



COMPLEX PROJECTS  
REQUIRE RESOLVE  
THRASHER'S GOT IT

**TOWN OF CEDAR GROVE  
KANAWHA COUNTY, WEST VIRGINIA**

**CONTRACT #2 – ADDITIONAL WASTEWATER COLLECTION SYSTEM  
UPGRADES AND IMPROVEMENTS**

**ADDENDUM #1**

**DECEMBER 6, 2023**

**THRASHER PROJECT #D10-11051.00**

TO WHOM IT MAY CONCERN:

A Pre-Bid Conference was held on Wednesday, November 29, 2023, on the above-referenced project, a copy of the sign in sheet is included in this Addendum. The following are clarifications and responses to questions posed by contractors for the above reference project.

**A. GENERAL**

1. **THE BID FORM HAS BEEN REVISED. YOU MUST USE THE REVISED BID FORM WHEN PREPARING YOUR BID PACKAGE FOR THIS PROJECT.**
2. Attached is the Prebid Sign-in Sheet.
3. Attached is the Town of Cedar Grove's Application for Business License.

**B. SPECIFICATIONS**

1. **Delete** Section 02100 – Site Sign. A site sign for the project already exists. No additional signs are needed.
2. **ADD** Section 02720 – Storm Sewerage

**C. DRAWINGS**

NOT APPLICABLE

**D. QUESTIONS AND RESPONSES**

**QUESTION**

1. What is the Manufacturer and Model Number of the Flow Meter the specs describe?

**RESPONSE:** Greyline  
Area-Velocity Flow Meter, Model AVFM 6.1.

2. Will Railroad Protection Insurance be required for this Contract?

**RESPONSE:** No.


**E. CLARIFICATIONS**

NOT APPLICABLE

If you have any questions or comments, please feel free to contact me at your earliest convenience. As a reminder, bids will be received until 11:00 a.m. on Wednesday, December 13, 2023, at the Town of Cedar Grove, 302 Alexander Street, Cedar Grove, WV 25039. Good luck to everyone and thank you for your interest in the project.

Sincerely,

THE THRASHER GROUP, INC.



Frederick L. Hypes, P.E., P.S.  
Project Manager



## **BID FORM FOR CONSTRUCTION CONTRACT**

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

### **ARTICLE 1—OWNER AND BIDDER**

This Bid is submitted to:

**Town of Cedar Grove  
302 Alexander Street  
Cedar Grove, WV 25039**

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

### **ARTICLE 2—ATTACHMENTS TO THIS BID**

- 2.01 The following documents are submitted with and made a condition of this Bid:
- A. Bid Opening Requirements

## **ARTICLE 3—BASIS OF BID—LUMP SUM BID AND UNIT PRICES**

### **GENERAL**

The Bidder shall take notice of and shall be responsible for any local or state taxes levied and applicable, and the cost for the same shall be included as part of the submitted Bid.

The total Bid cost stated includes a complete operating installation including furnishing and installation of any and all changes or additions in plans, piping, mechanical work, additional electrical work, accessories, controls, etc. necessary to accommodate alternative equipment systems or materials used in construction.

### **BID PROPOSAL**

The Bidder agrees to perform all required Work described in the detailed Specifications and as shown on the Plans for the complete construction and placing in satisfactory operation the Contract #2: Additional Wastewater Collection System Upgrades and Improvements project. The Project "Sequence of Construction" has been detailed in the Drawings and Specification Division 1, Project Summary, Section 011000. The Bidder agrees to perform all the Work proposed for the total of the following Bid prices.

#### **3.01 *Lump Sum Bids***

- A. Bidder will complete the Work in accordance with the Contract Documents for the lump sum (stipulated) price(s), together with any Unit Prices indicated in Paragraph 3.02 and shown in the bid schedule.
- B. Lump Sum Bids may be one of the following:
  - 1. Lump Sum Price (Single Lump Sum)
  - 2. Lump Sum Price (Base Bid and Alternates)
  - 3. Lump Sum Price (Sectional Lump Sum Bids)
- C. All specified cash allowance(s) are included in the price(s) set forth in the bid schedule and have been computed in accordance with Paragraph 13.02 of the General Conditions.
- D. All specified contingency allowances are included in the price(s) set forth in the bid schedule and have been computed in accordance with Paragraph 13.02 of the General Conditions.

#### **3.02 *Unit Price Bids***

- A. Bidder will perform the following Work at the indicated unit prices as shown in the Bid Schedule.
- B. Bidder acknowledges that:
  - 1. each Bid Unit Price includes an amount considered by Bidder to be adequate to cover Contractor's overhead and profit for each separately identified item, and
  - 2. estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Work will be based on actual quantities, determined as provided in the Contract Documents.

#### **3.03 *Total Bid Price (Lump Sum and Unit Prices)***

#### **3.04**

## **PROPOSED**

**CONTRACT #2: ADDITIONAL WASTEWATER COLLECTION SYSTEM  
UPGRADES AND IMPROVEMENTS  
FOR THE  
TOWN OF CEDAR GROVE  
KANAWHA COUNTY, WEST VIRGINIA  
THRASHER/DUNN PROJECT #D10-11051.00/1002**

**BID SCHEDULE**

*NOTE: Bid Unit Price amounts are to be shown in both words and figures. In case of discrepancy, the Bid Unit Price shown in words will govern. Bids shall include applicable taxes and fees.*

Bid Item	Quantity	Description with Unit Price Written in Words	Unit Price (In Figures)	Total Price (In Figures)
1	1	LS Mobilization/Demobilization		
			Dollars _____	
			Cents \$ _____	\$ _____
2	1	LS Video Taping of Project Area		
			Dollars _____	
			Cents \$ _____	\$ _____
3	50	Ton Special Fill		
			Dollars _____	
			Cents \$ _____	\$ _____
4	1	LS Cedar Grove pump station CSO flow meter shown on Drawing 1002-1A including cleaning of existing stainless steel static screen box; furnish and install CSO flow meter & associated electrical & control work, Complete in Place & Operating		
			Dollars _____	
			Cents \$ _____	\$ _____
<b>EAST GEORGE STREET (Bid Items 5-15)</b>				
5	1	EA Replace existing 4' diameter sanitary sewer manhole with ring & cover & all piping reconnections, Complete & Operating (0-6 ft)		
			Dollars _____	
			Cents \$ _____	\$ _____

6	5	VF	4' diameter manhole extra depth, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
7	1	EA	Replace existing 4' diameter storm sewer manhole with ring and cover and all piping reconnections, Complete in Place & Operating	_____ Dollars	_____ Cents	\$ _____	\$ _____
8	14	LF	Type E concrete trench replacement, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
9	1	EA	Connect existing 6" yard drain to drop inlet, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
10	4	EA	Replace existing drop inlet with frame and grate, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
11	1	EA	New 4' diameter storm manhole on existing line with frame and cover and all piping reconnects and new piping connects shown on the plans, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
12	1	EA	Reconnect 10" storm sewer to existing manhole, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
13	1	EA	Plug existing 10" storm sewer with non-shrinking grout, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____

14	280	LF	Type D trench replacement, Complete in Place			
				_____ Dollars		
				_____ Cents	\$ _____	\$ _____
15	40	LF	Concrete full-width pavement with reinforcing and curb, Complete in Place			
				_____ Dollars		
				_____ Cents	\$ _____	\$ _____
<b>WOLFE ROAD (Bid Items 16-21)</b>						
16	1	LS	Connect to existing sanitary sewer manhole, Complete in Place			
				_____ Dollars		
				_____ Cents	\$ _____	\$ _____
17	8	EA	Reconnect existing service lateral, Complete in Place			
				_____ Dollars		
				_____ Cents	\$ _____	\$ _____
18	150	LF	4" Service lateral with surface restoration, Complete in Place			
				_____ Dollars		
				_____ Cents	\$ _____	\$ _____
19	1	EA	4' Diameter manhole with ring and cover, Complete in Place			
				_____ Dollars		
				_____ Cents	\$ _____	\$ _____
20	180	LF	Replace existing 8" VCP Sanitary Sewer Line with new 8" SDR 35 PVC Sanitary Sewer Line, Complete in Place			
				_____ Dollars		
				_____ Cents	\$ _____	\$ _____
21	180	LF	Type B Asphalt Trench Replacement, Complete in Place			





6	5	VF	4' diameter manhole extra depth, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
7	1	EA	Replace existing 4' diameter storm sewer manhole with ring and cover and all piping reconstructions, Complete in Place & Operating	_____ Dollars	_____ Cents	\$ _____	\$ _____
8	14	LF	Type E concrete trench replacement, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
9	1	EA	Connect existing 6" yard drain to drop inlet, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
10	4	EA	Replace existing drop inlet with frame and grate, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
11	1	EA	New 4' diameter storm manhole on existing line with frame and cover and all piping reconnects and new piping connects shown on the plans, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
12	1	EA	Reconnect 10" storm sewer to existing manhole, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
13	1	EA	Plug existing 10" storm sewer with non-shrinking grout, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____

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14	280	LF	Type D trench replacement, Complete in Place
			Dollars
_____			Cents
			\$ _____ \$ _____

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15	40	LF	Concrete full-width pavement with reinforcing and curb, Complete in Place
			Dollars
_____			Cents
			\$ _____ \$ _____

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**TOTAL DEDUCTIVE ALTERNATE #1:** \_\_\_\_\_ (Words)  
 \_\_\_\_\_ (\$ \_\_\_\_\_) (Figures)  
 (Words)

**(Bid Unit Price amounts are to be shown in both words and figures. In case of discrepancy, the Bid Unit Price shown in words will govern.)**

**DEDUCTIVE ALTERNATE NO. 2 (EAST GEORGE MANHOLE REPLACEMENT) – Bid Item 22 Only**

22	1	LS	East George Street manhole and drop inlet replacement including piping reconnection excavation, removal and capping of existing abandoned waterline, surface restoration and all other work shown within limits of Layout 1 on Dwg. 1002-2
			Dollars
_____			Cents
			\$ _____ \$ _____

**TOTAL DEDUCTIVE ALTERNATE #2:** \_\_\_\_\_ (Words)  
 \_\_\_\_\_ (\$ \_\_\_\_\_) (Figures)  
 (Words)

**(Bid Unit Price amounts are to be shown in both words and figures. In case of discrepancy, the Bid Unit Price shown in words will govern.)**



17	8	EA	Reconnect existing service lateral, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
18	150	LF	4" Service lateral with surface restoration, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
19	1	EA	4' Diameter manhole with ring and cover, Complete in Place	_____ Dollars			
20	180	LF	Replace existing 8" VCP Sanitary Sewer Line with new 8" SDR 35 PVC Sanitary Sewer Line, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____
21	180	LF	Type B Asphalt Trench Replacement, Complete in Place	_____ Dollars	_____ Cents	\$ _____	\$ _____

**TOTAL DEDUCTIVE ALTERNATE #5:** \_\_\_\_\_ (Words)  
 \_\_\_\_\_ (\$ \_\_\_\_\_) (Figures)

**(Bid Unit Price amounts are to be shown in both words and figures. In case of discrepancy, the Bid Unit Price shown in words will govern.)**

3.05 *Method of Award-* Lowest Qualified Bidder (Deductive Alternate)]

If at the time this Contract is to be awarded, the lowest total bid submitted by a qualified, responsive, responsible bidder, as listed in contract does not exceed the amount of funds estimated by the Owner, as available to finance the contract, the construction contract will be awarded. If such bids exceed such amount, the Owner may reject all bids. The Owner may award the contract on the total bid submitted by a qualified, responsive, responsible bidder, less the amount(s) of the deductive

alternate(s) subtracted in numerical order to produce the lowest bid within the funds available for financing.

- A. Unit prices have been computed in accordance with paragraph 13.03.A of the General Conditions.
- B. Bidder acknowledges that estimated quantities are not guaranteed and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities, determined as provided in the Contract Documents.

**ARTICLE 4 — BASIS OF BID — COST PLUS FEE**

4.01 ~~The Contract Price will be the Cost of the Work, determined as provided in Paragraph 13.01 of the General Conditions, together with the following fee, and subject to the Guaranteed Maximum Price.~~

4.02 *Contractor's Fee*

- ~~A. Contractor's fee will be [number] percent of the Cost of the Work. No fee will be payable on the basis of costs itemized as excluded in Paragraph 13.01.C of the General Conditions.
  - 1. ~~The maximum amount payable by Owner as a percentage fee (Guaranteed Maximum Fee) will not exceed \$[insert cap amount], subject to increases or decreases for changes in the Work.~~~~
- ~~B. Contractor's fee will be determined by applying the following percentages to the various portions of the Cost of the Work as defined in Article 13 of the General Conditions. No fee will be payable on the basis of costs itemized as excluded in Paragraph 13.01.C of the General Conditions:~~

<b>Costs</b>	<b>Percent</b>
<del>Payroll costs (See Paragraph 13.01.B.1, General Conditions)</del>	
<del>Materials and Installed Equipment cost (GC 13.01.B.2)</del>	
<del>Amounts to be paid to Subcontractors (GC 13.01.B.3)</del>	
<del>Amount to be paid to special consultants (GC 13.01.B.4)</del>	
<del>Other costs (GC 13.01.B.5)</del>	

- ~~1. The maximum amount payable by Owner as a percentage fee (Guaranteed Maximum Fee) will not exceed \$[insert cap amount], subject to increases or decreases for changes in the Work.~~

~~C. Contractor's fee will be the fixed sum of \$[number].~~

4.03 *Guaranteed Maximum Price*

- ~~A. The Guaranteed Maximum Price to Owner of the Cost of the Work including Contractor's Fee will not exceed \$[Bidder fill in GMP].~~

**Deleted**

**ARTICLE 5 — PRICE PLUS TIME BID**

5.01 *Price Plus Time Contract Award (Stipulated Price Contract)*

- ~~A. The Bidder to which an award of the Contract will be made will be determined in part on the basis of the Total Bid Price and the total number of calendar days to substantially complete the Work, in accordance with the following:~~

	Description		Amount
A	1. Total Bid Price		#{number}
	2. Total number of calendar days to substantially complete the Work	{number} days	
	3. Liquidated Damages Rate (from Agreement)	#{number}/day	
B	4. Adjustment Amount (2 x 3)		#{number}
A+B	5. Amount for Comparison of Bids		#{number}

~~B. The purpose of the process in the table above is only to calculate the lowest price plus time (A+B) bid amount for bid comparison purposes. The price for completion of the Work (the Contract Price) is the Total Bid Price.~~

~~C. Bonds required under Paragraph 6.01 of the General Conditions will be based on the Contract Price.~~

5.02 *Price Plus Time Contract Award (Cost Plus Fee with Guaranteed Maximum Price Contract)*

A. The Bidder to which an award of Contract will be made will be determined in part on the basis of the Guaranteed Maximum Price and the total number of calendar days to substantially complete the Work, in accordance with the following:

	Description		Amount
A	1. Guaranteed Maximum Price		#{number}
	2. Total number of calendar days to substantially complete the Work	{number} days	
	3. Liquidated Damages Rate (from Agreement)	#{number}/day	
B	4. Adjustment Amount (2 x 3)		#{number}
A+B	5. Amount for Comparison of Bids		#{number}

~~B. The purpose of the process in the table above is only to calculate the lowest price plus time (A+B) bid amount for bid comparison purposes. The price for completion of the Work (the Contract Price) is based on the cost of the Work, plus a fee, subject to a guaranteed maximum price, as set forth in the Agreement.~~

~~C. Bonds required under Paragraph 6.01 of the General Conditions will be based on the Contract Price.~~

~~Deleted~~

**ARTICLE 6—TIME OF COMPLETION**

6.01 Bidder agrees that the Work will be substantially complete and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before the dates or within the number of calendar days indicated in the Agreement.

~~6.02 Bidder agrees that the Work will be substantially complete on or before [Bidder inserts date], and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions on or before [Bidder inserts date].~~

~~Deleted~~

~~6.03 Bidder agrees that the Work will be substantially complete within [Bidder inserts number] calendar days after the date when the Contract Times commence to run as provided in Paragraph 4.01 of the General Conditions, and will be completed and ready for final payment in accordance with~~

~~Paragraph 15.06 of the General Conditions within [Bidder inserts number] calendar days after the date when the Contract Times commence to run.~~

**Deleted**

6.04 Bidder accepts the provisions of the Agreement as to liquidated damages.

**ARTICLE 7—BIDDER’S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA**

7.01 *Bid Acceptance Period*

A. This Bid will remain subject to acceptance for 90 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

7.02 *Instructions to Bidders*

A. Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security.

7.03 *Receipt of Addenda*

A. Bidder hereby acknowledges receipt of the following Addenda:

<b>Addendum Number</b>	<b>Addendum Date</b>

**ARTICLE 8—BIDDER’S REPRESENTATIONS AND CERTIFICATIONS**

8.01 *Bidder’s Representations*

A. In submitting this Bid, Bidder represents the following:

1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect cost, progress, and performance of the Work.
3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
4. Bidder has carefully studied the reports of explorations and tests of subsurface conditions at or adjacent to the Site and the drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary Conditions, with respect to the Technical Data in such reports and drawings.
5. Bidder has carefully studied the reports and drawings relating to Hazardous Environmental Conditions, if any, at or adjacent to the Site that have been identified in the Supplementary Conditions, with respect to Technical Data in such reports and drawings.
6. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and the Technical Data identified in the Supplementary Conditions or by definition, with respect to the effect of such information, observations, and Technical Data on (a) the cost, progress, and performance of the Work; (b) the means, methods, techniques, sequences, and procedures of construction to be employed by

Bidder, if selected as Contractor; and (c) Bidder's (Contractor's) safety precautions and programs.

7. Based on the information and observations referred to in the preceding paragraph, Bidder agrees that no further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract.
8. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
9. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Contract Documents, and the written resolution thereof by Engineer is acceptable to Contractor.
10. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.
11. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

#### 8.02 *Bidder's Certifications*

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.
2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.
3. Bidder has not solicited or induced any individual or entity to refrain from bidding.
4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 8.02.A:
  - a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.
  - b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.
  - c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.
  - d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.



BIDDER hereby submits this Bid as set forth above:

Bidder:

\_\_\_\_\_  
*(typed or printed name of organization)*

By:

\_\_\_\_\_  
*(individual's signature)*

Name:

\_\_\_\_\_  
*(typed or printed)*

Title:

\_\_\_\_\_  
*(typed or printed)*

Date:

\_\_\_\_\_  
*(typed or printed)*

*If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.*

Attest:

\_\_\_\_\_  
*(individual's signature)*

Name:

\_\_\_\_\_  
*(typed or printed)*

Title:

\_\_\_\_\_  
*(typed or printed)*

Date:

\_\_\_\_\_  
*(typed or printed)*

Address for giving notices:

\_\_\_\_\_  
\_\_\_\_\_

Bidder's Contact:

Name:

\_\_\_\_\_  
*(typed or printed)*

Title:

\_\_\_\_\_  
*(typed or printed)*

Phone:

\_\_\_\_\_

Email:

\_\_\_\_\_

Address:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Bidder's Contractor License No.: (if applicable)

\_\_\_\_\_

**TOWN OF CEDAR GROVE  
KANAWHA COUNTY, WEST VIRGINIA  
CONTRACT #2 - ADDITIONAL WASTEWATER COLLECTION SYSTEM  
UPGRADES AND IMPROVEMENTS**

**PRE-BID CONFERENCE**  
Wednesday, November 29, 2023

Thrasher Project #D10-11051.00

Name	Representing	Phone #	Email Address
TIM SHAFFER	SOLAS ROCK CONTRACTING	304) 382-7606	SOLASROCKCONTRACTOR@HOTMAIL.COM
Matt Spadling	Benchmark Const.	304-545-1475	m.spadling@BMLCWV.COM
Terry Martin	Resident Council	304-744-4258	TerryMartin@WVregin3.org
Bruce Mills	Regional Council	304-744-4258	bruce.mills@wvregion3.org
Melissa Young	Town of Cedar Grove Manager	304-741-4792	myoung@cedar.gov

**TOWN OF CEDAR GROVE**  
 302 Alexander Street - PO Box 536 - Cedar Grove, WV 25039  
 Phone (304) 595-1841

**RENEWAL APPLICATION FOR BUSINESS LICENSE**

Account: 3203

The Thrasher Group, Inc.  
 600 White Oaks Boulevard  
 PO Box 940  
 Bridgeport, WV 26330

Mayor  
Melissa Young  
  
Recorder  
Jessica Morris

To continue operating your business in the Town of Cedar Grove, the annual Business License is now due to be renewed. Please refer to the Business License Options below and select any and all that apply to your business. If your specific business is not listed then please mark General License or Other and provide a description of your Business.

To assist us in making sure your business is reported under the correct category please indicate the nature of your business below.

LICENSED ACTIVITY	Number	License Fee
Barber		\$ 25.00
Beer		\$100.00
Funeral Home		\$ 90.00
Garage		\$ 5.00
Landlord		\$ 5.00
Machines		\$ 12.50 Each
Store		\$ 15.00
General Business		\$ 15.00
Other (Please provide description) <b>Contractor</b>		<b>\$ 15.00</b>
<b>License Fee</b>		
<b>Penalty</b>		
<b>Total Due</b>		

Please provide a copy of your West Virginia contractor's license as well as WV Business License Registration.

If you have any questions, Please call Town Hall, at 304-595-1841.

MAKE CHECK PAYABLE AND REMIT TO: **TOWN OF CEDAR GROVE**  
**PO BOX 536**  
**302 ALEXANDER STREET**  
**CEDAR GROVE, WV 25039**

\_\_\_\_\_  
 APPLICANTS SIGNATURE

\_\_\_\_\_  
 TITLE

\_\_\_\_\_  
 DATE

## SECTION 02720 - STORM SEWERAGE

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other specifications sections, apply to this section.

#### 1.2 RELATED DOCUMENTS

- A. This Section includes water service piping and appurtenances from the source of water through the distribution lines, terminating at (but including) corporation stops. Additionally, this section includes non-potable wash water system piping and appurtenances.

- 1. Related Sections: The following Sections contain requirements that relate to this Section:

- a. Section 02200 - "Earthwork" for excavation and backfill required for water service piping and structures.
- b. Section 02720 - "Storm Sewerage" for storm drainage connections to pit drains.
- c. Section 03300 - "Cast-In-Place Concrete" for supports and structures.
- d. Section 02771 - "Water Service Lines" for water service lines and appurtenances from the distribution lines through the meter setting to five (5) feet beyond the meter well.
- e. Section 02223 "Trenching Backfilling and Compacting" for trenching and backfilling.

#### 1.3 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and other specification sections.
- B. Product data for drainage piping specialties.
- C. Shop drawings for precast concrete storm drainage manholes and catch basins, including frames, covers, and grates.
- D. Shop drawings for cast-in-place concrete or precast manholes and catch basins, including frames and covers.
- E. Coordination drawings showing pipe sizes, manholes and catch basins locations and

elevations. Include details of underground structures and connections. Show other piping in the same trench and clearances from storm sewerage system piping. Indicate interface and spatial relationship between piping and proximate structures.

- F. Coordination profile drawings showing storm sewerage system piping in elevation. Draw profiles at a horizontal scale of not less than 1 inch equals 50 feet and a vertical scale of not less than 1 inch equals 5 feet. Indicate pipe and underground structures. Show types, sizes, materials, and elevations of other utilities crossing sewerage system piping.

#### 1.4 QUALITY ASSURANCE

- A. Environmental Compliance: Comply with applicable portions of local environmental agency regulations pertaining to storm sewerage systems.
- B. Utility Compliance: Comply with local utility regulations and standards pertaining to storm sewerage systems.

#### 1.5 PROJECT CONDITIONS

- A. Site Information: Perform site survey, research public utility records, and verify existing utility locations. Verify that storm sewerage system piping may be installed in compliance with original design and referenced standards.
  - 1. Locate existing storm sewerage system piping and structures that are to be abandoned and closed.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include but are not limited to the following:
  - 1. Cleanouts:
    - a. Ancon, Inc.
    - b. Josam Co.
    - c. Smith (Jay R.) Mfg. Co.
    - d. Wade Div.; Tyler Pipe.
    - e. Zurn Industries, Inc.; Hydromechanics Div.
  - 2. Trench Drain System:
    - a. Hancor, Inc.
    - b. PolyDrain, Inc.

3. Underground Warning Tapes:
  - a. Allen Systems, Inc.; Reef Industries, Inc.
  - b. Brady (W.H.) Co.; Signmark Div.
  - c. Calpico, Inc.
  - d. Carlton Industries, Inc.
  - e. EMED Co., Inc.
  - f. Seton Name Plate Co.

## 2.2 PIPE AND FITTINGS

- A. General: Provide pipe and pipe fitting materials compatible with each other as shown on the Contract Drawings.
- B. Hub and Spigot Cast-Iron Soil Pipe and Fittings: ASTM A 74, gray cast iron, for compression gasket joints.
  1. Class: Service.
  2. Class: Extra Heavy.
  3. Gaskets: ASTM C 564, rubber, thickness to match class of pipe.
- C. Hubless Cast-Iron Soil Pipe and Fittings: CISPI 301, gray cast iron, for coupling joints.
  1. Couplings: CISPI 310, ASTM C 564 neoprene sealing sleeve, with 300 Series stainless steel corrugated shield and clamp assembly.
  2. Heavy-Duty Couplings: ASTM C 564 neoprene sealing gasket, with Type 304 stainless steel housing or shield and stainless steel clamps. Coupling shall be 3 inches wide in sizes 1-1/2 to 4 inches and 4 inches wide in sizes 5 to 10 inches.
  3. Heavy-Duty Couplings: ASTM C 564 neoprene sealing gasket, with cast-iron housing and stainless steel bolts.
  4. Heavy-Duty Couplings: FM Approved, ASTM C 564 elastomeric sleeve, with stainless steel band and strips or cast-iron housing and corrosion-resisting bolts.
- D. Buried ductile-iron pipe 4 inches and larger: AWWA C151, Class 350. Non-buried flanged ductile iron pipe shall be AWWA C115, Class 53, unless otherwise specified on the drawings. Ball and socket ductile iron pipe shall be Class 55 or greater as dictated by the piping manufacturer.
  1. Lining: AWWA C104, cement mortar, seal coated.
  2. Gaskets: AWWA C111.
  3. Ductile-Iron and Cast-Iron Fittings: AWWA C110, ductile-iron or cast-iron, 250-psi pressure rating; or AWWA C153, ductile-iron compact fittings,

- 350-psi pressure rating.
  - a. Lining: AWWA C104, cement mortar.
  - b. Gaskets: AWWA C111, rubber.
- 4. Encasement: AWWA C105, polyethylene film tube.
- E. Ductile-Iron Culvert Pipe: ASTM A 716, for push-on joints.
  - 1. Lining: AWWA C104, asphaltic material seal coat, minimum 1 mil thick.
  - 2. Gaskets: AWWA C111, rubber.
- F. Ductile-Iron Sewer Pipe: AWWA C151, Class 350, for push-on joints unless specified otherwise on the drawings.
  - 1. Lining: AWWA C104, asphaltic material seal coat, minimum 1 mil thick.
  - 2. Gaskets: AWWA C111, rubber.
- G. Ductile-Iron Pipe Encasement: AWWA C105, polyethylene film tube.
- H. PVC (Polyvinyl Chloride) Sewer Pipe and Fittings: ASTM D 3034, SDR 35, for solvent cement or elastomeric gasket joints.
  - 1. Solvent Cement: ASTM D 2564.
  - 2. Gaskets: ASTM F 477, elastomeric seal.
- I. PVC (Polyvinyl Chloride) Sewer Pipe and Fittings: ASTM F 679, T-1 wall thickness, bell and spigot, for elastomeric gasket joints, 18" to 30".
  - 1. Gaskets: ASTM F 477, elastomeric seal.
- J. Reinforced Concrete Sewer Pipe and Fittings: ASTM C 76, Class III, Wall B, for rubber gasket joints.
  - 1. Gaskets: ASTM C 443, rubber.
- K. Nonreinforced Concrete Sewer Pipe and Fittings: ASTM C 14, Class 2, for rubber gasket joints.
  - 1. Gaskets: ASTM C 443, rubber.
- L. PVC (Polyvinyl Chloride): Sewer pipe and fittings: ASTM F-1803 closed profile truss pipe with integral bell and elastomeric seal joints; ASTM F477, 21" to 42".
- M. ABS (Acrylonitrile-Butadiene-Styrene) Sewer Pipe and Fittings: ASTM D 2751, for solvent cement or elastomeric gasket joints.

1. SDR 35 for 3 to 6 inches.
  2. SDR 42 for 8 to 12 inches.
  3. Solvent Cement: ASTM D 2235.
  4. Gaskets: ASTM F 477, elastomeric seal.
- N. Extra-Strength Vitrified Clay Sewer Pipe and Fittings: ASTM C 700, unglazed, for socket and spigot joint.
1. Sealing Elements: ASTM C 425, rubber.
- O. Standard-Strength Vitrified Clay Sewer Pipe and Fittings: ASTM C 700, unglazed, for socket and spigot joint.
1. Sealing Elements: ASTM C 425, rubber.
- P. Copper Drainage (DWV) Tube: ASTM B 306, drawn condition, for solder joints.
1. Copper Fittings: ANSI B16.23 cast copper or ANSI B16.29 wrought copper, solder-joint drainage fittings.
    - a. Solder Filler Metal: ASTM B 32, Alloy Sn50; tin (50 percent)-lead (50 percent).
    - b. Solder Filler Metal: ASTM B 32, Alloy Sb5; tin (95 percent)-antimony (5 percent).
- Q. Couplings: Rubber or elastomeric sleeve and stainless steel band assembly fabricated to match outside diameters of pipes to be joined shall not be allowed on this project.
- R. Couplings: Rubber or elastomeric compression gasket, made to match pipe inside diameter or hub, and adjoining pipe outside diameter.
1. Gaskets: ASTM C 425, rubber for vitrified clay pipe; ASTM C 443, rubber for concrete pipe; ASTM C 564, rubber for cast-iron soil pipe; and ASTM F 477, elastomeric seal for plastic pipe. Gaskets for dissimilar or other pipe materials shall be compatible with pipe materials being joined.

## 2.3 MANHOLES

- A. Precast Concrete Manholes: ASTM C 478, precast reinforced concrete, of depth indicated with provision for rubber gasket joints.
1. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and having a separate base slab or base section with integral floor.



2. Riser Sections: 4-inch minimum thickness, 48-inch diameter, and lengths to provide depth indicated.
  3. Top Section: Eccentric cone type, unless concentric cone or flat-slab-top type is indicated. Top of cone to match grade rings.
  4. Grade Rings: Provide 2 or 3 reinforced concrete rings, of 6 to 9 inches total thickness and match 24-inch diameter frame and cover.
  5. Gaskets: ASTM C 443, rubber.
  6. Steps: Cast into base, riser, and top sections sidewall at 12-to 16-inch intervals.
  7. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
  8. Channel and Bench: Concrete.
- B. Brick Manholes: Brick and mortar, shall not be accepted.
- C. Cast-in-Place Manholes: Reinforced concrete of dimensions and with appurtenances indicated, shall only be used when noted as "Cast in Place" on plans.
1. Bottom, Walls, and Top: Reinforced concrete.
  2. Channel and Bench: Concrete.
  3. Steps: Cast into sidewall at 12- to 16-inch intervals.
- D. Manhole Steps: Wide enough for an adult to place both feet on one step and designed to prevent lateral slippage off the step.
1. Material: Ductile iron or cast aluminum.
  2. Material: Steel-reinforced plastic.
- E. Manhole Frames and Covers: ASTM A 536, Grade 60-40-18, heavy-duty, ductile iron, 24-inch inside diameter by 7- to 9-inch riser with 4-inch minimum width flange, and 26-inch-diameter cover, indented top design, with lettering "STORM SEWER" cast into cover.

## 2.4 CLEANOUTS

- A. General: Provide cast-iron ferrule and countersunk brass cleanout plug, with round cast-iron access frame and heavy-duty, secured, scoriated cast-iron cover.

## 2.5 CATCH BASINS

- A. Precast Concrete Catch Basins: ASTM C 478 or ASTM C 858, precast reinforced concrete, of depth indicated. Sections shall have provision for rubber gasket joints. Base section slab shall have minimum thickness of 6 inches, riser sections shall have minimum thickness of 4 inches and be as shown on drawings. Top section and grade

rings shall match 24-inch frame and grate, unless otherwise indicated.

1. Base Section: Base riser section and separate base slab, or base riser section with integral floor.
  2. Riser Sections: Sections shall be of lengths to provide depth indicated.
  3. Top Section: Flat slab type with opening to match grade rings.
  4. Grade Rings: Provide 2 or 3 reinforced concrete rings, of 6 to 9 inches total thickness.
  5. Gaskets: ASTM C 443, rubber.
  6. Steps: Cast into riser sidewall at 12- to 16-inch intervals.
  7. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
  8. Channel and Bench: Concrete.
- B. Brick Catch Basins: Brick and mortar, shall not be accepted.
- C. Cast-in-Place Catch Basins: Reinforced concrete of dimensions and with appurtenances indicated, shall only be used when noted as "Cast in Place" on plans.
1. Bottom, Walls, and Top: Reinforced concrete.
  2. Channel and Bench: Concrete.
- D. Catch Basin Steps: Wide enough for an adult to place both feet on one step and designed to prevent lateral slippage off the step.
1. Material: Ductile iron or cast aluminum.
  2. Material: Steel-reinforced plastic.
- E. Catch Basin Frames and Grates: ASTM A 536 Grade 60-40-18, heavy-duty, ductile iron, 24-inch inside diameter by 7- to 9-inch riser with 4-inch minimum width flange, and 26-inch-diameter flat grate having small square or short slotted drainage openings.
- F. Curb Inlets: Precast concrete, brick, or other materials, of dimensions conforming to utility standards.

## 2.6 OUTFALLS

- A. General: Construct of cast-in-place reinforced concrete pipe, head wall, apron, tapered sides, and with rip rap, as indicated.
1. Rip Rap: Broken stone, irregular size and shape, one-two feet in diameter.

## 2.7 DRY WELLS

- A. General: ASTM C 858, precast reinforced perforated concrete rings, with cast-in-place concrete floor and lift-off-type concrete cover having cast-in lift rings, as indicated. Wall thickness shall be 4 inches minimum with 1-inch diameter or 1-by up to 3-inch slotted perforations arranged in rows parallel to axis of the ring. Total free area of perforations shall be approximately 15 percent of ring interior surface. Ring construction shall be designed to be self-aligning.
- B. General: Provide aggregate-filled dry wells as indicated.
  - 1. Aggregate: ASTM C 33, gravel, crushed gravel, or crushed stone.
  - 2. Film: Polyethylene sheet not less than 8 mils thick or other equivalent impervious material.

## 2.8 TRENCH DRAIN SYSTEM

- A. General: Provide modular channel trench drain system of channels, grates, and accessories, as indicated.
- B. Channels: Interlocking precast polymer concrete modular units, 6 inches wide, with built-in slope of 0.6 percent, and rounded inside bottom surface.
- C. Grates: Cast iron, heavy duty, designed to set in channel top recess without rocking or rattling.
- D. Accessories: Catch basins, channel caps, and other accessories of same material as channels, as indicated.

## 2.9 CONCRETE AND REINFORCEMENT

- A. Concrete: Portland cement mix, 3,000 psi.
  - 1. Cement: ASTM C 150, Type II.
  - 2. Fine Aggregate: ASTM C 33, sand.
  - 3. Coarse Aggregate: ASTM C 33, crushed gravel.
  - 4. Water: Potable.
- B. Reinforcement: Steel conforming to the following:
  - 1. Fabric: ASTM A 185, welded wire fabric, plain.
  - 2. Reinforcement Bars: ASTM A 615, Grade 60, deformed.

## 2.10 IDENTIFICATION

- A. Metallic-Lined Plastic Underground Warning Tapes: Polyethylene plastic tape with metallic core, 6 inches wide by 4 mils thick, solid green in color with continuously printed caption in black letters "CAUTION - STORM SEWER LINE BURIED

BELOW." This shall be installed over all storm conduits.

### PART 3 - EXECUTION

#### 3.1 PREPARATION OF FOUNDATION FOR BURIED STORM SEWERAGE SYSTEMS

- A. Grade trench bottom to provide a smooth, firm, stable, and rock-free foundation, throughout the length of the pipe.
- B. Remove unstable, soft, and unsuitable materials at the surface upon which pipes are to be laid, and backfill with clean sand or pea gravel to indicated level.
- C. Shape bottom of trench to fit bottom of pipe. Fill unevenness with tamped sand backfill. Dig bell holes at each pipe joint to relieve the bells of all loads and to ensure continuous bearing of the pipe barrel on the foundation.

#### 3.2 PIPE APPLICATIONS FOR UNDERGROUND STORM SEWERS

- A. Pipe Sizes 12 Inches and Larger: Reinforced concrete sewer pipe and fittings.
- B. Pipe Sizes 3 to 42 Inches: Extra-strength vitrified clay sewer pipe and fittings.
- C. Pipe Sizes 3 to 42 Inches: Standard-strength vitrified clay sewer pipe and fittings.
- D. Pipe Sizes 4 to 54 Inches: Ductile-iron pressure pipe and fittings.
- E. Pipe Sizes 4 to 54 Inches: Ductile-iron sewer pipe.
- F. Pipe Sizes 14 to 54 Inches: Ductile-iron culvert pipe.
- G. Pipe Sizes 4 to 36 inches: Nonreinforced concrete sewer pipe and fittings.
- H. Pipe Sizes 18 to 36 Inches: PVC sewer pipe.
- I. Pipe Sizes 2 to 15 Inches: Service-class hub and spigot cast-iron soil pipe and fittings. (NOT ACCEPTABLE FOR THIS PROJECT).
- J. Pipe Sizes 2 to 15 Inches: Extra-heavy-class hub and spigot cast-iron soil pipe and fittings. (NOT ACCEPTABLE FOR THIS PROJECT).
- K. Pipe Sizes 15 Inches and Smaller: PVC solvent cement joint sewer pipe and fittings. (NOT ACCEPTABLE FOR THIS PROJECT).
- L. Pipe Sizes 15 Inches and Smaller: PVC gasket joint sewer pipe and fittings.

- M. Pipe Sizes 12 Inches and Smaller: ABS solvent cement joint sewer pipe and fittings. (NOT ACCEPTABLE FOR THIS PROJECT).
- N. Pipe Sizes 12 Inches and Smaller: ABS gasket joint sewer pipe and fittings.
- O. Pipe Sizes 1-1/2 to 10 Inches: Hubless cast-iron soil pipe and fittings. (NOT ACCEPTABLE FOR THIS PROJECT).
- P. Pipe Sizes 8 Inches and Smaller: Copper Type DWV tube and copper drainage fittings.
- Q. Pipe sizes 24 to 48 Inches Smooth Interior Corrugated Polyethylene Pipe and Fittings.

### 3.3 STORM DRAINS

- A. Storm Drains shall include the excavation for and construction of pipe drains for surface drainage to the prescribed lines and grades at the designated locations in accordance with plans and specifications, or as directed by the engineer.
- B. References
  - 1. AASHTO M252: Specification for Corrugated Polyethylene Drainage Tubing, 3 to 10 inch diameter.
  - 2. AASHTO M294: Specification for Corrugated Polyethylene Pipe, 12 to 36 Inch diameter.
  - 3. ASTM D1056: Specification for Flexible Cellular Material - Sponge or Expanded Rubber.
  - 4. ASTM D1248: Specification for Polyethylene Plastics Molding and Extrusion Materials.
  - 5. ASTM D3350: Specification for Polyethylene Plastics Pipe and Fittings Materials.
  - 6. ASTM D2321: Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe.
- C. Submittals
  - 1. All pipe and fittings not covered by this specification shall be approved by the engineer seven days prior to the bid opening.
- D. Acceptable Manufacturers
  - 1. The large diameter gravity sewer pipe (18 inches and larger) shown as "GSP" on the plans may be polyethylene material and be Hi-Q pipe as manufactured

by Hancor, Inc., Advanced Drainage Systems, Inc. or equal.

E. Materials

1. The prescribed sizes of pipes are nominal inside diameters. Pipes shall be of the size and length shown on the plans.
2. Smooth interior corrugated polyethylene pipe. The product supplied under this specification shall be high density polyethylene corrugated exterior / smooth interior pipe. 4 through 10 inch diameters shall meet all the requirements of AASHTO M252 with the addition that the pipe have a smooth interior liner. 12 to 36 inch diameters shall conform to AASHTO M294 Type S. 42 and 48 inch diameters shall have minimum pipe stiffnesses of 20 and 17 psi, respectively, at 5% deflection; and shall meet all other requirements of AASHTO M294.

Material shall meet ASTM D1248 Type III, Category 4, Grade P33, Class C; or ASTM D3350 Cell Classification 324420C.

Minimum conveyance factors shall be based on a Manning "n" value of 0.010 and shall be shown in Table 1.

**TABLE 1: CONVEYANCE FACTORS**

<b>Nominal Diameter (Inch)</b>	<b>Conveyance Factor</b>	<b>Nominal Diameter (Inch)</b>	<b>Conveyance Factor</b>
4	2.5	18	136.4
6	7.3	24	293.9
8	15.7	30	532.9
10	28.5	36	866.6
12	46.3	42	1307.2
15	83.9	48	1866.4

3. Coupling bands shall cover at least one full corrugation on each section of pipe. Gasketed coupling bands are required, the gasket shall be made of closed-cell synthetic expanded rubber meeting the requirements of ASTM D1056, Type 2. All couplings shall produce a water tight seal. Gaskets shall be installed on the coupling band by the pipe manufacturer. All coupling requirement of the AASHTO Standard Specification for Highway Bridges, section 23, paragraph 23.3.1.5.4 (e).
4. Pipe fittings shall conform to AASHTO M252 or AASHTO M294. Fittings approved by the engineer are also acceptable.

F. Inspection - All delivered pipe shall be inspected. Damaged pipes may not be accepted.

- G. Installation shall be in accordance with ASTM D2321 and as recommended by the pipe manufacturer. Backfill shall be ASTM D2321 Class I, II, or III soils, or USCS material corresponding to these ASTM designations. Backfill material shall be placed in 6-inch lifts and compacted to 95 percent minimum density per AASHTO T99.

### 3.4 INSTALLATION, GENERAL

- A. General Locations and Arrangements: Drawings (plans and details) indicate the general location and arrangement of the underground storm sewerage system piping. Location and arrangement of piping layout take into account many design considerations. Install the piping as indicated, to the extent practical.
- B. Install piping beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings in accordance with manufacturer's recommendations for use of lubricants, cements, and other installation requirements. Maintain swab or drag in line and pull past each joint as it is completed.
- C. Use manholes or catch basins for changes in direction, except where a fitting is indicated. Use fittings for branch connections, except where direct tap into existing sewer is indicated.
- D. Use proper size increasers, reducers, and couplings, where different size or material of pipes and fittings are connected. Reduction of the size of piping in the direction of flow is prohibited.
- E. Install piping pitched down in direction of flow, at minimum slope of 1 percent, except where indicated otherwise.
- F. Extend storm sewerage system piping to connect to building storm drains, of sizes and in locations indicated.
- G. Install 1-inch-thick extruded polystyrene over underground building drain piping not under building. Width of insulation shall extend minimum of 12 inches beyond each side of pipe. Install directly over and center on pipe center line.
- H. Tunneling: Install pipe under streets or other obstructions that cannot be disturbed, by tunneling, jacking, or a combination of both.

### 3.5 PIPE AND TUBE JOINT CONSTRUCTION AND INSTALLATION

- A. Join and install hub and spigot cast-iron soil pipe and fittings, with compression

gaskets in accordance with CISPI "Cast Iron Soil Pipe and Fittings Handbook, Volume I." Use "Service" or "Extra Heavy" class gaskets to match class of pipe and fittings.

- B. Join and install hubless cast-iron soil pipe and fittings with CISPI-type couplings in accordance with CISPI "Cast Iron Soil Pipe and Fittings Handbook, Volume I."
- C. Join and install hubless cast-iron soil pipe and fittings, with heavy-duty-type couplings in accordance with applicable provisions of CISPI "Cast Iron Soil Pipe and Fittings Handbook, Volume I" and with the coupling manufacturer's installation instructions.
- D. Join and install ductile-iron pipe with ductile-iron or cast-iron push-on joint fittings and rubber gaskets in accordance with AWWA C600, except that anchorages are not required.
  - 1. Install polyethylene encasement in accordance with AWWA C105.
- E. Join and install PVC pipe as follows:
  - 1. Solvent cement joint pipe and fittings, joining with solvent cement in accordance with ASTM D 2855 and ASTM F 402.
  - 2. Pipe and gasketed fittings, joining with elastomeric seals in accordance with ASTM D 3212.
  - 3. Installation in accordance with ASTM D 2321.
- F. Join concrete pipe and fittings with rubber gaskets in accordance with ASTM C 443, and install piping in accordance with applicable provisions of ACPA "Concrete Pipe Installation Manual."
- G. Join vitrified clay pipe and fittings with rubber sealing elements in accordance with ASTM C 425, and install piping in accordance with ASTM C 12.
- H. Join and install ABS pipe as follows:
  - 1. Solvent cement joint pipe and fittings, in accordance with ASTM D 3212 and ASTM F 402.
  - 2. Join pipe and gasketed fittings with elastomeric seals in accordance with ASTM D 3212.
  - 3. Install piping in accordance with ASTM D 2321.
- I. Join copper tube with cast-copper or wrought-copper solder joint; drainage fittings in accordance with the procedures specified in AWS "Soldering Manual." Install tubing in accordance with applicable provisions of CDA "Copper Tube" handbook.



- J. Join different types of pipe with standard manufactured couplings and fittings intended for that purpose.
- K. Install metallic lined plastic underground warning tapes over all conduits.

### 3.6 MANHOLES

- A. General: Install manholes complete with accessories as indicated. Form continuous concrete or split pipe section channel and benches between inlets and outlet. Set tops of frames and covers flush with finish surface where manholes occur in pavements. Elsewhere, set tops 3 inches above finish surface, unless otherwise indicated.
- B. Place precast concrete manhole sections as indicated, and install in accordance with ASTM C 891.
- C. Construct cast-in-place manholes as indicated.
- D. Apply bituminous mastic coating at joints of sections.

### 3.7 CLEANOUTS

- A. Install cleanouts and extension from sewer pipe to cleanout at grade as indicated. Set cleanout frame and cover in concrete block 18 by 18 by 12 inches deep, except where location is in concrete paving. Set top of cleanout 1 inch above surrounding earth grade or flush with grade when installed in paving.

### 3.8 CATCH BASINS

- A. Construct catch basins to sizes and shapes indicated.
- B. Set frames and grates to elevations indicated.

### 3.9 OUTFALLS

- A. Construct outfalls of reinforced concrete which will attain 28-day compressive strength of not less than 3000 psi.

### 3.10 DRY WELLS

- A. Install as indicated, set on undisturbed native soil.
- B. Fill: Pack around dry well with 1- to 2-inch-size crushed rock or gravel, to minimum of 12 inches beyond dry well perimeter and full depth of dry well.

### 3.11 TRENCH DRAIN SYSTEM

- A. Install trench drains as indicated and in accordance with the manufacturer's installation instructions.
- B. Embed channels in minimum of 4 inches depth of concrete around bottom and sides.

### 3.12 TAP CONNECTIONS

- A. Make connections to existing piping and underground structures so that finished work will conform as nearly as practicable to the requirements specified for new work.
- B. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye fitting plus 6-inch overlap, with not less than 6 inches of 3000-psi 28-day compressive-strength concrete.
- C. Make branch connections from side into existing 4- to 21-inch piping by removing section of existing pipe and installing wye fitting into existing piping. Encase entire wye with not less than 6 inches of 3000-psi 28-day compressive-strength concrete.
- D. Make branch connections from side into existing 24-inch or larger piping or to underground structures by cutting opening into existing unit sufficiently large to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall, unless otherwise indicated. On outside of pipe or structure wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.
  - 1. Provide concrete that will attain minimum 28-day compressive strength of 3000 psi, unless otherwise indicated.
  - 2. Use epoxy bonding compound as interface between new and existing concrete and piping materials.
- E. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris, concrete, or other extraneous material that may accumulate.

### 3.13 CLOSING ABANDONED STORM SEWERAGE SYSTEM

- A. Abandoned Piping: Close open ends of abandoned underground piping that is indicated to remain in place. Provide sufficiently strong closures to withstand hydrostatic or earth pressure that may result after ends of abandoned utilities have

been closed.

1. Close open ends of concrete or masonry utilities with not less than 8-inch-thick brick masonry bulkheads.
  2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Wood plugs are not acceptable.
- B. Abandoned Structures: Remove structure and close open ends of the remaining piping or remove top of structure down to not less than 3 feet below final grade; fill structure with stone, rubble, gravel, or compacted dirt, to within 1 foot of top of structure remaining, and fill with concrete.

### 3.14 INSTALLATION OF IDENTIFICATION

- A. Install continuous plastic underground warning tape during back-filling of trench for underground storm sewerage piping. Locate 6 to 8 inches below finished grade, directly over piping.

### 3.15 FIELD QUALITY CONTROL

- A. Testing: Perform testing of completed piping in accordance with Section 01750 - "Testing and Disinfection" of these specifications.
- B. Cleaning: Clear interior of piping and structures of dirt and other superfluous material as work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.
1. In large, accessible piping, brushes and brooms may be used for cleaning.
  2. Place plugs in ends of uncompleted pipe at end of day or whenever work stops.
  3. Flush piping between manholes, if required by local authority, to remove collected debris.
- C. Interior Inspection: Inspect piping to determine whether line displacement or other damage has occurred.
1. Make inspections after pipe between manholes and manhole locations has been installed and approximately 2 feet of backfill is in place, and again at completion of project.
  2. If inspection indicates poor alignment, debris, displaced pipe, infiltration, or other defects, correct such defects and reinspect.

#### PART 4 - MEASUREMENT AND PAYMENT

##### 4.1 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work covered under this item.

##### 4.2 BASIS FOR PAYMENT

- A. Payment for work performed under this item shall be included in the Form of Proposal, payment shall be included in the Lump Sum and/or Unit Bid items to which work under this item is incidental.

In either situation, payments shall be full compensation for furnishing all the materials and performing all the work prescribed in a workmanlike and acceptable manner, including all labor, tools, equipment, supplies and incidentals necessary to complete the work and make it fully operational.

END OF SECTION 02720

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