent (5%) of the bid to insure the execution of the contract for which the bid is made. In case the bid is not accepted, the check or bid bond will be returned to the bidder, but if the bid is accepted and the bidder shall refuse or neglect to enter into a contract with the City of Goodlettsville within ten (10) days after the time he has been notified of the acceptance of his bid, the said check or bid bond shall be forfeited to the City of Goodlettsville as liquidated damages for the failure to do so.

No bidder may withdraw his bid for a period of sixty (60) days after closing time scheduled for the receipt of bids.

The City of Goodlettsville reserves the right to waive informalities and to reject any and all bids.

City of Goodlettsville, TN

INSTRUCTIONS TO BIDDERS

1. DEFINED TERMS

Terms used in these Instructions to Bidders have the meanings assigned to them in the General Conditions and the Supplemental General Conditions. The term "Bidder" means one who submits a Bid directly to Owner, as distinct from a subbidder, who submits a bid to a Bidder. The term "Successful Bidder" means the lowest, qualified, responsible, and responsive Bidder to whom Owner (on the basis of Owner's evaluation as hereinafter provided) makes an award. The term "Bidding Documents" includes the Advertisement or Invitation to Bid, Instructions to Bidders, the Bid Form, and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

2. COPIES OF CONTRACT DOCUMENTS

- 2.1 Complete sets of the Contract Documents in the number and for the payment sum, if any, stated in the Advertisement or Invitation to Bid may be obtained from Engineer.
- 2.2 Complete sets of Contract Documents must be used in preparing Bids; neither Owner nor Engineer assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Contract Documents.
- 2.3 Owner and Engineer in making copies of Contract Documents available on the above terms do so only for the purpose of obtaining Bids on the Work and do not confer a license or grant for any other use.

3. QUALIFICATIONS OF BIDDERS

To demonstrate qualifications to perform the Work, each Bidder must be prepared to submit written evidence, such as financial data, previous experience, present commitments and other such data as may be called for herein or in the General Conditions. Each Bid must contain evidence of Bidder's qualification to do business in the state where the Project is located or covenant to obtain such qualification prior to award of the contract. The Owner may make such investigations as she/he deems necessary to determine the ability of the bidder to perform the Work, and the Bidder shall furnish to the Owner all such information and data for this purpose as the Owner may request. The Owner reserves the right to reject any Bid if the evidence submitted by, or investigation of, such Bidder fails to satisfy the Owner that such Bidder is properly qualified to carry out the obligations of the contract and to complete the Work contemplated therein. Conditional Bids will not be accepted.

4. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

- 4.1 It is the responsibility of each Bidder before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site to become familiar with local conditions that may affect cost, progress, performance or furnishing of the Work, (c) consider federal, state, and local laws and regulations that may affect cost, progress, performance or furnishing of the Work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Engineer of all conflicts, errors or discrepancies in the Contract Documents.
- 4.2 Before submitting a Bid, each Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any

additional information and data which pertain to the physical conditions (surface, subsurface, and Underground Facilities) at or contiguous to the site or otherwise which may affect cost progress, performance or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of the Contract Documents.

- 4.3 On request in advance, Owner will provide each Bidder access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a Bid. Bidders shall fill all holes, clean up and restore the site to its former condition upon completion of such explorations.
- 4.4 The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Contract Documents and such means, methods, techniques, sequences, or procedures of construction as may be indicated in or required by the Contract Documents, and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

5. INTERPRETATIONS AND ADDENDA

- 5.1 All questions about the meaning or intent of the Contract Documents are to be directed to Engineer. Interpretations or clarifications considered necessary by Engineer in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by Engineer as having received the Contract Documents. Questions received less than fourteen (14) days prior to the date for Opening of Bids may not be answered. Only questions answered by formal written Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.
- 5.2 Addenda may also be issued to modify the Contract Documents as deemed advisable by Owner or Engineer.

6. BID SECURITY

- 6.1 Each Bid must be accompanied by Bid Security made payable to Owner in an amount of five percent of the Bidder's maximum Bid price and in the form of a Certified Check or a Bid Bond (on form attached, if a form is prescribed) issued by a surety meeting the requirements of Paragraph 5.02 of the General Conditions.
- 6.2 The Bid Security of the Successful Bidder will be retained until such Bidder has executed the Agreement and furnished the required contract surety, whereupon the Bid Security, if in the form of a Certified Check, will be returned. If the Successful Bidder fails to execute and deliver the Agreement and furnish the required contract security within ten (10) days after the Notice of Award, Owner may annul the Notice of Award and the Bid Security of that Bidder will be forfeited. The Bid Security of other Bidders whom Owner believes to have a reasonable chance of receiving the award may be retained by Owner until the earlier of the seventh day after the Effective Date of the Agreement or 90th day after Bid opening, whereupon Bid Security furnished by such Bidders, if in the form of a Certified Check, will be returned. Bid Security with Bids which are not competitive will be returned within seven (7) days after Bid opening.

7. CONTRACT TIME

The number of days which, or the date by which, the Work is to be substantially completed and also completed and ready for final payment (the Contract Time) are set forth in the Bid Form and the Agreement.

8. LIQUIDATED DAMAGES

Provisions for liquidated damages, if any, are set forth in the Supplemental General Conditions and are referred to in the Agreement.

9. SUBSTITUTE OR "OR-EQUAL" ITEMS

The Contract, if awarded, will be on the basis of materials and equipment indicated in the details and specified in the Specifications without consideration of possible substitute or "or-equal" items. Whenever it is indicated in the details or specified in the Specifications that a substitute "or-equal" item of material or equipment may be furnished or used by contractor if acceptable to Engineer, application for such acceptance will not be considered by Engineer until after the Effective Date of the Agreement. The procedure for submission of any such application by Contractor and consideration by Engineer is set forth in Paragraph 6.05 of the General Conditions and may be supplemented in the General Requirements.

10. SUBCONTRACTORS, SUPPLIERS AND OTHERS

- 10.1 If the Bid Form or Contract Documents require the identity of certain Subcontractors, Suppliers and other persons and organizations (including those who are to furnish the principal items of material and equipment) to be submitted to Owner in advance of the specified date prior to the Effective Date of the Agreement, the Bidder shall submit to Owner a list of all such Subcontractors, Suppliers and other persons and organizations proposed for those portions of the Work for which such identification is required. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, person or organization if requested by Owner. If Owner or Engineer, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, other person or organization, either may before the Notice of Award is given request the apparent Successful Bidder to submit an acceptable substitute without an increase in Bid price. If apparent Successful Bidder declines to make any such substitution, Owner may award the contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers and other persons and organizations. This will not constitute grounds for sacrificing the Bid Security of any Bidder. Any Subcontractor, Supplier, other person or organization listed and to whom Owner or Engineer does not make written objection prior to the giving of the Notice of Award will be deemed acceptable to Owner and Engineer subject to revocation of such acceptance after the Effective Date of the Agreement as provided in Paragraph 6.06 of the General Conditions.
- 10.2 No Contractor shall be required to employ any Subcontractor, Supplier, other person or organization against whom Contractor has reasonable objection.

11. BID FORM

- 11.1 The Bid Form is included with the Contract Documents; additional copies may be obtained from Engineer (or the issuing office).
- 11.2 All blanks on the Bid Form must be completed in ink or by typewriter. The bid price of each item on the form must be completed.
- 11.3 Bids by corporations must be executed in the corporate name by the president or a vice-president (or other corporate officer accompanied by evidence of authority to sign) and the corporate seal must be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation must be shown below the signature.
- 11.4 Bids by partnerships must be executed in the partnership name and signed by a partner, whose title must appear under the signature and the official address of the partnership must be shown below the signature.
- 11.5 All names must be typed or printed below the signature.
- 11.6 The Bid shall contain an acknowledgment of receipt of all Addenda (the numbers of which must be filled in on the Bid Form).
- 11.7 The address and telephone number for communications regarding the Bid must be shown.
- 11.8 The Bid price shall include such amounts as the Bidder deems proper for overhead and profit on account of any cash allowances named in the Contract Documents as provided in Paragraph 11.02 of the General Conditions.
- 11.9 Each Bid must be submitted on the prescribed form and accompanied by the submittals listed in the Bid Form.

12. SUBMISSION OF BIDS

Bids shall be submitted at the time and place indicated in the Advertisement for Bids and shall be enclosed in an opaque sealed envelope, clearly marked with the following:

- Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted)
- Name of Bidder
- Address of the Bidder
- License Number
- License Expiration Date
- License Classification Applying to this bid

Bids shall be by the Bid Security and other required documents. If the Bid is sent through the mail or other delivery system the sealed envelope shall be enclosed in a separate envelope with the notation "BID ENCLOSED" on the face of it.

13. MODIFICATION AND WITHDRAWAL OF BIDS

- 13.1 Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.
- 13.2 If, within twenty-four (24) hours after Bids are opened, any Bidder files a duly signed, written notice with Owner and promptly thereafter demonstrates to the reasonable satisfaction of Owner that there was a material and substantial mistake in the preparation of its Bid, that Bidder may withdraw its Bid and the Bid security will be returned. Thereafter, that Bidder will be disqualified from further bidding on the Work to be provided under the Contract Documents.

14. OPENING OF BIDS

- 14.1 Bids will be opened and (unless obviously non-responsive) read aloud publicly. An abstract of the amounts of the Base Bids and major alternatives (if any) will be made available to Bidders after the opening of Bids.
- 14.2 Any bid received after the time and date specified shall not be considered.

15. BIDS TO REMAIN SUBJECT TO ACCEPTANCE

All Bids will remain subject to acceptance for sixty (60) days after the day of the Bid opening, but Owner may, in its sole discretion, release any Bid and return the Bid Security prior to that date.

16. AWARD OF CONTRACT

- 16.1 Owner reserves the right to reject any and all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to be nonresponsive. Owner may also reject the Bid of any Bidder if Owner believes that it would not be in the best interest of the Project to make an award to that Bidder.

Owner also reserves the right to waive all informalities not involving price, time, or changes in the Work and to negotiate Contract terms with the Successful Bidder.

- 16.2 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.
- 16.3 In evaluating Bids, Owner will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.
- 16.4 In evaluating Bidders, Owner will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers,

and other individuals or entities must be submitted as provided in the Supplemental General Conditions.

- 16.5 Owner may conduct such investigations as Owner deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities to perform the Work in accordance with the Contract Documents.
- 16.6 If the Contract is to be awarded, Owner will award the Contract to the Bidder whose Bid is in the best interests of the Project.
- 16.7 If the Contract is to be awarded, Owner will give the Successful Bidder a Notice of Award within sixty (60) days after the day of the Bid opening.

17. CONTRACT SECURITY

Paragraph 5.01 of the General Conditions as may be modified by the Supplemental General Conditions set forth Owner's requirements as to Performance and Payment Bonds. When the Successful Bidder delivers the executed Agreement to Owner, it must be accompanied by the required Performance and Payment Bonds.

18. SIGNING OF AGREEMENT

When Owner gives a Notice of Award to the Successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within ten (10) days thereafter, Contractor shall sign and deliver the required number of counterparts of the Agreement and attached documents to Owner with the required Bonds. Within ten (10) days thereafter, Owner shall deliver one fully signed counterpart to Contractor. Each counterpart is to be accompanied by a complete set of the Drawings with appropriate identification.

19. RETAINAGE

Provisions concerning retainage and Contractors' rights to deposit securities in lieu of retainage are set forth in the Agreement.

20. POWER OF ATTORNEY

Attorneys-in-fact who sign Bid Bonds or Contract Bonds must file with each bond a certified and effective dated copy of their power of attorney.

21. LAWS AND REGULATIONS

The Bidder's attention is directed to the fact that all applicable State Laws, municipal ordinance, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract throughout, and they will be deemed to be included in the Contract the same as though herein written out in full.

22. SAFETY STANDARDS AND ACCIDENT PREVENTION

With respect to all Work performed under this contract, the Contractor shall:

- 22.1 Comply with the safety standards provisions of applicable laws, building and construction codes and the "Manual of Accident Prevention in Construction" published by the Associated General Contractors of America, the requirements of the Occupational Safety and Health Act of 1970 (Public Law 91-596), and the requirements of Title 29 of the Code of Federal Regulations, Section 1518 as published in the "Federal Register", Volume 36, No. 75, Saturday, April 17, 1971.
- 22.3 Exercise every precaution at all times for the prevention of accidents and the protection of persons (including employees) and property.
- 22.4 Maintain at his/her office or other well known place at the job site, all articles necessary for giving first aid to the injured, and shall make standing arrangements for the immediate removal to a hospital or doctor's care of persons (including employees), who may be injured on the job site before the employer has made a standing arrangement for removal of injured persons to a hospital or a doctor's care.

23. CLEAN AIR ACT

The Contract will not be awarded to any Contractor who is in violation of the Clean Air Act and/or the Federal Water Pollution Control Act or that utilizes any facility included in the EPA List of Violating Facilities (40 CFR, Part 15) 40 CFR, Part 30, 410-4. The Contractor shall not award any subcontract to any such subcontractor.

24. EROSION CONTROL

The City of Goodlettsville is committed to the prevention of erosion problems associated with construction. The Contractor shall at a minimum provide silt fencing, straw bales, etc... for the prevention of erosion problems associated the work done on this project. The erosion controls shown on these drawings and described in Section 2371 of these Specifications shall be followed.

25. SEWER LINE ABANDONMENT

This project involves the abandonment of some existing sewer lines and demolition of a pump station. The associated manholes of these abandoned sewer lines and the pump station top slab will be removed and the surrounding grounds repaired in accordance with Sections 2200 and 2920 of these Specifications. The manhole castings and hinged gratings will be removed by the Contractor undamaged and returned to the City of Goodlettsville Public Works per their instruction. The Contractor will remove and dispose of the manhole cones, upper barrel sections, wet well top slab and valve box. The bottom barrel of each manhole and lower portion of the wet-well will be crushed-in-place, filled with compacted dirt, and seeded as necessary. If the manhole is located in a paved area, it will be filled with compacted gravel and then covered with an asphalt or concrete cap to match the surroundings.

END OF SECTION

BID

PROJECT DESCRIPTION:

WASTEWATER SYSTEM IMPROVEMENTS

MADISON CREEK & WYNRIDGE WAY

INTERCEPTOR ADDITIONS (RFB 1608-0035)

CONTRACT IDENTIFICATION NUMBER:

GRW ENGINEERS, INC. PROJECT NO. 7732-04

THIS BID IS SUBMITTED TO:

CITY OF GOODLETTSVILLE, TN

105 SOUTH MAIN STREET

GOODLETTSVILLE, TN 37072

- 1.01** The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an agreement with OWNER in the form included in the Contract Documents to perform and furnish all work as specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the other terms and conditions of the Contract Documents.
- 2.01** BIDDER accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation, those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for sixty (60) days after the day of Bid opening. BIDDER will sign and submit the Agreement with the Bonds and other documents required by the Bidding Requirements within ten (10) days after the date of OWNER's Notice of Award.
- 3.01** In submitting this Bid, BIDDER represent, as more fully set forth in the Agreement, that:
- (a) BIDDER has examined copies of all the Bidding Documents and the following addenda (receipt of all which is hereby acknowledged):

ADDENDUM NUMBER

ADDENDUM DATE

- (b) BIDDER has familiarized itself with the nature and extent of the Contract Documents, Work, Site, Locality, and all local conditions and laws and regulations that in any manner may affect cost, progress, performance or furnishings of the Work.
- (c) BIDDER has studied carefully all reports and drawings of subsurface conditions and drawings of physical conditions which are identified in the Supplemental General Conditions as provided in paragraph 4.02 of the General Conditions, and accepts the determination set forth in the Supplemental General Conditions of the extent of the technical data contained in such reports and drawings upon which BIDDER is entitled to rely.
- (d) BIDDER has obtained and carefully studied (or assumes responsibility for obtaining and carefully studying) all such examinations, investigations, explorations, tests, and studies (in addition to or to supplement those referred to in (c) above) which pertain to the subsurface or

physical conditions at the site or otherwise may affect the cost, progress, performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of paragraph 4.02 of the General Conditions; and no additional examinations, investigations, explorations, tests, reports or similar information or data are or will be required by BIDDER for such purposes.

- (e) BIDDER has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, or similar information or data in respect of said Underground Facilities are or will be required by BIDDER in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Paragraph 4.04 of the General Conditions.
- (f) BIDDER has correlated the results of all such observations, examinations, investigations, explorations, tests, and studies with the terms and conditions of the Contract Documents.
- (g) BIDDER has given ENGINEER written notice of all conflicts, errors or discrepancies that it has discovered in the Contract Documents and the written resolution thereof by ENGINEER is acceptable to BIDDER.

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

5.01 BIDDER further declares that he understands the unit quantities shown in the Bid Schedule are approximate only, are subject to increase or decrease, and agrees that should the quantities of any of the items be decreased no claim will be made for anticipated profits nor will the OWNER honor such claims.

6.01 BIDDER agrees to perform all the work described in the CONTRACT DOCUMENTS for the following unit prices:

- Notes:
1. Bids shall include sales tax, where required, and all other applicable taxes and fees.
 2. All specific cash allowances are included in the price(s) set forth and have been computed in accordance with Paragraph 11.02 of the General Conditions.
 3. The City of Goodlettsville should be exempt from all taxes on materials used on this job. The City's tax number will be provided to the successful low bidder for the purpose of obtaining exemption.

Bid Schedule – Contract A: Madison Creek Gravity Sewer

Item No.	Bid Items	Approximate Quantity	Unit	Unit Bid Price	Total Price
1	15" SDR 26 PVC gravity sewer	550	LF	\$	\$
2	16" DIP gravity sewer (with Protecto 401 interior lining)	98	LF	\$	\$
3	8" SDR 26 PVC gravity sewer	70	LF	\$	\$
4	26" steel casing (0.375" wall thickness) bore & jack – hwy & creek crossing w/ 16" RJDIP carrier pipe (with Protecto 401 interior lining)	228	LF	\$	\$
5	26" steel casing (0.375" wall thickness) bore & jack – creek crossing w/ 16" RJDIP carrier pipe (with Protecto 401 interior lining)	150	LF	\$	\$
6	Standard 4 ft diameter manhole w/watertight frame & cover	6	EA	\$	\$
7	Extra depth for standard 4 ft. diameter manholes (in excess of 6' depth)	32	VLF	\$	\$
8	MH vent	1	EA	\$	\$
9	Service stub-out	1	EA	\$	\$
10	6" service line to cleanout	10	LF	\$	\$
11	Goodlettsville standard cleanout assembly	1	EA	\$	\$
12	8" connections to existing manholes	1	EA	\$	\$
13	Plug and grout abandoned sewer lines (force main and gravity)	3	EA	\$	\$
14	Asphalt base mix & surface course (overlay) replacement	200	SY	\$	\$
15	Salvage equipment, remove electrical back to service pole, demolish and fill in structures, remove fencing, grade, topsoil, fertilize and sod existing Madison Creek Pump Station	1	LS	\$*****	\$
TOTAL BID – CONTRACT A: MADISON CREEK GRAVITY SEWER:					\$

Bid Schedule – Contract B: Wynridge Way Gravity Sewer

Item No.	Bid Items	Approximate Quantity	Unit	Unit Bid Price	Total Price
1	8" SDR 26 PVC gravity sewer	322	LF	\$	\$
2	8" DIP gravity sewer (with Protecto 401 interior lining)	52	LF	\$	\$
3	16" steel casing (0.375" wall thickness) bore & jack – hwy crossing w/ 8" RJDIP carrier pipe (with Protecto 401 interior lining)	80	LF	\$	\$
4	Standard 4 ft diameter manhole w/ frame & cover	3	EA	\$	\$
5	Extra depth for standard 4 ft. diameter manholes (in excess of 6' depth)	8	VLF	\$	\$
6	Service stub-out	1	EA	\$	\$
7	6" service line	20	LF	\$	\$
8	Connect to existing service line	1	EA	\$	\$
9	8" connections to existing manholes	1	EA	\$	\$
10	Plug and grout abandoned sewer lines (force main and gravity)	3	EA	\$	\$
11	Asphalt base mix & surface course (overlay) replacement	70	SY	\$	\$
12	Salvage equipment, remove electrical back to service pole, demolish and fill in structures, remove fencing, grade, topsoil, fertilize and sod existing Wynridge Way Pump Station	1	LS	\$*****	\$
TOTAL BID – CONTRACT B: WYNRIDGE WAY GRAVITY SEWER:					\$

DEDUCTIVE ALTERNATE:

Deduct the amount of \$ _____ if awarded both Contracts (note: time of completion for both Contracts will be 150 days).

TOTAL BID – BOTH CONTRACTS LESS DEDUCTIVE ALTERNATE: \$ _____.

7.01 BIDDER agrees that the Work will be substantially complete and ready for final payment within 150 days for Contract A and 120 days for Contract B after the date when the Contract Time commences to run as provided in Paragraph 2.03 of the General Conditions:

- (a) The time for the Contract may be extended by mutual agreement between the Owner and the successful Bidder to accomplish additional work determined to be needed as part of this

Contract.

- (b) The quantities shown in this Bid Schedule are subject to increases or decreases depending on findings of physical & internal inspections of the sewer system. Thus, quantities shown in the Bid Schedule are not guaranteed.

BIDDER accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work on time.

8.01 The following documents are attached to and made a condition of this bid:

- (a) Required Bid Security in the form of Bid Bond or Certified Check.
- (b) A tabulation of Subcontractors, Suppliers and other persons and organizations required to be identified in the Bid.
- (c) Required BIDDER'S Qualification Statement with supporting data.

9.01. The terms used in this Bid which are defined in the General Conditions of the Construction Contract included as part of the Contract Documents have the meanings assigned to them in the General Conditions.

Respectfully submitted: _____

Contractor: _____

By: _____

(Signature)

Contractor's Address:

Telephone Number: _____

Federal EIN: _____

Email: _____

PROPOSED SUBCONTRACTORS

Each bidder shall enter, in the spaces provided, the names of major subcontractors he proposes to employ and the classification or type of work that they will perform. Upon award of contract, the named subcontractors shall be employed to perform the work, unless changes are specifically authorized by the Engineer.

A major subcontractor is defined as a subcontractor whose subcontract constitutes approximately three (3) percent or more of the total contract amount.

Failure to furnish all information requested in this Questionnaire may be cause for rejection of the Bid.

LIST OF SUBCONTRACTORS

<u>SUBCONTRACTOR'S /ADDRESS</u>	<u>WORK DESCRIPTION/TOTAL VALUE</u>
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

BID BOND

BIDDER (Name and Address):

SURETY (Name and Address of Principal Place of Business):

OWNER (Name and Address):

CITY OF GOODLETTSVILLE
105 Main Street
GOODLETTSVILLE, TENNESSEE 37072

BID

BID DUE DATE: _____

PROJECT: WASTEWATER SYSTEM IMPROVEMENTS, MADISON CREEK & WYNRIDGE WAY INTERCEPTOR ADDITIONS consisting of Contracts A & B with approximately 1,468 LF of 8", 15" and 16" gravity sewer which includes approximately 378 LF 16" gravity sewer jack and bore (26" steel encasement), 80 ft of 8" gravity sewer jack and bore (16" encasement), 9 manholes, salvage & demolition of two (2) sewage pump stations and appurtenances together with all related work as specified in the drawings & specifications

BOND

BOND NUMBER: _____

DATE (Not later than Bid due date): _____

PENAL SUM: _____

(Words)

(Figures)

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER

SURETY

_____(Seal)

_____(Seal)

Bidder's Name and Corporate Seal

Surety's Name and Corporate Seal

By: _____

By: _____

Signature and Title

Signature and Title
(Attach Power of Attorney)

Attest: _____

Attest: _____

Signature and Title

Signature and Title

- Note: (1) Above addresses are to be used for giving required notice.
(2) Any singular reference to Bidder, Surety, OWNER or other party shall be considered plural where applicable.

1. Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to OWNER upon default of Bidder the penal sum set forth on the face of this Bond.
2. Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents.
3. This obligation shall be null and void if:
 - 3.1. OWNER accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment Bonds required by the Bidding Documents, or
 - 3.2. All Bids are rejected by OWNER, or
 - 3.3. OWNER fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof).
4. Payment under this Bond will be due and payable upon default by Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from OWNER, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.
5. Surety waives notice of and any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by OWNER and Bidder, provided that the total time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.
6. No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in paragraph 4 above is received by Bidder and Surety and in no case later than one year after Bid due date.
7. Any suit or action under this Bond shall be commenced only in a court of competent jurisdiction located in the state in which the Project is located.
8. Notices required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.
9. Surety shall cause to be attached to this Bond a current and effective Power or Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.
10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of this Bond conflicts with any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.
11. The term "Bid" as used herein includes a Bid, offer or proposal as applicable.

EJCDC
STANDARD FORM OF AGREEMENT
BETWEEN OWNER AND CONTRACTOR
ON THE BASIS OF A STIPULATED PRICE

THIS AGREEMENT is dated as of the _____, day of _____, in the year 2016, by and between the CITY OF GOODLETTSVILLE (hereinafter called Owner) and _____ (hereinafter called Contractor).

Owner and Contractor, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 - WORK

Contractor shall complete all Work as specified or indicated in the Contract Documents. The Work is generally described as follows:

Goodlettsville RFB 1608-0035: Wastewater System Improvements, Madison Creek & Wynridge Way Interceptor Additions consisting of Contracts A & B with approximately 1,468 LF of 8", 15" and 16" gravity sewer which includes approximately 378 LF 16" gravity sewer jack and bore (26" steel encasement), 80 LF of 8" gravity sewer jack and bore (16" encasement), 9 manholes, salvage & demolition of two (2) sewage pump stations and appurtenances together with all related work as specified in the drawings & specifications.

ARTICLE 2 - ENGINEER

GRW Engineers, Inc., who is hereinafter called Engineer and who is to act as Owner's representative, assume all duties and responsibilities and have the rights and authority assigned to Engineer in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

ARTICLE 3 - CONTRACT TIME

- 3.1 The Work will be substantially complete within 150 days for Contract A and 120 days for Contract B from the date when the Contract Time commences to run as provided in Paragraph 2.03 of the General Conditions and completed and ready for final payment in accordance with Paragraph 14.07 of the General Conditions within 150 days from the date when the Contract Time commences to run.
- 3.2 Liquidated Damages. Owner and Contractor recognize that time is of the essence of this Agreement and that Owner will suffer a financial loss if the Work is not completed within the times specified in Paragraph 3.1 above, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. They also recognize the delays, expense and difficulties involved in a legal or arbitration proceeding in proving the actual loss suffered by Owner if the Work is not completed on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay Owner as stipulated in Section 17.06 of the Supplemental General Conditions for each day that expires after the time specified in Paragraph 3.1 for Substantial Completion until the Work is substantially complete. After Substantial Completion, if Contractor shall neglect, refuse or fail to complete the remaining Work within the Contract Time or any proper extension thereof granted by Owner, Contractor shall pay Owner as stipulated in Section 17.06 of the Supplemental General Conditions for each day that expires after the time specified in Paragraph 3.1 for completion and readiness for final payment.

ARTICLE 4. CONTRACT PRICE

- 4.1 Owner shall pay Contractor for completion of the Work in accordance with the Contract Documents in current funds in the amount stated in the Contractor's Bid copy of which is attached.
- 4.2 Contractor declares that he understands the unit quantities shown in the Bid Schedule are approximate only, are subject to increase or decrease, and agrees that should the quantities of any of the items be decreased no claim will be made for anticipated profits nor will the OWNER honor such claims.

ARTICLE 5. PAYMENT PROCEDURES

Contractor shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by Owner as provided in the General Conditions.

- 5.1 Progress Payments. Owner shall make payments on account of the Contract Price on the basis of Contractor's Applications for Payment as recommended by City Engineer, on or about the 25th day of each month during construction as provided below. All progress payments will be on the basis of the progress of the Work measured by the schedule of values established in Paragraph 2.07 of the General Conditions (and in the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements.
 - a. The Progress Payments shall include the cost of Stored Materials, LESS an amount of retainage equal to 5% of their total cost throughout the Contract period. Stored materials are defined as materials and equipment not incorporated in the Work but delivered, suitably stored and accompanied by documentation satisfactory to Owner as provided in Paragraph 14.02A of the General Conditions.
- 5.2 Upon issuance of the Certificate of Substantial Completion, Owner shall pay an amount sufficient to increase total payments to Contractor to 100% of the Contract Price, LESS such amounts as the Owner has determined and documented in the issuance of the Certificate of Substantial Completion, or which Owner may withhold in accordance with Paragraph 14.04.A of the General Conditions.
- 5.3 Upon final completion and acceptance of the Work in accordance with paragraph 14.07 of the General Conditions, Owner shall pay the remainder of the Contract Price as provided in said Paragraph 14.07.

ARTICLE 6 - INTEREST

All moneys not paid within thirty days after payment is due as provided in Article 14 of the General Conditions shall bear interest at the maximum rate allowed by law at the place of the Project.

ARTICLE 7 - CONTRACTOR'S REPRESENTATIONS

In order to induce Owner to enter into this Agreement, Contractor makes the following representations:

- 7.1 Contractor has familiarized itself with the nature and extent of the Contract Documents, Work, Site, Locality, and all local conditions and laws and regulations that in any manner may affect cost, progress, performance, or furnishing the Work.
- 7.2 Contractor has studied carefully any reports of explorations and tests of subsurface conditions and drawings of physical conditions which are identified in the Supplemental General Conditions as provided in Paragraph 4.02 of the General Conditions, and accepts the determination set forth in of the Supplemental General Conditions of the extent of the technical data contained in such reports and drawings upon which Contractor is entitled to rely.

- 7.3 Contractor has obtained and carefully studied (or assumes responsibility of obtaining and carefully studying) all such examinations, investigations, exploration, tests, reports, and studies (in addition to or to supplement those referred to in Paragraph 7.2 above) which pertain to the subsurface or physical conditions at or contiguous to the site or otherwise may affect the cost, progress, performance or furnishing of the Work as Contractor considers necessary for the performance or furnishing of the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Paragraph 4.02 of the General Conditions; and no additional examination, investigations, explorations, tests, reports, studies or similar information or data are or will be required by Contractor for such purposes.
- 7.4 Contractor has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing Underground Facilities at or contiguous to the site and assumes responsibility for the accurate location of said Underground Facilities. No additional examinations, investigations, explorations, tests, reports, studies, or similar information or data in respect of said Underground Facilities are or will be required by Contractor in order to perform and furnish the Work at the Contract Price, within the Contract Time and in accordance with the other terms and conditions of the Contract Documents, including specifically the provisions of Paragraph 4.04 of the General Conditions.
- 7.5 Contractor has correlated the results of such observations, examinations, investigations, explorations, tests, reports, and studies with the terms and conditions of the Contract Documents.
- 7.6 Contractor has given Engineer written notice of all conflicts, errors or discrepancies that he has discovered in the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
- 7.7 The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

ARTICLE 8. CONTRACT DOCUMENTS

The Contract Documents consist of the following:

- 8.1 This Agreement (Pages 1 to 5, inclusive).
- 8.2 Performance, Payment, and other Bonds.
- 8.3 Notice of Award and Notice to Proceed.
- 8.4 General Conditions (Pages 1 to 39, inclusive).
- 8.5 Supplemental General Conditions (Pages 1, to 4 inclusive).
- 8.6 Specifications as listed in the Table of Contents.
- 8.7 Drawings, consisting of 5 sheets (not including cover sheet), bearing the following general title:
WASTEWATER SYSTEM IMPROVEMENTS, MADISON CREEK &
WYNRIDGE WAY INTERCEPTOR ADDITIONS
- 8.8 Addenda number _____ inclusive.

- 8.9 Contractor's Bid (Pages 1 to 5, inclusive) together with Supplementary Information Submitted with the Bid.
- 8.10 Documentation submitted by Contractor prior to Notice of Award.
- 8.11 The following which may be delivered or issued after the Effective Date of the Agreement and are not attached hereto: All Written Amendments and other documents amending, modifying, or supplementing the Contract Documents pursuant to Paragraph 3.04 of the General Conditions.

There are not Contract Documents other than those listed above in this Article 8. The Contract Documents may only be amended, modified or supplemented as provided in Paragraph 3.04 of the General Conditions.

ARTICLE 9. MISCELLANEOUS

- 9.1 Terms used in this Agreement which are defined in Article 1 of the General Conditions will have the meanings indicated in the General Conditions.
- 9.2 No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and specifically but without limitation monies that may become due and monies that are due may not be assigned without such consent except to the extent that the effect of this restriction may be limited by law, and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.
- 9.3 Owner and Contractor each binds itself, its partners, successor, assigns and legal representatives to the other party hereto, its partners, successors, assigns and legal representative in respect of all covenants, agreements, and obligations contained in the Contract Documents.

IN WITNESS WHEREOF, Owner and Contractor have signed this Agreement in the required number of originals. One counterpart each has been delivered to Owner, Contractor, and Engineer. All portions of the Contract Documents have been signed or identified by Owner or by Engineer on their behalf. This Agreement will be effective on _____, 2016.

OWNER: CITY OF GOODLETTSVILLE, TENNESSEE

(Authorized Signature for Owner)

ATTEST:

(Signature)

Address For Giving Notices:

City of Goodlettsville

105 Main Street

Goodlettsville, TN 37072

CONTRACTOR:

(Authorized Signature for Contractor)

ATTEST:

(Signature)

Address For Giving Notices:

NOTICE OF AWARD

Dated: _____

To: _____

(Bidder)

Address: _____

Contract: WASTEWATER SYSTEM IMPROVEMENTS, MADISOIN CREEK
& WYNRIDGE WAY INTERCEPTOR ADDITIONS (RFB 1608-0035)

Owner's Contract No. Contract A and/or Contract B

You are notified that your bid dated _____ for the above Contract has been considered. You are the apparent successful bidder and have been awarded a contract for:
Wastewater System Improvements, Goodlettsville Sewer System Modifications,
Madison Creek Interceptor Addition as listed in the Bid Form

The Contract Price of your Contract is \$ _____

Copies of each of the Proposed Contract Documents (except Drawings) accompany this Notice of Award. Sets of the Drawings will be delivered separately or otherwise made available to you immediately.

You must comply with the following conditions precedent within ten days of the date of this Notice of Award.

1. You must deliver to the OWNER fully executed counterparts of the Agreement including all the Contract Documents. This includes the Drawings. The appropriate Contract Documents must bear your signature.
2. You must deliver with the executed Agreement the Contract Security (Bonds) as specified in the Instructions to Bidders (Paragraph 17), General Conditions (Paragraph 5.01) and Supplementary Conditions (Paragraph SC-5.01).

EJCDC No. 1910-22 (1996 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America and the Construction Specifications Institute.

3. (List other conditions precedent).

Failure to comply with these conditions within the time specified will entitle OWNER to consider your bid abandoned, to annul this Notice of Award and to declare your Bid Security forfeited.

Within ten days after you comply with those conditions, OWNER will return to you one fully signed counterpart of the Agreement with the Contract Documents attached.

CITY OF GOODLETTSVILLE

(OWNER)

(AUTHORIZED SIGNATURE)

(TITLE)

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE OF AWARD is hereby acknowledged by _____

this the _____ day of _____ 2013

Contractor

Title

NOTICE TO PROCEED

Dated: _____

To: _____

(Contractor)

Address: _____

Contract: WASTEWATER SYSTEM IMPROVEMENTS, MADISON CREEK
& WYNRDIGE WAY INTERCEPTOR ADDITIONS (RFB 1608-0035)

Owner's Contract No.: Contract A and/or Contract B

You are notified that the Contract Times under the above Contract will commence to run _____ . By that date, you are to start performing your obligations under the Contract Documents. In accordance with the Agreement, the date of Substantial Completion is _____ and the date of readiness for final payment is _____ .

Before you may start any Work at the Site, Paragraph 2.05.C of the General Conditions provides that you and Owner must each deliver to the other (with copies to Engineer and other identified additional insureds) certificates of insurance which each is required to purchase and maintain in accordance with the Contract Documents.

EJCDC No. 1910-23 (1996 Edition)

Prepared by the Engineers Joint Contract Documents Committee and endorsed by The Associated General Contractors of America and the Construction Specifications Institute.

Also, before you may start any Work at the Site you must:

1. Submit a proposed project schedule to the Owner/Engineer for review and approval; and
2. Submit for approval a proposed notice that will be used to inform the public of proposed construction that may affect their use of the sewer system or road closures/detours.

CITY OF GOODLETTSVILLE

(OWNER)

(AUTHORIZED SIGNATURE)

(TITLE)

ACCEPTANCE OF NOTICE

Receipt of the above NOTICE TO PROCEED is hereby acknowledged by _____

this the _____ day of _____ 2013 .

Contractor

Title

CONSTRUCTION PERFORMANCE BOND

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CITY OF GOODLETTSVILLE
105 MAIN STREET
GOODLETTSVILLE, TN 37072

CONSTRUCTION CONTRACT

Date:

Amount:

Description (Name and Location):

BOND

Date (Not earlier than Construction Contract Date):

Amount:

Modifications to this Bond Form:

CONTRACTOR AS PRINCIPAL

Company: (Corp. Seal)

SURETY

Company: (Corp. Seal)

Signature _____
Name and Title:

Signature _____
Name and Title:

CONTRACTOR AS PRINCIPAL

Company: (Corp. Seal)

SURETY

Company: (Corp. Seal)

Signature _____
Name and Title:

Signature _____
Name and Title:

EJCDC No. 1910-28A(1984 Edition)

Prepared through the joint efforts of the Surety Association of America, Engineers' Joint Contract Documents Committee, The Associated General Contractors of America and the American Institute of Architects.

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.
2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 3. 1.
3. If there is no Owner Default, the Surety's obligation under this Bond shall arise after:
 - 3.1. The Owner has notified the Contractor and the Surety at its address described in Paragraph 10 below, that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owners right, if any, subsequently to declare a (Contractor Default); and
 - 3.2. The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and the Surety have received notice as provided in Subparagraph 3. 1; and
 - 3.3. The Owner has agreed to pay the balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a contractor selected to perform the Construction Contract in accordance with the terms of the contract with the Owner.
4. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:
 - 4.1. Arrange for the Contractor, with consent of the Owner, to perform and complete the Construction Contract; or
 - 4.2. Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or
 - 4.3. Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or
 - 4.4. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:
 1. After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or
 2. Deny liability in whole or in part and notify the Owner citing reasons therefor.
5. If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 4.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part without further notice, the Owner shall be entitled to enforce any remedy available to the Owner.

6. After the Owner has terminated the Contractor's rights to complete the Construction Contract, and if the Surety elects to act under Subparagraph 4.1, 4.2 or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:
 - 6.1. The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;
 - 6.2. Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 4; and
 - 6.3. Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.
7. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, or successors.
8. The Surety hereby waives notice of any change including changes of time to the Construction Contract or to related subcontracts, purchase orders and other obligations.
9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.
10. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.
11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.
12. Definitions.
 - 12.1. Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.
 - 12.2. Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.
 - 12.3. Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.
 - 12.4. Owner Default: Failure of the Owner which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

(FOR INFORMATION ONLY - Name, Address and Telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE (Architect, Engineer or other party):

CONSTRUCTION PAYMENT BOND

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CITY OF GOODLETTSVILLE
105 MAIN STREET
GOODLETTSVILLE, TN 37072

CONSTRUCTION CONTRACT

Date:
Amount:
Description (Name and Location):

BOND

Date (Not earlier than Construction Contract Date):
Amount:
Modifications to this Bond Form:

CONTRACTOR AS PRINCIPAL
Company: (Corp. Seal)

SURETY
Company: (Corp. Seal)

Signature _____
Name and Title:

Signature _____
Name and Title:

CONTRACTOR AS PRINCIPAL
Company: (Corp. Seal)

SURETY
Company: (Corp. Seal)

Signature _____
Name and Title:

Signature _____
Name and Title:

EJCDC No. 1910-28B(1984 Edition)
Prepared through the joint efforts of the Surety Association of America, Engineers' Joint Contract Documents Committee, The Associated General Contractors of America, American Institute of Architects, American Subcontractors Association, and the Associated Specialty Contractors.

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.

2. With respect to the Owner, this obligation shall be null and void if the Contractor:

- 2.1. Promptly makes payment, directly or indirectly, for all sums due Claimants, and
- 2.2. Defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity whose claim, demand, lien or suit is for payment for labor, materials or equipment furnished for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 12) of any claims, demands, liens or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.

4. The Surety shall have no obligation to Claimants under this Bond until:

- 4.1. Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.
- 4.2. Claimants who do not have a direct contract with the Contractor:
 1. Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and
 2. Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and
 3. Not having been paid within the above 30 days, have sent a written notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.

5. If a notice required by Paragraph 4 is given by the Owner to the Contractor or to the Surety, that is sufficient compliance.

6. When the Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:

- 6.1. Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and that basis for challenging any amounts that are disputed.
- 6.2. Pay or arrange for payment of any undisputed amounts.

7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

8. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract

and to satisfy claims, if any, under any Construction Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

9. The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the work or part of the work is located after the expiration of one year from the date (1) on which the Claimant gave the notice required by Subparagraph 4.1 or Clause 4.2 (iii), or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the Owner or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in the Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is, that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. DEFINITIONS

- 15.1. Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms labor, materials or equipment that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.
- 15.2. Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.
- 15.3. Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

(FOR INFORMATION ONLY - Name, Address and Telephone)

AGENT or BROKER:

OWNER'S REPRESENTATIVE (Architect, Engineer or other party):

DATE (MM/DD/YY)

CERTIFICATE OF INSURANCE

SAMPLE

PRODUCER	THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.
	COMPANY A
INSURED	COMPANY B
	COMPANY C
	COMPANY D

COVERAGES

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION (MM/DD/YY)	LIMITS		
A	GENERAL LIABILITY				GENERAL AGGREGATE	\$ 1,000,000	
	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY				PRODUCTS-COMP/OP AGG	\$ 1,000,000	
	<input type="checkbox"/> CLAIMS MADE <input checked="" type="checkbox"/> OCCUR				PERSONAL & ADV INJURY	\$ 1,000,000	
	<input checked="" type="checkbox"/> CONTRACTOR'S PROTECTION				EACH OCCURRENCE	\$ 1,000,000	
					FIRE DAMAGE (Any One)	\$ 100,000	
					MED EXP (Any One Person)	\$ 10,000	
A	AUTOMOBILE LIABILITY				COMBINED SINGLE LIMIT	\$ 1,000,000	
	<input checked="" type="checkbox"/> ANY AUTO				BODILY INJURY	\$ 1,000,000	
	<input checked="" type="checkbox"/> ALLOWED AUTOS				(Per Person)		
	<input checked="" type="checkbox"/> SCHEDULED AUTOS				BODILY INJURY	\$ 1,000,000	
	<input checked="" type="checkbox"/> HIRED AUTOS				(Per Accident)		
	<input checked="" type="checkbox"/> NON-OWNED AUTOS				PROPERTY DAMAGE	\$ 1,000,000	
A	GARAGE LIABILITY				AUTO ONLY-EA ACCIDENT	\$	
	<input type="checkbox"/> ANY AUTO				OTHER THAN AUTO ONLY	\$	
					EACH ACCIDENT	\$	
					AGGREGATE	\$	
A	EXCESS LIABILITY				EACH OCCURRENCE	\$	
	<input type="checkbox"/> UMBRELLA FORM				AGGREGATE	\$	
	<input type="checkbox"/> OTHER THAN UMBRELLA FORM					\$	
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY				STATUTORY LIMITS		
	THE PROPRIETOR/ PARTNERS/EXECUTIVE				<input type="checkbox"/> INC	EACH ACCIDENT	\$ 1,000,000
	OFFICERS ARE:				<input type="checkbox"/> EXC	DISEASE-POLICY LIMIT	\$ 1,000,000
						DISEASE-EACH EMPLOYEE	\$ 1,000,000
A	OTHER: BUILDER'S RISK AND/OR INSTALLATION FLOATER						

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS:

CERTIFICATE HOLDER

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

SUPPLEMENTAL ATTACHMENT FOR CERTIFICATE OF INSURANCE

PROJECT _____

INSURED _____

- | A. General Liability | Yes | No | N/A |
|--|--------------------------|--------------------------|--------------------------|
| 1. Does the General Aggregate apply to this Project only? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Does this policy include coverage for: | | | |
| a. Premises—Operations? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| b. Explosion, Collapse and Underground Hazards? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| c. Personal Injury Coverage? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| d. Products Coverage? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| e. Completed Operations? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| f. Contractual Coverage for the Insured's Obligations in Paragraph 5.04.B.4 of the General Conditions. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

- B. Worker's Compensation**
1. If the Insured is exempt from Worker's Compensation statutes, does the Insured carry the equivalent Voluntary Compensation coverage?

- C. Final Payment Information**
1. Is the certificate being furnished in connection with the Contractor's request for final payment in accordance with the requirements of Paragraph 14.07.A.2 of the General Conditions?
2. If so, and if the policy period extends beyond Project Completion Date, is Completed Operations coverage for this Project continued for the balance of this policy period?

- D. Termination Provisions**
1. Has each policy shown on the certificate and this Supplement been endorsed to provide the holder with 30 days notice of cancellation and/or expiration? List below any policies which do not contain this notice.

E. Other Provisions

Authorized Representative

Date of Issue

CERTIFICATE OF OWNER'S ATTORNEY

I the undersigned, _____, the duly authorized and acting legal representative of the City of Goodlettsville do hereby certify as follows:

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

Date: _____

Attorney

APPLICATION FOR PAYMENT

STATE OF _____

COUNTY OF _____

COMES the undersigned affiant, _____, and states that he is _____ of _____ GENERAL CONTRACTOR
for the construction of _____

By his personal knowledge, he further states that the WORK covered by APPLICATION FOR PAYMENT NO. _____, dated _____, has been completed in accordance with the CONTRACT DOCUMENTS and executed amendments thereto; that for this APPLICATION FOR PAYMENT, except as noted hereinafter as exceptions, the CONTRACTOR has paid in full or has otherwise satisfied all obligations (1) for equipment and materials (whether incorporated into the WORK or acceptably stored on-site), (2) for all work, labor, and services performed, and (3) for all known indebtedness and claims against the CONTRACTOR for damages arising in any manner in connection with the performance of this CONTRACT for which the OWNER, the OWNER'S property, or the CONTRACT funds might in any way be held responsible, including the applicable State Statute, and that the current payment on this APPLICATION FOR PAYMENT is now due and payable.

EXCEPTIONS: (If none, write "NONE". Attach additional sheets, if necessary. If required by the OWNER, the CONTRACTOR shall furnish a bond satisfactory to the OWNER for each exception.)

THIS affidavit is directed to _____ by and through its _____

CONTRACTOR

DATE

SUBSCRIBED and sworn to before me by _____, on this day of _____

NOTARY PUBLIC SEAL

STATEMENT BY ENGINEER

BASED upon on-site observation, and to the best of my knowledge, understanding, and belief, the WORK has progressed to the point indicated herein; and the quality of the WORK complies with the requirements of the CONTRACT DOCUMENTS.

ENGINEER

DATE

APPLICATION FOR PAYMENT SUMMARY

ORIGINAL CONTRACT WORK COMPLETED TO DATE	\$
+ CHANGE ORDER WORK COMPLETED TO DATE	\$
TOTAL WORK COMPLETED TO DATE	\$
+ BALANCE OF STORED MATERIALS	\$
TOTAL ENTITLEMENT TO DATE	\$
- AMOUNT RETAINED AT	\$
- CLAIMS AGAINST THE CONTRACT FUNDS	\$
TOTAL DUE CONTRACTOR TO DATE	\$
- TOTAL AMOUNT OF PREVIOUS PAYMENTS	\$

TOTAL CONTRACT PRICE

ORIGINAL CONTRACT PRICE	\$
+CHANGE ORDER	\$
TOTAL CONTRACT PRICE TO DATE	\$

AMOUNT DUE CONTRACTOR THIS PAYMENT	\$
RETAINAGE THIS PERIOD	\$
TOTAL FUNDS NEEDED	\$

PERCENT COMPLETE (EXCLUDING STORED MATERIALS): %

AUTHORIZATION BY OWNER:

DATE

ATTACHMENTS:

- Application for Payment No.
- Change Order No.(s)
- Bonds
- Record/Projection of Cash Disbursements

- Inventory of Stored Materials
- Invoices
- Progress Schedules
- Other

TABLE OF CONTENTS

	<u>Page</u>
ARTICLE 1 - DEFINITIONS AND TERMINOLOGY	4
1.01 <i>Defined Terms</i>	4
1.02 <i>Terminology</i>	6
ARTICLE 2 - PRELIMINARY MATTERS.....	7
2.01 <i>Delivery of Bonds</i>	7
2.02 <i>Copies of Documents</i>	7
2.03 <i>Commencement of Contract Times; Notice to Proceed</i>	7
2.04 <i>Starting the Work</i>	7
2.05 <i>Before Starting Construction</i>	7
2.06 <i>Preconstruction Conference</i>	8
2.07 <i>Initial Acceptance of Schedules</i>	8
ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE	8
3.01 <i>Intent</i>	8
3.02 <i>Reference Standards</i>	8
3.03 <i>Reporting and Resolving Discrepancies</i>	8
3.04 <i>Amending and Supplementing Contract Documents</i>	9
3.05 <i>Reuse of Documents</i>	9
ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS	9
4.01 <i>Availability of Lands</i>	9
4.02 <i>Subsurface and Physical Conditions</i>	9
4.03 <i>Differing Subsurface or Physical Conditions</i>	10
4.04 <i>Underground Facilities</i>	11
4.05 <i>Reference Points</i>	11
4.06 <i>Hazardous Environmental Condition at Site</i>	11
ARTICLE 5 - BONDS AND INSURANCE.....	12
5.01 <i>Performance, Payment, and Other Bonds</i>	12
5.02 <i>Licensed Sureties and Insurers</i>	13
5.03 <i>Certificates of Insurance</i>	13
5.04 <i>CONTRACTOR's Liability Insurance</i>	13
5.05 <i>OWNER's Liability Insurance</i>	14
5.06 <i>Property Insurance</i>	14
5.07 <i>Waiver of Rights</i>	15
5.08 <i>Receipt and Application of Insurance Proceeds</i>	15
5.09 <i>Acceptance of Bonds and Insurance; Option to Replace</i>	15
5.10 <i>Partial Utilization, Acknowledgment of Property Insurer</i>	16
ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES.....	16
6.01 <i>Supervision and Superintendence</i>	16
6.02 <i>Labor; Working Hours</i>	16
6.03 <i>Services, Materials, and Equipment</i>	16
6.04 <i>Progress Schedule</i>	17
6.05 <i>Substitutes and "Or-Equals"</i>	17
6.06 <i>Concerning Subcontractors, Suppliers and Others</i>	18
6.07 <i>Patent Fees and Royalties</i>	19

	<u>Page</u>
6.08 Permits	19
6.09 Laws and Regulations	19
6.10 Taxes	19
6.11 Use of Site and Other Areas	19
6.12 Record Documents	20
6.13 Safety and Protection	20
6.14 Safety Representative	21
6.15 Hazard Communication Programs	21
6.16 Emergencies	21
6.17 Shop Drawings and Samples	21
6.18 Continuing the Work	22
6.19 CONTRACTOR's General Warranty and Guarantee	22
6.20 Indemnification	22
 ARTICLE 7 - OTHER WORK	 23
7.01 Related Work at Site	23
7.02 Coordination	23
 ARTICLE 8 - OWNER'S RESPONSIBILITIES	 24
8.01 Communications to Contractor	24
8.02 Replacement of ENGINEER	24
8.03 Furnish Data	24
8.04 Pay Promptly When Due	24
8.05 Lands and Easements; Reports and Tests	24
8.06 Insurance	24
8.07 Change Orders	24
8.08 Inspections, Tests, and Approvals	24
8.09 Limitations on OWNER's Responsibilities	24
8.10 Undisclosed Hazardous Environmental Condition	24
8.11 Evidence of Financial Arrangements	24
 ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION	 24
9.01 OWNER'S Representative	24
9.02 Visits to Site	24
9.03 Project Representative	25
9.04 Clarifications and Interpretations	25
9.05 Authorized Variations in Work	25
9.06 Rejecting Defective Work	25
9.07 Shop Drawings, Change Orders and Payments	25
9.08 Determinations for Unit Price Work	25
9.09 Decisions on Requirements of Contract Documents and Acceptability of Work	25
9.10 Limitations on ENGINEER's Authority and Responsibilities	26
 ARTICLE 10 - CHANGES IN THE WORK; CLAIMS	 26
10.01 Authorized Changes in the Work	26
10.02 Unauthorized Changes in the Work	26
10.03 Execution of Change Orders	26
10.04 Notification to Surety	27
10.05 Claims and Disputes	27
 ARTICLE 11 - COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK	 27
11.01 Cost of the Work	27
11.02 Cash Allowances	29
11.03 Unit Price Work	29

	<u>Page</u>
ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES	30
12.01 <i>Change of Contract Price</i>	30
12.02 <i>Change of Contract Times</i>	30
12.03 <i>Delays Beyond CONTRACTOR's Control</i>	30
12.04 <i>Delays Within CONTRACTOR's Control</i>	31
12.05 <i>Delays Beyond OWNER's and CONTRACTOR's</i>	30
12.06 <i>Delay Damages</i>	31
ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK.....	31
13.01 <i>Notice of Defects</i>	31
13.02 <i>Access to Work</i>	31
13.03 <i>Tests and Inspections</i>	31
13.04 <i>Uncovering Work</i>	32
13.05 <i>OWNER May Stop the Work</i>	32
13.06 <i>Correction or Removal of Defective Work</i>	32
13.07 <i>Correction Period</i>	32
13.08 <i>Acceptance of Defective Work</i>	33
13.09 <i>OWNER May Correct Defective Work</i>	33
ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION	34
14.01 <i>Schedule of Values</i>	34
14.02 <i>Progress Payments</i>	34
14.03 <i>CONTRACTOR's Warranty of Title</i>	35
14.04 <i>Substantial Completion</i>	35
14.05 <i>Partial Utilization</i>	36
14.06 <i>Final Inspection</i>	36
14.07 <i>Final Payment</i>	36
14.08 <i>Final Completion Delayed</i>	36
14.09 <i>Waiver of Claims</i>	37
ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION.....	37
15.01 <i>OWNER May Suspend Work</i>	37
15.02 <i>OWNER May Terminate for Cause</i>	37
15.03 <i>OWNER May Terminate For Convenience</i>	38
15.04 <i>CONTRACTOR May Stop Work or Terminate</i>	38
ARTICLE 16 - DISPUTE RESOLUTION	38
16.01 <i>Methods and Procedures</i>	38
ARTICLE 17 - MISCELLANEOUS.....	38
17.01 <i>Giving Notice</i>	38
17.02 <i>Computation of Times</i>	39
17.03 <i>Cumulative Remedies</i>	39
17.04 <i>Survival of Obligations</i>	39
17.05 <i>Controlling Law</i>	39

GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

A. Wherever used in the Contract Documents and printed with initial or all capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof.

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

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

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

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

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

6. *Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).

7. *Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, Bid security form, if any, and the Bid form with any supplements.

8. *Bonds*--Performance and payment bonds and other instruments of security.

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

10. *Claim*--A demand or assertion by OWNER or CONTRACTOR seeking an adjustment of Contract Price or

Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.

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

12. *Contract Documents*--The Contract Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders, and Engineer's written interpretations and clarifications issued on or after the Effective Date of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or hard copies of the items listed in this paragraph are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by OWNER to CONTRACTOR are not Contract Documents.

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

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

15. *CONTRACTOR*--The individual or entity with whom OWNER has entered into the Agreement.

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

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

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

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

20. *ENGINEER's Consultant*--An individual or entity having a contract with ENGINEER to furnish services as ENGINEER's independent professional associate or consultant with respect to the Project and who is identified as such in the Supplementary Conditions.

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

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

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

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

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

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

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

28. *Notice of Award*--The written notice by OWNER to the apparent successful bidder stating that upon timely compliance by the apparent successful bidder with the conditions precedent listed therein, OWNER will sign and deliver the Agreement.

29. *Notice to Proceed*--A written notice given by OWNER to CONTRACTOR fixing the date on which the

Contract Times will commence to run and on which CONTRACTOR shall start to perform the Work under the Contract Documents.

30. *OWNER*--The individual, entity, public body, or authority with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be performed.

31. *Partial Utilization*--Use by OWNER of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.

32. *PCBs*--Polychlorinated biphenyls.

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

34. *Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part as may be indicated elsewhere in the Contract Documents.

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

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

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

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

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

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

by OWNER which are designated for the use of CONTRACTOR.

41. *Specifications*--That part of the Contract Documents consisting of written technical descriptions of materials, equipment, systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.

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

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

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

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

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

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

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

49. *Work Change Directive*--A written statement to CONTRACTOR issued on or after the Effective Date of the Agreement and signed by OWNER and recommended

by ENGINEER ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.

50. *Written Amendment*--A written statement modifying the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly construction-related aspects of the Contract Documents.

1.02 Terminology

A. Intent of Certain Terms or Adjectives

1. Whenever in the Contract Documents the terms "as allowed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of ENGINEER as to the Work, it is intended that such action or determination will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to ENGINEER any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.10 or any other provision of the Contract Documents.

B. Day

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

C. Defective

1. The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER's recommendation of final payment (unless responsibility for the protection thereof has been assumed

by OWNER at Substantial Completion in accordance with paragraph 14.04 or 14.05).

D. *Furnish, Install, Perform, Provide*

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

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

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

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

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

ARTICLE 2 - PRELIMINARY MATTERS

2.01 *Delivery of Bonds*

A. When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish.

2.02 *Copies of Documents*

A. OWNER shall furnish to CONTRACTOR up to ten copies of the Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.

2.03 *Commencement of Contract Times; Notice to Proceed*

A. The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the

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

2.04 *Starting the Work*

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

2.05 *Before Starting Construction*

A. *CONTRACTOR's Review of Contract Documents:* Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error, ambiguity, or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless CONTRACTOR knew or reasonably should have known thereof.

B. *Preliminary Schedules:* Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for its timely review:

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

2. a preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing, and processing such submittal; and

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

C. *Evidence of Insurance:* Before any Work at the Site is started, CONTRACTOR and OWNER shall each

deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which CONTRACTOR and OWNER respectively are required to purchase and maintain in accordance with Article 5.

2.06 *Preconstruction Conference*

A. Within 20 days after the Contract Times start to run, but before any Work at the Site is started, a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in paragraph 2.05.B, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

2.07 *Initial Acceptance of Schedules*

A. Unless otherwise provided in the Contract Documents, at least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to review for acceptability to ENGINEER as provided below the schedules submitted in accordance with paragraph 2.05.B. CONTRACTOR shall have an additional ten days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to CONTRACTOR until acceptable schedules are submitted to ENGINEER.

1. The progress schedule will be acceptable to ENGINEER if it provides an orderly progression of the Work to completion within any specified Milestones and the Contract Times. Such acceptance will not impose on ENGINEER responsibility for the progress schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve CONTRACTOR from CONTRACTOR's full responsibility therefor.

2. CONTRACTOR's schedule of Shop Drawing and Sample submittals will be acceptable to ENGINEER if it provides a workable arrangement for reviewing and processing the required submittals.

3. CONTRACTOR's schedule of values will be acceptable to ENGINEER as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

3.01 *Intent*

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

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

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

3.02 *Reference Standards*

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

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

2. No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of OWNER, CONTRACTOR, or ENGINEER, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall any such provision or instruction be effective to assign to OWNER, ENGINEER, or any of ENGINEER's Consultants, agents, or employees any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, CONTRACTOR shall report it to ENGINEER in writing at once. CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency as required by paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in paragraph 3.04; provided, however, that CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any such conflict, error, ambiguity, or discrepancy unless CONTRACTOR knew or reasonably should have known thereof.

B. Resolving Discrepancies

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

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

b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 Amending and Supplementing Contract Documents

A. The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways: (i) a Written Amendment; (ii) a Change Order; or (iii) a Work Change Directive.

B. The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways: (i) a Field Order; (ii) ENGINEER's approval of a Shop Drawing or Sample; or (iii) ENGINEER's written interpretation or clarification.

3.05 Reuse of Documents

A. CONTRACTOR and any Subcontractor or Supplier or other individual or entity performing or furnishing any of the Work under a direct or indirect contract with OWNER: (i) shall not have or acquire any title

to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of ENGINEER or ENGINEER's Consultant, including electronic media editions; and (ii) shall not reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaptation by ENGINEER. This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude CONTRACTOR from retaining copies of the Contract Documents for record purposes.

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

4.01 Availability of Lands

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

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

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

4.02 Subsurface and Physical Conditions

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

1. those reports of explorations and tests of subsurface conditions at or contiguous to the Site that

ENGINEER has used in preparing the Contract Documents;
and

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

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized:* CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER, or any of ENGINEER's Consultants with respect to:

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

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

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

4.03 *Differing Subsurface or Physical Conditions*

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

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

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

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

4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents; then CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by paragraph 6.16.A), notify

OWNER and ENGINEER in writing about such condition. CONTRACTOR shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

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

C. *Possible Price and Times Adjustments*

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

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

b. with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of paragraphs 9.08 and 11.03.

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

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

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

c. CONTRACTOR failed to give the written notice within the time and as required by paragraph 4.03.A.

3. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in paragraph 10.05. However, OWNER, ENGINEER, and ENGINEER's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses, or damages (including but not limited to all fees and charges of

engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.

4.04 *Underground Facilities*

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

1. OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and
2. the cost of all of the following will be included in the Contract Price, and CONTRACTOR shall have full responsibility for:
 - a. reviewing and checking all such information and data,
 - b. locating all Underground Facilities shown or indicated in the Contract Documents,
 - c. coordination of the Work with the owners of such Underground Facilities, including OWNER, during construction, and
 - d. the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.

B. *Not Shown or Indicated*

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

2. If ENGINEER concludes that a change in the Contract Documents is required, a Work Change Directive

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

4.05 *Reference Points*

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

4.06 *Hazardous Environmental Condition at Site*

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

B. *Limited Reliance by CONTRACTOR on Technical Data Authorized:* CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER or any of ENGINEER's Consultants with respect to:

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

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

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

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

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

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

F. If after receipt of such written notice CONTRACTOR does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then OWNER may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in paragraph 10.05.

OWNER may have such deleted portion of the Work performed by OWNER's own forces or others in accordance with Article 7.

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

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

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

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. CONTRACTOR shall furnish performance and payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment

becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Contract Documents.

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

C. If the surety on any Bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.01.B, CONTRACTOR shall within 20 days thereafter substitute another Bond and surety, both of which shall comply with the requirements of paragraphs 5.01.B and 5.02.

5.02 Licensed Sureties and Insurers

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

5.03 Certificates of Insurance

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

5.04 CONTRACTOR's Liability Insurance

A. CONTRACTOR shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from

CONTRACTOR's performance of the Work and CONTRACTOR's other obligations under the Contract Documents, whether it is to be performed by CONTRACTOR, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

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

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

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

4. claims for damages insured by reasonably available personal injury liability coverage which are sustained: (i) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (ii) by any other person for any other reason;

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

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

B. The policies of insurance so required by this paragraph 5.04 to be purchased and maintained shall:

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

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

3. include completed operations insurance;

4. include contractual liability insurance covering CONTRACTOR's indemnity obligations under paragraphs 6.07, 6.11, and 6.20;

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

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

7. with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and CONTRACTOR shall furnish OWNER and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to OWNER and any such additional insured of continuation of such insurance at final payment and one year thereafter).

5.05 *OWNER's Liability Insurance*

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

5.06 *Property Insurance*

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

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

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

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

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

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

6. include testing and startup; and

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

B. OWNER shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

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

D. OWNER shall not be responsible for purchasing and maintaining any property insurance specified in this paragraph 5.06 to protect the interests of CONTRACTOR,

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

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

5.07 Waiver of Rights

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

B. OWNER waives all rights against CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and the officers, directors,

partners, employees, agents, and other consultants and subcontractors of each and any of them for:

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

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

C. Any insurance policy maintained by OWNER covering any loss, damage or consequential loss referred to in paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against CONTRACTOR, Subcontractors, ENGINEER, or ENGINEER's Consultants and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them.

5.08 Receipt and Application of Insurance Proceeds

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

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

5.09 Acceptance of Bonds and Insurance; Option to Replace

A. If either OWNER or CONTRACTOR has any objection to the coverage afforded by or other provisions of the Bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by paragraph 2.05.C. OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the Bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent Bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.

5.10 *Partial Utilization, Acknowledgment of Property Insurer*

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

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

6.01 *Supervision and Superintendence*

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

shall be responsible to see that the completed Work complies accurately with the Contract Documents.

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

6.02 *Labor; Working Hours*

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

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

6.03 *Services, Materials, and Equipment*

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

B. All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of OWNER. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

6.04 *Progress Schedule*

A. CONTRACTOR shall adhere to the progress schedule established in accordance with paragraph 2.07 as it may be adjusted from time to time as provided below.

1. CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.07) proposed adjustments in the progress schedule that will not result in changing the Contract Times (or Milestones). Such adjustments will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

2. Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of Article 12. Such adjustments may only be made by a Change Order or Written Amendment in accordance with Article 12.

6.05 *Substitutes and "Or-Equals"*

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

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

a. in the exercise of reasonable judgment ENGINEER determines that: (i) it is at least equal in quality, durability, appearance, strength, and design characteristics; (ii) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole, and;

b. CONTRACTOR certifies that: (i) there is no increase in cost to the OWNER; and (ii) it will conform

substantially, even with deviations, to the detailed requirements of the item named in the Contract Documents.

2. Substitute Items

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

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

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

d. CONTRACTOR shall first make written application to ENGINEER for review of a proposed substitute item of material or equipment that CONTRACTOR seeks to furnish or use. The application shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified. The application will state the extent, if any, to which the use of the proposed substitute item will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute item and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute item from that specified will be identified in the application, and available engineering, sales, maintenance, repair, and replacement services will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change, all of which will be considered by ENGINEER in evaluating the proposed substitute item. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute item.

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

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

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

E. ENGINEER's Cost Reimbursement: ENGINEER will record time required by ENGINEER and ENGINEER's Consultants in evaluating substitute proposed or submitted by CONTRACTOR pursuant to paragraphs 6.05.A.2 and 6.05.B and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER approves a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluating each such proposed substitute.

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

6.06 Concerning Subcontractors, Suppliers, and Others

A. CONTRACTOR shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to OWNER as indicated in paragraph 6.06.B), whether initially or as a replacement, against whom OWNER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier, or other individual or entity to

furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

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

C. CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier or other individual or entity, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.

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

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

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

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

6.07 Patent Fees and Royalties

A. CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of OWNER or ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees or agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 Permits

A. Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all

construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto, such as plant investment fees.

6.09 Laws and Regulations

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

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

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

6.10 Taxes

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

6.11 Use of Site and Other Areas

A. Limitation on Use of Site and Other Areas

1. CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the

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

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

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

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

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

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

6.12 Record Documents

A. CONTRACTOR shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show

changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to ENGINEER for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to ENGINEER for OWNER.

6.13 Safety and Protection

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

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

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

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

B. CONTRACTOR shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All damage, injury, or loss to any property referred to in paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or ENGINEER's Consultant, or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them). CONTRACTOR's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with

paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).

6.14 *Safety Representative*

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

6.15 *Hazard Communication Programs*

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

6.16 *Emergencies*

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

6.17 *Shop Drawings and Samples*

A. CONTRACTOR shall submit Shop Drawings to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. All submittals will be identified as ENGINEER may require and in the number of copies specified in the General Requirements. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show ENGINEER the services, materials, and equipment CONTRACTOR proposes to provide and to enable ENGINEER to review the information for the limited purposes required by paragraph 6.17.E.

B. CONTRACTOR shall also submit Samples to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers, and the use for which intended and otherwise as ENGINEER may require to enable ENGINEER to review

the submittal for the limited purposes required by paragraph 6.17.E. The numbers of each Sample to be submitted will be as specified in the Specifications.

C. Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER as required by paragraph 2.07, any related Work performed prior to ENGINEER's review and approval of the pertinent submittal will be at the sole expense and responsibility of CONTRACTOR.

D. *Submittal Procedures*

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

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

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

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

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

2. Each submittal shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents with respect to CONTRACTOR's review and approval of that submittal.

3. At the time of each submittal, CONTRACTOR shall give ENGINEER specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, such notice to be in a written communication separate from the submittal; and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to ENGINEER for review and approval of each such variation.

E. *ENGINEER's Review*

1. ENGINEER will timely review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER. ENGINEER's review and

approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.

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

3. ENGINEER's review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of each submittal as required by paragraph 6.17.D.3 and ENGINEER has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for complying with the requirements of paragraph 6.17.D.1.

F. *Resubmittal Procedures*

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

6.18 *Continuing the Work*

A. CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by paragraph 15.04 or as OWNER and CONTRACTOR may otherwise agree in writing.

6.19 *CONTRACTOR's General Warranty and Guarantee*

A. CONTRACTOR warrants and guarantees to OWNER, ENGINEER, and ENGINEER's Consultants that all Work will be in accordance with the Contract Documents and will not be defective. CONTRACTOR's

warranty and guarantee hereunder excludes defects or damage caused by:

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

2. normal wear and tear under normal usage.

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

1. observations by ENGINEER;

2. recommendation by ENGINEER or payment by OWNER of any progress or final payment;

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

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

5. any acceptance by OWNER or any failure to do so;

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

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

8. any correction of defective Work by OWNER.

6.20 *Indemnification*

A. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage:

1. is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible

property (other than the Work itself), including the loss of use resulting therefrom; and

2. is caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such individual or entity.

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

C. The indemnification obligations of CONTRACTOR under paragraph 6.20.A shall not extend to the liability of ENGINEER and ENGINEER's Consultants or to the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them arising out of:

1. the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or
2. giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.

ARTICLE 7 - OTHER WORK

7.01 *Related Work at Site*

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

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

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

B. CONTRACTOR shall afford each other contractor who is a party to such a direct contract and each utility owner (and OWNER, if OWNER is performing the other work with OWNER's employees) proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, CONTRACTOR shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of ENGINEER and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.

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

7.02 *Coordination*

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

1. the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;
2. the specific matters to be covered by such authority and responsibility will be itemized; and
3. the extent of such authority and responsibilities will be provided.

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

ARTICLE 8 - OWNER'S RESPONSIBILITIES

8.01 *Communications to Contractor*

A. Except as otherwise provided in these General Conditions, OWNER shall issue all communications to CONTRACTOR through ENGINEER.

8.02 *Replacement of ENGINEER*

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

8.03 *Furnish Data*

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

8.04 *Pay Promptly When Due*

A. OWNER shall make payments to CONTRACTOR promptly when they are due as provided in paragraphs 14.02.C and 14.07.C.

8.05 *Lands and Easements; Reports and Tests*

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

8.06 *Insurance*

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

8.07 *Change Orders*

A. OWNER is obligated to execute Change Orders as indicated in paragraph 10.03.

8.08 *Inspections, Tests, and Approvals*

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

8.09 *Limitations on OWNER's Responsibilities*

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

8.10 *Undisclosed Hazardous Environmental Condition*

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

8.11 *Evidence of Financial Arrangements*

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

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 *OWNER'S Representative*

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

9.02 *Visits to Site*

A. ENGINEER will make visits to the Site at intervals appropriate to the various stages of construction as ENGINEER deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. Based on information obtained during such visits and observations, ENGINEER,

for the benefit of OWNER, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. ENGINEER's efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defective Work.

B. ENGINEER's visits and observations are subject to all the limitations on ENGINEER's authority and responsibility set forth in paragraph 9.10, and particularly, but without limitation, during or as a result of ENGINEER's visits or observations of CONTRACTOR's Work ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work.

9.03 *Project Representative*

A. If OWNER and ENGINEER agree, ENGINEER will furnish a Resident Project Representative to assist ENGINEER in providing more extensive observation of the Work. The responsibilities and authority and limitations thereon of any such Resident Project Representative and assistants will be as provided in paragraph 9.10 and in the Supplementary Conditions. If OWNER designates another representative or agent to represent OWNER at the Site who is not ENGINEER's Consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.

9.04 *Clarifications and Interpretations*

A. ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents as ENGINEER may determine necessary, which shall be consistent with the intent of and reasonably inferable from the Contract Documents. Such written clarifications and interpretations will be binding on OWNER and CONTRACTOR. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a written clarification or interpretation, a Claim may be made therefor as provided in paragraph 10.05.

9.05 *Authorized Variations in Work*

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

9.06 *Rejecting Defective Work*

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

9.07 *Shop Drawings, Change Orders and Payments*

A. In connection with ENGINEER's authority as to Shop Drawings and Samples, see paragraph 6.17.

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

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

9.08 *Determinations for Unit Price Work*

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

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

A. ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the

acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work, the quantities and classifications of Unit Price Work, the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, and Claims seeking changes in the Contract Price or Contract Times will be referred initially to ENGINEER in writing, in accordance with the provisions of paragraph 10.05, with a request for a formal decision.

B. When functioning as interpreter and judge under this paragraph 9.09, ENGINEER will not show partiality to OWNER or CONTRACTOR and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by ENGINEER pursuant to this paragraph 9.09 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.07) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.

9.10 Limitations on ENGINEER's Authority and Responsibilities

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

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

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

D. ENGINEER's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by paragraph

14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.

E. The limitations upon authority and responsibility set forth in this paragraph 9.10 shall also apply to ENGINEER's Consultants, Resident Project Representative, and assistants.

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS

10.01 Authorized Changes in the Work

A. Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

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

10.02 Unauthorized Changes in the Work

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

10.03 Execution of Change Orders

A. OWNER and CONTRACTOR shall execute appropriate Change Orders recommended by ENGINEER (or Written Amendments) covering:

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

2. changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually

performed in accordance with a Work Change Directive; and

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

10.04 *Notification to Surety*

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

10.05 *Claims and Disputes*

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

B. *ENGINEER's Decision:* ENGINEER will render a formal decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any. ENGINEER's written decision on such Claim, dispute, or other matter will be final and binding upon OWNER and CONTRACTOR unless:

1. an appeal from ENGINEER's decision is taken within the time limits and in accordance with the dispute resolution procedures set forth in Article 16; or

2. if no such dispute resolution procedures have been set forth in Article 16, a written notice of intention to appeal from ENGINEER's written decision is delivered by OWNER or CONTRACTOR to the other and to ENGINEER within 30 days after the date of such decision, and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction within 60 days after the date of such decision or within 60 days after Substantial Completion, whichever is later (unless otherwise agreed in writing by OWNER and CONTRACTOR), to exercise such rights or remedies as the appealing party may have with respect to such Claim, dispute, or other matter in accordance with applicable Laws and Regulations.

C. If ENGINEER does not render a formal decision in writing within the time stated in paragraph 10.05.B, a decision denying the Claim in its entirety shall be deemed to have been issued 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.

D. No Claim for an adjustment in Contract Price or Contract Times (or Milestones) will be valid if not submitted in accordance with this paragraph 10.05.

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

11.01 *Cost of the Work*

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

1. Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Such employees shall include without limitation superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for

employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by OWNER.

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

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

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

5. Supplemental costs including the following:

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

b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery,

appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of CONTRACTOR.

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

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

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

f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's fee.

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

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

i. When the Cost of the Work is used to determine the value of a Change Order or of a Claim, the cost of premiums for additional Bonds and insurance required because of the changes in the Work or caused by the event giving rise to the Claim.

j. When all the Work is performed on the basis of cost-plus, the costs of premiums for all Bonds and

insurance CONTRACTOR is required by the Contract Documents to purchase and maintain.

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

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

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

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

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

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

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

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

11.02 *Cash Allowances*

A. It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums as may be acceptable to OWNER and ENGINEER. CONTRACTOR agrees that:

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

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

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

11.03 *Unit Price Work*

A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by ENGINEER subject to the provisions of paragraph 9.08.

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

C. OWNER or CONTRACTOR may make a Claim for an adjustment in the Contract Price in accordance with paragraph 10.05 if:

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

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

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

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

12.01 *Change of Contract Price*

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

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

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

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

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

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

1. a mutually acceptable fixed fee; or

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

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

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

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

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

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

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

12.02 *Change of Contract Times*

A. The Contract Times (or Milestones) may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Times (or Milestones) shall be based on written notice submitted by the party making the claim to the ENGINEER and the other party to the Contract in accordance with the provisions of paragraph 10.05.

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

12.03 *Delays Beyond CONTRACTOR's Control*

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

12.04 Delays Within CONTRACTOR's Control

A. The Contract Times (or Milestones) will not be extended due to delays within the control of CONTRACTOR. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.

12.05 Delays Beyond OWNER's and CONTRACTOR's Control

A. Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay.

12.06 Delay Damages

A. In no event shall OWNER or ENGINEER be liable to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from:

1. delays caused by or within the control of CONTRACTOR; or
2. delays beyond the control of both OWNER and CONTRACTOR including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.

B. Nothing in this paragraph 12.06 bars a change in Contract Price pursuant to this Article 12 to compensate

CONTRACTOR due to delay, interference, or disruption directly attributable to actions or inactions of OWNER or anyone for whom OWNER is responsible.

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

13.01 Notice of Defects

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

13.02 Access to Work

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

13.03 Tests and Inspections

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

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

1. for inspections, tests, or approvals covered by paragraphs 13.03.C and 13.03.D below;
2. that costs incurred in connection with tests or inspections conducted pursuant to paragraph 13.04.B shall be paid as provided in said paragraph 13.04.B; and
3. as otherwise specifically provided in the Contract Documents.

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

therewith, and furnish ENGINEER the required certificates of inspection or approval.

D. CONTRACTOR shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for OWNER's and ENGINEER's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to OWNER and ENGINEER.

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

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

13.04 Uncovering Work

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

B. If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as ENGINEER may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim therefor as provided in paragraph 10.05. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation,

inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.

13.05 OWNER May Stop the Work

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

13.06 Correction or Removal of Defective Work

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

13.07 Correction Period

A. If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for CONTRACTOR's use by OWNER or permitted by Laws and Regulations as contemplated in paragraph 6.11.A is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions: (i) repair such defective land or areas, or (ii) correct such defective Work or, if the defective Work has been rejected by OWNER, remove it from the Project and replace it with Work that is not defective, and (iii) satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or repaired or may have the rejected Work

removed and replaced, and all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

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

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

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

13.08 *Acceptance of Defective Work*

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

13.09 *OWNER May Correct Defective Work*

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

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

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

D. CONTRACTOR shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies under this paragraph 13.09.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 *Schedule of Values*

A. The schedule of values established as provided in paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to ENGINEER. Progress payments on account of Unit Price Work will be based on the number of units completed.

14.02 *Progress Payments*

A. *Applications for Payments*

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

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

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

B. *Review of Applications*

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

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

a. the Work has progressed to the point indicated;

b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.08, and to any other qualifications stated in the recommendation); and

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

3. By recommending any such payment ENGINEER will not thereby be deemed to have represented that: (i) inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents; or (ii) that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or entitle OWNER to withhold payment to CONTRACTOR.

4. Neither ENGINEER's review of CONTRACTOR's Work for the purposes of recommending payments nor ENGINEER's recommendation of any payment, including final payment, will impose responsibility on ENGINEER to supervise, direct, or control the Work or for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for CONTRACTOR's failure to comply with Laws and Regulations applicable to CONTRACTOR's performance of the Work. Additionally, said review or recommendation will not impose responsibility on ENGINEER to make any examination to ascertain how or for what purposes CONTRACTOR has used the moneys paid on account of the Contract Price, or to determine that title to any of the Work, materials, or equipment has passed to OWNER free and clear of any Liens.

5. ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER's opinion, it would be incorrect to make the representations to OWNER referred to in paragraph 14.02.B.2. ENGINEER may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in ENGINEER's opinion to protect OWNER from loss because:

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

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

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

d. ENGINEER has actual knowledge of the occurrence of any of the events enumerated in paragraph 15.02.A.

C. *Payment Becomes Due*

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

D. *Reduction in Payment*

1. OWNER may refuse to make payment of the full amount recommended by ENGINEER because:

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

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

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

d. OWNER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.02.B.5.a through 14.02.B.5.c or paragraph 15.02.A.

2. If OWNER refuses to make payment of the full amount recommended by ENGINEER, OWNER must give CONTRACTOR immediate written notice (with a copy to ENGINEER) stating the reasons for such action and

promptly pay CONTRACTOR any amount remaining after deduction of the amount so withheld. OWNER shall promptly pay CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by OWNER and CONTRACTOR, when CONTRACTOR corrects to OWNER's satisfaction the reasons for such action.

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

14.03 *CONTRACTOR's Warranty of Title*

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

14.04 *Substantial Completion*

A. When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Promptly thereafter, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER does not consider the Work substantially complete, ENGINEER will notify CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. OWNER shall have seven days after receipt of the tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the Work is not substantially complete, ENGINEER will within 14 days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefor. If, after consideration of OWNER's objections, ENGINEER considers the Work substantially complete, ENGINEER will within said 14 days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending

final payment between OWNER and CONTRACTOR with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER in writing prior to ENGINEER's issuing the definitive certificate of Substantial Completion, ENGINEER's aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.

B. OWNER shall have the right to exclude CONTRACTOR from the Site after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.

14.05 Partial Utilization

A. Use by OWNER at OWNER's option of any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which OWNER, ENGINEER, and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by OWNER for its intended purpose without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following conditions.

1. OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to OWNER and ENGINEER that such part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of that part of the Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers that part of the Work to be substantially complete, the provisions of paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

2. No occupancy or separate operation of part of the Work may occur prior to compliance with the

requirements of paragraph 5.10 regarding property insurance.

14.06 Final Inspection

A. Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, ENGINEER will promptly make a final inspection with OWNER and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective.

CONTRACTOR shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

14.07 Final Payment

A. Application for Payment

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

2. The final Application for Payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by subparagraph 5.04.B.7; (ii) consent of the surety, if any, to final payment; and (iii) complete and legally effective releases or waivers (satisfactory to OWNER) of all Lien rights arising out of or Liens filed in connection with the Work.

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

B. Review of Application and Acceptance

1. If, on the basis of ENGINEER's observation of the Work during construction and final inspection, and ENGINEER's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, ENGINEER will, within ten days after receipt of the final Application for Payment, indicate in writing ENGINEER's recommendation of payment and present the Application for Payment to OWNER for payment. At the same time ENGINEER will also give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.09. Otherwise, ENGINEER will return the Application for Payment to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application for Payment.

C. Payment Becomes Due

1. Thirty days after the presentation to OWNER of the Application for Payment and accompanying documentation, the amount recommended by ENGINEER will become due and, when due, will be paid by OWNER to CONTRACTOR.

14.08 Final Completion Delayed

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

14.09 Waiver of Claims

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

1. a waiver of all Claims by OWNER against CONTRACTOR, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special

guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and

2. a waiver of all Claims by CONTRACTOR against OWNER other than those previously made in writing which are still unsettled.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

15.01 OWNER May Suspend Work

A. At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to CONTRACTOR and ENGINEER which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if CONTRACTOR makes a Claim therefor as provided in paragraph 10.05.

15.02 OWNER May Terminate for Cause

A. The occurrence of any one or more of the following events will justify termination for cause:

1. CONTRACTOR's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.07 as adjusted from time to time pursuant to paragraph 6.04);

2. CONTRACTOR's disregard of Laws or Regulations of any public body having jurisdiction;

3. CONTRACTOR's disregard of the authority of ENGINEER; or

4. CONTRACTOR's violation in any substantial way of any provisions of the Contract Documents.

B. If one or more of the events identified in paragraph 15.02.A occur, OWNER may, after giving CONTRACTOR (and the surety, if any) seven days written notice, terminate the services of CONTRACTOR, exclude CONTRACTOR from the Site, and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and

equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case, CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by OWNER arising out of or relating to completing the Work, such excess will be paid to CONTRACTOR. If such claims, costs, losses, and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such claims, costs, losses, and damages incurred by OWNER will be reviewed by ENGINEER as to their reasonableness and, when so approved by ENGINEER, incorporated in a Change Order. When exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

C. Where CONTRACTOR's services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

15.03 OWNER May Terminate For Convenience

A. Upon seven days written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the Contract. In such case, CONTRACTOR shall be paid (without duplication of any items):

1. for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
2. for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;
3. for all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and
4. for reasonable expenses directly attributable to termination.

B. CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.

15.04 CONTRACTOR May Stop Work or Terminate

A. If, through no act or fault of CONTRACTOR, the Work is suspended for more than 90 consecutive days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within 30 days after it is submitted, or OWNER fails for 30 days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days written notice to OWNER and ENGINEER, and provided OWNER or ENGINEER do not remedy such suspension or failure within that time, terminate the Contract and recover from OWNER payment on the same terms as provided in paragraph 15.03. In lieu of terminating the Contract and without prejudice to any other right or remedy, if ENGINEER has failed to act on an Application for Payment within 30 days after it is submitted, or OWNER has failed for 30 days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may, seven days after written notice to OWNER and ENGINEER, stop the Work until payment is made of all such amounts due CONTRACTOR, including interest thereon. The provisions of this paragraph 15.04 are not intended to preclude CONTRACTOR from making a Claim under paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to CONTRACTOR's stopping the Work as permitted by this paragraph.

ARTICLE 16 - DISPUTE RESOLUTION

16.01 Methods and Procedures

A. Dispute resolution methods and procedures, if any, shall be as set forth in the Supplementary Conditions. If no method and procedure has been set forth, and subject to the provisions of paragraphs 9.09 and 10.05, OWNER and CONTRACTOR may exercise such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.

ARTICLE 17 - MISCELLANEOUS

17.01 Giving Notice

A. Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of

the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

17.02 *Computation of Times*

A. When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

17.03 *Cumulative Remedies*

A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

17.04 *Survival of Obligations*

A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Agreement.

17.05 *Controlling Law*

A. This Contract is to be governed by the law of the state in which the Project is located.

SUPPLEMENTAL GENERAL CONDITIONS

These Supplemental General Conditions amend or supplement the General Conditions of the Construction Contract and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplemental General Conditions which are defined in the Standard General Conditions of the Construction Contract have the meanings assigned to them in the General Conditions.

SGC-3.01

Add the following new paragraph immediately after Paragraph 3.01C:

If there is any conflict between the provisions of the Contract Documents and any referenced provisions within the Contract Specifications, the language of the Contract Documents will take precedence over that of any standard specification, manual, or code.

SGC-4.02

Add the following new paragraph after Paragraph 4.02B:

If any geotechnical exploration for the project was performed and reported, said report will be included as an Appendix. The geotechnical report shall be used as a reference and all recommendations included therein shall be followed in full.

SGC-4.04

Add the following new paragraphs immediately after Paragraph 4.04 B.2:

Special precautions shall be taken by the Contractor to avoid damage to existing overhead and underground utilities owned and operated by the Owner or by public or private utility companies.

The available information concerning the location of existing underground utilities is shown on the Drawings. While it is believed that the locations shown are reasonably correct, neither the Engineer nor the Owner can guarantee the accuracy or adequacy of this information.

Before proceeding with the work, the Contractor shall confer with all public or private companies, agencies or departments that own and operate utilities in the vicinity of the construction work. The purpose of the conference, or conferences, shall be to notify said companies, agencies or departments of the proposed construction schedule, verify the location of, and possible interference with, the existing utilities that are shown on the Drawings, arrange for necessary suspension of service, and make arrangements to locate and avoid interference with all utilities (including house connections) that are not shown on the Drawings. The Engineer and Owner have no objection to the Contractor arranging for the said utility companies, agencies, or departments to locate and uncover their own utilities; however, the Contractor shall bear the entire responsibility and cost of locating and avoiding, or repairing damage to said existing utilities.

The Contractor shall locate all unknown metallic hazards, namely buried pipe, metals, etc., by using a pipe locator. The pipe locator shall immediately precede the trench ditching and all hazards located shall be marked in such manner as to notify the machine operator of such hazard.

Where existing utilities or appurtenant structures either underground or above ground, are encountered, they shall not be displaced or molested unless necessary, and in such case shall be replaced in as good or better condition than found as quickly as possible. Relocation and/or replacement of all utilities and appurtenant structures to accommodate the construction work shall be at the Contractor's expense, unless such relocation and/or replacement is by statute agreement the responsibility of the owner of the utility.

SGC-5.01

Add the following new paragraph immediately after Paragraph 5.01C:

The Performance Bond shall remain in full force and effect throughout the Guaranty period referred to in SGC 6.03. All warranties and guarantees remaining in effect at and beyond the Guaranty expiration date shall be relinquished and transferred to the Owner. Copies of such warranty/guaranty shall be submitted to the Engineer prior to date of the start of the Guaranty period.

SGC-5.06

Delete Paragraph 5.06A in its entirety and insert the following in its place:

Unless otherwise provided in the Supplemental General Conditions, Contractor shall purchase and maintain property insurance upon the work at the site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplemental General Conditions or required by Laws and Regulations). This insurance shall:

Delete Paragraph 5.06B in its entirety and insert the following in its place:

Contractor shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplemental General Conditions or Laws and Regulations which will include the interests of Owner, Contractor, Subcontractors, Engineer, Engineer=s Consultants, and any other individuals or entities identified in the Supplemental General Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.

Add the following paragraphs after Paragraph 5.06E:

F. The insurance required by this Paragraph shall include specific coverage and be written for not less than the limits of liability and coverages tabulated in the prototype Certificate of Insurance included as Section 00620, or as required by law, whichever is greater.

G. The Contractor shall provide INSTALLATION FLOATER INSURANCE when Builder's Risk Insurance is inappropriate, or when Builder's Risk Insurance will not respond, to cover damage or destruction to renovations, repairs, materials, or equipment being installed or otherwise being handled or stored by the Contractor, including off-site storage, transit and installation. The amount of coverage shall provide full replacement value (FRV) of the property, repairs, additions, materials, or equipment being installed, otherwise being handled or stored on or off premises. All risks coverage shall be provided.

SGC-5.08 Delete Paragraph 5.08 in its entirety.

SGC-6.02

Add the following new paragraphs immediately after Paragraph 6.02A:

The Contractor shall employ workmen skilled in their various duties and shall remove from the project, at the request of the Engineer, any person employed in, about, or upon the work, who misconducts himself or is incompetent or negligent in the performance of the duties assigned to him.

No person under the age of eighteen (18) years and no convict labor shall be employed to perform any work under this Contract. No person whose age or physical condition is such as to make his employment dangerous to his health or safety or to the health or safety of others shall be employed to perform any work under this Contract, provided that this shall not operate against the employment of physically handicapped persons, otherwise employable, where such persons may be safely assigned to work which they can ably perform. There shall be no discrimination because of race, creed, color or political affiliation in the employment of persons for work under this Contract.

With respect to additional skilled, semi-skilled and unskilled workers employed to perform work on the project, preference in employment shall be given first to persons who reside in the city in which the work is to be performed, and second to persons residing in the county in which the work is to be performed.

SGC-6.03

Add the following new paragraph immediately after Paragraph 6.03B:

The Contractor agrees that he will obtain from the manufacturers of equipment and materials furnished under this Contract guarantees against defective materials and workmanship, and if those guarantees furnished by the manufacturer do not extend for the term of one (1) year from and after the date upon which the final estimate of the Engineer is formally approved by the Owner or other established date as set forth hereinbefore, he shall make the necessary arrangements and assume all cost for extending this guarantee for the required period.

SGC-6.08

Delete Paragraph 6.08A in its entirety and insert the following in its place.

Owner shall obtain and pay for all construction permits, including building permits. Contractor is responsible for all utility permits and fees for usage during the construction period. Contractor is responsible for any electrical, plumbing and/or building inspections and fees which may be required.

SGC-10.03

Add the following new paragraph immediately after Paragraph 10.03:

B. A sample Change Order form is included as Section 00940.

SGC-12.03

Add the following new paragraph immediately after Paragraph 12.03:

The Contractor shall make no claim for extra compensation due to delays of the project beyond his control. Such delays may include those caused by any act or neglect on the part of the Owner or Engineer, or by any employee of either, or by any separate contractor employed by the Owner, or by changes ordered in the work, or by labor disputes, fire, unusual delays in transportation, adverse weather conditions not reasonably

anticipatable, unavoidable casualties, or by delay authorized by the Owner pending arbitration, or by any other cause which the Engineer determines may justify the delay. Additional costs incurred in accelerating the work to compensate for such delays (as defined above) shall also not form the basis for such compensation claims.

SGC-13.06

Add a new paragraph immediately after Paragraph 13.06 of the General Conditions which is to read as follows:

When the repairs or replacements involve one or more items of installed equipment, Contractor shall provide the services of qualified factory-trained servicemen in the employ of the equipment manufacturers to perform or supervise the repairs or replacements.

SGC-13.09

Add the following new paragraph immediately after Paragraph 13.09D:

When the Engineer or the Owner deems it necessary, and so orders, such replacements or repairs under this section shall be undertaken by the Contractor within twenty-four (24) hours after service of notice. If the Contractor unnecessarily delays or fails to make the ordered replacements or repairs within the time specified, or if any replacements or repairs within the time specified, or if any replacements or repairs are of such nature as not to admit of the delay incident to the service of a notice, then the Owner shall have the right to make such replacements or repairs and the expense thereof shall be paid by the Contractor or deducted from any moneys due to Contractor.

SGC-14.01

Add the following to Paragraph 14.01:

The Application for Payment form shall be exactly as shown in Section 00630.

SGC-17.06

Add the following new paragraph immediately after Paragraph 17.05:

If the Contractor shall fail or refuse to complete the work within the Contract Time, or extension of time granted by the Owner, then the Contractor agrees as a partial consideration for the awarding of this Contract that the Owner may retain from the compensation otherwise to be paid to the Contractor the amount specified below, not as a penalty but as liquidated damages, for each and every calendar day that the Contractor shall be in default after the time stipulated in the Contract Documents.

SCHEDULE OF LIQUIDATED DAMAGES	
Original Amount of Contract	Liquidated Damages Per Day
Up to \$100,000	\$200
\$100,001 to \$500,000	\$300
\$500,001 to \$1,000,000	\$350
\$1,000,001 to \$2,000,000	\$400

Over \$2,000,000	\$450 Plus \$50 Per Each Additional \$1,000,000
------------------	---

The said amount is fixed and agreed upon by and between the Contractor and Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain.

SGC 17.07

Add the following new paragraph immediately after Paragraph 17.06:

The Contractor shall take all necessary precautions to minimize the disruption in water and/or wastewater system operations and shall be held responsible for all damages brought about by disruptions of the operations if such disruptions are a direct cause of Contractor negligence and or a failure of the Contractor to coordinate his work effort with the Owner. Sewer service to the customers shall be maintained at all times.

CHANGE ORDER

GRW ENGINEERS, INC.

404 BNA DRIVE, SUITE 201

NASHVILLE, TENNESSEE 37217

Change Order No.:

Date:

Project:

Project No.:

Owner: CITY OF GOODLETTSVILLE, TN

Contractor:

Attachments:

The **Contractor** is hereby directed to perform the **Work** described in the **Contract For Construction** as amended by the **Change Order**:

Original Contract Amount.....	\$
Net Change By Previous Change Orders.....	\$
Contract Amount Prior To This Change Order.....	\$
Amount of This Change Order.....	\$
New Contract Amount.....	\$

The Contract Time Is:

The Contract Completion Date Is:

This **Change Order** is intended to, and the **Contractor** agrees that it does, fairly and adequately compensate the **Contractor** for extra direct costs (labor, materials, etc.) as well as all expenses and damages which may result from any delays, suspensions, stretch-outs, scheduling, inefficiencies, and accelerations in the **Work** associated with this **Change Order**, and the **Contractor** releases the **Owner** and the **Engineer** from any claims for such expenses and damages, including but not limited to changes in sequence of work; delays; disruption; rescheduling; extended overhead; acceleration; wage; material; or other escalations; and all other impact costs.

This **Change Order** is intended to, and the **Contractor** agrees that it does, provide the **Contractor** a reasonable and adequate period of time in which to complete the **Work** in accordance with the **Contract For Construction**, as amended by this **Change Order**, and the **Contractor** releases the **Owner** and the **Engineer** from any claims for additional time to perform the **Work**.

OWNER:

CONTRACTOR:

(Date)

(Date)

GRW ENGINEERS, INC. 1/23/02

SECTION 02400 - BORING AND JACKING

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. Provide all labor, materials, equipment and services required to furnish and install all bored and jacked carrier pipes in encasement pipes under railroad and highway crossings as shown on the Drawings and/or specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Erosion Control: Section 02270
- B. Sanitary Sewage System: Section 02730

1.03 SUBMITTALS

- A. Descriptive literature, catalog cuts, and dimensional prints clearly indicating all dimensions and materials of construction, shall be submitted on all items specified herein to the Engineer for review before ordering.
- B. At the time of submission, the Contractor shall, in writing, call the Engineer's attention to any deviations that the submittals may have from the requirements of the Contract Drawings and Specifications.
- C. Comply with all specified requirements.

PART 2 - PRODUCTS

2.01 CARRIER PIPE

- A. Carrier pipe shall be as shown on the drawings.

2.02 CASING PIPE

- A. Casing pipe shall be steel, plain end, have a minimum yield point strength of 35,000 psi and conform to ASTM A 252 Grade 2 or ASTM A 139 Grade B without hydrostatic tests. The steel pipe shall have welded joints and be in at least 18 foot lengths. The casing pipe shall be coal tar epoxy coated.

- B. The diameter of the casing pipe shall be as follows:

Carrier Pipe Nominal Diameter (inches)	6	8	10	12	16	18	24	27	30	33	36
Casing Pipe Nominal Diameter (inches)	10	14	16	18	26	30	38	40	46	48	50

For carrier pipe sizes greater than 36-inches nominal diameter, the casing pipe diameter size shall be determined by the Engineer or as shown on the Contract Drawings.

- C. The wall thickness of the casing pipe shall be as follows:

Casing Pipe Nominal Diameter (inches)	Under 20	20	24	30	33	36	42	48
Casing Pipe Nominal Thickness (inches)	0.375	0.375	0.375	0.375	0.438	0.469	0.562	0.625

However, should a greater casing pipe thickness be specified or required on Highway permit approval sheets, said permit thickness requirement shall govern. Permit approval sheets will be made available to the Contractor.

2.03 CASING SPACERS

- A. **Stainless Steel Casing Spacers:** Stainless steel casing spacers shall be bolt-on style with a shell made in two (2) sections of heavy T-304 stainless steel. Connecting flanges shall be ribbed for extra strength. The shell shall be lined with a PVC liner .090" thick with 85-90 durometer. All nuts and bolts are to be 18-8 stainless steel. Runners shall be made of ultra high molecular weight polymer with inherent high abrasion resistance and a low coefficient of friction. Runners shall be supported by risers made of heavy t-304 stainless steel. The supports shall be mig welded to the shell and all welds shall be fully passivated. Stainless steel casing spacers shall be made by Cascade Waterworks Mfg. Co., or equal.
- B. **Solid Polyethylene Casing Spacers:** Solid polyethylene casing spacers shall be bolt-on style with a shell made in two (2) sections. Carrier pipe shall be wrapped with rubber strap inside casing space to prevent slippage. All nuts and bolts are to be 18-8 stainless steel. Solid polyethylene casing spacers shall be made by Calpico Inc., Raci, or equal.

2.04 CASING END SEALS

- A. Wrap-around end seals - Wrap-around end seals shall be made of a waterproof flexible coal tar membrane or with butyl mastic reinforced with fiberglass. The two exposed edges of the wrap-around seal shall be adhesively bonded forming a watertight seal. The ends of the wrap shall be sealed on the casing and carrier pipe by stainless steel bands. Wrap-around end seals shall be made by Calpico Inc., or equal.

PART 3 - EXECUTION

3.01 CROSSINGS - GENERAL

- A. Where designated on the drawings, crossings beneath state maintained roads, not to be disturbed shall be accomplished by boring and jacking a casing pipe.
- B. Steel casing pipe for crossings shall be bored and/or jacked into place to the elevations shown on the drawings. All joints between lengths shall be solidly butt-welded with a smooth non-obstructing joint inside. The casing pipe shall be installed without bends. The carrier pipe shall be installed after the casing pipe is in place, and shall extend a minimum of two (2) feet beyond each end of the casing to facilitate making joint connections. The carrier shall be braced and centered with casing spacers within the casing pipe to preclude possible flotation. Casing spacers shall be installed on a 6 foot centers on the carrier pipe within the casing pipe. The height of the supports and runners combined shall be sufficient to keep the carrier pipe at least 0.75" from the casing pipe wall at all times.
- C. At each end of the casing pipe, the carrier pipe shall be sealed with casing end seals. The end seals shall extend a minimum of 12 inches in each direction from the end of the casing pipe.
- D. After the carrier pipe has been installed, inspected, tested and sealed as specified, the annular space between the carrier pipe and the casing pipe shall be filled with coarse sand and sealed in a manner acceptable to the Engineer. Weep holes shall be provided in the closure at the lower end of the casing pipe to facilitate drainage.

3.02 BORING AND JACKING

- A. The Contractor shall excavate his own pits, as he may deem necessary, and will set his own line and grade stakes which shall be checked by the Engineer. Permits, as required, will be furnished or obtained by the Owner, but shall be in the Contractor's hands before any excavating is commenced.
- B. The boring method shall consist of pushing the pipe into the earth with a boring auger rotating within the pipe to remove the spoil.
 - 1. The boring operation shall be progressed on a 24-hour basis without stoppage (except for adding lengths of pipe) until the leading edge of the pipe has reached the receiving pit.
 - 2. The front of the pipe shall be provided with mechanical arrangements or devices that will positively prevent the auger from leading the pipe so that there will be no unsupported excavation ahead of the pipe.

3. The auger and cutting head arrangement shall be removable from within the pipe in the event an obstruction is encountered. If the obstruction cannot be removed without excavation in advance of the pipe, the pipe shall be abandoned in place and immediately filled with grout.
 4. The over-cut by the cutting head shall not exceed the outside diameter of the pipe by more than 2 inch. If voids should develop or if the bored hole diameter is greater than the outside diameter of the pipe by more than approximately 1 inch, grouting or other approved methods must be used to fill such voids.
 5. The face of the cutting head shall be arranged to provide a reasonable obstruction to the free flow of soft or poor material.
 6. Methods not having this boring arrangement will not be permitted. Contractor's boring arrangement plans and methods must be submitted to, and approved by, the Engineer.
- C. In the event an obstruction is encountered in boring which cannot be removed and it becomes necessary to withdraw the casing and commence elsewhere, the hole from which the casing is withdrawn shall be completely backfilled with coarse sand rammed in.
- D. Insurance to be furnished by the Contractor to cover this type of work shall be adequate to meet the requirements of the Railroad and/or State or County Highway Departments. Insurance shall consist of comprehensive general liability and automobile liability insurance.
- E. Before award of the contract, the Contractor shall furnish a statement of his experience of such work, or if inexperienced, shall advise the Owner as to whom he will sublet the work and give a statement of the experience of the subcontractor, which shall be satisfactory to the Owner.

3.03 CONTRACTOR'S RESPONSIBILITIES

- A. Perform all work in accordance with Tennessee Department of Transportation Rules and Regulations.

END OF SECTION

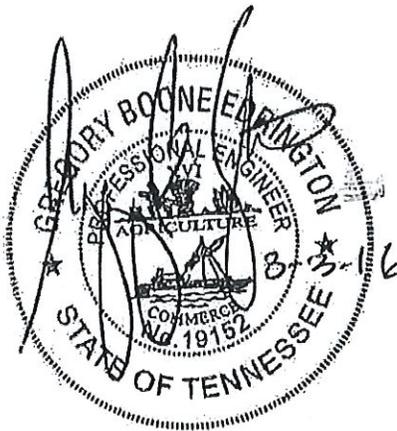
16-0545

SPECIFICATIONS FOR WASTEWATER

CITY OF GOODLETTSVILLE, TENNESSEE

SEPTEMBER 2016

SEWER ONLY



APPROVED FOR CONSTRUCTION
THE DOCUMENT BEARING THIS STAMP HAS BEEN RECEIVED AND REVIEWED BY THE
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES
AND IS HEREBY APPROVED FOR CONSTRUCTION BY THE COMMISSIONER

AUG 04 2016

THIS APPROVAL IS VALID FOR ONE YEAR
THE APPROVAL SHALL NOT BE CONSTRUED AS CREATING A PRESUMPTION OF CORRECT
OPERATION OR AS WARRANTING BY THE COMMISSIONER THAT THE APPROVED FACILITIES
WILL REACH THE DESIGN GOAL

Greg
FOR THE COMMISSIONER
TITLE

TDEC's Design Criterion

"Chapter 2 of TDEC's design Criterion has been updated and can be accessed at the following website: <http://www.tn.gov/environment/article/wr-wq-water-quality-reports-publications>. Chapter 18 of the design guidelines has been deleted with portions of the chapter included in the updated Chapter 2. In any instance the TDEC design criterion, TDEC's design criterion shall overrule".

SPECIFICATIONS FOR SANITARY SEWERS
THE CITY OF GOODLETTSVILLE, TENNESSEE

TABLE OF CONTENTS

GENERAL REQUIREMENTS

SPECIFICATIONS

DIVISION I

Section 01090 Reference Standards

Part 1 General

1.1 Requirements Included	01090-1
1.2 Quality Assurance	01090-1
1.3 Abbreviations, Names and Addresses of Organizations	01090-1

Section 01410 Testing Laboratory Services

Part 1 General

1.1 Requirements Included	01410-1
1.2 Related Sections	01410-1
1.3 Laboratory Duties	01410-1
1.4 Limitations of Authority of Testing Laboratory	01410-2
1.5 Contractor's Responsibilities	01410-2

Part 2 Products
(Not Used)

Part 3 Execution

3.1 Material Tests	01410-3
--------------------	---------

Section 01560 Temporary Controls

Part 1 General

1.1 Requirements Included	01560-1
1.2 Related Sections	01560-1
1.3 Unit Prices	01560-1
1.4 Dust Control	01560-1
1.5 Water Control	01560-1
1.6 Debris Control	01460-2
1.7 Pollution Control	01560-2
1.8 Erosion of Spoil Materials	01560-2
1.9 Disposal of Spoil Material	01560-3
1.10 Office of Contractor	01560-3
1.11 Work in Streets and Alleys	01560-3
1.12 Work in Vicinity of Existing Sewers	01560-3
1.13 Traffic Control	01560-4

Part 2 Products
2.1 Materials, General 01560-4
2.2 Barriers 01560-4

Part 3 Execution
3.1 General - Barriers and Signs 01560-4
3.2 Removal - Barriers and Signs 01560-4
3.3 Dust Control 01560-4

Section 01710 Cleanup and Restoration

Part 1 General
1.1 Summary 01710-1
1.2 Related Sections 01710-1

Part 2 Products
(Not Used)

Part 3 Execution
3.1 Cleanup and Restoration 01710-1

Section 01720 Project Record Documents

Part 1 General
1.1 Requirements Included 01720-1
1.2 Related Sections 01720-1
1.3 Maintenance of Documents and Samples 01720-1
1.4 Submittal 01720-1

Part 2 Products
(Not Used)

Part 3 Execution
(Not Used)

DIVISION 2

Section 02222 Excavation

Part 1 General
1.1 Summary 02222-1
1.2 Related Sections 02222-1

Part 2 Products
(Not Used)

Part 3 Execution
3.1 Preparation of the Site 02222-1
3.2 Excavation 02222-2
3.3 Sheet piling, Shoring and Bracing 02222-4

3.4 Dewatering Excavation	02222-5
3.5 Foundation Strengthening	02222-5
3.6 Use of Explosive	02222-6

Section 02223 Backfilling

Part 1 General

1.1 Summary	02223-1
1.2 Related Sections	02223-1
1.3 Reference Standards	02223-1
A. Tennessee Department of Transportation Standard	

Part 2 Products

2.1 Materials

A. Force Sanitary Sewer and Force Mains	
1. Outside Roadway	02223-1
2. Inside Roadway	02223-1

Part 3 Execution

3.1 General

A. Outside Roadways	02223-2
B. Inside Roadways	02223-2
C. Check Dams	02223-2

3.2 Installation

A. Force Sanitary Sewer and Force Mains	
1. Outside of Roadway	02223-2
a. Bedding	02223-2
b. Backfill	02223-3
2. Inside of Roadway	02223-5
a. Bedding	02223-5
b. Backfill	02223-5
3. Gravel Refill	02223-6

Section 02270 Slope Protection and Erosion Control

Part 1 General

1.1 Summary	02270-1
1.2 Submittals	02270-1
1.3 Sequencing and Scheduling	02270-1

Part 2 Products

2.1 Materials

A. Temporary Berms	02270-1
B. Temporary Slope Drains	02270-1
C. Sediment Structures	02270-2
D. Check Dams	02270-2
E. Temporary Seeding and Mulching	02270-2
F. Brush Barriers	02270-2
G. Baled Hay or Straw Checks	02270-2
H. Temporary Silt Fences	02270-2
I. Rip-Rap Stone	02270-2

Part 3 Execution

3.1 Installation

A.	Construction Requirements	02270-2
B.	Construction of Temporary Berms	02270-3
C.	Construction of Temporary Slope Drains	02270-3
D.	Construction of Sediment Structures	02270-4
E.	Construction of Check Dams	02270-4
F.	Temporary Seeding and Mulching	02270-4
G.	Brush Barriers	02270-4
H.	Baled Hay or Straw Erosion Checks	02270-4
I.	Construction of Temporary Silt Fences	02270-4

3.2	Maintenance	02270-5
-----	-------------	---------

3.3	Rubble Rip-Rap	02270-5
-----	----------------	---------

A.	General	02270-5
B.	Rubble Rip-Rap (Plain)	02270-5
C.	Rubble Rip-Rap (Grouted)	02270-5

Section 02575 Pavement Replacement and Repair

Part 1 General

1.1	Summary	02575-1
1.2	Related Sections	02575-1
1.3	Reference Standards	02575-1

Part 2 Products

2.1	Materials	02575-1
-----	-----------	---------

Part 3 Execution

3.1 Installation

A.	Pavement Restoration and Maintenance	02575-1
B.	Adjustment of Castings	02575-2
C.	Curb and/or Gutters	02575-2
D.	Paving	
1.	Full Width Pavement Replacement	02575-2
2.	Permanent Pavement Trench Repair Replacement	02575-2

Section 02730 Sanitary Sewerage System

Part 1 General

1.1	Summary	02730-1
1.2	Related Sections	02730-1

1.3 Reference Standards

A.	American Water Works Association (AWWA)	02730-1
B.	American National Standards Institute (ANSI)	02730-1
C.	American Society of Testing Materials (ASTM)	02730-1

1.4 Submittals

A.	Test Requirements	02730-2
1.	Concrete Sanitary Sewer Pipe	02730-2
2.	Concrete Sewer Pipe Joints	02730-2

3. Ductile Cast Iron Gravity and Pressure Sanitary Sewer Pipe and Fittings	02730-3
4. Polyvinyl Chloride (PVC) Pressure Sanitary Sewer Pipe and Fittings	02730-3
5. Polyvinyl Chloride (PVC) Sewer Pipe 8", 10" and 12"	02730-3
6. Concrete	02730-3
7. Miscellaneous Materials	02730-4
1.5 Product Delivery, Storage and Handling	02730-4

Part 2 Products

2.1 General	02730-4
-------------	---------

2.2 Materials

A. Concrete, and/or Polyvinyl Chloride Sanitary Sewers	
1. Concrete, and/or PVC Sewer Pipe	02730-4
2. Joint Material for Concrete, and/or PVC Sewer Pipe	02730-5
B. Ductile Iron Gravity and/or Pressure Line Sewers	
1. Ductile Iron Sewer Pipe	02730-5
2. Joint Material for Ductile Iron Gravity and/or Pressure Line Sewers	02730-6
3. Air Relief Valve	02730-6
C. Polyvinyl Chloride (PVC) Pressure Sanitary Sewer Pipe	02730-6
D. Six-Inch (6") Tee Connections for House Services	02730-7
E. Six-Inch (6") House Services	02730-7
F. Service Reconnections	02730-7
G. Polyvinyl Chloride Sewer Cleanout Assemblies	02730-7
H. Manholes and Appurtenances	
1. Standard Manhole Sidewall	02730-7
2. Concrete Manhole Bases and Fillets	02730-8
a. Precast Manhole Bases and Fillets	02730-8
b. Poured-in-Place Manhole Bases and Fillets	02730-8
3. Manhole Frames and Covers	02730-8
4. Manhole Drop Pipe Assembly	02730-9
5. Pipe Resilient Connectors to Manholes	02730-9
6. Sealant and Coatings	02730-9
7. Stubouts	02730-9
8. Manhole Steps	02730-9
9. Vent Pipe Assemblies	02730-9
10. Concrete Encasement and/or Cradle	02730-10
I. Pump Stations	
1. Radio Telemetry	02730-10
2. Telemetry Equipment	02730-10
3. Repeater Station	02730-10
4. Approval by City Engineer	02730-11
5. Emergency Provisions	02730-11
6. Twelve Month Warranty	02730-11
7. Backup Emergency Power	02730-11

Part 3 Execution

3.1 Installation

- A. Concrete, and/or Polyvinyl Chloride (PVC) Sanitary Sewers
 - 1. General 02730-11
 - 2. Pipe Laying 02730-13
- B. Ductile Iron Gravity and/or Pressure Line Sewers 02730-13
- C. Six-Inch (6") Tee Connections for House Services 02370-14
- D. Six-Inch (6") House Sewer Services 02730-14
- E. Cleanout Assembly 02730-15
- F. Service Connections 02730-15
- G. Manholes and Appurtenances 02730-16
 - 1. Manhole Bases and Fillets 02730-16
 - 2. Manhole Sidewall 02730-17
 - 3. Precast Manhole Flat Top 02730-18
 - 4. Manhole Frames and Covers 02730-18
 - 5. Manhole Drop Pipe Assembly 02730-19
 - 6. Shallow Manholes 02730-19
 - 7. Pipe Resilient Connectors to Manholes 02730-19
 - 8. Sealing 02730-20
 - 9. Stubouts 02730-20
 - 10. Manhole Steps 02730-20
 - 11. Vent Pipe Assemblies 02730-20
- H. Concrete Encasement and/or Cradle 02730-21

3.2 Testing

- A. General 02730-21
- B. Testing of Gravity Sewers
 - 1. Visual Tests 02730-22
 - 2. Low Pressure Air Tests 02730-22
 - a. Positive Pressure Test 02730-22
 - b. Negative Pressure Test 02730-22
 - 3. Infiltration Tests 02730-23
 - 4. Internal TV Inspection and/or Smoke Testing 02730-24
 - 5. Deflection Tests 02730-24
- C. Testing of Ductile Iron Gravity and/or Pressure Line Sewers
 - 1. Ductile Gravity Sewers 02730-25
 - 2. Ductile or Polyvinyl Chloride 02730-25
- D. Testing of Six-Inch (6") House Sewer Services 02730-25
- E. Manhole Vacuum Test 02730-25

3.3 Maintenance

02730-26

Section 02935 Topsoil and Seeding

Part 1 General

- 1.1 Summary 02935-1
- 1.2 Related Sections 02935-1
- 1.3 Unit Prices 02935-1

Part 2 Products	
2.1 Materials	02935-1
A. Topsoil	02935-1
B. Seed	02935-1
C. Straw	02935-1
D. Sod	02935-1
E. Fertilizer	02935-1

Part 3 Execution	
3.1 Installation	02935-2
A. Topsoil and Seeding	02935-2
B. Topsoil and Sodding	02935-2
3.2 Maintenance	02935-3

Section 03300 Concrete

Part 1 General	
1.1 Summary	03300-1
1.2 General Requirements	03300-1
1.3 Submittals	03300-1

Part 2 Products	
2.1 Concrete	03300-2
2.2 Proportions for Concrete	03300-2
2.3 Water Content	03300-3
2.4 Reinforcing Steel	03300-3

Part 3 Execution	
3.1 Placing Concrete	03300-3
3.2 Soil and Water Conditions	03300-4
3.3 Storage of Materials	03300-4
3.4 Work in Cold and Hot Weather	03300-5
3.5 Inspection	03300-5
3.6 Placing Reinforcement	03300-5
3.7 Construction Joints	03300-6

Standard Sewer Line Details

Collar Detail	
Standard Concrete Cap	
Standard Concrete Encasement	
Standard Drop Structure	
4" To 24" Drop Structure Invert Detail	
Full Width Pavement Replacement	
Typical Trench	
Trench Repair Pavement Replacement	
Standard Precast Manhole (A-A)	
Standard Shallow Manhole (A-A)	
Elevation Section "B-B"	
Detail of Mastic Gasket for Precast Manhole Sections	
Manhole Frames and Covers	
Rip-Rap Detail	

Cleanout
Typical Service Line Detail
Service Line for Deep Trenches
6" Cleanout Frame & Cover-Traffic Bearing
6" Cleanout Frame & Cover-Easement
Vent Pipe Assembly

SECTION 01090
REFERENCE STANDARDS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Abbreviations and acronyms used in contract documents to identify reference standards.

1.2 QUALITY ASSURANCE

- A. Application: When a standard is specified by reference, comply with requirements and recommendations stated in that standard except when requirements are modified by the contract documents, or applicable codes establish stricter standards.
- B. Publication Date: The publication in effect on the date of issue of contract documents, except when a specific publication date is specified.

1.3 ABBREVIATIONS, NAMES AND ADDRESSES OF ORGANIZATIONS

- A. Obtain copies of referenced standards direct from publication source, when needed for proper performance of work, or when required for submittal by contract documents.

AASHTO American Association of State Highway and
Transportation Officials
44 North Capital Street, NW
Washington, DC 20001

ANSI American National Standards Institute
(Former American Standards Association-ASA)
1430 Broadway
New York, New York 10018

AREA American Railroad Engineering Association
2000 "L" Street, NW
Washington, DC 20036

ASCE American Society of Civil Engineers
345 East 47th Street
New York, New York 10017

ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA. 19103
AWWA	American Water Works Association 6666 W. Quincy Avenue Denver, Colorado 80235
FHWA	Federal Highway Administration Federal Building, U.S. Courthouse Nashville, Tennessee 37202
FSS	Federal Specifications and Standards General Services Administration Specifications and Consumer Information Distribution Section (WFSIS) Washington, DC 20407
TDOT	Tennessee Department of Transportation James K. Polk Building 505 Deaderick Street Nashville, Tennessee 37219

B. Whenever abbreviations are used in this Contract Document, such abbreviations shall have the following meanings:

CY	Cubic Yard
FT	Feet
MFBM	One Thousand Feet Board Measure
LBS	Pounds
M	One Thousand
PVC	Polyvinyl Chloride
MJ	Mechanical Joint
B & S	Bell and Spigot T & G Tongue and Groove
ES	Extra Strength
SS	Standard Strength
VC	Vitrified Clay
RC	Reinforced Concrete
MH	Manhole
ASA	American Standards Association, Inc.
PCA	Portland Cement Association

END OF SECTION

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Contractor will employ and pay for the services of an independent testing laboratory to perform specified testing.
- B. All tests shall be made in accordance with specified procedures; or, if not herein specified, they shall be made in accordance with applicable recognized standard practice. Reports of tests provided by the Contractor shall be promptly submitted to the Engineer; or, if provided by the Engineer, copies shall be promptly submitted to the Contractor.

1.2 RELATED SECTIONS

- A. Conditions of the Contract: Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities.
- B. Testing laboratory inspection, sampling and testing is required for:
 - 1. Section 02223 Backfilling
 - 2. Section 03300 Concrete

1.3 LABORATORY DUTIES

- A. Cooperate with Engineer and Contractor; provide qualified personnel after due notice.
- B. Perform specified inspections, sampling and testing of materials and methods of construction:
 - 1. Comply with specified standards.
 - 2. Ascertain compliance of materials with requirements of contract documents.
- C. Promptly notify Engineer and Contractor of observed irregularities or deficiencies of work or products.
- D. Promptly submit written report of each test and inspection; one (1) copy each to Engineer, Contractor and one (1) copy to record documents file. Each report shall include:
 - 1. Date issued.
 - 2. Project title and number.

3. Testing, laboratory name, address and telephone number.
4. Name and signature of laboratory inspector.
5. Date and time of sampling or inspection.
6. Record of temperature and weather conditions.
7. Date of test.
8. Identification of product and specification section.
9. Location of sample or test in the project.
10. Type of inspection or test.
11. Results of tests and compliance with contract documents.
12. Interpretation of test results, when requested by Engineer.

E. Perform additional tests as required by Engineer.

1.4 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

A. Laboratory is not authorized to:

1. Release, revoke, alter or enlarge on requirements of contract documents.
2. Approve or accept any portion of the work.
3. Perform any duties of the Contractor.

1.5 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall give the Engineer sufficient notice of the time and place of any test to be made at the point of manufacture, assembly, or fabrication in order that the Engineer may witness the test if he so desires.
- B. Cooperate with laboratory personnel, and provide access to work to manufacturer's operation.
- C. Secure and deliver to the laboratory, adequate quantities and representational samples of materials proposed to be used and which require testing.
- D. Provide to the laboratory the preliminary design mix proposed to be used for concrete and other materials mixes which require control by the testing laboratory.
- E. Furnish copies of products test reports as required.
- F. Furnish incidental labor and facilities:
 1. To provide access to work to be tested.
 2. To obtain and handle samples at the project site or at the source of the product to be tested.
 3. To facilitate inspection and tests.
 4. For storage and curing of test samples.
- G. Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

1. When tests or inspections cannot be performed after such notice, reimburse Owner for laboratory personnel and travel expenses incurred due to Contractor's negligence.
- H. Employ and pay for the services of a separate, equally qualified independent testing laboratory to perform additional inspections, sampling and testing required.
1. For the Contractor's convenience.
 2. When initial tests indicate work does not comply with contract documents.

PART 2 PRODUCTS
(Not Used)

PART 3 EXECUTION

3.1 MATERIAL TESTS

- A. All materials incorporated in this Contract shall be subject to inspection and test as follows: All tests, except as noted shall be made by an independent established Testing Laboratory, employed and paid for by the Contractor. The Laboratory selected shall be approved by the Engineer before definitely retained by the Contractor. Samples at the mill or factory shall be taken by a representative of the Testing Laboratory. Samples of construction materials from the site of the work, such as sand, gravel, concrete cylinders, etc., for which laboratory tests are required, shall be taken, assembled or prepared on the site of the work by representatives of the Testing Laboratory or by a competent employee of the Contractor subject to the approval of the Engineer. Any necessary containers, shipping boxes or crates shall be supplied by the Testing Laboratory or the Contractor. The Testing Laboratory or the Contractor shall pay all costs of transporting samples to the Laboratory. The Contractor shall furnish, without additional charges, all material that may reasonably be required for testing purposes.
- B. Payment for tests shall be made by the Contractor. The tests to be made, the number of samples, and acceptance and rejection shall be based on the latest revised issue of standards and tentative standards of the American Society for Testing Materials unless otherwise noted in the Contract Specifications. Two signed copies of test reports on Testing Laboratory forms or letterhead shall be delivered to the Engineer prior to incorporation of the material into the work.
- C. All tests shall be made in accordance with procedures specified in the Contract Specifications; or, if not herein specified, they shall be made in accordance with applicable recognized standard practice. Reports of tests provided by the Contractor shall be promptly submitted to the Engineer; or, if provided by the Engineer, copies shall be promptly submitted to the Contractor.

END OF SECTION

SECTION 01560

TEMPORARY CONTROLS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Furnish, install and maintain suitable barriers as required to prevent public entry, and to protect the work, existing facilities, trees and plants from construction operations; remove when no longer needed, or at completion of work.
- B. Provide and maintain methods, equipment and temporary construction and signs, as necessary to provide controls over environmental conditions at the construction site and related areas under Contractor's control; remove physical evidence of temporary facilities at completion of work.
- C. Maintain a suitable office in the vicinity of the area.

1.2 RELATED SECTIONS

- A. Section 01700 Contract Closeout Procedures
- B. Section 01710 Cleanup and Restoration
- C. Section 02722 Excavation

1.3 UNIT PRICES

- A. Dust Control
 - 1. No separate measurement and payment will be made for this work.

1.4 DUST CONTROL

- A. Provide positive methods and apply dust control materials to minimize raising dust from construction operation, and provide positive means to prevent air-borne dust from dispersing into the atmosphere.

1.5 WATER CONTROL

- A. Provide methods to control surface water to prevent damage to the project, the site, or adjoining properties.
 - 1. Control fill, grading and ditching to direct surface drainage away from excavations, pits, tunnels and other construction areas; and to direct drainage to proper runoff.

- B. Provide, operate and maintain hydraulic equipment of adequate capacity to control surface water.
- C. Dispose of drainage water in a manner to prevent flooding, erosion, or other damage to any portion of the site or to adjoining areas.

1.6 DEBRIS CONTROL

- A. Maintain all areas under Contractor's control free of extraneous debris.
- B. Initiate and maintain a specific program to prevent accumulation of debris at construction site, storage and parking areas, or along access roads and haul routes.
 - 1. Provide containers for deposit of debris as specified in Section 01710-Cleanup and Restoration.
 - 2. Prohibit overloading of trucks to prevent spillages on access and haul routes.
 - a. Provide periodic inspection of traffic areas to enforce requirements.
- C. Schedule periodic collection and disposal of debris as specified in section 01710-Cleanup and Restoration.
 - 1. Provide additional collections and disposals of debris whenever the periodic schedule is inadequate to prevent accumulations.

1.7 POLLUTION CONTROL

- A. Provide methods, means and facilities required to prevent contamination of soil, water or atmosphere by discharge of noxious substances from construction operations.
- B. Provide equipment and personnel, perform emergency measures required to contain any spillages, and to remove contaminated soils or liquids.
 - 1. Excavate and dispose of any contaminated earth off-site, and replace with suitable compacted fill and topsoil.
- C. Take special measures to prevent harmful substances from entering public water.
 - 1. Prevent disposal of wastes, effluents, chemicals, or other such substances adjacent to streams, or in sanitary or storm sewers.
- D. Provide systems for control of atmospheric pollutants.
 - 1. Prevent toxic concentrations of chemicals.
 - 2. Prevent harmful dispersal of pollutants into the atmosphere.

1.8 EROSION CONTROL

- A. Plan and execute construction and earthwork by methods to control surface drainage from cuts and fills, and from borrow and waste disposal areas, to prevent erosion and sedimentation.
 - 1. Hold the areas of bare soil exposed at one time to a minimum.
 - 2. Provide temporary control measures such as berms, dikes, and drains.
- B. Construct fills and waste areas by selective placement to eliminate surface silts or clays which will erode.
- C. Periodically inspect earthwork to detect any evidence of the start of erosion, apply corrective measures as required to control erosion.

1.9 DISPOSAL OF SPOIL MATERIAL

During the execution of this work spoil material will have to be disposed of by the Contractor. The Contractor is required to:

- 1. Reveal the location of the site of disposal.
- 2. Obtain all necessary approvals and permits to dispose of the waste at the proposed site.

1.10 OFFICE OF CONTRACTOR

- A. If, in the opinion of the Owner, the Contractor's regularly established business office is so removed from the area so as to interfere with the transactions between the Owner and the Contractor, the Contractor shall provide and maintain an office within Davidson or Sumner County at a location to be approved by the Owner.
- B. The above office shall be the headquarters of a foreman or superintendent authorized to receive drawings, instructions, or other communications, articles or things from the Owner or its agents, and any such thing given to the said foreman or superintendent or delivered to the Contractor's office at the site of the work in his absence shall be deemed to have been given to the Contractor.

1.11 WORK IN STREETS AND ALLEYS

- A. Throughout the performance of the work or in connection with this Contract, the Contractor shall construct and adequately maintain suitable and safe crossing over the trenches and such detours as are necessary to care for public and private traffic. The material excavated from the trenches shall be compactly deposited along the sides of the trench or elsewhere in such a manner as shall give as little inconvenience as possible to the traveling public, to adjoining property owners, to other contractors or to the Owner.

1.12 WORK IN VICINITY OF EXISTING SEWERS

- A. Where the work on this project is in the vicinity of existing Public or Private Sewers, the Contractor shall schedule his operations in such a manner that all existing sewer service may be adequately maintained.
- B. Where existing sewers are to be removed from service permanently or temporarily, the Contractor shall bypass, in as manner acceptable to the Engineer, all sewage and drainage which may be received by those sewers until the existing sewers are returned to service or replaced.
- C. The Contractor shall not use any existing sanitary sewer to divert or dispose of storm or surface water. After a connection has been made to any existing sanitary sewers, the Contractor shall plug the nearest opening to said connection and make such provisions that are necessary for pumping, bypassing and conducting storm or surface water, to insure the above until the acceptance of the project.

1.13 TRAFFIC CONTROL

The contractor shall obtain approval of and coordinate all traffic control measures with the Department of Public Works. Traffic control shall conform to Part VI of the Manual on Uniform Traffic Control Devices (MUTCD), latest edition.

PART 2 PRODUCTS

2.1 MATERIALS, GENERAL

- A. Materials may be new or used, suitable for the intended purpose, but must not violate requirements of applicable codes and standards.

2.2 BARRIERS

- A. Materials to Contractor's option, as appropriate to serve required purpose.

PART 3 EXECUTION

3.1 GENERAL - BARRIERS AND SIGNS.

- A. Install facilities of a neat and reasonable uniform appearance, structurally adequate for required purposes.
- B. Maintain barriers and signs during entire construction period.
- C. Relocate barriers as required by progress of construction.

3.2 REMOVAL - BARRIERS AND SIGNS

- A. Completely remove barricades and signs, including foundations, when construction has progressed to the point that they are no longer needed and when approved by

the Engineer.

- B. Clean and repair damage caused by installation, fill and grade areas of the site to required elevations and slopes, and clean the area.

3.3 DUST CONTROL

- A. All available precautions shall be taken to control dust. When the Engineer judges dust to be a problem, the Contractor shall control the dust by sprinkling, by applying calcium chloride, or by other methods as directed.
- B. If track drills are used for drilling rock, water must be provided with the drill to eliminate dust.

END OF SECTION

SECTION 01710

CLEANUP AND RESTORATION

PART 1 GENERAL

1.1 SUMMARY

- A. This item shall include the cleanup and restoration of areas and facilities disturbed by construction operations including removal and disposal of waste material and trash; replacement of all bituminous and/or concrete driveways, parking areas, sidewalks and/or ramps disturbed during construction operations; and the separation and redepositing of topsoil, final grading, raking, fertilizing, seeding and strawing of trenches and areas disturbed by construction operations across public and/or private property.
- B. This item shall not include the temporary surfacing or permanent pavement replacement of any public street or roadway disturbed during construction operations, these items of work being covered elsewhere in these Specifications.

1.2 RELATED SECTIONS

- A. Section 02222: Excavation
- B. Section 02223: Backfilling
- C. Section 02730: Sanitary Sewerage System
- D. Section 02935: Topsoil and Seeding

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

3.1 CLEANUP AND RESTORATION

- A. The Contractor shall not allow the site of the work to become littered with trash and waste material, but shall maintain the same in a neat and orderly condition throughout the construction period. The Engineer shall determine what is or is not waste material and the time, place and manner of disposal of the same. The Contractor shall reveal the location of disposal and obtain all approvals and permits as directed in Section 01560 - Temporary Controls.
- B. The Contractor's method for disposal of trash and waste shall not cause damage or create a nuisance to other public or private property.
- C. The Contractor shall keep the construction site clean and remove surplus and

Section 01710-2
Cleanup and Restoration

discarded materials, temporary structures, stumps and portions of trees and debris of any kind. He shall leave the site of work in a neat and orderly condition, similar or equal to that prior to construction.

- D. The Contractor shall return all reusable items salvaged from abandoned or replaced facilities. Items may include manhole, valve box, and meter box, frames and covers, piping and fittings or other reusable equipments.
- E. Cleanup and restoration operation shall be concurrent with the construction operation and shall be completed before final acceptance by the owner. The Contractor shall replace with like and kind any trees, shrubbery, fences, culverts, bridges, houses or buildings and all water, sewer, gas telephone and electrical lines thereto, and all other private and public property along or adjacent to the work.
- F. Where directed by the Engineer, the Contractor shall topsoil, rake, fertilize, seed and straw all lawns and grass areas disturbed by construction operations. Said operations shall be specified and additional payment will be made only as specified in Section 02935, "Topsoil and Seeding", paragraph 3-A of these specifications.
- G. All private and public property along or adjacent to the work disturbed by construction operations shall be restored to a condition similar or equal to that existing prior to construction. All private property restoration shall be made within two (2) weeks of excavation.
- H. Before final acceptance by the Owner, the Contractor shall replace and/or restore any water, sewer, drain, and gas lines and appurtenances, electrical, telephone, telegraph conduits and wires, both underground and above ground, and appurtenances; traffic signals, fire and police alarm systems and appurtenances; sidewalks, curbs gutter, drainage ditches and pavements and all other public utility facilities and appurtenances along or adjacent to the work that may have been disturbed by construction operations.
- I. All public utility facilities and appurtenances along or adjacent to the work disturbed by construction operations shall be restored to a condition similar or equal to that existing prior to construction.
- J. Temporary pavement of public streets and roads shall be installed, and additional payment shall be made as specified in Section 2575 "Pavement Replacement and Repairs", paragraph 1.3-A. of these specifications.
- K. Permanent pavement replacement of public streets and roads shall be installed and additional payment shall be made as specified in "Pavement Contract Specifications" of the Contract.
- L. Gravel, bituminous and/or concrete driveway and/or parking areas and concrete sidewalk and/or ramp replacement shall be installed; and additional payment shall be made as specified in Section 02575 "Pavement Replacement and

Repair", paragraph 1.3-N of these specifications.

- M. Contractor's attention is called to the fact that no additional payment will be allowed under this Contract for maintaining the gravel shoulder with crusher stone once the trench has been completely gravel refilled and prior to the shoulder being shot and chipped. Also, no additional payments will be allowed for that portion of the shoulder beyond the trench limits disturbed by construction.
- N. Restoration of areas and facilities disturbed by construction operations shall be properly and regularly maintained in a condition similar or equal to that prior to construction during a period of one (1) year after the final acceptance of the work by the Owner. Any repairs required because of unsatisfactory backfill or defective materials, and workmanship shall be at the expense of the Contractor. Maintenance measures made necessary by ordinary wear and tear shall not be at the expense of the Contractor.
- O. Cleanup and restoration of areas and facilities, disturbed by construction operations shall be considered an integral part of the excavation work and no separate payment will be allowed therefore except as herein specified.

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 REQUIREMENTS INCLUDED

A. Maintain at the site for the owner, one (1) record copy of:

1. Drawings
2. Specifications
3. Addenda
4. Change Orders and other modifications to the contract
5. Engineer field orders or written instructions
6. Approved shop drawings, product data and samples
7. Field test records.

1.2 RELATED SECTIONS

A. Section 01340: Shop Drawings, Product Data and Samples

1.3 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Store documents and samples in Contractor's field office, apart from documents used for construction.

1. Provide files and racks for storage of documents.

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

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

1.4 SUBMITTAL

A. At contract closeout, deliver two (2) Paper and one (1) Digital record document to the City as Certified by a Professional Engineer.

1. Digital plans are to be in the following format(s) only: Autodesk *.dwg, or Microstation *.dgn. Digital map data must be projected in NAD 1983 State Plane Tennessee FIPS 4100 Feet.

B. Accompany submittal with transmittal letter in duplicate containing:

1. Date
2. Project title and number
3. Contractor's name and address
4. Title and number of each record document

5. Signature of Contractor or his authorized representative

PART 2 PRODUCTS

(Not used)

PART 3 EXECUTION

(Not used)

END OF SECTION

SECTION 02222

EXCAVATION

PART 1 GENERAL

1.1 SUMMARY

The work to be performed under this section shall include the preparation of the site of work; the loosening, loading, removing and disposing of all materials, wet or dry, which are necessary to be removed to construct all sanitary sewers and appurtenances included under this Contract; furnishing, placing and maintaining all sheeting, shoring, bracing and timbering necessary for the proper protection and safety of the work, the workmen, the public and adjacent property and improvements; the dewatering of the excavation; and all other work necessary and incidental to perform the excavation required to construct the sanitary sewers and appurtenances under this Contract. All Contractors shall have Confined Space Entry policies and procedures per OSHA requirements.

Excavation will be unclassified and the cost shall be merged into the unit prices bid for other items of work under this Contract. No distinction shall be made between rock and dirt excavation, and no separate payment will be allowed therefore.

1.2 RELATED SECTION

- A. Section 02223: Backfilling
- B. Section 02730: Sanitary Sewerage System
- C. Section 03300: Concrete

PART 2 PRODUCTS

(Not Used)

PART 3 EXECUTION

3.1 PREPARATION OF THE SITE

The Contractor shall notify any private property owner, company, or individual and/or proper utility facility owner or supervising official not less than twenty-four (24) hours in advance of any work which might damage or interfere with the operation or use of their property and/or public utility facilities.

Where the area to be excavated is occupied by trees, brush or other vegetable growth, such growth shall be cleared from the area and disposed of in a satisfactory manner except trees, cultivated shrubs, flowers, etc., situated within public right-of-way and /or easements through private property, but not located directly within excavation limits, shall remain undisturbed. Small trees, cultivated shrubs, flowers, etc., located directly

within excavation limits shall be transplanted so they may be replaced during property restoration operations. No tree larger than six (6) inches in diameter shall be removed or disturbed without the permission of the Engineer. The Contractor shall exercise special precautions for the protection and preservation of such objects throughout all stages of construction and will be held liable for any damage which may result to said objects from excavation or construction operations.

The Contractor shall remove from the site of work debris, objectionable matter and such small buildings and structures as are specifically noted on the Contract Drawings to be removed. All other structures or objects such as buildings, walks, curb, walls, fences, etc., located within excavation limits shall be removed in such a manner that they may be replaced during property restoration operations. All such objects not located within excavation limits shall not be disturbed or removed without the permission of the Engineer, and the Contractor shall exercise special precautions for the protection and preservation of such objects throughout all stages of construction and will be held liable for any damage which may result to objects from excavation or construction operations.

Where excavation is to be done in paved areas, the pavement shall be neatly cut or sawed to the required width; the Contractor shall exercise special precautions that all pavements located outside the limits of excavation are not disturbed or damaged and will be held liable for any damage which may result to said pavements from excavation or construction operations.

Prior to excavation operations, the Contractor shall accurately locate all public utility facilities and all private water and sewer service lines, septic tanks and drainfields or connections thereto that may be affected by the proposed construction. During excavation operation, the Contractor shall take special precautions that all such facilities and appurtenances thereto are not damaged or disturbed and will be held liable for any damage which may result to said facilities from excavation or construction operations.

Preparation of the site shall be considered an integral part of the excavation work, and no separate payment will be allowed therefore.

3.2 EXCAVATION

The ground shall be excavated in open trenches, of sufficient width and depth to provide ample room within the limits of excavation or the line of sheeting and bracing, for the proper construction of sanitary sewers and their appurtenances as shown on the Contract Drawings and for removing any material which the Engineer may deem unsuitable for foundation.

In trench excavations where the force main or sanitary sewer pipes are laid, the width of the trench at the top of the pipe shall not exceed four-thirds ($4/3$) of the internal diameter of the sewer plus eight (8) inches, provided a greater width may be permitted by the Engineer where it is necessary to sheet or brace the trench. There shall be a minimum of four (4) inches clear space on each side of the pipe to permit placing of backfill around the pipe.

In dirt excavation, the bottom of the trench shall be excavated to a minimum depth of

four (4) inches below the bottom of the pipe, and in rock excavation the bottom of the trench shall be excavated to a minimum depth of six (6) inches below the bottom of the pipe and these spaces refilled with crushed stone as specified hereinafter. Dirt shall be interpreted to mean all soils other than rock, sand, or gravel. Any excavation carried below these depths shall also be refilled with crushed stone, and refill with tamped dirt or large rocks will not be allowed. Prior to placing the required refill, loose dirt or rocks shall be removed from the bottom of the trench.

No refill shall be placed until the Engineer has determined that the foundation is sufficient to support the proposed construction. Any additional excavation necessary to obtain a satisfactory foundation shall be specified hereinafter.

In areas not subject to vehicular traffic excavation of the trench shall not advance more than two hundred (200) feet ahead of pipe laying, or further than, in the opinion of the Engineer, the Contractor can lay pipe by the end of the day's work.

Excavation, backfilling, cleanup and temporary pavement on any individual road or street in which sewers are installed shall be prosecuted concurrently with the sewer installation to the point that satisfactory ingress and egress to public streets and private property can be maintained.

Excavation and waste material stored about the work shall be so placed and work so conducted as to cause no obstruction to the traveling public. No waste material shall be placed on public paved areas.

At any time when, in the judgment of the Engineer, the Contractor has obstructed or closed or is carrying on operations on a greater portion of the streets, or public ways than is necessary for the proper execution of the work, the Engineer may require the Contractor to finish the sections on which work is in progress before work is started on any additional section.

The Contractor shall make provisions by bridges or otherwise, at cross streets, highways, sidewalks, and private driveways for free passage of vehicles and pedestrians. Where bridging is impractical or unnecessary, the Contractor may make arrangements satisfactory to the Engineer for the diversion of traffic.

The Contractor shall secure the approval and obtain operation procedures from the City of Goodlettsville before closing or starting construction operations within the right-of-way of any street or alley.

Excavation for manholes and other structures shall not exceed that required to allow clear space between the outer surface of the structure and the banks of the excavations or the sheeting used to protect the excavation, as required for obtaining the required compaction of the backfill material. The bottom of the excavation shall be true to shape and elevation as shown on the Contract Drawings. Any excavation carried below the required elevation shall be refilled with crushed stone (#67 or 57) or the concrete specified for use in the base of the structure at the Contractor's expense.

Should rock be encountered in the excavation, it shall be removed by blasting or other methods. Where blasts are made, the excavation shall be covered with sufficient excavation and/or timber or steel matting to prevent danger to life or property. The Contractor shall secure all permits required by law for blasting operation and additional hazard insurance required at his own expense and shall observe all applicable laws and ordinances pertaining to blasting operations.

If track drills are used for drilling rock, water must be provided with the drill to eliminate dust.

No claim for an additional compensation beyond the Contract price of the work will be allowed on account of the character of the ground in which the trenches or other excavation is made.

The Contractor shall assume the risk of meeting and the Contract unit price shall include the cost of removal of quicksand, hardpan, clay, rock, boulders, rubbish, unforeseen obstacles, underground conduits, gas pipes, water pipes, drain tile, trees, roots, timber or masonry structures, railroad tracks, pavements, and sidewalk and the delay and/or damage occasioned by the same, whether or not shown on the Contract Drawings.

The location of existing piping and underground utilities such as sewer and gas lines, electrical and telephone conduits, etc., as shown on the Contract Drawings, have been determined from the best available information by actual surveys, or furnished and taken from the records and drawings of the existing utilities. However, the Owner does not assume responsibility for the possibility that, during construction, utilities other than those shown may be encountered, or that actual location of those shown may be different from the locations designated on the Contract Drawings.

At locations where it is necessary that locations be known of underground facilities, the Contractor shall, at his own expense, furnish all labor and tools to either verify and substantiate or definitely establish the position of the facilities.

Sufficient barriers, lights and flares shall be provided and maintained at all trenches and excavations to insure the safety of the workmen and public.

In all excavation, except in paved areas, where rock is encountered, the excavated dirt and rock materials shall be separated in such a manner that during backfilling operations the top one-foot (1') of trench backfill shall be dirt as specified hereinafter.

3.3 Sheeting, Shoring and Bracing

The Contractor shall furnish and install all temporary sheeting, shoring and bracing required to maintain the excavation in a safe working condition and to permit the safe and efficient installation of all items of Contract work. Sheeting, shoring and bracing shall be used in wet, saturated or flowing ground, ground subject to slides, cave-ins, settlement or movement and/or locations shown on the Contract Drawings.

Where excavations are made adjacent to existing buildings or other structures or in paved streets or alleys, the Contractor shall take particular care to sheet, shore and

brace the sides of the excavation adequately so as to prevent any undermining or settlement beneath such structures or pavement. Underpinning of adjacent structures shall be done when necessary and reviewed by the Engineer.

All sheeting, shoring and bracing shall have sufficient strength and rigidity to withstand the pressure exerted and to maintain the wall of the excavation in place.

Lumber used may be any species which will satisfactorily withstand driving. It shall be sawed with square corners, and shall be free from worm holes, loose knots, wind shakes, decay and unsound portion which might impair its strength or tightness. Minimum thickness shall be two-inch (2") nominal. Lumber shall be No. 2 common yard lumber in less than six-inch (6") sizes and common structural grade on timber six (6) inches and over. Steel sheet piling of an approved design and type may be used.

Sheeting, shoring and bracing shall not be left in place unless shown on the Contract Drawings or necessary for the safety and protection of new or existing work.

The sheeting, shoring and bracing shall be removed as the work progresses in such a manner as to prevent caving in of the sides of the excavation, or damage to the new or existing work. While sheeting, shoring and bracing are being removed, all voids left shall be filled and compacted. The Contractor may elect to use a portable steel box in lieu of the above, if approved by the Engineer.

All sheeting, shoring and bracing shall be considered an integral part of the excavation work, and no separate payment will be allowed therefore.

3.4 Dewatering Excavation

The Contractor shall do all ditching, pumping, well pointing and bailing, build all drains, and do all work necessary to keep the excavation clear of ground water, sewage or storm water during the process of the work and until the finished work is safe from injury.

No pipe shall be laid in water, and water shall not be allowed to run over masonry until concrete or mortar has set at least forty-eight (48) hours.

All water pumped or drained from the work shall be disposed of in a manner satisfactory to the Engineer without damage to adjacent property or to other work under construction. The Contractor shall not dispose of storm or surface water through new or existing sanitary sewerage facilities. After a connection has been made to any existing sanitary sewer, the Contractor shall plug the nearest opening to said connection and make provisions that are necessary for pumping, by-passing and conducting storm or surface water to insure the above.

Necessary precautions shall be taken to protect all construction against flooding and/or floatation from hydrostatic uplift.

The dewatering of the excavation shall be considered an integral part of the excavation work, and no separate payment will be allowed therefore.

3.5 Foundation Strengthening

After the excavation is opened and grade established, it will be examined by the Engineer who will determine whether or not it is satisfactory foundation for pipes and/or appurtenances, or if it is necessary to stabilize the base.

When ordered by the Engineer or designated on the Contract Drawings, the base shall be stabilized by installing concrete cradle or encasement, or by removing unsatisfactory material and refilling with gravel as directed by the Engineer during construction.

Concrete cradle or encasement shall be installed and additional payment shall be made as specified in Section 02730, "Sanitary Sewerage System", paragraph 1.3-F of these Specifications.

Gravel refill, from a plane six (6) inches below the bottom of the pipe, shall be installed; and additional payment shall be made as specified in Section 02730, "Sanitary Sewerage System", paragraph 1.3-H, of these Specifications.

3.6 Use of Explosives

Should the Contractor elect to use explosives in the prosecution of the work, the Contractor shall employ only workmen familiar and skilled in the use of explosives, carefully cover the explosion with suitable timber, matting and/or excavation, and exercise the utmost care so as not to endanger life or property.

The Contractor shall obtain all necessary permits and/or licenses and carry on such work in compliance with all the Government ordinances and the State of Tennessee laws.

Whenever explosives are stored or kept, they shall be stored in a safe and secure manner, and all storage places shall be plainly marked "DANGEROUS - EXPLOSIVES."

END OF SECTION

SECTION 02223

BACKFILLING

PART 1 GENERAL

1.1 SUMMARY

The work to be performed under this section shall include the placement and compaction of all materials which are necessary to provide pipe bedding, pipe envelope and backfill for all water mains, sanitary sewers and appurtenances and all other work necessary and incidental to perform the backfill required to construct the sanitary sewers and appurtenances under this Contract.

1.2 RELATED SECTIONS

- A. Section 02222: Excavation
- B. Section 02730: Sanitary Sewerage System
- C. Section 03300: Concrete

1.3 REFERENCE STANDARDS

- A. Tennessee Department of Transportation Standard
Specifications for Road and Bridge Construction (TDOT).

PART 2 PRODUCTS

2.1 MATERIALS

- A. For Sanitary Sewers and Force Mains
 - 1. Outside Roadway
 - a. Bedding - TDOT Section 903, Class "A", No. 67 aggregate
 - b. Refill and/or Backfill - TDOT Section 903, Class "A", No. 67 or No. 57 aggregate
 - 2. Inside Roadway
 - a. Bedding - TDOT Section 903, Class "A", No. 67 aggregate
 - b. Refill and/or Backfill - TDOT Section 903, Class "A", No. 67 or No. 57 aggregate

PART 3 EXECUTION

3.1 GENERAL

A. Outside Roadways

The Contractor's attention is called to the fact that, when laying force mains and sanitary sewers, the envelope shall be gravel.

B. Inside Roadways including shoulders and paved areas.

The Contractor's attention is called to the fact that the entire excavated trench for proposed force mains and sanitary sewers shall be completely bedded and backfilled with gravel.

3. Check Dams

Check dams shall be installed in the bedding and backfill of all new or replaced sewer lines to limit the drainage area subject to the french drain effect of gravel bedding. Dams shall consist of compacted clay bedding and backfill at least three (3) feet thick to the top of the trench and cut into the walls of the trench two (2) feet. Alternatively, concrete may be used, keyed into the trench walls. Dams shall be placed no more than 500 feet apart. The preferred location is upstream of each manhole. All stream crossings will include check dams on both sides of the crossing.

3.2 INSTALLATION

A. For Sanitary Sewers and Force Mains

1. Outside of Roadway

a. Bedding

All sewers outside roadway shall be bedded in a crushed stone bedding, not less than six (6) in thickness.

The crushed stone envelope around sewers outside roadway shall extend from six (6) inches below the pipe up to eight (8) inches over the top of the pipe and shall be not less than six (6) inches in thickness on the sides of the pipe. The envelope shall consist of clean crushed stone free from debris and other objectionable materials, placed in even layers simultaneously on each side of the pipe, and shall be thoroughly consolidated (tamped) to completely fill the haunches of the pipe. Consolidation by jetting will not be allowed.

The crushed stone material to be used for pipe bedding and envelope shall be equal to size 67 as given in the latest standard specifications for road and bridge construction, Section 903.

The sanitary sewer pipe shall be installed as specified elsewhere in these specifications. Care shall be taken to prevent the pipe from shifting from the specified line and grade.

No pipe shall be backfilled above the top of the pipe until the alignment and joints have been checked and inspected by the Engineer. As soon as the pipe is approved, the trench shall be backfilled to eight (8) inches above the top of the pipe.

The cost of furnishing and installing crushed stone bedding and envelope shall be merged into the unit price bid for that depth of sewers, and no separate payment will be made therefore.

b. Backfill

Backfill material from a height of eight (8) inches above the top of the pipe shall consist of excavated material and may have a broken stone content of approximately three-fourths ($3/4$) by volume. Sufficient earth material shall be incorporated into such backfill to completely fill all voids. Individual stones shall not exceed eight (8) inches in their maximum dimension. Such backfill material shall be placed and spread in even layers not exceeding twelve (12) inches in depth. The cost of this backfill for sewers outside of the roadway shall be merged into the unit bid price per lineal foot for that depth sewers. At all locations closely adjacent to pavements, driveways, parking areas, buildings, or other improvements subject to damage by displacement, backfill shall be tamped and thoroughly compacted in six-inch (6") layers (before compaction). Power operated tampers shall not be used for that portion of the backfill under a height of one (1) foot above the top of the pipe. In other areas backfill may be placed without tamping, but the backfill shall be compacted to a density equivalent to that which will result from spreading by a bulldozer thereon. The Contractor shall exercise precaution to prevent damage to the force main or sewer line from the operation of backfill equipment.

Earth material for backfill that, in the opinion of the Engineer is too dry to allow thorough compaction, shall receive an admix of sufficient water prior to compaction to serve the required compaction. Earth material considered by the Engineer to have excessive water content or otherwise unsuitable shall not be placed.

Under paved roads or shoulders within the street right-of-way, the trench shall be completely backfilled with gravel as specified in paragraph 3.22-B-2 of this Section of these Specifications.

When the material excavated from the trench, in the opinion of the Engineer,

Section 02223-4
Backfilling

is suitable for backfill, it shall be used.

The trench excavation, except in pavement areas, shall have the top one (1) foot backfilled with fine loose earth free from large clods, vegetable matter, debris, stones, or other objectionable materials; and the adjacent surface of the work shall be left in a neat and workmanship condition.

Where trenches have been cut across or along pavements, graveled roadway shoulders, sidewalks, driveways, parking areas or other areas subject to pedestrian or vehicular traffic, the top six-inch (6") and the adjacent area disturbed by construction operations shall be temporarily paved by placing and spreading gravel or crushed stone thereon.

Such temporary pavement shall be maintained by the Contractor until any required temporary pavement or permanent pavement and/or property restoration has been completed.

The temporary pavement and its base course and subgrade shall be inspected by the Department of Public Works for full compliance with the Department's requirements for permanent pavement at a later date.

Backfill around manholes and other structures shall be conducted in the same manner as specified herein before.

All backfilling shall be done in such a manner as will not disturb or injure the pipe or structure against which backfill is being placed. Any pipe or structure injured, damaged, or displaced by backfill operations shall be excavated and repaired by the Contractor at his expense as directed by the Engineer.

Any settlement of backfill below the original ground surface shall be remedied by the Contractor for a period of one year after final completion and acceptance by the Owner.

In areas not subject to vehicular traffic, backfill shall not be left unfinished more than three hundred feet (300') behind the pipe laying, or farther than, in the opinion of the Engineer, can be backfilled by the end of the day's work.

Excavation, backfill, cleanup and temporary pavement on any individual road or street in which sewers are installed shall be prosecuted concurrently with the sewer installation as specified hereinbefore under the applicable provisions for excavation.

Backfill shall be considered an integral part of the excavation work, and no

separate payment will be allowed therefore except as herein specified.

Gravel backfill in gravel parking areas and driveways shall be considered an integral part of the excavation work, and no separate payment will be allowed therefore.

2. Inside of Roadway

a. Bedding

All sewers under roadway shall be bedded in a crushed stone bedding not less than six (6) inches in thickness.

The crushed stone envelope around all sewers under roadway shall extend from six (6) inches below the pipe up to eight inches over the top of the pipe and shall be not less than six (6) inches in thickness on the sides of the pipe. The envelope shall consist of clean crushed stone free from debris and other objectionable materials, placed in even layers simultaneously on each side of the pipe, and shall be thoroughly consolidated to completely fill the haunches of the pipe.

Consolidation by jetting will not be allowed. The crushed stone material to be used for pipe bedding and envelope shall be equal to size 67 as given in the latest standard specifications for road and bridge construction, Section 903.

The sanitary sewer pipe shall be installed as specified elsewhere in these specifications. Care shall be taken to prevent the pipe from shifting from the specified line and grade.

No pipe shall be backfilled above the top of the pipe until the alignment and joints have been checked and inspected by the Engineer. As soon as the pipe is approved, the trench shall be backfilled to eight (8) inches above the top of the pipe.

The cost of furnishing and installing crushed stone bedding and envelope shall be merged into the unit price bid for the depth of sewers, and no separate payment will be made therefore.

b. Backfill

Trenches for sewers constructed under roadway and/or gravel driveways will be backfilled from a point 8 inches above the top of the pipe to the existing surface of the roadway with crushed stone (#57 or 67) or an approved off-site

Section 02223-6
Backfilling

non-compressible material with the last 12 inches and make-up backfill to be of pug mill mix variety with a moisture content of 3%.

The cost of furnishing and installing crushed stone backfill shall be merged into the unit price bid for sewers under roadway, and no separate payment will be made therefore.

Gravel backfill and/or gravel driveways shall be considered an integral part of the Contract, and no additional payment will be allowed therefore.

The Contractor's attention is called to the fact that no additional payment will be allowed under this Contract for maintaining the gravel sewer trenches with crusher run stone (pug-mill mix) once the trench has been completely gravel refilled and prior to the roadways being paved.

Pug-Mill Mix, where required, shall be installed in the top portion of the trench in roadway area, and gravel shall be No. 7 (1/2" and smaller) or No. 8 (3/8" and smaller) or other sizes approved by the Engineer.

All surplus excavated material which is not used in backfilling shall be removed from the job site and disposed of by the Contractor at his own expense in a manner satisfactory to the Engineer. The Contractor shall not use any vacant lot or private property as a spill site without the written authorization of the owner or his agent. A copy of said authorization shall be filed with the Engineer.

3. Gravel Refill

This item shall include furnishing, placing and installing gravel refill at the locations specified or as directed by the Engineer during construction. This shall also include the removing and disposing of all unsuitable material necessary to establish satisfactory foundations and install gravel refill.

Work to be performed shall include all work necessary for the furnishing and placing of gravel refill.

Gravel refill furnished shall be No. 67, 57 or other size approved by the Engineer. Both sewer lines and services shall be gravel backfilled under paved roadways and/or shoulders within street rights-of-ways as specified in paragraph 3.22-B-2 of this Section of these Specifications.

END OF SECTION

SECTION 02270

SLOPE PROTECTION AND EROSION CONTROL

PART 1 GENERAL

1.1 SUMMARY

- A. This section shall consist of control measures as shown in the Plans or directed by the Engineer during the life of the Contract to control erosion and water pollution, through the use of berms, dikes, dams, sediment basins, fiber mats, netting, mulches, grasses, slope drains, temporary silt fences, and other control devices.
- B. The temporary pollution control provisions contained herein shall be coordinated with the permanent erosion control features to assure economical, effective, and continuous erosion control throughout the construction of post-construction period.
- C. Temporary pollution control shall include construction work outside the project area where such work is necessary as a result of construction such as borrow pit operations, haul roads and equipment storage sites.

1.2 SUBMITTALS

- A. At the pre-construction conference, the Contractor shall submit for acceptance his schedule for accomplishment of temporary and permanent erosion control work, as are applicable for clearing and grubbing, grading, bridges and other structures at watercourses, construction, and paving. He shall also submit for acceptance his proposed method of erosion control on haul roads and borrow pits and his plan for disposal of waste materials. No work shall be started until the erosion control schedules and methods of operations have been accepted by the Engineer.

1.3 SEQUENCING AND SCHEDULING

- A. Prior to the pre-construction conference, the Contractor shall meet with the Engineer to go over in detail the expected problem areas regarding the erosion control work. Different solutions should be discussed so that the best method might be determined. It is the basic responsibility of the Contractor to develop an erosion control plan acceptable to the Engineer.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Temporary Berms: A temporary berm is constructed of compacted soil, with or without a shallow ditch, at the top of fill slopes or transverse to centerline on fills. These berms are used temporarily at the top of newly constructed slopes to prevent excessive erosion until permanent controls are installed or slopes stabilized.

- B. Temporary Slope Drains: A temporary slope drain is a facility consisting of stone gutters, fiber mats, plastic sheets, concrete or asphalt gutters, half round pipe, metal pipe, plastic pipe, sod or other material acceptable to the Engineer that may be used to carry water down slopes to reduce erosion.
- C. Sediment Structures: Sediment basins, ponds, and traps, are prepared storage areas, constructed to trap and store sediment from erodible areas in order to protect properties and stream channels below the construction areas from excessive siltation.
- D. Check Dams: Check dams are barriers composed of logs and poles, large stones or other materials placed across a natural or constructed drainway. Stone check dams shall not be utilized where the drainage area exceeds fifty (50) acres. Log and pole structures shall not be used where the drainage area exceeds five (5) acres.
- E. Temporary Seeding and Mulching: Temporary seeding and mulching are measures consisting of seeding, mulching, fertilizing, and matting utilized to reduce erosion. All cut and fill slopes including waste sites and borrow pits shall be seeded when and where necessary to eliminate erosion.
- F. Brush Barriers: Brush barriers shall consist of brush, tree trimmings, shrubs, plants, and other approved refuse from the clearing and grubbing operations. Brush barriers are placed on natural ground at the bottom of fill slopes, where the most likely erodible areas are located, to restrain sedimentation particles.
- G. Baled Hay or Straw Checks: Baled hay or straw erosion checks are temporary measures to control erosion and prevent siltation. Bales shall be either hay or straw containing five (5) cubic feet or more of material. Baled hay or straw checks shall be used where the existing ground slopes toward or away from the embankment along the toe of slopes, in ditches, or other areas where siltation erosion or water runoff is a problem.
- H. Temporary Silt Fences: Silt fences are temporary measures utilizing woven wire or other approved material attached to posts with filter cloth composed of burlap, plastic filter fabric, etc., attached to the upstream side of the fence to retain the suspended silt particles in the runoff water.
- I. Rip-Rap Stone: Rip-rap stone shall be sound, dense and durable, free from excessive cracks, pyrite intrusions and other structural defects. Stones which will be used with mortar shall be free from dirt, oil, or other material that might prevent good adhesion with the mortar.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Construction Requirements: The Contractor shall be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in his accepted schedule. Temporary pollution control measures shall be

used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to the installation of permanent pollution control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

Where erosion is likely to be a problem, clearing and grubbing operations should be so scheduled and performed that grading operations and permanent erosion control features can follow immediately thereafter if the project conditions permit; otherwise, erosion control measures may be required between successive construction stages. Under no conditions shall the surface area of erodible earth material exposed at one time by clearing and grubbing exceed 750,000 square feet without approval of the Engineer.

Under no conditions shall the amount of surface area or erodible earth material exposed at one time by excavation or fill within the project area exceed 750,000 square feet without prior approval by the Engineer.

The Engineer may increase or decrease the amount of surface area of erodible earth material to be exposed at one time by clearing and grubbing, excavation, borrow and fill operations as determined by his analysis of project conditions.

In the event of conflict between these requirements and pollution control laws, rules and regulations, or other Federal, State or Local agencies, the more restrictive laws, rules or regulations shall apply.

- B. Construction of Temporary Berms: A temporary berm shall be constructed of compacted soil, with a minimum width of 24 inches at the top and a minimum height of 12 inches with or without a shallow ditch, constructed at the top of fill slopes or transverse to centerline on fills. Temporary berms shall be graded so as to drain a compacted outlet at a slope drain. The area adjacent to the temporary berm in the vicinity of the slope drain must be properly graded to enable this inlet to function efficiently and with minimum ponding in this area. All transverse berms required on the downstream side of a slope drain shall extend across the grade to the highest point at approximately a 10-degree angle with a perpendicular to centerline. The top width of these berms may be wider and the side slope flatter on transverse berms to allow equipment to pass over these berms with minimal disruptions. When practical and until final roadway elevations are approached, embankments should be constructed with a gradual slope to one side of the embankment to permit the placement of temporary berms and slope drains on only one side of the embankment.
- C. Construction of Temporary Slope Drains: Temporary slope drains shall consist of stone gutters, fiber mats, plastic sheets, concrete or asphalt gutters, half-round pipe, metal pipe, plastic pipe, flexible rubber, or other materials which can be used as temporary measures to carry water accumulating in the cuts and on the fills down the slopes prior to installation of permanent facilities or growth of adequate ground cover on the slopes. Fiber matting and plastic sheeting shall not be used on slopes steeper than 4:1 except for short distances of 20 feet or less.

All temporary slope drains shall be adequately anchored to the slope to prevent disruption by the force of the water flowing in the drains. The base for temporary slope drains shall be compacted and concavely formed to channel the water or hold the slope drain in place. The inlet end shall be properly constructed to channel water into the temporary slope drain. Energy dissipaters, sediment basins, or other approved devices shall be constructed at the outlet end of the slope drains to reduce erosion downstream. An ideal dissipater would be dumped rock or a small sediment basin which would slow the water as well as pick up some sediment. All temporary slope drains shall be removed when no longer necessary and the site restored to match the surroundings.

- D. Construction of Sediment Structures: Sediment structures shall be utilized to control sediment at the foot of embankments where slope drains outlet; at the bottom as well as in the ditchline atop waste sites; in the ditchlines or borrow pits. Sediment structures may be used in most drainage situations to prevent excessive siltation of pipe structures. All sediment structures shall be at least twice as long as they are wide.

When use of temporary sediment structures is to be discontinued, all sediment accumulation shall be removed, and all backfilled and properly compacted. The existing ground shall be restored to its natural or intended conditions.

- E. Construction of Check Dams: Check dams shall be utilized to retard stream flow and catch sediment loads. Materials utilized to construct check dams are varied and should be clearly illustrated or explained in the Contractor's erosion control plan.

All check dams shall be keyed into the sides and bottom of the channel a minimum depth of two feet.

Stone check dams should generally not be utilized where the drainage area exceeds fifty (50) acres. Log and pole structures should generally not be used where the drainage area exceeds five (5) acres.

- F. Temporary Seeding and Mulching: Seeding and mulching shall be performed in accordance with Section 02935, Topsoil and Seeding.
- G. Brush Barriers: Brush barriers shall consist of brush, tree trimmings, shrubs, plants, and other approved refuse from the clearing and grubbing operations. The brush barriers shall be constructed approximately parallel to original ground contour. The brush barrier shall be compressed to an approximate height of three to five feet and approximate width of five to ten feet. The embankment shall not be supported by the construction of brush barriers.
- H. Baled Hay or Straw Erosion Checks: Hay or straw erosion checks shall be embedded in the ground four to six inches to prevent water flowing under them. The bales shall also be anchored securely to the ground by wooden stakes driven through the bales into the ground. Bales can remain in place until they rot, or be removed after they have served their purpose, as determined by the Engineer. The

Contractor shall keep the checks in good conditions by replacing broken or damaged bales immediately after damage occurs. Normal debris clean-out will be considered routine maintenance.

- I. Construction of Temporary Silt Fences: Temporary silt fences shall be placed on the natural ground, at the bottom of the fill slopes, in ditches, or other areas where siltation is a problem. Silt fences are constructed of wire mesh fence with a covering of burlap or some other suitable material on the upper grade side of the fence and anchored into the soil.

The Contractor shall be required to maintain the silt fence in a satisfactory condition for the duration of the project or until its removal is requested by the Engineer. The silt accumulation at the fence may be left in place and seeded, removed, etc., as directed by the Engineer. The silt fence becomes the property of the Contractor whenever the fence is removed.

3.2 MAINTENANCE

The temporary erosion control features installed by the Contractor shall be acceptably maintained by the Contractor until no longer needed or permanent erosion control methods are installed. Any materials removed shall become the property of the Contractor.

In the event that temporary erosion and pollution control measures are required due to the Contractor's negligence, carelessness, or failure to install permanent controls as a part of work as scheduled, and are ordered by the Engineer, such work shall be performed by the Contractor at his own expense.

Where the work to be performed is not attributed to the Contractor's negligence, carelessness, or failure to install permanent controls and falls within the specifications for a work item that has as a contract price, the units of work shall be paid for at the proper contract prices.

3.3 RUBBLE RIP-RAP

A. General

Rubble-stone rip-rap shall be constructed upon the prepared foundation, by hand, and the stones shall be set or placed as close together as is practicable in order to reduce the voids to a minimum.

When rubble-stone rip-rap is constructed in layers, the layers shall be thoroughly tied together with large stones protruding from one layer into the other.

The standard depth of rubble-stone rip-rap shall be 12 inches, unless otherwise indicated or directed, and in no instance shall be less than 10 inches in depth. Rubble-stone rip-rap shall have an average depth for each 25 square feet of surface of no less than the depth indicated on the Plans or as directed by the Engineer, or the standard depth required in these Specifications.

Each stone shall be bedded with the depth perpendicular to the surface upon which it is set. The length shall be placed as directed by the City Engineer and each main stone shall be placed against the adjoining stones with sides and ends in contact. The stone shall be placed in such a manner as to stagger all joints as far as it is possible.

B. RUBBLE RIP-RAP (PLAIN)

For plain rip-rap, the main stones shall be thoroughly "chinked" and filled with the smaller stones by throwing them over the surface in any manner that is practical for the smaller stones to fill the voids. This work shall continue with the progress of the construction. Tamping of the stones will not be required if the stones have been placed in a reasonable and satisfactory manner.

C. RUBBLE RIP-RAP (GROUTED)

For grouted rip-rap, after chinking and filling the voids between the stones shall be completely filled with grout. Care shall be taken to prevent earth or sand from filling the spaces between the stones before the grout is poured.

The grout used to fill the voids shall be composed of one part Portland cement and four parts of sand, measured by volume, mixed thoroughly with sufficient water to make a grout of such consistency that it will flow into and completely fill the voids.

Immediately before pouring the grout, the stones shall be wetted by sprinkling. The grout shall be carefully poured into the voids between the stones. This work shall begin at the lower portions of the rip-rap and progress upward. The entire bottom line of voids shall be filled with grout before the line of voids next above is poured. The pouring of the grout shall be accomplished by the use of vessels of adequate size and shape. Broadcasting, slopping, or spilling of grout from the vessels on the surface of the rip-rap will not be permitted. Progress of pouring shall be sufficiently slow to prevent the grout from oozing from the voids and flowing over the surface. During the pouring operations and continuing until the grout has assumed its initial set, fiber brooms shall be used to maintain a uniform distribution. The grouting operations shall continue until such a time as all the voids have been completely filled and the grout has set even with the surface of the rip-rap.

As soon as any section of the grouted rip-rap has hardened sufficiently, it shall be cured by sprinkling with water until it has been covered with burlap, cotton or jute mats, earth or liquid membrane-forming compound. The mats or earth shall be maintained by soaking with water for a period of not less than 72 hours. The water used for wetting and curing the grouted rip-rap shall be free from salt or alkali.

END OF SECTION

SECTION 02575

PAVEMENT REPLACEMENT AND REPAIR

PART 1 GENERAL

1.1 SUMMARY

All labor, material equipment, tools and services required for the furnishing and installation of all pavement and appurtenances thereto required for this Project shall be furnished and installed in compliance with the Contract Documents. All paving shall be accomplished as shown on the Paving Schedule included in the Contract Documents.

1.2 RELATED SECTIONS

A. Section 02223: Backfilling

1.3 REFERENCE STANDARDS

All paving construction shall be in accordance with Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction-(TDOT) dated March 1, 1981, including all revisions except as revised by the City of Goodlettsville. The Contractor will be required to have a reputable paving Contractor install the permanent pavement replacement under this Contract.

PART 2 PRODUCTS

2.1 MATERIALS

All materials to be used in the replacement or repair of existing pavement shall be in accordance with the Tennessee Department of Transportation Standard Specifications for Road and Bridge Construction.

PART 3 EXECUTION

3.1 INSTALLATION

A. Pavement Restoration and Maintenance

Where force mains and sanitary sewers are constructed under paved roadway surfaces, within public right-of-ways, the Contractor shall backfill the ditch with crushed stone in accordance with Section 02223, paragraph 3.21-B-2 and paragraph 3.22-B-2 respectively, of these specifications. The top twelve (12) inches of crushed stone backfill shall be "pug-mill" mix.

Where force mains and/or sewers are constructed under paved roadway surfaces, within public right-of-ways, it shall be the responsibility of the Contractor, upon completion of the pipeline installation, to regrade the streets to similar or equal original base conditions and template that existed prior to construction. This rebasing and/or regrading shall be satisfactory to the City of Goodlettsville before the streets are accepted for paving operations. The Contractor shall further be responsible for the maintenance of the disturbed streets until repaving operations have been initiated.

B. Adjustment of Castings

The attention of the Contractor is called to the requirement that all water valve boxes, manhole castings, and other castings will be required to be adjusted to meet the finished grade of any permanent pavement replacement.

The cost of making the necessary adjustments to all castings shall be considered an integral part of the Contract, and no separate payment will be allowed therefore.

C. Curb and/or Gutters

The attention of the Contractor is called to the fact that curb and/or gutters may exist.

The Contractor will be responsible for replacing the curb and/or gutter sections of the same material, including any base, as that removed or disturbed. All edges broken shall be sawed or cut off at right angles prior to replacement.

The cost of replacing any curb and/or gutter shall be considered an integral part of the paving and shall be merged into the unit price bid for paving.

D. Paving

1. Full Width Pavement Replacement

This item shall include all labor, materials, and equipment necessary to furnish and install the base stone binder and surface course.

Furnish and install the thicknesses indicated for the lengths shown in accordance with the City of Goodlettsville latest revised specifications.

In the event additional crusher run stone base is required by the Engineer, the cost for placing the crusher run stone shall be merged in to the price for pavement replacement; no additional payment will be allow therefore.

2. Permanent Pavement Trench Repair Replacement

This item shall pertain to that portion of the sewer line trenches that cross

Section 02575-3
Pavement Replacement and Repair

existing streets only and shall include the construction and replacement of the permanent street pavement to the details as follows:

- a. It shall include removing the temporary pavement as necessary for the construction of the permanent pavement.
- b. A minimum two-foot (2') cutback of existing pavement from the edges of the existing trench.
- c. The permanent pavement replacement shall consist of eight (8) inches of crusher run stone, nine (9) inches bituminous binder mix (307-B Modified Tennessee Department of Highway Standard Specifications), two (2) inches asphalt surface course mix (411-E Tennessee Department of Highway Standard Specifications), and shall match the existing street surface.

Permanent pavement replacement, as specified herein, shall be installed within thirty (30) days after all work is completed within a street, unless directed otherwise by the Engineer.

The installation shall meet the latest requirements of the Tennessee Department of Transportation or the City of Goodlettsville.

END OF SECTION

SECTION 02730

SANITARY SEWERAGE SYSTEM

PART 1 GENERAL

1.1 SUMMARY

Work under this section includes the providing of all labor, material, equipment, tools and services required for the furnishing, installation, construction and testing of all gravity sewers, pressure pipelines and appurtenances thereto required.

1.2 RELATED SECTIONS

- A. Section 02222: Excavating
- B. Section 02223: Backfilling
- C. Section 03300: Concrete

1.3 REFERENCE STANDARDS

A. American Water Works Association (AWWA)

- C-210 Ductile Iron Coal-Tarepoxy Coating
- C-302 Reinforced Concrete Pipe (Non-Cylinder)
- C-500 Gate Valves 3" through 48" for Water and Sewerage Systems

B. American National Standards Institute (ANSI)

- A-21.4 Cement Mortar Lining for Ductile Iron and Gray Iron Pipe and Fittings for Water
- A-21.10 Ductile-Iron and Gray Iron Fittings, 3"-48" for Water and Other Liquids
- A-21.11 Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe Fittings
- A-21.51 Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids

C. American Society of Testing Materials (ASTM)

- A-48 Gray Iron Castings
- C-39 Compressive Strength of Cylindrical Concrete Specimens
- C-76 Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe
- C-172 Sampling Freshly Mixed Concrete
- C-443 Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
- C-478 Precast Reinforced Concrete Manhole Sections
- C-497 Testing Concrete Pipe, Sections, or Tile

C-923	Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes
C-1214	Concrete pipe sewer lines by negative air pressure (vacuum)
D-1784	Rigid Poly (Vinyl Chloride) Compounds and Chlorinated Poly (Vinyl Chloride) Compounds
D-2241	Polyvinyl Chloride (PVC) Plastic Pipe (SDR-PR)
D-3034	Type PSM Poly(vinyl chloride)(PVC) Sewer Pipe and Fittings
D-3139	Joints for Plastic Pressure Pipe Using Flexible Elastomeric Seals
D-3212	Joints for Drain and Sewer Plastic Pipe Using Flexible Elastomeric Seals

Where materials and methods are indicated in these specifications as being in conformance with a standard specification, it shall refer in all cases to the latest edition of the specifications and shall include all interim revisions. Listing of a standard specification without further reference indicates that the particular material or method shall conform to such listed specification.

1.4 SUBMITTALS

A. Test Requirements

The attention of the Contractor is directed to the provisions of the Conditions of the Contract requiring the inspection and testing of materials to be incorporated in the work included under this Contract. The required tests shall be done by an independent testing laboratory, selected by the Contractor and approved by the Engineer. All such tests shall be at the expense of the Contractor, and no separate payment will be allowed therefore.

All materials to be incorporated in the construction of gravity sewers, pressure pipelines, and appurtenances required under this Contract shall be subject to inspections and tests as follows:

1. Concrete Sewer Pipe

Sanitary sewer pipe shall be in conformance with the following specifications for each type furnished and installed under this Contract:

- a. Reinforced Concrete Pipe shall conform to ASTM C-76, Wall "B", and Class as specified on the Contract Drawings.

Where the total quantity of concrete or clay sanitary sewer pipe required on this Contract, including all pipe sizes, is less than one thousand (1,000) feet, the pipe shall be visually inspected by the Engineer at the site for conformance to the required specifications.

Where the quantities, including all sizes, exceed the above, tests shall be by independent laboratory for conformance with the required specifications. Test shall be made on one-half of one percent (0.5%) of the number of pipe, of each size required, but in no case less than two (2) specimens of each size.

2. Concrete Sewer Pipe Joints

Concrete sewer pipe joints shall be in conformance with the following specifications for each type of pipe furnished and installed under this Contract:

- a. Joints for concrete sewer pipe shall conform to ASTM C-443.

The number and manner of tests for sewer pipe joints for conformance to the required specifications shall be the same as required for the sewer pipe.

3. Ductile Cast Iron Gravity and Pressure Sanitary Sewer Pipe and Fittings

Where the total quantity of ductile cast iron gravity and pressure sanitary sewer pipe and fittings on this Contract, including all sizes, is less than two hundred (200) tons, each piece shall bear the manufacturer's serial number and shall be certified by the manufacturer for conformance with ANSI A21-51 AWWA C-151 and ANSI A21.10 AWWA C-110.

Where the quantity on this Contract, including all pipe sizes, exceeds the above, tests shall be by independent laboratory for conformance with ANSI A21-51 AWWA C-151 and ANSI A21.10 AWWA C-110.

4. Polyvinyl Chloride (PVC) Pressure Sanitary Sewer Pipe and Fittings

The polyvinyl chloride (PVC) pipe shall be in conformance with ASTM Specification D-2241 and shall consist of Type I, grade 1, PVC compound conforming to ASTM D-1784. All pipe shall be Class 200-SDR 21.

Acceptance of all PVC pipe and joints shall in part be based on the receipt of a written certification. This certification shall consist of a copy of the manufacturer's test report or a statement by the seller, accompanied by a copy of the test results, that the material has been sampled, tested, and inspected in accordance with the provisions of applicable ASTM standards. Each certification so furnished shall be signed by an authorized agent of the seller or manufacturer. The contractor shall secure this certification from the manufacturer and furnish to the Engineer. The quantity of PVC pipe and joints to be tested shall not be less than that specified for concrete and clay pipe and joints in "Test Requirements", paragraph B of this Section of these Specifications.

5. Polyvinyl Chloride (PVC) Sewer Pipe 8", 10", 12" and 15"

The polyvinyl chloride (PVC) pipe shall be in conformance with ASTM Specification D-3034, SDR35 of the latest revision. Pipe jointing shall be accomplished by the use of flexible elastomeric gaskets conforming to ASTM Specification D-3212.

Acceptance of all PVC pipe and joints shall in part be based on the receipt of a written certification. This certification shall consist of a copy of the manufacturer's test report or a statement by the seller, accompanied by a copy of the test results, that the material has been sampled, tested, and inspected in accordance with the provisions of applicable ASTM standards. Each certification so furnished shall be signed by an authorized agent of the seller or manufacturer. The Contractor shall secure this certification from the manufacturer and furnish to

the Engineer. The quantity of PVC pipe and joints to be tested shall not be less than that specified for concrete and clay pipe and joints in "Test Requirements", paragraph B of this Section of these Specifications.

6. Concrete

For each separate class of concrete of twenty-five (25) cubic yards placed, two (2) standard six-inch (6") concrete cylinders shall be made and tested.

The cylinders of each set shall be molded from the same sample of concrete and tested at seven (7) and twenty-eight (28) days.

Sampling of concrete for test purposes shall be per ASTM C-172. Testing of specimens shall be per ASTM C-39.

7. Miscellaneous Materials

All material used on this project shall be visually inspected by the Engineer at the site for conformance to the required specifications.

Where reasonable doubt exists that said material fails to meet the specifications, the Engineer may require certified mill test, samples and/or test by independent laboratory, or other suitable form of verification that the material meets the required specifications.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Materials delivered to site shall be inspected for damage, unloaded and stored with the minimum of handling. Store materials on site in enclosures or under protective coverings. Store plastic piping and rubber gaskets under cover and protect from exposure to direct sunlight. Store materials above ground. Interior of pipe and fittings shall be kept free of dirt and debris.

B. Pipe, fittings, valves, hydrants and other accessories shall be handled to insure delivery to the point of installation in sound undamaged condition. If coatings or linings of pipe or fittings are damaged, such pipe or fittings shall be removed from the site and new materials furnished at no extra cost. Pipe shall not be left in the sunlight, but shall be stored under cover and protected from exposure to direct sunlight.

PART 2 PRODUCTS

2.1 GENERAL

All material and equipment shall be furnished by an established and reputable manufacturer or supplier. All materials and equipment shall be new and shall be first-class ingredients and construction, designed and guaranteed to perform the service required and shall conform to the following specifications or shall be the product of the listed manufacturer or equal thereto as approved by the Engineer.

2.2 MATERIAL

A. Concrete, and/or Polyvinyl Chloride (PVC) Gravity Sanitary Sewers

1. Concrete, and/or PVC Sewer Pipe

The sanitary sewer pipe furnished and installed on this project may be concrete, or PVC conforming to the following specifications, at the Contractor's option unless shown otherwise on the Contract Drawings or in the Contract.

All concrete sewer pipe furnished and installed on this project shall be reinforced concrete pipe, conforming to the requirements of ASTM C-76, Wall "B", Class III, IV or V as specified on the Contract Drawings. Laying lengths of reinforced concrete sewer pipe shall not exceed eight (8) feet unless written approval of the owner is secured. Pipe shall be manufactured with machine Bell Pallets with a maximum slope of 2 degrees.

Polyvinyl chloride (PVC) sewer pipe furnished and installed on this project shall be in conformance with the requirements of ASTM Specification D3034 for SDR35 pipe. Laying lengths shall be regular commercial lengths not to exceed thirteen (13) feet.

All concrete pipe shipped to the project shall bear the mark of an approved testing laboratory showing that such pipe was tested and approved by the testing laboratory at the site of the manufacturer's plant. Testing of the pipe shall conform to ASTM C-76 and C-497. Certified test reports shall be furnished to the Engineer.

All PVC pipe shipped to the project shall bear the mark of an approved testing laboratory showing that such pipe was tested and approved by the testing laboratory at the site of the manufacturer's plant. Testing of PVC pipe shall conform to ASTM D3034. Certified test reports shall be furnished to the Engineer.

The quantity of concrete and PVC pipe to be tested shall not be less than that specified in "Test Requirements", paragraph 1.5-B of this Section of the Specifications.

2. Joint Material for Concrete, and/or PVC Sewer Pipe

The Contractor shall furnish the Engineer with complete technical and construction data on the jointing material he proposes to use on this Project and shall obtain the Engineer's approval prior to incorporating the jointing material into the work.

The jointing material furnished and installed on this Project for use on concrete sewer pipe shall be rubber gasket type, "Press Seal", "Tylox", or approved equal conforming to the requirements of ASTM 443. These joints shall be installed in accordance with the manufacturer's recommendations.

The jointing material furnished and installed on this Project for use on PVC sewer pipe shall be flexible, elastomeric type, push-on joints conforming to the requirements of ASTM D-3212. These joints shall be field assembled in

conformance with the manufacturer's recommendations.

The testing and certification requirements for sewer pipe joints shall be similar to those described for sewer pipe, and shall be in conformance with the applicable ASTM standards. The minimum number of joints to be tested for concrete and PVC pipe shall be specified in "Test Requirements", paragraph 1.5-B of this Section of the Specifications.

B. Ductile Iron Gravity and/or Pressure Line Sewers

1. Ductile Iron Sewer Pipe

The ductile iron pipe and fittings furnished and installed on this project shall conform to the requirements of ANSI 21.51/AWWA C-151 and ANSI A21.10/AWWA C-110, respectively. Pipe Class shall be 52 unless otherwise indicated on the Drawings. All ductile iron pipe and fittings shall be cement-mortar lined in accordance with ANSI A21-4/AWWA C-104. Pressure rating for fittings in sizes 4" through 24" shall be 350 psi minimum for ductile iron. Above 24" in size, minimum pressure rating for fittings shall be 250 psi for ductile iron.

All ductile iron pipe and fittings shipped to the project shall bear the mark of an approved testing laboratory showing that such pipe was tested and approved by the testing laboratory at the site of the manufacturer's plant. Testing shall conform to all requirements of ANSI 21.51/AWWA C-151 and ANSI A21.10/AWWA C-110. Certified test reports shall be furnished to the Engineer.

The quantity of ductile iron pipe and fittings to be tested shall not be less than that specified in "Test Requirements", paragraph 1.5-B of this Section of these Specifications.

2. Joint Material for Ductile Iron Gravity and/or Pressure Line Sewers

The joints used for the pipe furnished under this Contract shall be the slip-type, single gasket joints and shall conform to all requirements of ANSI, A21.11 and AWWA C-111. The joints shall be good for 150 pounds per square inch of operating pressure.

The joint material furnished and installed on this Project for use on ductile iron gravity and/or pressure line sewers shall be the gasket type joint equal to "Bell-Tite", "Fast-Tite", or "Tyton" fittings. Mechanical type fittings may be used on short sections of ductile iron gravity sewers if approved by the Engineer. Fittings shall not be lighter than the pipe for which they are used and shall be field assembled in conformance with the manufacturer's directions.

3. Air Relief Valve

An air relief valve shall be placed at the necessary high points in the force main to prevent air locking.

C. Polyvinyl Chloride (PVC) Pressure Sanitary Sewer Pipe

Section 02730-7
Sanitary Sewerage System

1. Polyvinyl chloride pressure sewer pipe shall conform to Designation ASTM D-2241 and shall consist of Type I, Grade 1, PVC compound conforming to ASTM D-1784. All pipe shall be Class 200-SDR 21.
2. Pipe shall have integral bell and spigot joints. Provisions shall be made for contraction and expansion at each joint with an elastomeric ring. Threaded or solvent welded type joints shall not be used. Bell end pipe and couplings with elastomeric gaskets shall meet the requirements of ASTM D-3139.
3. The Contractor shall install a continuous run of plastic metallic tape above the top of the PVC pipe at 18 to 24 inches below finished grade. Tape shall be suitable for detection with metal pipe location equipment, labeled to identify contents of pipe, and brightly colored to contrast with the soil.
4. Pipe shall carry National Sanitation Foundation (NSF) seal, and be factory marked with manufacturer's identification, pipe size, material and pressure rating.
5. Air Relief Valve
An air relief valve shall be placed at the necessary high points in the force main to prevent air locking.

D. Six-Inch (6") Tee Connections for House Services

Construction, installation and material of pipe containing tee openings and the joint materials for the same shall be in conformance with the requirements of the specifications for that portion of the main sewer where installed. All concrete tees shall be machine made in one piece and shall be manufactured integrally by the same process as plain concrete sewer pipe and shall meet ASTM Specifications C-76 with revisions.

E. Six-Inch (6") House Services

The furnishing, constructing and installing of all materials and/or methods used in the construction of six-inch (6") house sewer services shall be as specified in the applicable provisions of paragraph 3.1-A of this Section and paragraph 3.1-B of this Section of the Contract Specifications and as shown on Drawing, except as herein provided. Where there has been no 6-inch tee installed for a house (lot), saddling the main is permitted. The required (specific) saddle to be used is a Romac Industries, Inc. Style "CB" Sewer Saddle with appropriate range gasket per pipe diameter.

F. Service Reconnections

The furnishing, constructing and installing of all materials and/or methods used in the construction of reconnecting all "live" sanitary services shall be as specified in paragraph 3.2-E of this Section of the Contract Specifications and as shown on

Drawing.

G. Polyvinyl Chloride Sewer Cleanout Assemblies

Polyvinyl Chloride (PVC) sewer pipe and fittings furnished and installed on this project for cleanout assemblies shall be in conformance with Paragraph 2.2 - A of this section using flexible joints if replaced from the main. If a cleanout assembly is inserted into an existing lateral, the PVC pipe and fittings may conform to 2.2-A or ASTM D-1785, Schedule 40 PVC1120 with D-2466 solvent welded fittings.

H. Manholes and Appurtenances .

1. Standard Manhole Sidewall

Standard manhole sidewall shall be constructed of concrete of the following types:

- a. Precast concrete rings
- b. Precast concrete manhole sidewalls with base
- c. Precast concrete monolithic manhole sidewall
- d. Precast concrete monolithic manhole with base

All precast concrete manhole sidewall shall conform to the requirements of ASTM C-478.

2. Concrete Manhole Bases and Fillets

Concrete manhole bases and fillets shall be precast. In an instance where a manhole must be placed over an existing line "Dog House" manholes are prohibited. A precast base and fillet must be used. The manhole sidewall shall conform to the following requirements:

a. Precast Manhole Bases and Fillets

All materials and methods used to precast manhole bases and/or fillets shall conform to the applicable provisions for precast manhole sidewall as set out in these Specifications.

Class of Concrete	"B"
Gals. Water per sack of cement	5.50
Min. bags cement per cub yard of concrete	5.75
Min. 28 day strength 1 cylinder lbs./sq.inch	2800
Min. 28 day strength average for 5 cylinders lbs/sq.inch	3500

Slump in inches

2-4

3. Manhole Frames and Covers

Manhole frames and covers shall be made of cast iron conforming to the details shown on the Contract Documents and meeting the requirements of ASTM A-48, Class 30.

All casting shall be made accurately to the required dimensions and shall be sound, smooth, clean and free from blisters and other defects. Defective castings which have been plugged or otherwise treated to remedy defects shall be rejected. Contact surfaces of frames and covers shall be machined so that the covers rest securely in the frames with no rocking and with the covers in contact with the frames for the entire perimeter of the contact surface. No "Bolt Down" frames and covers are to be used unless prior approval by the City Engineer has been granted. The required frame and cover is John Bouchard and Sons #1150 and #1123, Traffic Bearing and Traffic Bearing Watertight Type respectively, as per the Standard Detail-Manhole Frames and Covers. All Manhole Frames must have a minimum 24" clear opening.

4. Manhole Drop Pipe Assembly

Pipe, specials and fittings used in the construction of the manhole drop assembly shall conform to the details shown on the Contract Documents and meet the requirements of that portion of the main sewer where installed.

The support for the drop assembly shall be concrete and shall conform to the details shown on the Contract Documents and the requirements as specified hereinafter.

Concrete for the base and support of the drop assembly shall be Class "A" as specified in these Specifications.

5. Pipe Resilient Connectors to Manholes

Resilient connectors between the manhole and pipes such as Kor-N-Seal I or II, 1" to 18" and 18" to 59" respectively, shall be installed in the precast or cored opening manhole wall. Sealing material shall be installed in the precast or cored opening. The resilient connector shall meet the requirements set forth in ASTM C-923. An external bond made entirely of corrosion resistant stainless steel shall be used to affect the seal around the pipe.

6. Sealant and Coatings

a. Sealant to be used in joints and where specified shall be an approved

flexible plastic gasket similar to Ram-Nek.

b. All precast manholes shall be cast with XYPEX® Admix C-1000 in the concrete for waterproofing and corrosive protection. The manufacturer's addition rate for Concentrate C-1000 is 3% by weight of cement. A red dye must be added to the concentrate, which renders the concrete a reddish-pink color.

7. Stubouts

Stubouts shall be the "bell" or "hub" end of a joint of pipe conforming to the requirements of the main sewer.

8. Manhole Steps

Manhole steps shall be inserted and securely embedded in the manhole sidewall and shall be non-skid design. Manhole steps will be made of Alcoa Part #15295 Aluminum OR M.A. Industries Part #PSI-45 Plastic or approved equal for each. The entire project shall have the same manhole step materials.

9. Vent Pipe Assemblies

The pipe shall be Schedule 40 steel pipe or Class 52, ductile cast iron pipe, cement mortar lined. Pipe surface preparation shall be done using SSPC-SP10 Near-White blast cleaning. Only one coat is required: TNEMEC 435 PERMA-GLAZE AT 30.0 - 40.0 MILS D.F.T.

10. Concrete Encasement and/or Cradle

Concrete for concrete encasement and/or cradle shall be Class "C" as specified in Section 03300.

I. Pumping Stations

1. Radio telemetry shall be supplied with the pump station. The Contractor is responsible for providing the appropriate equipment to tie into the Owner's (City of Goodlettsville's) existing Supervisory Control and Data Acquisition (SCADA) system. This includes and is not limited to all radios, antennas, cables, conduit and antenna by masts and lightning protection.
2. The telemetry equipment supplier shall provide radio path surveys. All paths shall be designed for at least 99.9% reliability. The telemetry supplier shall provide all necessary forms, completely filled out, to the end user for radio frequency coordination and FCC licensing. The only action required on the part of the end user shall be to sign the forms. The telemetry system supplier shall pay all licensing fees.
3. Where a repeater station is required, the equipment supplier shall coordinate

with the Owner for all possible locations.

4. All pump station components must have prior approval by the City Engineer i.e. pumps, valves and piping.
5. All pump stations must have emergency pump out provisions.
6. All pump stations must have a twelve (12) month warranty and at the eleventh (11th) month be reinspected to be certain there are no outstanding problems or issues.
7. All pump stations are to have Backup Emergency Generator Power.

PART 3 EXECUTION

3.1 INSTALLATION

A. Concrete and/or Polyvinyl Chloride (PVC) Sanitary Sewers

1. General

The Contractor shall be responsible for setting all grade stakes, lines and levels and preparation of cut sheets. The Contractor shall provide level, level rod and tripod on the job site at all times for the purpose of checking grades, as deemed necessary by the Engineer.

All grade and alignment stakes for construction under this project shall be set by a land surveyor registered to practice in the State, and all costs thereof shall be borne by the Contractor. The requirement for this work to be accomplished by a registered land surveyor may be waived by the Engineer in the event the Contractor desires to utilize his own personnel who are qualified to set the grade and alignment stakes. The Contractor shall assume all responsibility for the correctness of the grade and alignment stakes.

The contractor may use batter boards or a properly calibrated beam device. No claim for extra work shall be allowed for alleged inaccuracy of the laser beam device. Grade hubs for laser beams shall not exceed 100 feet apart with centerline hubs every 50 feet to check laser and grade between manholes.

If the Contractor elects to use batter boards, he shall provide and maintain on the work at all times a gauge rod of sufficient length to reach from the invert of the sewer pipe being laid to the top line strung on the three batter boards. The gauge rod shall be graduated and numbered each foot of its entire length. The gauge rod shall be equipped with either a plumb line or two spirit levels and the utmost care used to insure a truly vertical gauge rod at the time a reading is taken and

pipe is being set.

One week prior to the commencement of trench excavation, the Contractor shall prepare and submit to the Engineer for review four (4) copies of detailed Cut Sheets showing the beginning and ending manholes; the distance between manholes; the grade, size and type of line; the depth of cut; etc. Cut Sheets shall bear the seal of either a Land Surveyor or Engineer registered in the State of Tennessee. The form of Cut Sheet shall be provided to the Contractor. All expense for the preparation of Cut Sheets shall be borne by the Contractor and be included in the unit price bid per foot of pipe.

Cut Sheets must be reviewed by the Engineer in writing before trenching operations may be permitted. It shall be the responsibility of the Contractor to prepare Cut Sheets (one week) in advance of his anticipated trenching schedule.

The junction of two or more sewers shall be made in strict conformance with the Contract Drawings. The cost of all connections shall be included in the Contract price for the new sewers unless specifically provided in the Contract.

New sewer connections with old existing sewers shall be made within a manhole. Where an old manhole exists at the point of connection of new and old sewers that is made of brick, the brick manhole shall be replaced by a new precast or poured in place manhole adhering to the specifications of this document. The Contractor shall reconstruct fillet (invert) of the manhole to accommodate the new connection. The cost of such work shall be included in the Contract price for new main sewer unless other payments are specifically provided for in these specifications.

Where no old manhole exists at the point of connection, a new manhole shall be constructed of the size and type shown on the Contract Drawings. Payment for such additional manholes will be made at the unit price in the Contract for new manholes, which price shall include all work necessary to make the connection.

Connections of new sewers to existing sewers when encountered in construction and not shown on the Contract Drawings shall be made where ordered by the Engineer. Such connections shall be made within a manhole, except for house sewer and drain connections. When such sewer connections are made within an existing manhole, any added work involved will be paid for in accordance with the procedure outlined in the Conditions of the Contract. If the Engineer orders such connections be made in a new manhole, such new manhole will be paid for at the prices established in the Contract, which price shall include all work necessary to make the connections.

When connections are made with sewers carrying sewerage or water, special care

must be taken that no part of the work is built under water; a flume or dam must be installed and pumping maintained if necessary to keep the new work in the dry until completed and concrete or mortar has set up.

Junctions for future sewer connections indicated on the Contract Drawings on precast concrete manholes shall be provided with a 2' - 0" long stubout connected to the manhole with a pipe resilient connector unless shown otherwise on the plans. The stubout shall be sealed by means of an approved stopper.

Check dams shall be installed in the bedding and backfill of all new or replaced sewer lines to limit the drainage area subject to the french drain effect of grave bedding. Dams shall consist of compacted clay bedding and backfill at least three (3) feet thick to the top of the trench and cut into the walls of the trench two (2) feet. Alternatively, concrete may be used, keyed into the trench walls. Dams shall be placed no more than 500 feet apart. The preferred location is upstream of each manhole. All stream crossings will include check dams on both sides of the crossing.

There shall be no physical connection between a public or private water supply system and a sanitary sewer or appurtenance thereto which would permit the passage of any wastewater or polluted water into the potable supply. Horizontal separation: Whenever possible, sewers should be laid at least 10 feet, horizontally, from any existing or proposed water main. Should local conditions prevent a lateral separation to 10 feet, a sewer may be laid closer than 10 feet to a water main if it is laid in a separate trench and if the elevation of the top (crown) of the sewer is at least 18 inches below the bottom (invert) of the water main.

Vertical separation:

Whenever sewers must cross under water mains, the sewer shall be laid at such an elevation that the top of the sewer is at least 18 inches below the bottom of the water main. When the elevation of the sewer cannot be varied to meet the above requirements, the water main shall be relocated to provide this separation or reconstructed with the mechanical-joint pipe for a distance of 10 feet on each side of the sewer. One full length of water main should be centered over the sewer so that both joints will be as far from the sewer as possible. When it is impossible to obtain proper horizontal and vertical separation as stipulated above, both the water main and sewer shall be constructed of the mechanical-joint-ductile-iron pipe and shall be pressure-tested to assure water-tightness before use as a water line and sewer line respectively. The Engineer reserves the right to make minor changes in location during construction to meet and situations uncovered during construction.

2. Pipe Laying

Installation of concrete pipe shall conform to ASTM C-12 and these Specifications. Installation of PVC pipe should conform to ASTM D-2321 and these Specifications. In case of a conflict between these specifications and the

above Standards, the more stringent requirements shall apply. Each pipe shall be laid on an even, firm bed, so that no uneven strain will come to any part of the pipe. Particular care shall be exercised to prevent the pipes bearing on the sockets. Bell holes for bell and spigot pipe shall be dug at each point as hereinbefore specified. Each pipe shall be laid in the presence of the inspector. The bell end of the pipe shall be laid upgrade.

The foundation under, the bedding around and over, and the backfill within the trench of the sewer pipe shall be as specified in these specifications under Section 02223 - "Backfilling".

The interior of the sewer shall, as the work progresses, be cleaned of all dirt, jointing material and superfluous materials of every description. On small pipe sewers where cleaning after laying must be difficult, a swab or drag shall be kept inside the pipe line and pulled forward past each joint immediately after its completion.

All pipe shall be completely shoved home. On pipe of the tongue and groove type, 30" in diameter and larger, pressure must be applied to the center of each pipe as it is laid by a winch and cable or other mechanical means properly set and operated to insure that the spigot is all the way home in the socket, and that the sewer joint is of uniform size throughout the circumference of the pipe.

Laying holes in pipe if used shall be tapered and shall be plugged before backfilling with a tapered concrete plug set in mortar or mastic.

B. Ductile Iron Gravity and/or Pressure Line Sewers

Ductile iron gravity sewers shall be installed in compliance with the applicable provisions of paragraph 3.1-A of this Section of these Specifications.

Where ductile iron gravity sewer is supported on piers, the installation shall be as detailed on the Contract Drawings and as directed by the Engineer during construction in compliance with the applicable provisions of these specifications.

It shall be the Contractor's responsibility to install the ductile iron pressure sewer to the line and grade as shown on the Contract Documents.

It will not be necessary that the pressure line sewer pipe be laid with the use of batter boards, but the Contractor shall take care that the installed pipe has the required depth of cover as shown on the Contract Drawings and that the pipe is installed to a straight line.

All bends, tees, crosses, plugs, etc., shall be backed up and anchored with concrete so that there will be no movement of the pipe due to internal or external pressures. The concrete shall be placed around the fittings and completely fill the space between the fittings and the wall of the trench as shown on the Contract Drawings. Concrete shall

conform to the applicable provisions of paragraph 3.1-F of this Section of these Specifications. The cost of furnishing and installing said concrete anchors shall be included in the Contract unit price of pressure line sewer.

Pressure line sewer may be backfilled prior to testing; however, the Contractor shall assume the risk of re-excavation to the pipe if the system fails to meet the requirements of the pressure test. Any defects, cracks or leakage that may develop, or that may be discovered either in the joints or in the body of the casting, shall be promptly made good by the Contractor, at his own expense, to the satisfaction of the Engineer.

Proper and suitable tools and equipment for the safe and convenient handling and laying of the pipes and fittings shall be used. Great care shall be taken to prevent the pipe coating from being damaged, particularly on the inside of the pipes and fittings.

All sewer line laid across creeks shall be Ductile Iron Pipe (DIP) with a concrete encasement as per the Standard Concrete Encasement Detail.

C. Six-Inch (6") Tee Connections for House Services

This item shall include the furnishing, installing and plugging six-inch (6") tee connections for future connections of house sewer services at locations shown on the Contract Drawings or as specified by the Engineer during construction.

Construction, installation and material of pipe containing tee openings and the joint materials for the same shall be in conformance with the requirements of the specifications for that portion of the main sewer where installed. All concrete tees shall be machine made in one piece and shall be manufactured integrally by the same process as the concrete sewer pipe and shall meet ASTM Specifications C-76 with revisions. No tee shall have stubs or outlets attached by hand or other means except by the above process. The sewer service line shall be extended a minimum of 4 feet and capped as specified under paragraph 3.1-D of this Section of these Specifications.

D. Six-Inch (6") House Sewer Services

This item shall include furnishing and installing six-inch (6") house sewer service sanitary sewers at the locations as shown on the Contract Drawings or as directed by the Engineer during construction. It shall also include bends, caps and joint material as specified herein.

The furnishing, construction and installing of all materials and/or methods used in the construction of six-inch (6") house sewer services shall be as specified in the applicable provisions of paragraph 3.1-A of this Section and paragraph 3.1-B of this section of the Contract Specifications and as shown on Drawing, except as herein provided.

The location of all six-inch (6") house sewer services shall be as directed by the Engineer during construction. It will not be necessary that said sewers be laid with a batter line. The gradient will be determined by the Engineer, but in no case shall it be less than one-eighth-inch (1/8") per foot.

The pipe material and method of jointing shall be the same as specified for the main sewer.

Where directed by the Engineer, the Contractor shall saw off the bell of the last joint of 6" sewer pipe laid on each service line and cap the end of each service line with a Quik Cap flexible (PVC) cap (Ferinco or approved equal) with an external band made entirely of corrosion-resistant stainless steel to effect the seal around the pipe. No additional payment will be allowed for cutting and capping the service pipe.

Whenever any manhole is core drilled specifically for insertion of a six inch (6") service line the pipe shall be inserted at an elevation 0.20 feet higher than the Invert Elevation Out of the manhole just as if the six inch service pipe (line) were an Invert Elevation Inlet Pipe. Core drilling shall not only be into the base or sidewall of the manhole but also into table so as to create an invert for the service itself resulting in a continuous flow rate.

E. Cleanout Assembly

This item shall include the furnishing of all materials and doing all work to provide a six-inch (6") single cleanout assembly at the end of each service as per details shown on the Contract Drawings. Cleanout shall be complete as shown on detail. All six inch (6") service cleanouts are required to have a box with frame and cover. In driveways (Traffic Bearing Areas) the cleanout box shall be a precast Cloud Concrete Valve Box Part #UT-045 with a John Bouchard & Sons Frame and Cover Part #8006. In easements the cleanout box will be a Mid-States Plastics, Incorporated Part # MSBC1015-12 with a Sigma Corporation RUSSCO SEWER LID Cover Part #LC-2512S. Box and frame and cover shall be complete as shown on detail.

F. Service Connections

1. General

This item shall include the furnishing of all materials and doing all work necessary to reconnect each "live" sanitary sewer service to the new sanitary sewer collector lines. It shall be the responsibility of the Contractor to determine whether a service is "live" and whether it is sanitary sewer. No payment will be made for reconnecting a "dead" service.

2. Cleanout Assembly

Each reconnected service shall be provided with a six-inch (6") single cleanout assembly as per details shown on the Contract Drawings. Cleanout shall be complete as shown on detail. Reconnected service cleanouts will also be

installed with box, frame and cover as specified in Section 3.1-E of these Specifications.

3. Reconnection

Reconnections of dissimilar pipes shall be made with a corrosion resistant coupling with stainless steel hose clamps (Fernco or approved equal). Reconnection shall be as per details shown on the Contract Drawings.

G. Manholes and Appurtenances

This item shall include the furnishing of all materials and doing all work necessary for the complete construction of standard and/or special manholes of the types, sizes, shapes, dimensions and at the locations shown on the Contract Documents. No BOLT DOWN manholes unless approved by the City Engineer.

1. Manhole Bases and Fillets

a. Precast Manhole Bases

The contractor shall install the precast concrete manhole base upon a crushed stone (No. 67, 57 or approved equal) bed that is a minimum of six (6) inches thick. This bed shall be carefully brought to the required grade. Care shall be taken that the bed is level and even so that when the precast unit is set in place, the manhole sidewall will be installed plumb and the concrete manhole base is in full contact upon the gravel base.

The precast manhole base shall be a minimum of eight (8) inches in thickness. For units that require the fillets to be poured-in-place, a minimum of two (2) inches shall be allowed from the inside of the base to the Invert of the downstream pipe for the construction of the fillet.

Backfilling operations, as specified herein, may begin after the installation of the precast manhole sidewall with base has been completed. Upon completion of the backfilling operations, traffic may be allowed on the structure.

b. Fillets

Except as otherwise specified, fillets in manholes shall be tapered uniformly between the inverts of the inlet pipe and the outlet pipe. Fillets in junction manholes shall be constructed with curved channels for side streams so as to minimize turbulence as shown on detail. Fillets in end manholes shall be shaped to drain to the discharge pipe.

In cases where the invert of the inlet pipe(s) is six (6) inches or more above

the invert of the outlet pipe, the flow line of the fillet at the inlet side shall not be greater than six (6) inches above the invert of the outlet pipe so as to provide clearance for maintenance or testing equipment.

Fillets shall be neatly and uniformly shaped, shall have a brushed finish, and shall be constructed of concrete as specified herein. No cement mortar shall be used to obtain the required shape or finish.

All cost of manhole fillets shall be included in the Contractor unit price, and no separate payment will be allowed therefore.

2. Manhole Sidewall

a. Precast manhole sidewall

- (1) The Contractor shall carefully order the precise manhole sidewall to meet the required field conditions. The height of the unit in place shall be such so as to allow adjusting rings to be placed on top of the manhole transition section prior to setting the casting. A minimum of two (2) inches and a maximum of ten (10) inches of precast concrete adjustment rings will be allowed. A precast concrete adjusting ring must be used for this purpose.
- (2) The "corbell" section of the manhole sidewall shall be cast in the shape of a concentric cone.
- (3) At all joints of precast manhole sidewall, an approved flexible, plastic gasket material similar to Ram-Nek shall be applied to the joint surface prior to the placement of the next manhole section. Sufficient gasket material shall be used to fill the void in the joint.
- (4) The Contractor shall take care while backfilling that the backfill material shall be brought up all around the manhole sidewalls in equal levels simultaneously.
- (5) All pipe line connections to the manhole sidewall shall be made with resilient connectors as specified hereinafter.

3. Precast Manhole Flat Top

Where necessary because of height restrictions, a standard precast "flat-top" manhole slab may be used. This top shall be installed only where the manufacturer cannot cast a straight wall with corbell section unit to meet the required height of the manhole. A flat-top manhole slab may be used only

within the height ranges as follows:

- a. The maximum height allowed for a completed standard "flat-top" manhole shall be six (6) feet. This vertical centerline height shall be measured from the invert of the outlet pipe to the top of the manhole casting. Above this height, a manhole with a corbel section shall be installed.
- b. The minimum height allowed for a completed standard "flat-top" manhole shall be four (4) feet. (Vertical height measured same as maximum height.) Below this height a shallow type manhole shall be installed.
- c. The access hole cast in the "flat-top" slab shall be located at the midpoint between the center of the slab and edge of the slab. (This shift off-center of the access hole is specified to allow the access hole to be cast nearer the manhole steps and still facilitate the use of the access hole for maintenance equipment.)

4. Manhole Frames and Covers

The manhole frame for the cover shall be set on top of the manhole cone at the required elevation. Where manholes are constructed in paved areas or fill slopes, the surface of the frame and cover shall be tilted so as to conform to the exact slope, crown and grade of the existing pavement or area adjacent thereto. Vertical adjustments to new and existing manhole frames and covers will be done exclusively with Cloud Concrete Grade Ring Part #24HMGRRG or approved equal. Existing loose/broken grade rings will be replaced and/or sealed as directed by the City so as to obtain a water tight seal from the top of the manhole riser cone to the bottom of the frame and cover. Sealing between a grade ring and the top of the manhole riser cone and the bottom of the manhole frame is to be done using Ram-Nek Joint Sealant Part #RN103 size 3/4" or approved equal. In an instance where more than one grade ring is required they are also to be sealed with Ram-Nek Joint Sealant Part #RN103 size 3/4". A City inspector is required to witness all manhole adjustments.

5. Manhole Drop Pipe Assembly

Where the difference in invert elevations of an entering sewer and a discharging sewer, intercepting in the same manhole, is two (2) feet or more, a drop manhole assembly shall be constructed on the entering sewer in accordance with Paragraph 2.2-G.4 of this Section specifications and per details shown on the Contract Drawings.

6. Shallow Manholes

All material and methods used in the construction of shallow manholes, to the details shown on the Contract Document, shall conform to the applicable provisions for manhole construction set out in these specifications.

All costs of furnishing, constructing and installing manhole bases, fillets, sidewalls, casting and all other work necessary for a complete shallow manhole to the details as shown on the Contract Documents shall be included in the Contract unit price for shallow type manholes, and no separate payment will be allowed therefore.

7. Pipe Resilient Connectors to Manholes

All connections of pipe to manhole sidewall shall be made with resilient connectors. Openings in the manhole sidewall for the pipe shall be precast or cored to provide required size and location. The hole shall be manufactured to allow for lateral and vertical movement, as well as angular adjustments through 20 degrees. A resilient connector between the manhole and pipes such as Kor-N-Seal or A-Lok shall be installed in the precast or cored openings. Seals shall be installed in the precast or cored openings. The resilient connector shall meet the requirements set forth in ASTM C-923. The insulator ring provided by manhole supplier must be used to prevent mortar used for cosmetic dressing to set up inside resilient connector creating an adverse rigid connection. An external band made entirely of corrosion resistant stainless steel shall be used to affect the seal around the pipe. A torque wrench, as specified by the manhole supplier or approved equal, must be used to seat resilient connector to pipe.

As shown on the detail for resilient connectors, the void between the pipe and the connector shall be filled with an approved flexible gasket material.

Resilient connectors shall be considered an integral part of the manhole sidewall, and no separate payment will be allowed therefore.

8. Sealing

The sealing of the joints in the manhole sidewall and inverts of the manhole shall conform to the following specifications for waterproofing and sealing. Safety regulations and precautions set out by the paint manufacturer and OSHA shall be strictly observed.

All joints between sections of precast manhole sidewall shall be sealed with an approved flexible plastic gasket similar to Ram-Nek that shall be applied to

the joint surface prior to the placement of next manhole section. Sufficient gasket shall be used to fill the void in the joint.

9. Stubouts

Provisions for future sewers will be provided by installing a 24" long stubout to the size, line and grade indicated unless shown otherwise on the Plans. Such "stubouts" shall be the "bell" or "hub" end of a joint pipe, conforming to the requirements of the main sewer. The "bell" or "hub" shall be plugged with a disk stopper of the same material and sealed in place with the same joints as specified for the main sewer. All cost involved in placing the "stubouts" shall be included in the Contract unit price for manhole sidewall, and no separate cost will be allowed therefore.

10. Manhole Steps

Manhole steps shall be inserted and securely embedded in the manhole sidewall. Manhole steps shall be considered as an integral part of the manhole sidewall, and no separate payment will be allowed therefore.

11. Vent Pipe Assemblies

The vent pipe shall be located out of a travel way, in back of a curb or sidewalk, or as called for on the plans. Manhole cone to be precast for insertion of vent pipe or cone can be core drilled. Use Kor-N-Seal I & II Toggle Korband Connector for watertight fit.

The top of the vent pipe shall not be less than nine (9) feet above the existing ground line or set to the elevation as indicated on the Contract Drawings.

Concrete foundation for manhole vent pipe assemblies shall be Class "A" concrete as specified in these Specifications. Forms will not be required unless the foundation is located in backfill materials.

H. Concrete Encasement and/or Cradle

Concrete for concrete encasement and/or cradle shall be Class "CB" as specified herein and conforming to the requirements of P.C.A. Specifications for Plain and Reinforced Concrete.

All concrete shall be adequately protected from injurious action of the sun by keeping it wet, covering with water-saturated covering, or other methods satisfactory to the Engineer.

Concrete shall be mixed and placed only when the temperature is at forty degrees

(40°)F. or above and rising, unless specifically authorized by the Engineer, in which event all materials shall be heated in a manner approved by the Engineer. In freezing weather, suitable means shall be provided for maintaining the concrete at a temperature of at least fifty degrees (50°)F for a period not less than seventy-two (72) hours after placing, or until the concrete has hardened. Salt, chemicals, or other foreign materials shall not be mixed with the concrete for the purpose of preventing freezing, unless approved by the Engineer.

Concrete shall be placed before initial set has occurred and in no event after it has contained its water content for more than thirty (30) minutes.

All concrete shall be placed in the dry, upon clean, damp surfaces, free from water, and never upon soft mud or dry earth.

Freshly placed concrete shall be protected from wash by rain, flowing water, mud deposits and other injurious conditions.

Care shall be taken when placing concrete cradle and/or encasement that the sewer pipe is not moved from its proper grade and alignment.

Imperfect or damaged work, or any material damage before final acceptance, shall be satisfactorily replaced by the Contractor at his own expense. Removal and/or replacement of concrete work shall be done in a manner that will not impair its strength.

3.2 TESTING

A. General

It is the intent of these specifications to secure pipe lines with a minimum amount of leakage. All gravity pipelines shall be tested for infiltration; and, if designated in the Specifications, also for exfiltration.

B. Testing of Gravity Sewers

1. Visual Tests

Upon completion of the construction, or earlier if the Engineer deems advisable, the Engineer will make a visual inspection of the sewer and construction site. The Contractor shall immediately repair all leaks and defects found by such inspection.

In addition to general cleanup and leakage, the following standards shall be used to determine failure or defects of this project.

Sewers must be built so as to remain true to line and grade. The inclining grade of the bottom of the sewer after completion shall be such that after flooding the flood water will drain so that no remaining puddle of water will be deeper than

one-half ($\frac{1}{2}$) of an inch on pipe thirty-six (36) inches internal diameter or smaller, and three-quarters ($\frac{3}{4}$) of an inch on pipe larger than thirty-six (36) inches internal diameter. Any section of pipe that does not comply with the specifications at any time previous to final acceptance of the work shall be replaced or relaid at the Contractor's expense.

The Contractor will be held strictly responsible that all parts of the work shall bear the load of the backfill. If cracks one-hundredth ($\frac{1}{100}$) of an inch or larger develop in the reinforced concrete pipe within one year from the date of final acceptance of the work, the Contractor will be required to replace, at his expense, all such pipe defects.

2. Low Pressure Air Tests

A. Positive Pressure Test

Upon completion of construction, or earlier if the Engineer deems advisable, the Contractor will provide the necessary equipment and labor to perform low positive pressure air tests in accordance with the provisions of ASTM C1103.

This test shall be performed in the presence of the Engineer and shall be performed on all types of gravity sewer pipe materials. This test shall also include the house sewer service to the cleanout assembly and service lines from manholes. It is imperative that plugs be installed and braced to prevent blowouts. A 6-psi pressure relief device must be used. No one will be allowed in or near the manholes during pressurization, testing, or depressurization.

B. Negative Pressure Test

Upon completion of construction, or earlier if the Engineer deems advisable, the Contractor will provide the necessary equipment and labor to perform low negative pressure air tests in accordance with the provisions of ASTM C-1214. This test shall be performed in the presence of the Engineer and shall be performed on all types of gravity sewer pipe materials. This test shall also include the house sewer services to the cleanout assembly and service lines from manholes. It is imperative that plugs be installed and braced to prevent blowouts. A 6 psi pressure relief device must be used. No one will be allowed in or near the manholes during pressurization, testing, or depressurization.

3. Infiltration Tests

Ground water above the pipe will reduce air loss. If the section of line under test shows significant infiltration, the Contractor, at no added compensation over the Contract price for the sewers, shall furnish, install and maintain a V-notch sharp crested weir in a wood frame tightly secured at the low end of each sewer lateral and at locations on the main sewers directed by the Engineer. The joints shall

be tight, and visible leakage in the joints or leakage in excess of that specified above shall be repaired at the Contractor's expense by any means found to be necessary. Infiltration testing procedures shall follow ASTM C-969 except that maximum allowable infiltration shall be 25 gallons per mile per inch of diameter of sewer per 24-hour day at any time.

When infiltration is demonstrated to be within the allowable limits, the Contractor shall remove such weirs.

Infiltration tests may be required for the complete line or any portion thereof. Failure of any part of the line to pass an infiltration test shall be sufficient reason to require additional work by the Contractor to reduce the amount of infiltration in such portion of the line tested.

The passing of an infiltration test shall in no way relieve the Contractor of any responsibility to repair visible leaks found during the visual inspection.

4. Internal TV Inspection and/or Smoke Testing

The Contractor is required to conduct an Internal T.V. Inspection using CCTV Unit. The CCTV used must record and display on screen the footage from the center of the manhole it is filming from. The direction the CCTV Unit must use is from upstream to downstream manhole (with the flow, NOT AGAINST) unless otherwise permitted by the City Engineer or his representative. The recorded Internal T.V. Inspection video will be provided to the City Engineer as VHS videotape or in electronic format burnt to a compact disc or digital videodisc. A TV log must be recorded with all pertinent information i.e. day, time, pipe diameter, service locations, blockages, deformed pipe, ect. The contractor may also perform smoke tests as requested by the City Engineer or his representative. No additional cost to the City of Goodlettsville shall be charged by the contractor for either smoke testing or TV inspections. Furthermore, the Contractor will be responsible for correcting all deficiencies discovered by these tests at no additional cost to the City of Goodlettsville. TV Inspection Work (CCTV) will be done once all gravity sewer lines have passed the air pressure and mandrel pull tests and all manholes have passed the vacuum test.

5. Deflection Tests

No pipe will be accepted that has deflected more than 5%. All polyvinyl chloride (PVC) sewer pipe shall pass a go/no-go, mandrel inspection sized as shown in the table below. The test shall be conducted after the pipe is in place and not less than thirty (30) days after the pipe has been completely backfilled. To insure accurate testing, the sewer lines shall be thoroughly cleaned before testing. Any section that fails to pass shall be repaired by rebedding or replacement of the pipe and retested to satisfaction of the Engineer. The mandrel will be provided by the Owner or the Contractor may provide a mandrel approved by the Engineer. The mandrel shall be pulled by hand freely through the sewer pipe

from manhole to manhole.

PVC Pipe Nominal Size <u>Inches</u>	Mandrel Size <u>Inches</u>
8	7.6
10	9.5
12	11.4
16	14.25

C. Testing of Ductile Iron Gravity and/or Pressure Line Sewers

1. Ductile Gravity Sewers

Testing of ductile iron gravity sewers shall be in accordance with paragraph 3.2-B-1, 2, 3 of this Section of these Specifications except that the allowable infiltration and exfiltration shall not exceed 10 gallons per mile per inch of diameter of sewer per 24-hour day at any time.

2. Ductile Iron or Polyvinyl Chloride Pressure Line Sewers

When a stretch of pipe and appurtenances has been completed, the Contractor shall furnish proper appliances and facilities for testing and draining the same without injury to the work or surrounding territory. He shall test by filling the pipe with clean water under the minimum hydrostatic test pressure designated in the specifications. The test pressure shall not be less than 150 psi. No pipe installation will be accepted until the leakage is less than 11.65 gallons per day, per mile, per inch nominal diameter at a pressure of 150 psi. The duration of the test shall be at least 2 hours. The hydrostatic testing shall be performed in accordance with Section 4 of AWWA C-600. The allowable leakage for various diameter pipes at the specified test pressure shall meet the requirements of Table 6 of AWWA C-600. Water for making tests shall be furnished by the Contractor at his expense.

D. Testing of Six-Inch (6") House Sewer Services

All service connections and service lines shall be included in and must satisfy all tests specified to be performed in paragraph 3.2-B of this Section of these Specifications.

E. Manhole Vacuum Test

It will be required that all manholes be subjected to a vacuum test of at least 10" Hg. prior to acceptance by this Department. The test shall be conducted to include the manhole casting (frame) and will be considered acceptable if the vacuum remains at 10" Hg. or drops to no less than 9" Hg. within one (1) minute. If the manhole fails the initial test, the Contractor shall locate the leak and make appropriate repairs, acceptable to the Engineer, in preparation for additional tests.

It is also called to the Contractor's attention that he will be required to furnish all equipment necessary for this test including the manhole sealing apparatus, gauges, pump, plugs and operating personnel.

The cost of this work shall be merged into the unit price bid for manholes, and no additional payment will be allowed.

3.3 MAINTENANCE

Immediately upon completion of each individual sewer line or a 1,500' segment of this sewer line constructed under this Contract, the Contractor shall begin and prosecute to completion the cleanup and property restoration for this particular line. This shall be done prior to the start of another line, unless a written permission is obtained from the Owner and/or Engineer to begin another line. This permission will only be given if the following conditions and situations exists:

The Contractors maintain a sufficient cleanup crew on the project at all times, weather permitting, and that the progress shall be at least equal to the pipe laying progress on the project. The cleanup must be maintained not more than one line or 1,500 feet, whichever is least, behind the pipe laying crew. This shall be subject to weather and ground conditions.

Conditions permitting, property cleanup and restoration shall begin and be prosecuted to completion on a timely basis as set forth herein. Failure by the Contractor to prosecute and complete property cleanup and restoration on a timely basis will result in the withholding of 15% of the payment due for that part of the completed pipe sewer for which cleanup and property restoration has not been accomplished. This 15% withholding constitutes payment for work not completed. This amount shall be in addition to the retained percentage for work completed. This withholding of 15% will continue on subsequent payment estimates until such time as cleanup and property restoration is in compliance.

Cleanup and restoration of areas and facilities disturbed by construction operations shall be considered an integral part of the excavation work, and no separate payment will be allowed therefore except as herein specified.

3.4 Warranty

1. All Sanitary Sewers and Appurtenances, including Pump Stations, are to be warranted for one (1) year. At the eleventh (11th) month all Sanitary Sewers and Appurtenances, including Pump Stations are to be reinspected to insure there are no outstanding problems or issues that have not been resolved.

END OF SECTION

SECTION 03300

CONCRETE

PART 1 GENERAL

1.1 SUMMARY

- A. The work under this heading shall include plain concrete for pipe blocking and encasement, vaults and manholes, and slabs on grade.
- B. The work shall include all necessary protection and curing of the concrete work immediately following the finishing thereof and for as long a period as may be deemed necessary by the Engineer for the proper protection of finished surfaces.
- C. The work shall include all field Engineering required for the work of this section and the design and preliminary testing of the controlled concrete mixes.

1.2 GENERAL REQUIREMENTS

- A. The Contractor shall examine the drawings and specifications for this portion of the work, and for other work affecting his own, and shall report to the Engineer for adjustment of any discrepancies found to exist. He shall check shop drawings to see that they conform to his work and assist other craftsmen in their work.
- B. The Engineer's drawings and schedules show the typical dimensions and form of concrete work and sizes. These drawings show the general design and extent of the concrete work, which shall be installed to meet conditions as intended. The drawings are not intended to serve as shop drawings, nor to show every item in detail.
- C. The Contractor shall have in charge of the work, at all times during construction, a competent superintendent, with experience in this type of construction work. Under the superintendent there shall be one or more foremen in charge of placing and curing concrete.
- D. The Contractor shall lay out all concrete work, and establish correct levels therefore, and be responsible for the accuracy of same. He shall at all times be responsible for the safety of the concrete work. He shall see to it that at no time is the concrete structure subject to loading or overloading, with materials, and apparatus by others, or by his own operations.

1.3 SUBMITTALS

- A. All cement specified is to be mill tested, copies of tests to be furnished to the Engineer. If other tests of cement are required, they will be made as ordered and in such manner as directed by the Engineer, the cost of which will be borne by the

Owner. Such tests shall be made by a laboratory approved by the Engineer and reports of all tests shall be made to the Engineer.

- B. The Contractor shall submit to the Engineer, shop drawings showing details of concrete reinforcing steel, bending details, and other items necessary to proper installation of materials into the completed work.

PART 2 PRODUCTS

2.1 CONCRETE

- A. Concrete for this project will be ready mix. It shall comply with these specifications or with the "Specifications for Ready Mixed Concrete" ASTM Designation C94 for the strengths specified herein for Class A, Class B and Class C concrete.

2.2 PROPORTIONS FOR CONCRETE

- A. Concrete shall be composed of fine aggregate, coarse aggregate, Portland cement, admixture and water. The Contractor shall have available all equipment necessary to positively determine and control the actual amounts of all materials entering into the concrete, and shall provide sieves for analysis of aggregates. He shall have the supplier make sieve analysis of aggregates and demonstrate method of weighing aggregates as often as the Engineer requests same, in order to determine that the concrete is in accordance with the requirements of the specifications.
- B. The mix shall be designed to secure concrete having the following minimum compressive strength at the age of 7, and 28 days as determined by breaking test specimens in accordance with procedure set forth in the ASTM Designation C39 except where otherwise specified.

Class of Concrete	"A"	"B"	"C"
Gals. Water per sack of cement	5.0	5.5	8.0
Min.bags cement per cubic yard of concrete	6.5	5.75	4.5
Min.28 day strength 1 cylinder lbs. per sq. inch			3800
			2800 1800
Min.28 day strength average for 5 cylinders lbs. per sq. inch			4500
			3500 2000
Slump in inches	1-4	2-4	1-4

Suitable means shall be provided for controlling and accurately measuring the

water. Free water or moisture carried by aggregates shall be included as part of the mixing water.

- C. The strengths and slumps shall be specified. The concrete mixture shall be so designed that the materials will not segregate and excessive bleeding will not occur.
- D. At the outset of the work full size or trial batches shall be run to determine the most desirable combination of aggregates to secure the desired results. Proportioning of aggregates shall be carefully done by scales or by containers of known capacity and the effect of contained moisture as to bulking and weight must be compensated for. When the proper combination of aggregates has been established, care shall be exercised to proportion accordingly so long as the aggregate supply remains constant. Should the type of aggregate available be changed, new proportioning standards shall be established by trial before continuing the operations.
- E. The above proportions are based on the use of gravel for course aggregate. If other course aggregate is used, proportions will be adjusted accordingly. All materials shall be measured by weight except the water and cement may be measured by volume when so authorized by the Engineer. One standard bag of Portland Cement will be considered as 94 pounds in weight, and one gallon of water as 8.33 pounds.
- F. The proportions in all mixture, to meet the essential requirements, must be such that the sand and cement form a rich, strong mortar, sufficient to thoroughly bond in the course aggregate making it inert in the mass when set.

2.3 WATER CONTENT

- A. The amount of water to be used in mixing concrete shall at all times be the minimum amount necessary to produce a plastic mixture of the strength specified, of the desired density, uniformity and workability.

In general, the consistency of any load of concrete shall be that required for the specified placing conditions and method of placement; from 2 inches to 4 inches for concrete poured directly into the trench, when such slump tests are made in accordance with the ASTM requirements therefore.

- B. The matter of regulating the water content in concrete is of importance to the job from the standpoint of placing same to obtain the greatest density and to secure the necessary strength. The Contractor shall see that this detail is properly supervised. Where the desired results are not being obtained, the Engineer may direct changes in the water control.

2.4 REINFORCING STEEL

- A. Reinforcing steel shall have minimum yield strength of 60,000 psi with a nominal

allowable stress of 24,000 psi. No foreign steel will be allowed. Steel shall be free of rust and corrosion.

PART 3 EXECUTION

3.1 PLACING CONCRETE

All concrete shall be adequately protected from injurious action of the sun by keeping it wet, covering with water-saturated covering, or other methods satisfactory to the Engineer.

Concrete shall be mixed and placed only when the temperature is at forty degrees (40°) F. or above and rising, unless specifically authorized by the Engineer, in which event all materials shall be heated in a manner approved by the Engineer. In freezing weather, suitable means shall be provided for maintaining the concrete at a temperature of at least fifty degrees (50°) F. for a period not less than seventy-two (72) hours after placing, or until the concrete has hardened. Salt, chemicals, or other foreign materials shall not be mixed with the concrete for the purpose of preventing freezing, unless approved by the Engineer.

Concrete shall be placed before initial set has occurred and in no event after it has contained its water content for more than thirty (30) minutes.

All concrete shall be placed in the dry, upon clean, damp surfaces, free from water, and never upon soft mud or dry earth.

Freshly placed concrete shall be protected from wash by rain, flowing water, mud deposits and other injurious conditions.

Care shall be taken when placing concrete cradle and/or encasement around pipe that the pipe is not moved from its proper grade and alignment.

Imperfect or damaged work, or any material damage before final acceptance, shall be satisfactorily replaced by the Contractor at his own expense. Removal and/or replacement of concrete work shall be done in a manner that will not impair its strength.

3.2 SOIL AND WATER CONDITIONS

- A. Under no circumstances shall any footings for piers, columns, foundations, or bearing walls be started on soft or filled ground. Soil shall be moist; but not muddy, at time of placing concrete. Contractor shall secure the Engineer's approval of the soil condition for all footings before they are poured.
- B. Concrete shall not be poured on frozen earth or trench bottoms. Temporary coverings of tarpaulins, or otherwise, shall be installed over excavations made during weather in which temperatures are below freezing in order to keep frost out

of the excavation or subgrade. Should the bottom of excavations be frozen prior to pouring concrete, the same shall be excavated to remove frozen material.

- C. Excavations for concrete construction below grade shall be protected from surface water entering same by banking the spoil around or alongside the excavation made. Subsurface water entering the excavation shall be removed by pumping and bailing. No concrete shall be placed under water at any time, nor shall water be permitted to flow through or over freshly placed concrete.

3.3 STORAGE OF MATERIALS

- A. There should be no need for storage of concrete materials where all concrete will be ready mixed.
- B. Reinforcing steel shall be laid out systematically in accordance with the identification tags thereon in the order required for the construction and protected. Heavy timbers shall be laid at intervals for support of the steel and to keep same off the ground. No heavy materials shall be piled or laid upon reinforcement to bend or deform its shape in any way. The Contractor shall assign a space on the site of ample size and accessible to the work for storage, handling, assorting, etc., of the steel and the space shall be maintained in a neat and orderly manner.

3.4 WORK IN COLD AND HOT WEATHER

- A. Concrete work done in cold or freezing weather shall be protected by steam coils or dutch-ovens for uniformly heating the aggregates before same are mixed, by heating the mixing water, and by heat applied to the concrete mixture after placing. No frosty or frozen aggregates shall be used at any time. The use of salt, chemicals, or so-called anti-freezing compounds in the concrete is prohibited.
- B. Concrete shall not be placed during or immediately after protracted periods of freezing weather; unless special precautions are taken to free all materials to be used from frost and ice, and to prevent freshly placed concrete from freezing before it has sufficiently hardened. The temperature of the concrete shall be maintained not below fifty degrees (50°) F. for a period of 72 hours after same is placed.
- C. Concrete placed below grade shall be protected from formation of ice thereon for a period of 30 days after placing.
- D. Contractor shall provide all equipment and fuel needed for any heating that may be required as well as the necessary labor and watchmen to attend fires and insure proper heating at all times, both day and night. The Contractor shall keep himself informed as to weather predictions and endeavor to plan his pouring operations so as to avoid the necessity of cold weather precautions insofar as possible.
- E. In hot weather, concrete must be kept wet until thoroughly set. During extremely hot weather the coarse aggregate shall be sprayed frequently to utilize the cooling

effect of evaporation and the coolest water available used for mixing.

3.5 INSPECTION

- A. No concrete shall be placed until area for placement, including the steel tied in place, has been inspected and approved by the Engineer. The work shall be open at all times for inspection by the public authorities and the Owner. Ways and means shall be provided by the Contractor at all times for access to all parts of the work for inspection by the Engineer and others in authority, such provision to be safe and secure as necessary and demanded.

3.6 PLACING REINFORCEMENT

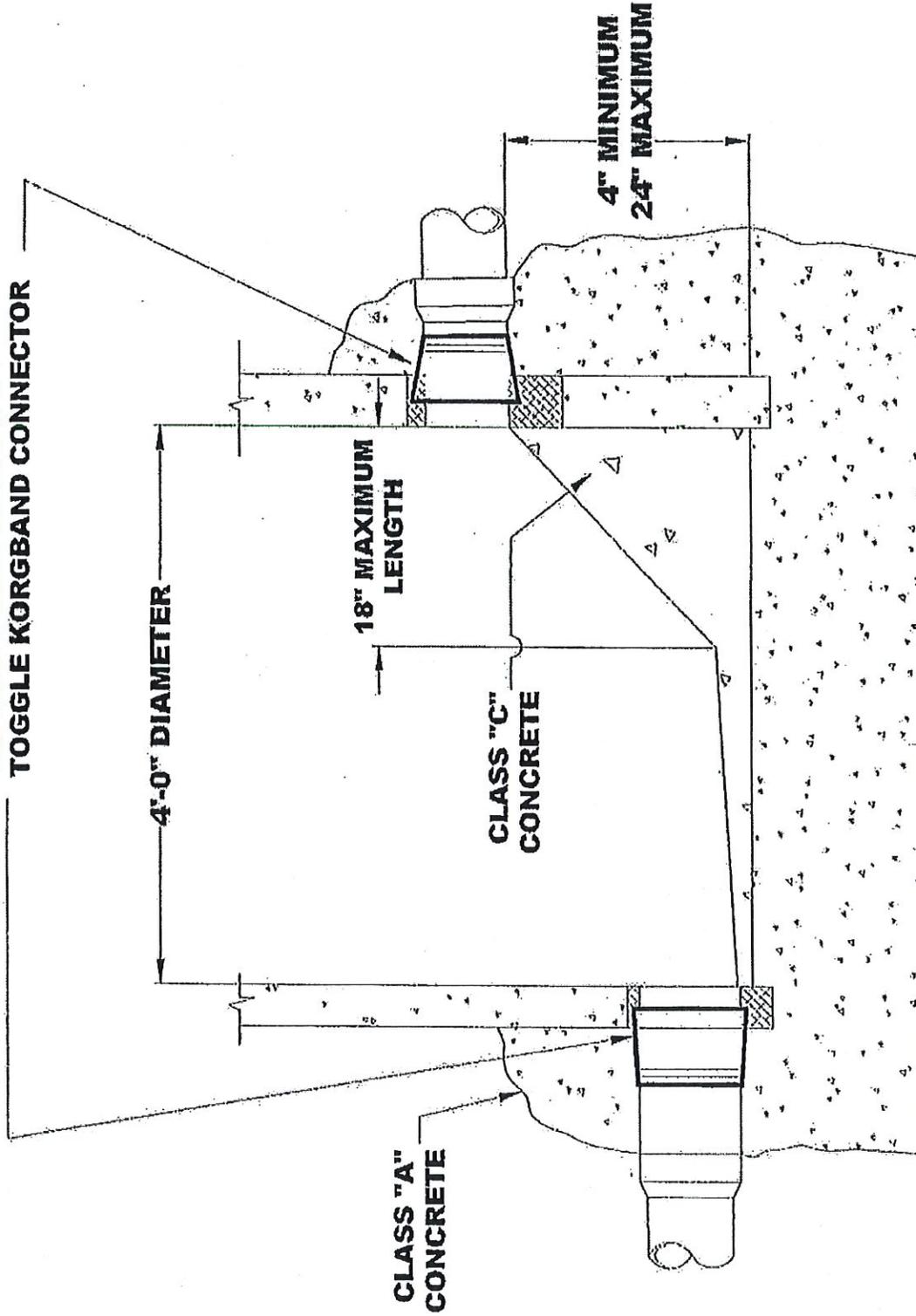
- A. Metal reinforcement before placing shall be thoroughly cleaned of mill scale, rust and coatings that would destroy or reduce the bond. Bars shall be of the required size, fabricated to the required shape and form.
- B. The Contractor shall receive reinforcement on the job and lay out bars according to identification in good order to expedite location for placing in permanent position. Reinforcement bars or members shall have identification tags attached, corresponding to marks or numbers designated for same on the approved shop drawings. Reinforcement shall be stored and supported above grade in a horizontal position in such manner that the shape is not distorted. In no case shall reinforcement be stored directly in contact with the ground surface.
- C. The workmen responsible for placing the reinforcement shall be supplied with adequate copies of the drawings and bar lists. Heating of reinforcement for bending on the job will not be permitted. Openings framed out of concrete slabs and walls shall be properly reinforced, and dowels and keyways provided so as not to weaken the construction.
- D. Metal reinforcement shall be accurately positioned and secured against displacement by using tie wires of annealed wire not less than No. 16 gauge, or suitable clips at all intersections, and shall be supported in a manner that will keep all metal away from the exposed surfaces of the walls or members.
- E. The minimum clear distance between any bar and the weather side of all exterior concrete shall be 2 inches. Not less than 1/2 inch coverage shall be provided for bars in concrete footings and wall footings.
- F. The placing of reinforcement shall be carefully done, bars accurately spaced and held in required position by tie wires and chair supports. Whenever concrete is being poured, a workman shall be on hand to see that the reinforcing steel is not displaced during the operation, and to hook the reinforcement up into its required position.

3.7 CONSTRUCTION JOINTS

- A. Construction joints shall be horizontal or vertical and keyways installed as shown on the drawings or as directed by the Engineer. Joints not indicated on the drawings shall be so made and located as to least impair the strength and appearance of the structure. Where a horizontal joint is to be made, any excess water and laitance shall be removed from the surface after concrete is deposited. Before depositing of concrete is resumed, the hardened surface shall be cleared and roughened, all weak concrete removed, and the joint grouted with neat cement and water.

END OF SECTION

INSTALL KOR-N-SEAL I & II
TOGGLE KORBAND CONNECTOR



4" TO 24" DROP STRUCTURE INVERT DETAIL

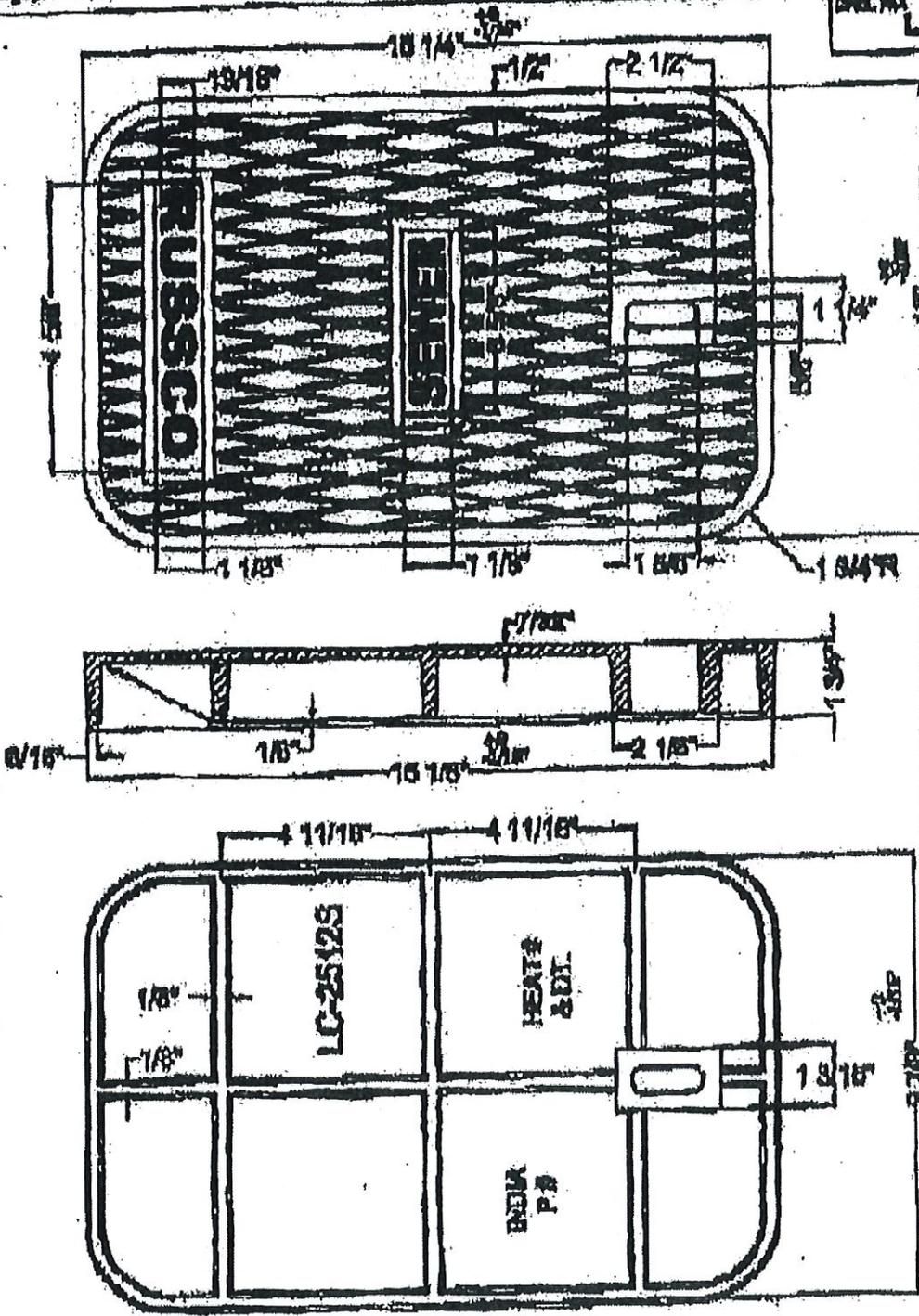
NOTE: SEE STANDARD PRECAST MANHOLE FOR TYPICAL DIMENSIONS.

700 East Main Drive
 Crystal Springs, NJ 08874

SIGMA
 CORPORATION

LC-2512S

EASEMENT Cleanout LID



BOX AND LID CAN BE PURCHASED AT:
 NATIONAL WATERWORKS
 120 FERRO DR.
 NASHVILLE, TN 37207
 615-226-9632 OFFICE
 615-227-8676 FAX
 MANGER: CHARLIE NORMAN 4/11/97

MATERIAL: Cast Iron		DESCRIPTION: C. I. "RUSSCO" "SEWER" LID ONLY	
FINISH: PAINTED		WEIGHT: 17 LBS.	APPROV. OR: [Signature]
DEV. BY: [Signature]	DESIGNED BY: [Signature]	MANUFACT.:	
RASANTA DAS,	ASHIS DEY,		



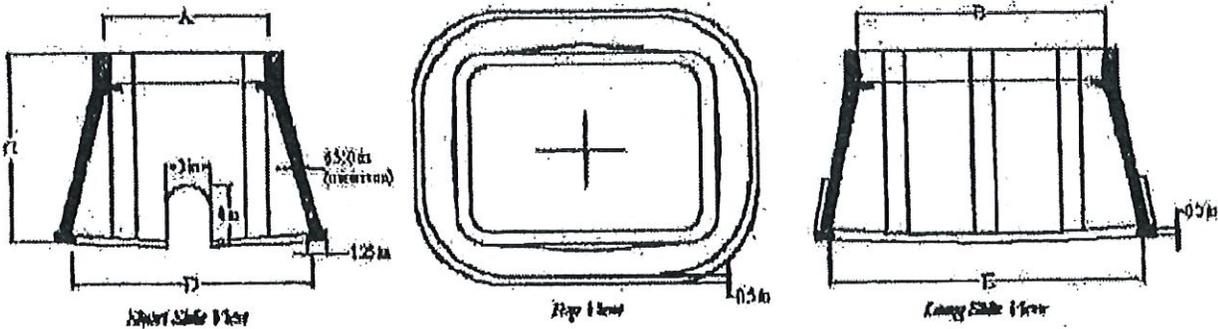
Mid-States Plastics, Inc.

Customer Service: KY 800-444-7615 TX 800-821-8554

Fax: KY 858-408-7010 TX 936-760-1357

Web: www.ms-meter-boxes.com Email: productinfo@msmeterboxes.com

MSBC Series Meter Boxes EASEMENT Cleanout BOX



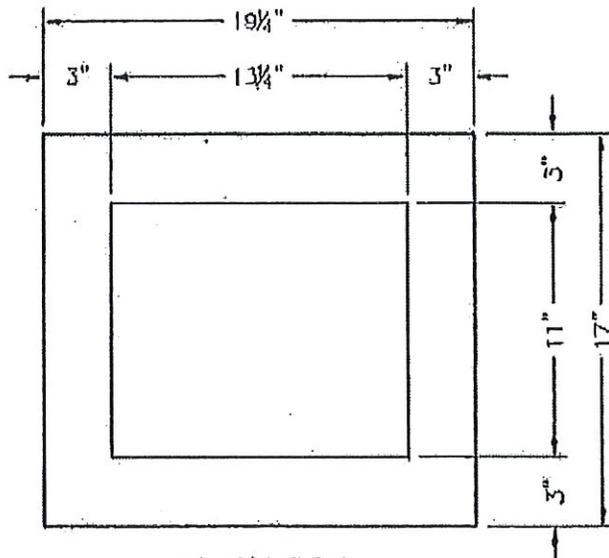
Part Number	A	B	C	D	E	Weight
MSBC1015-12	10.25"	15.5"	12"	15.5"	20.75"	13 lbs
MSBC1015-18	10.25"	15.5"	18"	15.5"	20.75"	20 lbs
MSBC1015-24	10.25"	15.5"	24"	15.5"	20.75"	26 lbs
MSBC1118-12	11.25"	18.125"	12"	16.75"	23.125"	18 lbs
MSBC1118-26	11.25"	18.125"	26"	16.75"	23.125"	30 lbs
MSBC1416-12	14.5"	16.5"	12"	17"	17.5"	14 lbs
MSBC1324-13	13.75"	23.1875"	12"	19"	27.625"	23 lbs
MSBC1710-18	17.625"	30.5"	18"	22.875"	35"	40 lbs

All dimensions and weights are nominal and subject to change without notice

Typical Specification:

The meter box shall be high-density Polyethylene of one-piece molded construction for durability and impact strength with dimensions as shown in the referenced drawing. The meter box must have a minimum wall thickness of .550" and have been tested to withstand a 15,000 lb, vertical load freestanding and a 200lb side load, applied with a 4"x4" plate 1" down for the top center of the box, without deflecting more than 1". All edges shall be clean and smooth for safety during handling and installation. Inner and outer walls are to be smooth with a bright white interior to ease meter reading with a black exterior to retard UV degradation. The meter box shall have an anti-settling flange on the bottom for stability and pre-molded pipe entry areas on each end. The box shall weigh no more than listed weight for each meter size for safety and ease of handling, transport and installation. The meter box shall be MSBC style as manufactured by Mid-States Plastics Inc. or equal.

TRAFFIC BEARING CLEANOUT BOX

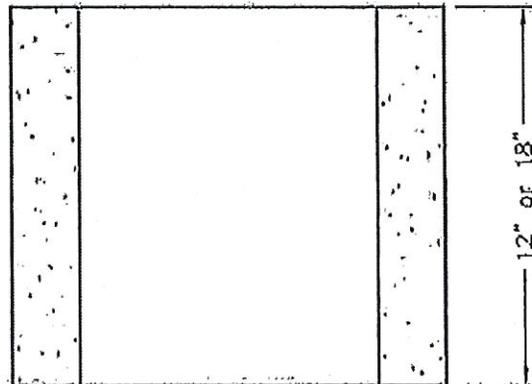
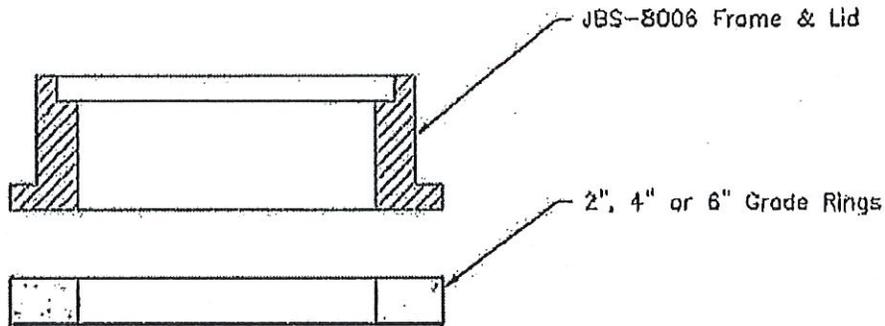


PLAN VIEW

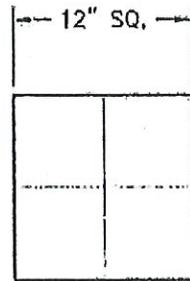
Concrete: 4500 psi @ 28 Days

Weights:

2" GR	- 32 Lbs.
4" GR	- 63 Lbs.
6" GR	- 95 Lbs.
12" Box	- 189 Lbs.
18" Box	- 283 Lbs.



SECTION VIEW



FOOTER BLOCK
(4" Thick)

SCALE: 1 1/2" = 1'-0"



125 International Blvd., LaVerne, IN 37086
Phone: 615-793-1920 Fax: 615-793-9625

VALVE

FILE NAME: 382UWMVALVE_DET.DWG

ISSUE DATE: January 2002

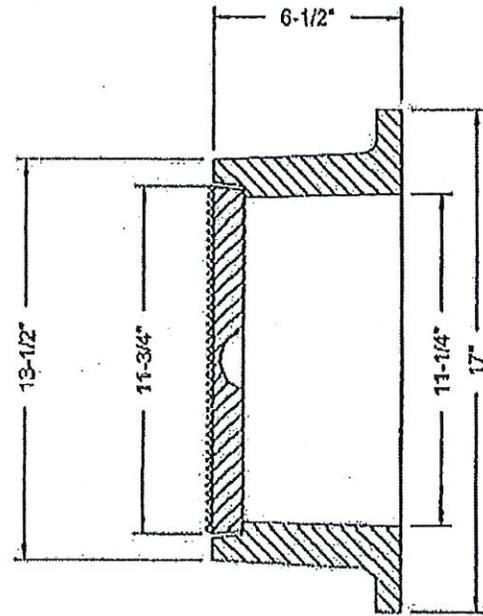
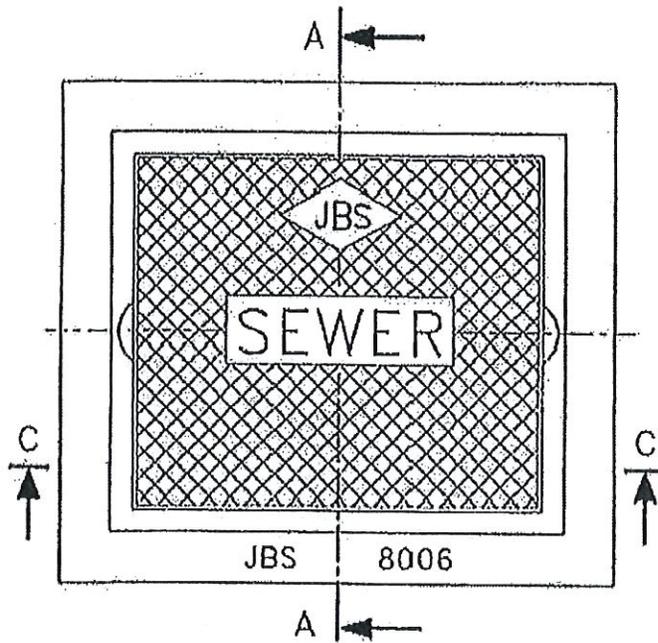
www.oldcastleprecast.com

Valve Box

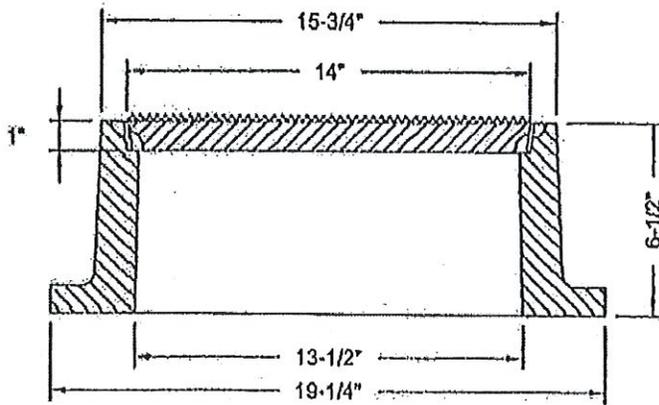
Part # UT-045

Copyright © 2002 Oldcastle Precast, Inc.

Traffic Bearing Cleanout Frame & Cover



SECTION A - A



SECTION C - C

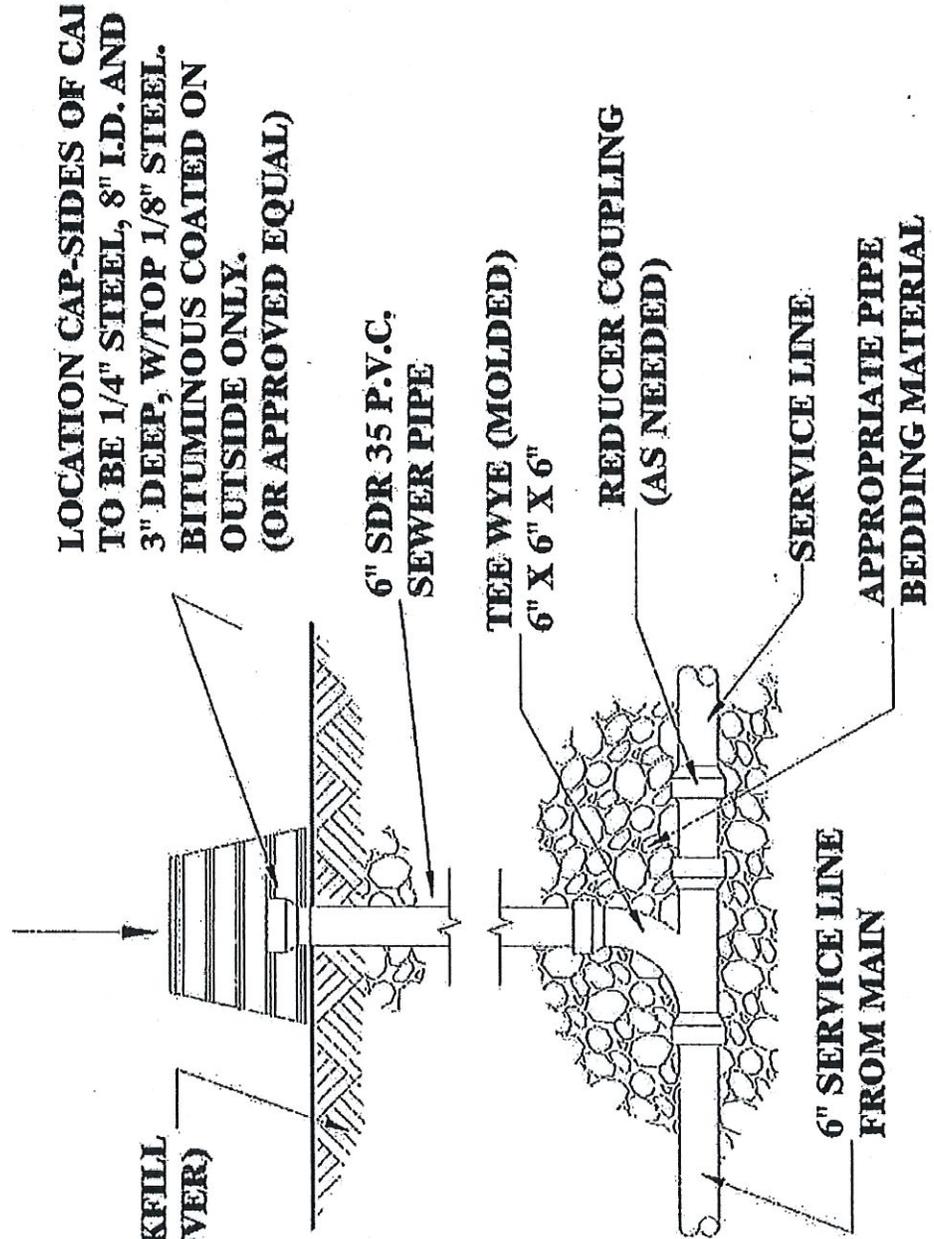
METRO STANDARD
TRAFFIC DUTY

John Bouchard & Sons Co.

1024 Harrison Street, Nashville, TN 37203
Tel: 615-256-0112 Fax: 615-327-2427

8006 FRAME & COVER

6" Cleanout Box-Traffic Bearing or Easement-See Cleanout Detail Drawings



LOCATION CAP-SIDES OF CLEANOUT TO BE 1/4" STEEL, 8" I.D. AND 3" DEEP, W/TOP 1/8" STEEL. BITUMINOUS COATED ON OUTSIDE ONLY. (OR APPROVED EQUAL)

DIRT BACKFILL (HAND COVER)

6" SDR 35 P.V.C. SEWER PIPE

TEE WYE (MOLDED) 6" X 6" X 6"

REDUCER COUPLING (AS NEEDED)

SERVICE LINE

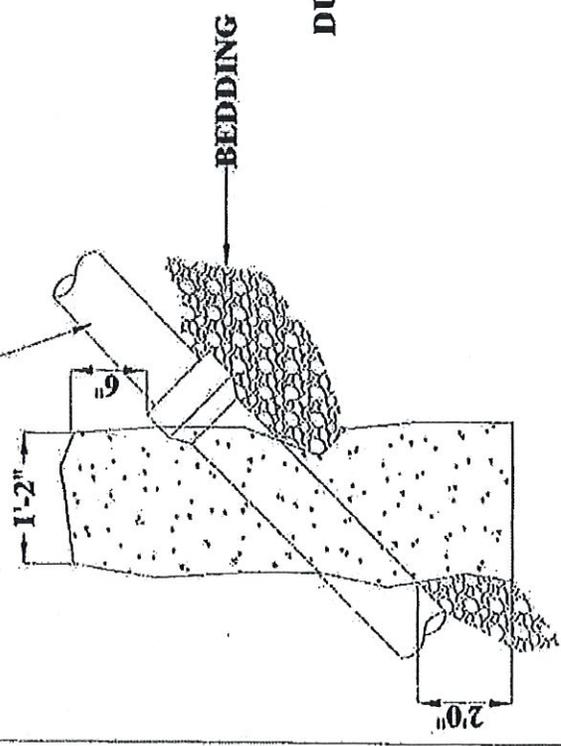
APPROPRIATE PIPE BEDDING MATERIAL

6" SERVICE LINE FROM MAIN

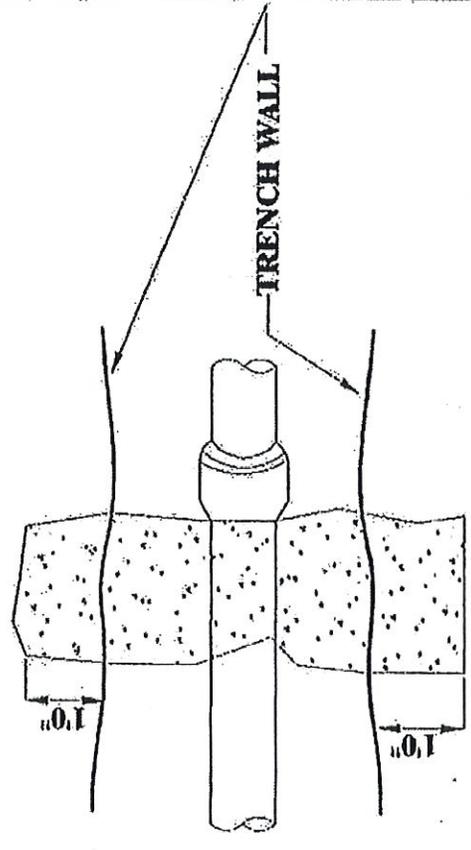
- NOTES:**
- 1. ALL FITTINGS AND LINES TO BE P.V.C. SOLVENT WELD (STANDARD DIMENSION RATION 35)**
 - 2. WHEN SERVICE LINE FROM MAIN LINE IS 4", ALL FITTINGS AND LINES TO BE 4" (SCHEDULE 40).**

CLEANOUT

DUCTILE IRON PIPE



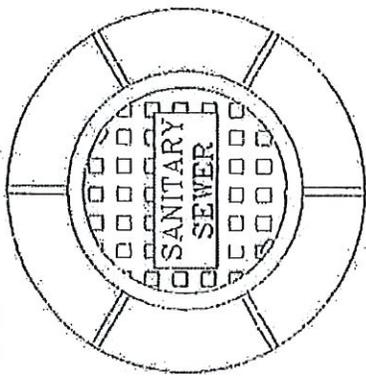
SECTIONAL VIEW



PLAN VIEW

DUCTILE IRON PIPE

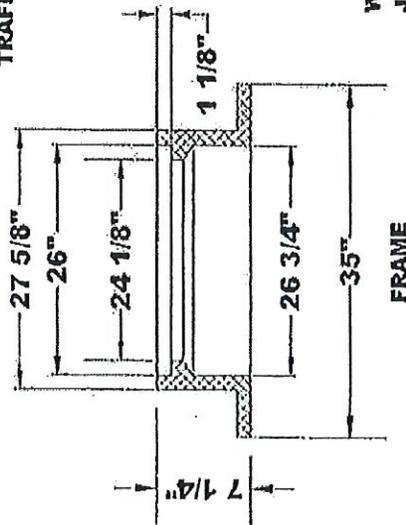
COLLAR DETAIL



TRAFFIC:
JOHN BOUCHARD & SONS #1150

APPROXIMATE FRAME &
COVER WEIGHT: 415 LBS.
TRAFFIC (JOHN BOUCHARD & SONS)

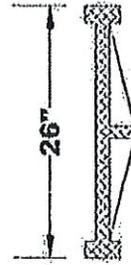
PLAN



FRAME

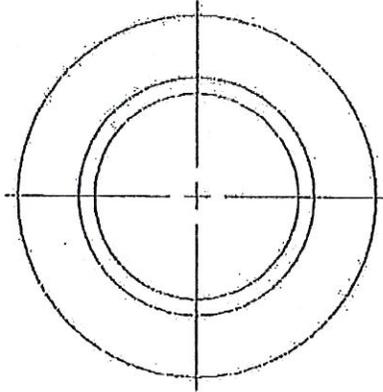
WATERTIGHT:
JOHN BOUCHARD & SONS
#1123

APPROXIMATE FRAME &
COVER WEIGHT: 535 LBS.

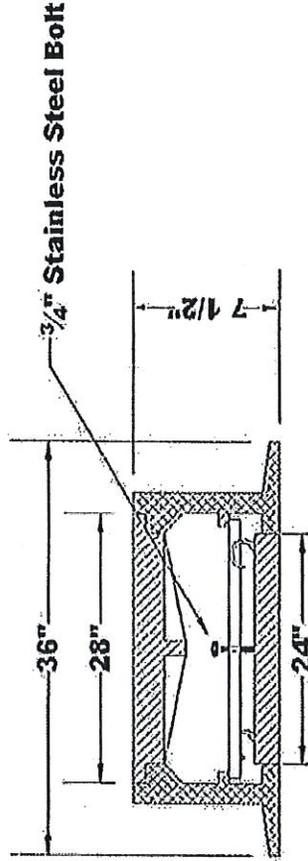


COVER

STANDARD TYPE



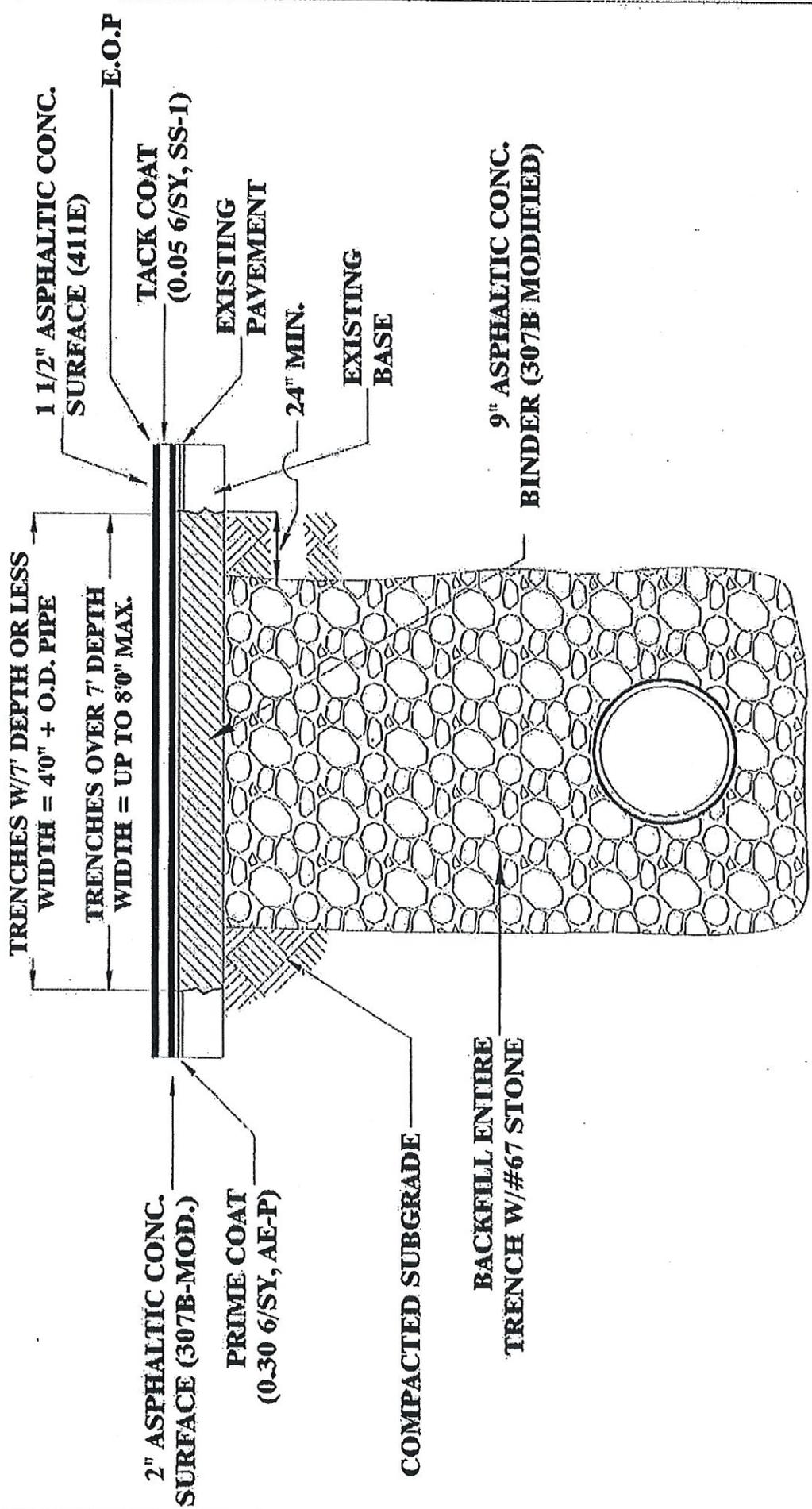
PLAN



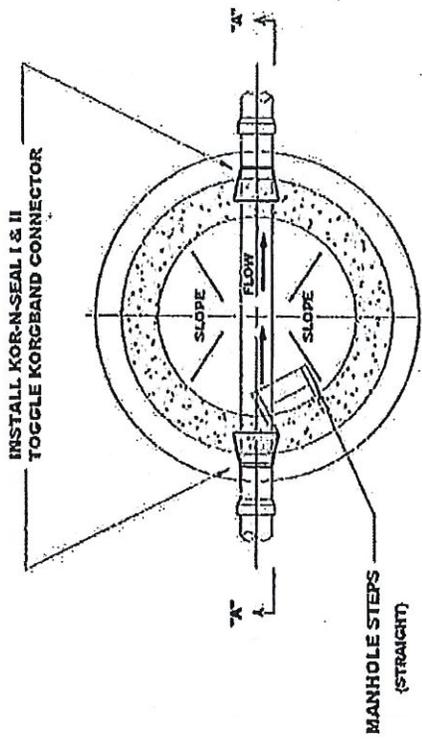
FRAME & COVER
WATERTIGHT TYPE

MANHOLE FRAMES AND COVERS

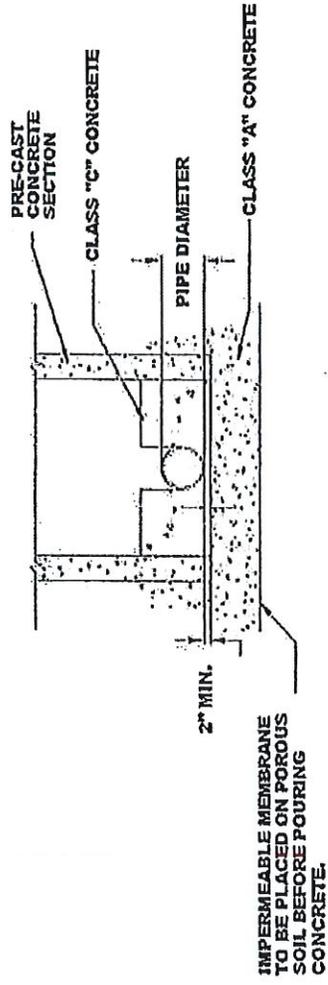
NOT TO SCALE



FULL WIDTH PAVEMENT REPLACEMENT



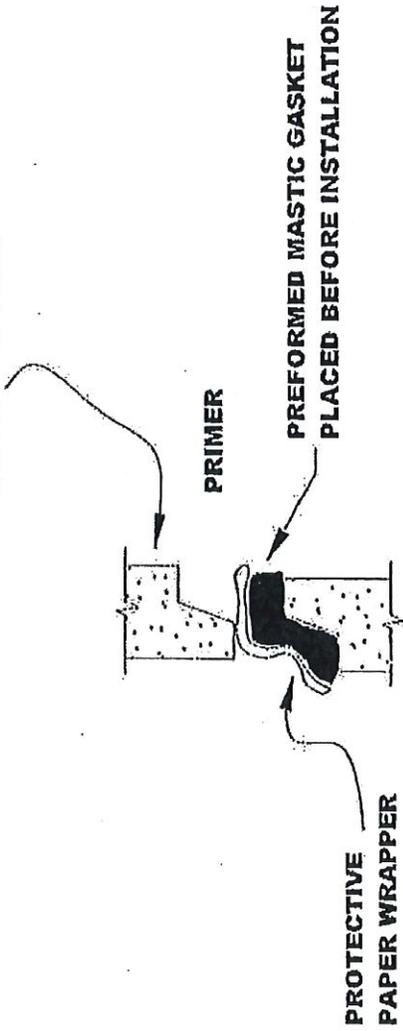
PLAN VIEW



ELEVATION SECTION "B-B"

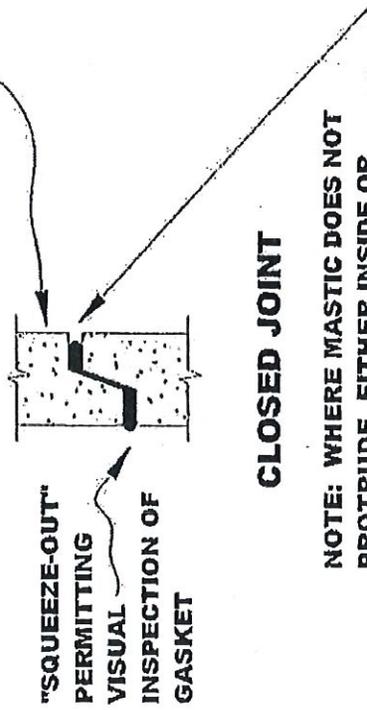
NOTE: CONCRETE WILL BE READY MIX AND SHALL COMPLY WITH THE SPECIFICATIONS ASTM DESIGNATION 94 FOR THE CLASSES A, B, AND C AS OUTLINED IN THE STANDARD SPECS.

PRECAST M.H. SECTION

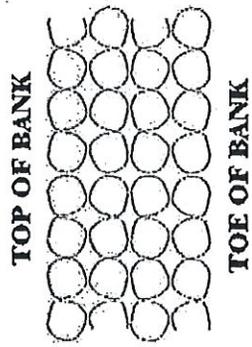


OPEN JOINT

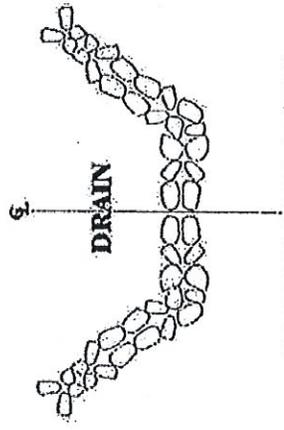
PRECAST M.H. SECTION



DETAILS OF MASTIC GASKET FOR PRECAST MANHOLE SECTIONS



PLAN VIEW



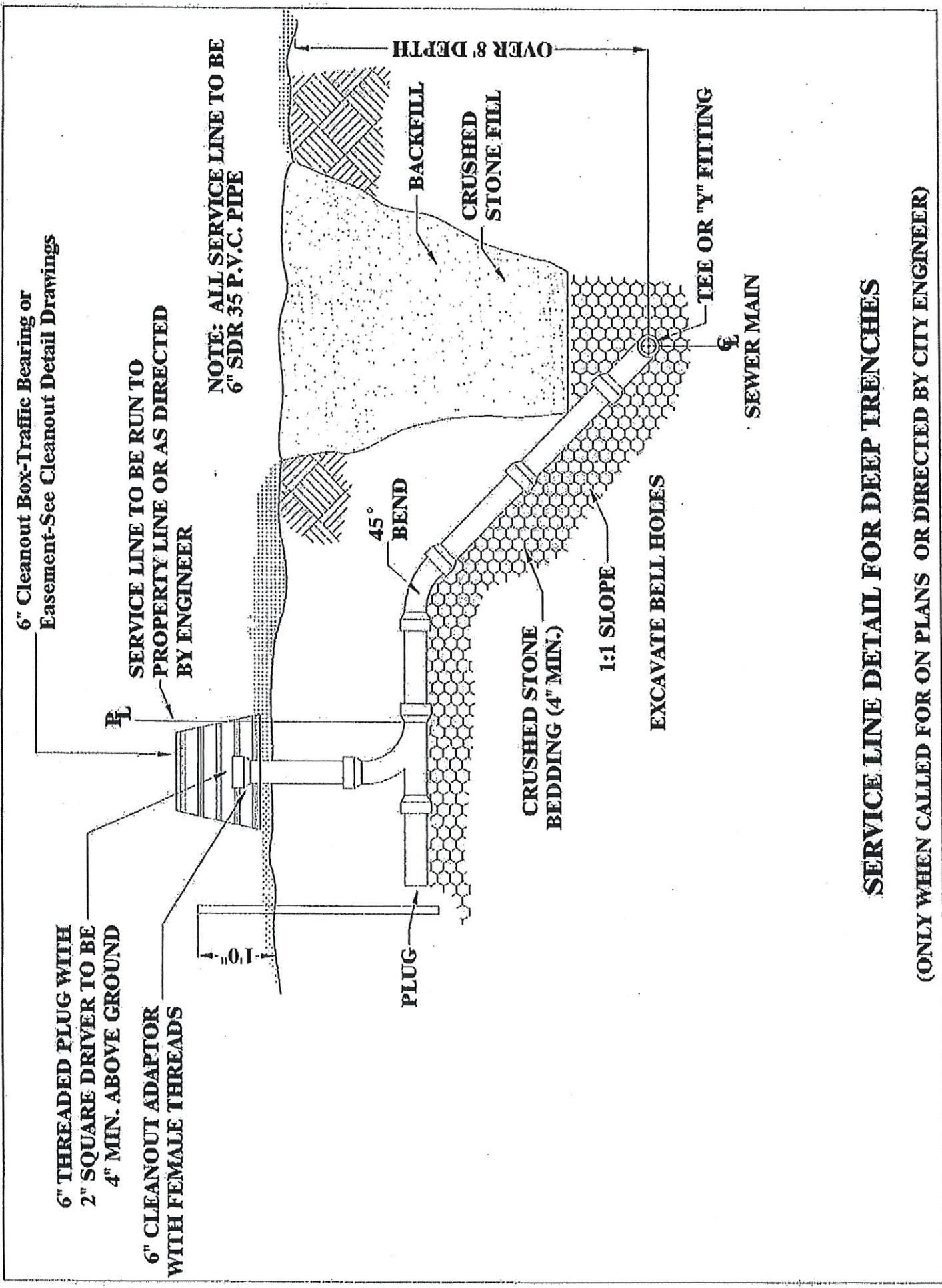
SECTIONAL VIEW

NOTE: FACE OF RIP-RAP IS TO BE FLUSH WITH SIDES AND BOTTOM OF DRAIN

RIP-RAP STABILIZATION WHERE NOTED WILL CONSIST OF HAND-PLACED NATIVE LIMESTONE, HAVING A MAXIMUM LENGTH/WIDTH DIMENSION OF 12" IN EITHER DIRECTION AND A MAXIMUM THICKNESS OF 6". TREATMENT WILL BE PLACED IN TWO INTERLOCKING (NESTING) LAYERS. RIP-RAP SHALL BE PLACED FOR THE FULL WIDTH OF AREA DISTURBED BY PIPE LAYING OPERATIONS. LIMIT OF WIDTH FOR PAYMENT OF RIP-RAP SHALL BE AS FOLLOWS:

PIPE DIAMETER	RIP-RAP WIDTH
8"	5'
10"	5.5'
12"	6'
15"-16"	8'
18"	8.5'
21"	9'
24"	10'

RIP-RAP DETAIL



SERVICE LINE DETAIL FOR DEEP TRENCHES

(ONLY WHEN CALLED FOR ON PLANS OR DIRECTED BY CITY ENGINEER)

1. BACKFILL ON SERVICE LINES TO BE AS DESCRIBED IN PROJECT SPECS.
2. SERVICE LINES FOR DEEP TRENCHES TO BE USED WHERE SHOWN ON PLANS OR AS DIRECTED BY ENGINEER. SERVICE FOR DEEP TRENCHES SHALL BE CONSTRUCTED AS SHOWN IN DETAIL ABOVE IN LIEU OF VERTICAL STACKS ENCASED IN CONCRETE.
3. BATTER BOARDS NO REQUIRED FOR LAYING PIPE, BUT GRADE TO BE REASONABLY UNIFORM AND ALIGNMENT STRAIGHT. GRADE SHALL BE THAT WHICH IS SUFFICIENT TO PROVIDE SERVICE TO BUILDING OR AS DIRECTED BY ENGINEER WITH MINIMUM TO BE THAT ALLOWED BY LOCAL PLUMBING CODE OR 1/8" PER FOOT MINIMUM OR AS NOTED ON PLANS.
4. MARKING ROD SHALL EXTEND FROM BOTTOM OF END OF SERVICE LINE TO 1'0" ABOVE GROUND.

SERVICE LINE TRENCHING DETAILS

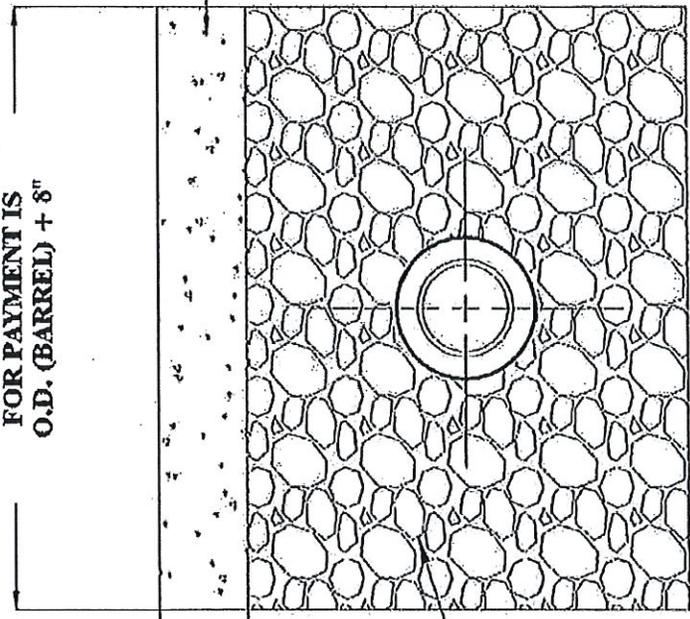
HORIZONTAL WIDTH LIMIT
FOR PAYMENT IS
O.D. (BARREL) + 8"

CLASS "B" CONCRETE

NOTE: CONCRETE TO BE
POURED TO LIMITS OF
TRENCH REGARDLESS
OF WIDTH.

6" MIN.

PIPE ENVELOPE
8" ABOVE PIPE
6" ON THE BOTH SIDES OF THE PIPE
6" BELOW THE PIPE



STANDARD CONCRETE CAP

ALL SEWER LINE LAID ACROSS CREEKS SHALL BE D.I.P. IN CONJUNCTION WITH THE STANDARD CONCRETE ENCASEMENT.

CLASS "B" CONCRETE

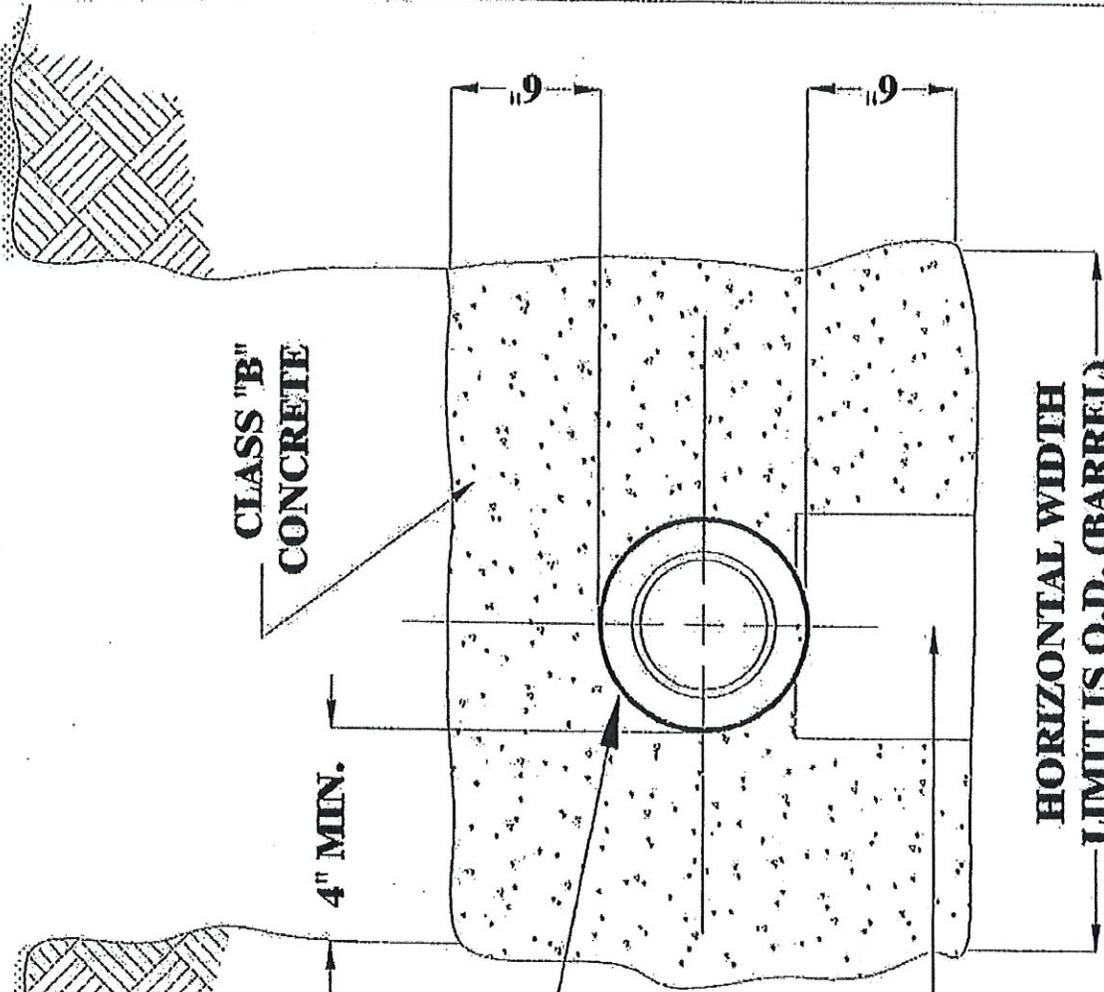
4" MIN.

NOTE: CONCRETE IS TO BE Poured TO LIMITS OF TRENCH EXCAVATION REGARDLESS OF WIDTH OR DEPTH.

PRECAST CONCRETE BLOCK BEHIND EACH BELL.

HORIZONTAL WIDTH LIMIT IS O.D. (BARREL) PLUS 8"

STANDARD CONCRETE ENCASEMENT



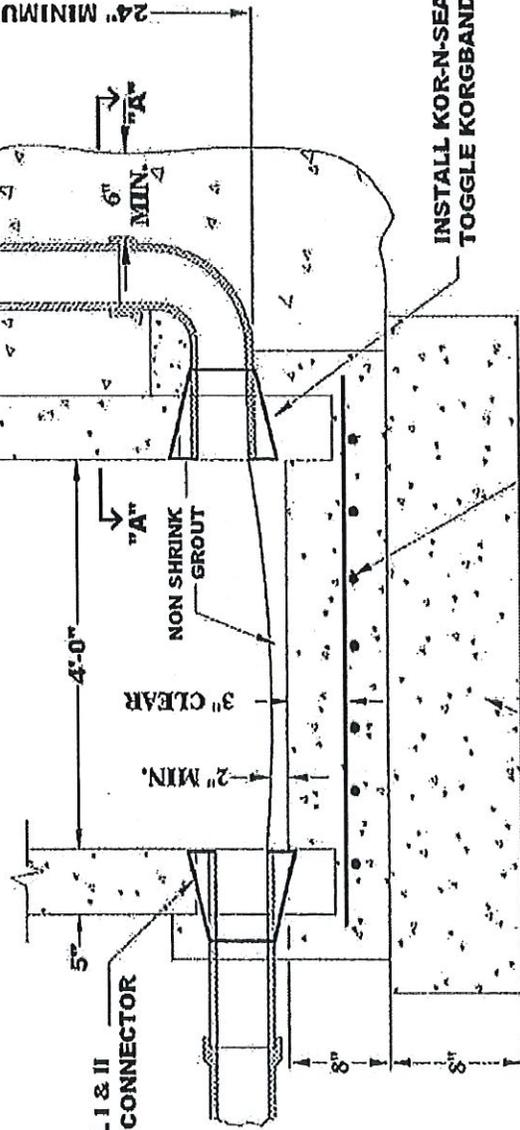
NOTE: DROP PIPE DIAMETER
TO BE SAME AS INCOMING
LINE DIAMETER.

CLASS "C" CONCRETE
ENCASEMENT



24" MINIMUM

INSTALL KOR-N-SEAL I & II
TOGGLE KORBAND CONNECTOR

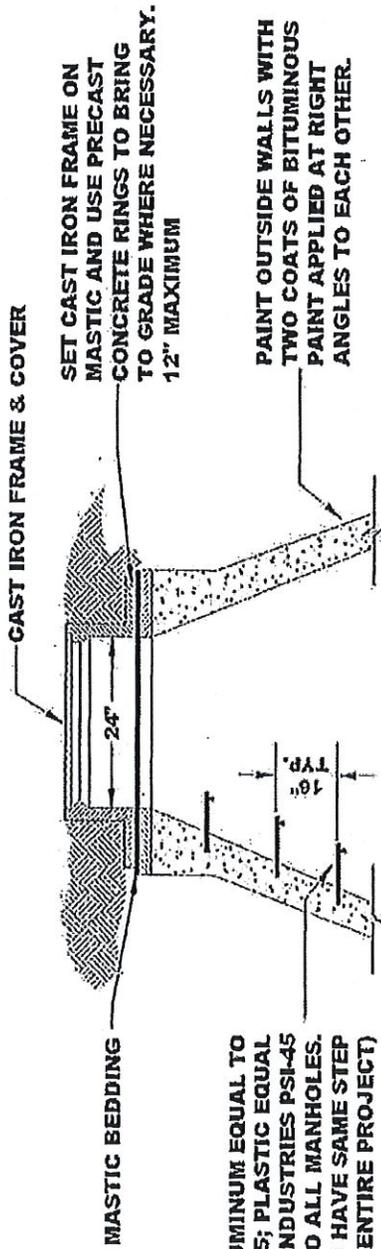


INSTALL KOR-N-SEAL I & II
TOGGLE KORBAND CONNECTOR

NO. 4'S @ 10" EACH WAY FOR
M.H.'S 14' DEEP AND OVER

6'-0" X 8'-0" X 8" THICK PAD
FOR MANHOLES 14' DEEP OR MORE

STANDARD DROP STRUCTURE

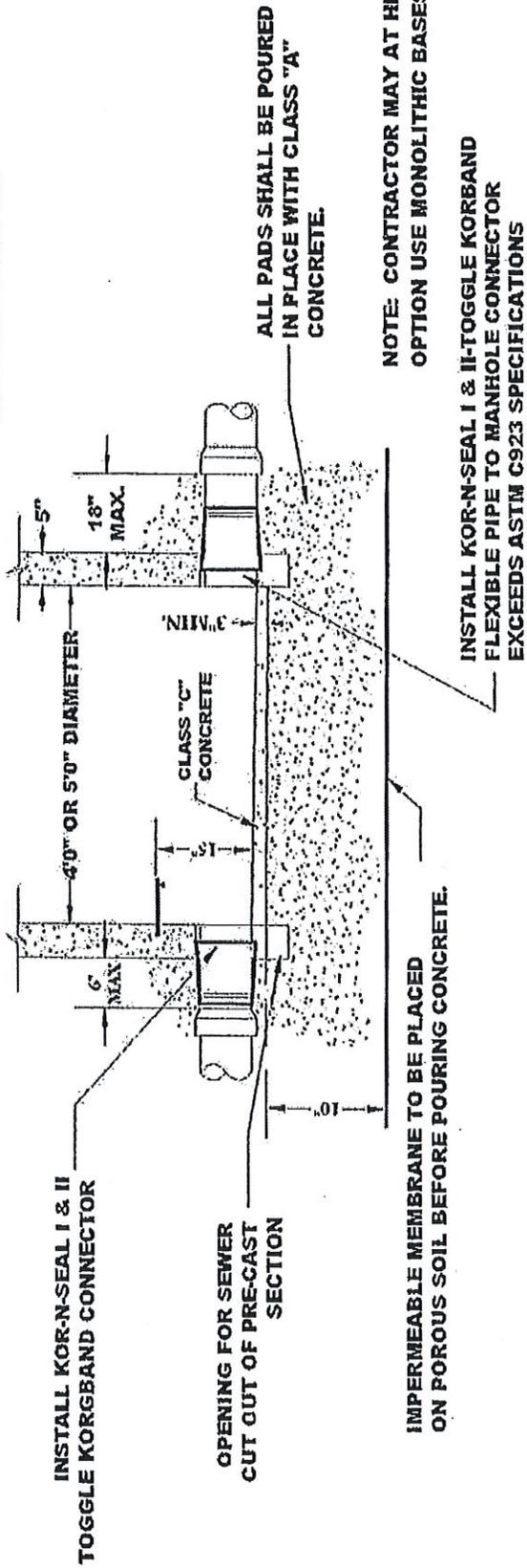


SET CAST IRON FRAME ON MASTIC AND USE PRECAST CONCRETE RINGS TO BRING TO GRADE WHERE NECESSARY. 12" MAXIMUM

PAINT OUTSIDE WALLS WITH TWO COATS OF BITUMINOUS PAINT APPLIED AT RIGHT ANGLES TO EACH OTHER.

STEPS TO BE ALUMINUM EQUAL TO ALCOA NO. 15295; PLASTIC EQUAL TO M.A. INDUSTRIES PSI-45 APPLICABLE TO ALL MANHOLES. (EACH M.H. TO HAVE SAME STEP MATERIALS FOR ENTIRE PROJECT)

PRECAST CONCRETE MANHOLE SECTIONS ASTM C-478

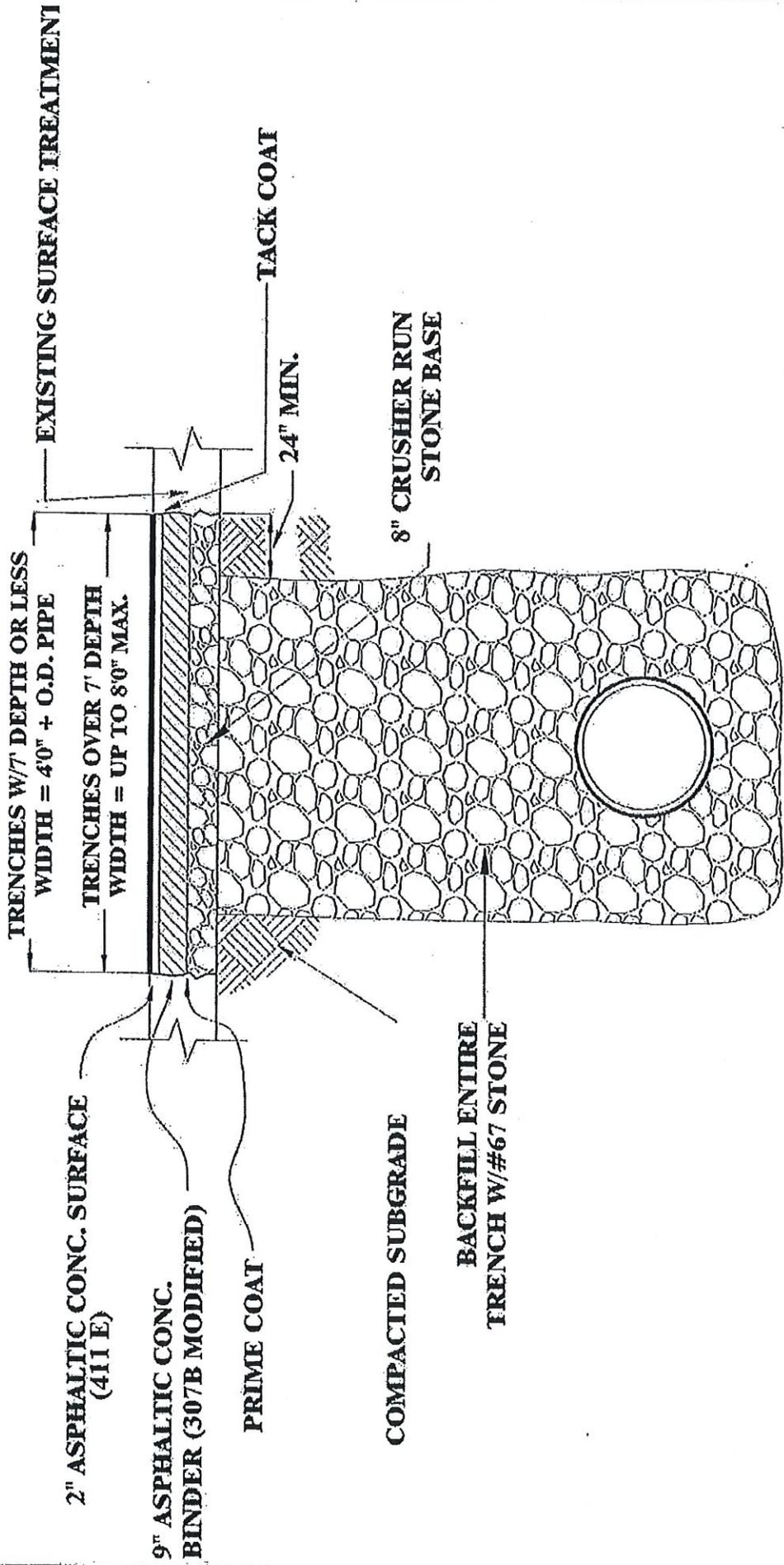


ALL PADS SHALL BE POURED IN PLACE WITH CLASS "A" CONCRETE.

NOTE: CONTRACTOR MAY AT HIS OPTION USE MONOLITHIC BASES.

INSTALL KOR-N-SEAL I & II-TOGGLE KORBAND FLEXIBLE PIPE TO MANHOLE CONNECTOR EXCEEDS ASTM C923 SPECIFICATIONS

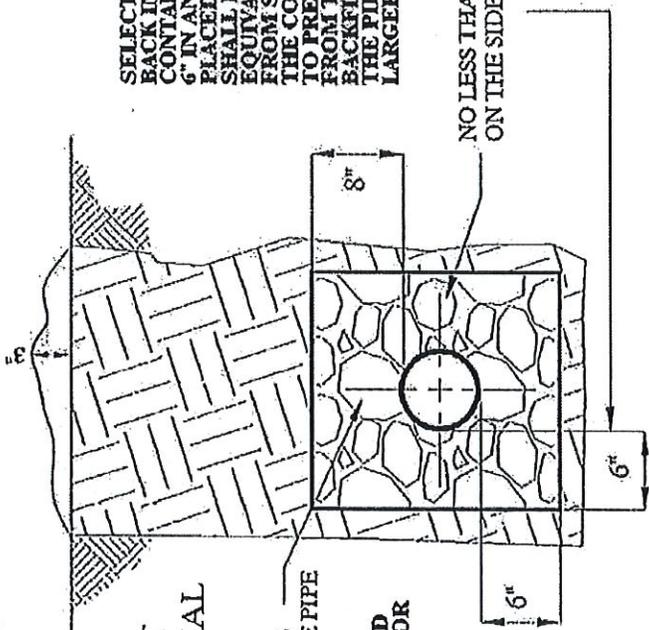
STANDARD PRECAST MANHOLE (A-A)



ASPHALTIC CONCRETE SURFACE

TRENCH REPAIR PAVEMENT REPLACEMENT

BACKFILL MATERIAL TO BE LEFT
ROUNDED TO A MIN. OF 3' ABOVE
ADJACENT GROUND LINE



THE ENTIRE PIPE ENVELOPE SHALL CONSIST
OF CRUSHED STONE #67 OR APPROVED EQUAL

SELECTED BACKFILL MATERIAL TO BE PUT
BACK INTO TRENCH IN 12" LIFTS AND SHALL
CONTAIN NO STONE MATERIAL LARGER THAN
6" IN ANY DIMENSION. BACKFILL MAY BE
PLACED WITHOUT TAMPING, BUT THE BACKFILL
SHALL BE COMPACTED TO A DENSITY
EQUIVALENT TO THAT WHICH WILL RESULT
FROM SPREADING BY A DOZER THEREON.
THE CONTRACTOR SHALL EXERCISE CAUTION
TO PREVENT DAMAGE TO THE SEWER
FROM THE OPERATION OF BACKFILL EQUIPMENT.
THE PIPE WILL CONTAIN NO STONE MATERIAL
LARGER THAN 6" IN ANY DIMENSION.

**TYPICAL TRENCH
NON-TRAFFIC AREAS
OUTSIDE OF ROADWAY**

PIPE BEDDING NOT TO
BE LESS THAN 6 INCHES

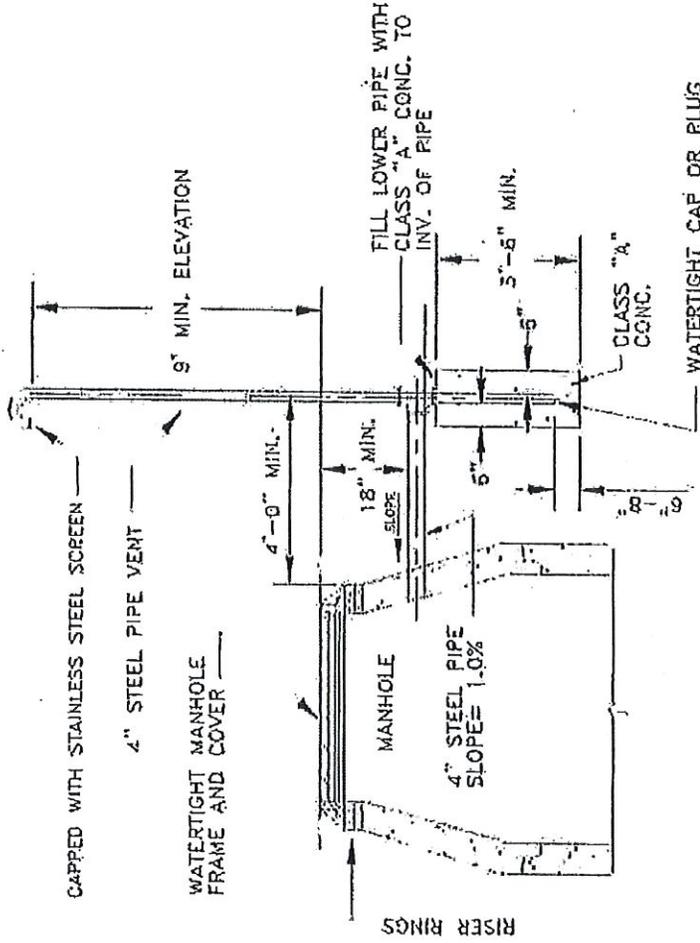
NO LESS THAN 8 INCHES
ABOVE THE TOP OF THE PIPE

CRUSHED STONE #67 SPADED
UNDER AND AROUND PIPE FOR
CONSOLIDATION

NO LESS THAN 6 INCHES
ON THE SIDES OF THE PIPE

INSERTION OF VENT PIPE INTO MANHOLE

MANHOLE CONE TO BE PRECAST FOR INSERTION OF VENT PIPE OR CONE CAN BE CORE DRILLED. USE KOR-N-SEAL I & II TOGGLE KORBAND CONNECTOR FOR WATERTIGHT FIT.



PIPE LOCATION & FINISH

VENT PIPE SHALL BE LOCATED OUT OF A TRAVEL WAY, IN BACK OF A CURB OR SIDEWALK, OR AS CALLED FOR ON PLANS. PIPE SURFACE PREPARATION SHALL BE DONE USING SSEC-SF10 NEAR-WHITE BLAST CLEANING. ONLY ONE COAT IS REQUIRED: TREMEC 435 PERMA-GLAZE AT 30.0 - 40.0 MILS D.F.T.

CITY OF GOODLETTSVILLE, TENNESSEE
SEWER DEPARTMENT

NOT TO SCALE

3/1/06



Goodlettsville

VENT PIPE ASSEMBLY DETAILS