

April 5, 2024

**RE: Utility Improvements Phase 1
Gregory, South Dakota
SPN #15247**

BID LETTING: Wednesday, April 10, 2024 @ 2:00 PM

ADDENDUM NUMBER 1

The following modifications are to be made to the plans and specifications for the Utility Improvements Phase 1 Project.

Section C-410 Bid Form:

Remove and replace the original bid form with the updated version attached to this addendum. The changes to the Bid form are as described below:

- Added Item 27 – Temporarily Connect to Existing Lift Station
- Added Item 38 – Steel Encasement Pipe
- Added Item 39 – PVC Encasement Pipe
- Changed quantity of Connect to Existing 6" Water Main from 15 to 16
- Changed quantity of Connect to Existing 8" Water Main from 10 to 12
- Changed quantity of Furnish and Install 12" CMP from 40 to 104
- Changed quantity of Furnish and Install 15" CMP from 312 to 401
- Changed quantity of Furnish and Install 18" CMP from 98 to 92

Section C-800, Supplementary Conditions:

Paragraph SC 6.03 K. 2: Change the amount of excess or umbrella liability insurance for the general aggregate and each occurrence to \$5,000,000.

Section 33 05 09.33, Thrust Restraint for Utility Piping:

Paragraph 3.02 B: Remove the restraint specification table and the following section from the paragraph: "The restraint lengths indicated below shall be provided. Any pipe or fitting joints within the length indicated below from the fitting shall be mechanically restrained."

Section 33 14 17, Water Service Laterals:

Paragraph 2.06: Add the following paragraph: "Curb Box lids shall be provided with a tracer wire screw that is tapped into the bottom of the lid for securing a quick connect eyelet terminal. Once tightened, the threaded end of the screw becomes accessible for attaching an alligator clip at the top of the lid."

Section 33 31 00, Sanitary Sewer Piping:

Product specifications have been updated to include pressurized PVC pipe requirements as well as pressure pipe connections. See attached updated Section 33 31 00 for complete information.

All other items of the plans and specifications remain unchanged.



Camden Hofer

Camden A. Hofer, Project Engineer
Schmucker, Paul, Nohr & Associates

The undersigned hereby acknowledges receipt of Addendum Number 1 to the plans and specifications for the *Gregory Utility Improvements – Phase I Project*.

FIRM NAME _____
BY _____
TITLE _____
DATE _____

ATTACH THIS SIGNED ADDENDUM NO. 1 TO THE BID FORM WHEN SUBMITTING.

Bid Schedule A - Wastewater

Item #	Description	Quantity	Unit Price	Total Price
1	Remove and Dispose of Existing Manhole	41 EA		
2	6" Sanitary Sewer	139 LF		
3	8" Sanitary Sewer Pipe (0'-10')	6,251 LF		
4	8" Sanitary Sewer Pipe (10'-12')	4,285 LF		
5	8" Sanitary Sewer Pipe (12'-14')	2,911 LF		
6	8" Sanitary Sewer Pipe (14'-16')	965 LF		
7	8" Sanitary Sewer Pipe (16'-18')	786 LF		
8	8" Sanitary Sewer Pipe (0'-10') Alley	1,761 LF		
9	8" Sanitary Sewer Pipe (10'-12') Alley	590 LF		
10	8" Sanitary Sewer Pipe (12'-14') Alley	359 LF		
11	8" Sanitary Sewer Pipe (14'-16') Alley	70 LF		
12	8" Sanitary Sewer Pipe (Bored)	120 LF		
13	Post TV Inspection of Sewer	18,098 LF		
14	Sanitary Sewer Manholes to 10 Feet	48 EA		
15	Sanitary Manhole Inside Drop Assembly	1 EA		
16	Additional Depth Sanitary Sewer Manhole	66 VF		
17	Core Drill Manhole and Connect 8" Sewer to Manhole	2 EA		
18	Connect to Existing Manhole	2 EA		
19	Connect to Existing 6" to 8" Sewer Main	13 EA		
20	8" x 4" Inserted Tee	5 EA		

Bid Schedule A - Wastewater

Item	Description	Quantity	Unit Price	Total Price
21	8" x 4" Sanitary Sewer Wyes	276 EA		
22	8" x 6" Sanitary Sewer Wyes	4 EA		
23	4" Double Cleanout Assembly	1 EA		
24	Tracer Wire Access Box	229 EA		
25	Tracer Wire Ground	229 EA		
26	Connect to Existing Sewer Service	265 EA		
27	Temporarily Connect to Existing Lift Station	1 EA		
28	4" Sanitary Sewer Service Cap	22 EA		
29	4" Sanitary Sewer Service Pipe	7,230 LF		
30	4" Sanitary Sewer Service Pipe (Alley)	218 LF		

Bid Schedule A - Water

Item	Description	Quantity	Unit Price	Total Price
31	Remove and Dispose of Valve and Box	16 EA		
32	Remove and Dispose of Fire Hydrant	13 EA		
33	4" Water Main	3 LF		
34	6" Water Main - Directionally Drilled	190 LF		
35	6" Water Main	14,456 LF		
36	6" Water Main (Alley)	2,823 LF		
37	8" Water Main	615 LF		
38	Steel Encasement Pipe	70 LF		
39	PVC Encasement Pipe	20 LF		
40	Fire Hydrant	23 EA		
41	Tracer Wire Access Box	23 EA		
42	Tracer Wire Grounding Rod	44 EA		
43	6" Gate Valve w/ Box	60 EA		
44	8" Gate Valve w/ Box	3 EA		
45	6" Tee	34 EA		
46	8" x 6" Tee	4 EA		
47	6" x 4" Reducer	1 EA		
48	8" x 6" Reducer	4 EA		
49	6" Cross	1 EA		
50	6" Cap	1 EA		

Bid Schedule A - Water

Item	Description	Quantity	Unit Price	Total Price
51	Connect to Existing 6" Water Main	16 EA		
52	Connect to Existing 8" Water Main	12 EA		
53	6" 22.5° Bend	3 EA		
54	6" 11.25° Bend	1 EA		
55	8" Cross	1 EA		
56	8" 45° Bend	2 EA		
57	Connect to Existing 4" Water Main	1 EA		
58	Connect to Existing 6" Water Main	16 EA		
59	Connect to Existing 8" Water Main	12 EA		
60	6"x1" Service Saddle W/ Corp Stop	185 EA		
61	6"x2" Service Saddle W/ Corp Stop	4 EA		
62	8"x1" Service Saddle W/ Corp Stop	3 EA		
63	1" Curb Stop w/ Box	188 EA		
64	2" Curb Stop w/ Box	4 EA		
65	Connect to Existing Water Services (All Sizes)	192 EA		
66	1" Service Line (Bored)	242 EA		
67	1" Service Line	5,403 LF		
68	1" Service Line - Alley	304 LF		
69	2" Service Line	204 LF		

Bid Schedule A - Surfacing and Miscellaneous

Item	Description	Quantity	Unit Price	Total Price
70	Mobilization	1 LS		
71	Remove, Salvage and Reset Street Sign	8 EA		
72	Remove, Salvage and Reset Mail Box and Post	44 EA		
73	Remove and Dispose of Tree Greater than 6" Diameter	1 EA		
74	Remove, Salvage and Reset Fence	40 LF		
75	Remove and Dispose of Existing Culvert	595 LF		
76	Mill and Salvage Asphalt/Blotter Surface with Base	24,450 TN		
77	Separate Mobilizations for Milling/Pulverization	3 EA		
78	Remove and Dispose of Asphalt/Blotter Surface without Milling	153 SY		
79	Remove, Salvage and Replace Gravel Surfacing	2,785 SY		
80	Remove and Dispose of Concrete	2,021 SY		
81	Remove and Dispose of Concrete Curb & Gutter	1,714 LF		
82	Furnish and Install 12" CMP	104 LF		
83	Furnish and Install 15" CMP	401 LF		
84	Furnish and Install 18" CMP	92 LF		
85	4" Concrete Sidewalk	1,280 SF		
86	Detectable warning panel	20 SF		
87	6" Concrete Approach	746 SY		
88	6" Valley Gutter	1,035 SY		
89	6" Concrete Fillet	114 SY		

Bid Schedule A - Surfacing and Miscellaneous

Item	Description	Quantity	Unit Price	Total Price
90	Concrete Curb and Gutter	1,669 LF		
91	Concrete Barrier Curb	73 LF		
92	Street Excavation	24,600 CY		
93	Ditch Excavation and Grading	100 CY		
94	Geotextile Fabric Separator	80,313 SY		
95	Place and Grade Recycled Millings	24,450 TN		
96	Fine Grading of Base Material	80,313 SY		
97	Gravel Base Course	12,070 TN		
98	6" Gravel Surfacing	520 TN		
99	3" Gravel Surfacing	1,430 TN		
100	3" Asphalt Paving	14,010 TN		
101	Asphalt Binder on the Basis of Composite Mix in Place	14,010 TN		
102	Separate Mobilizations for Asphalt Surfacing	3 EA		
103	Traffic Control Signs	410 SF		
104	Type III Barricades	73 EA		
105	Traffic Control, Miscellaneous	1 LS		
106	Culvert Protection	14 EA		
107	Seeding	27,495 SY		
108	Silt Fence	100 LF		

Total For Bid Schedule A
Items 1 - 108 Inclusive _____

SECTION 33 31 00 SANITARY SEWER PIPING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. The general provisions of the Contract, including General and Supplementary Conditions, shall apply to the Work covered in this section.
- B. Related Work Specified Elsewhere:
 - 1. Trenching, Backfilling and Compacting - Section 31 23 33
 - 2. Sanitary Sewer Valves - Section 33 31 24
 - 3. Sanitary Sewer Testing - Section 33 31 25
 - 4. Sewer Cleaning and Televising - Section 33 31 30
 - 5. Sanitary Manholes - Section 33 31 50

1.02 DESCRIPTION OF WORK

- A. The work covered under these specifications shall include the furnishing of all labor, material, tools, and equipment necessary to furnish and install, complete in place, all piping and fittings as shown on the drawings and as specified herein.

1.03 SUBMITTALS

- A. The Contractor shall submit for review copies of shop drawings for materials specified herein in accordance with the requirements of Section 01 33 23 and the requirements as hereinafter specified.
- B. Certificates from the manufacturer that the materials meet or exceed specified requirements shall be submitted upon request.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All materials shall be packed, loaded, transported, unloaded and handled in such a manner so as to prevent damage to the materials.
- B. All material shall be loaded and unloaded by lifting with slings or hoists or skidding so as to avoid shock or damage. Dropping or rolling will not be permitted. The use of end hooks to install or move piping will not be allowed.
- C. All materials shall be stored on the site in accordance with the manufacturer's recommendations. Do not store materials directly on the ground.
- D. All materials shall be kept clean and dry. The insides of all piping and fittings shall be kept free of dirt and debris.

1.05 MEASUREMENT AND PAYMENT

- A. Piping of the different types, depths and classes as called for on the Bid Form shall be measured and paid for on a lineal foot, complete in place. Measurement shall be to the nearest lineal foot. Payment shall be made at the unit prices bid as shown on the Bid Form.
- B. Bedding material will be considered incidental to the unit price bid with no separate measurement or payment.
- C. Piping of the different types, depths and classes that are to be bored as called for on the Bid Form shall be measured and paid for on a lineal foot basis.
- D. Piping of the different types, depths and classes that are able to be slip lined shall be measured and paid for on a lineal foot basis.
- E. Incidental items associated with the piping materials for which no separate measurement and payment will be made include but are not limited to:
 - 1. Gaskets
 - 2. Lubricants
 - 3. Protective Coatings and Encasements
 - 4. Linings
 - 5. Polywrap (ductile iron buried locations)
 - 6. Existing pipe removal and disposal
- F. All fittings, caps, plugs and other appurtenances shall, unless specifically called for on the Bid Form, will be considered incidental and included in the unit prices bid for piping as appropriate with no separate payment made.
- G. Tracer wire will not be measured. Payment for tracer wire will be incidental to the sewer service piping and force main. All fasteners splice kits and other appurtenances shall also be considered incidental.
- H. Tracer wire access boxes and grounds will be measured on a per each basis. Payment for tracer wire access boxes and grounds will be on the basis of each tracer box or ground installed as called for on the Bid Form. Tracer wire, PVC conduit, wire fasteners, splice kits, adjusting to grade and other appurtenances shall be considered incidental to tracer wire access boxes.
- I. Payment for service cleanouts shall be full compensation for all labor, materials and equipment required to complete the cleanout including concrete markers as indicated in the plans. Payment shall be made on a per cleanout installed at the unit price indicated in the Bid Form.
- J. Connections to existing lines of different sizes as called for on the Bid Form shall be measured and paid for at the unit price as shown on the Bid Form. Payment shall be full compensation for furnishing all material, equipment and labor to make the necessary connections. Temporary connections made to maintain service shall be considered incidental to the overall work.
- K. Payment for bypass pumping shall be full compensation for all labor, materials and equipment required to pump to the wastewater and allow construction to be completed while maintaining continuous service. Payment shall be made at the lump sum price indicated on the Bid Form and shall be inclusive for the entire project.
- L. The removal and disposal of the existing buried piping shall be considered incidental to the project.

M. Refer to dewatering in Section 31 23 33.

PART 2 PRODUCTS

2.01 PRESSURIZED POLYVINYL CHLORIDE (PVC) PIPE

- A. Polyvinyl Chloride pipe shall meet the minimum requirements of I.P.S. pressure Class 160, SDR 26 pipe conforming to the requirements of ASTM 2241.
- B. The pipe shall be made from Type 1, Grade 1, Class 12454B compounds conforming to ASTM D1784.
- C. All pipe shall be marked with the following: Nominal pipe size, material code designation, SDR, pressure rating, manufacturer's name or trademark, NSF seal and ASTM numbers.
- D. The PVC pipe shall be furnished in 20-foot laying lengths. Longer lengths will be allowed only if the Contractor certifies that he will provide equipment on the project to fully support the pipe while being transported and distributed over the project.
- E. All PVC pipe shall be furnished with gasket joints conforming to ASTM D3139. Rubber gaskets shall conform to the requirement of ASTM F477.
- F. Manufacturer's proof of design tests and joint dimensions shall be submitted to the Engineer for gasket joints which do not maintain SDR throughout the joint.
- G. Gasket joint couplings used for plain end pipe shall have a pressure rating equal to the pipe on which used. Centering of pipe within the coupling will be assured by means of an integral positive stop in the coupling. All couplings must be of the double gasket type. Couplings requiring welds will not be allowed.
- H. All gasketed joints shall have a seating depth equal to at least 50% of the nominal pipe diameter.
- I. The ends of the pipe to be inserted into couplings or joints shall be factory marked to allow field checking of the depth of setting of the pipe in the joint socket.
- J. The gasket lubricant shall be furnished by and approved for the intended use by the pipe manufacturer.

2.02 BURIED DUCTILE IRON FITTINGS FOR PRESSURIZED PVC PIPE

- A. Ductile iron fittings shall conform to the requirements of ANSI Specifications A21.10 or A21.53.
- B. Ductile iron fittings to be installed underground shall be mechanical joint conforming to the requirements of ANSI A21.11. Mechanical joint nuts and bolts shall be stainless steel. The exterior finish of buried fittings shall be a coal tar varnish coating not less than 1 mil thick.
- C. All ductile iron fittings shall be lined with cement mortar in accordance with ANSI A21.4.
- D. All ductile iron fittings installed in buried locations shall be wrapped with polyethylene material. Low density polyethylene encasement material shall have a minimum thickness of not less than 8 mils. The polyethylene material shall be marked and installed according to AWWA C105.

2.03 PRESSURE PIPE CONNECTIONS

- A. Couplings for PVC to PVC connections shall be made by restrained joint long sleeves conforming to Paragraph 2.02. Alternatively, the PVC to PVC pipe connections shall be made by a restraint coupling conforming to the following requirements.
- B. Couplings shall be gasketed, sleeve type of a diameter to properly fit the pipes being joined. Each coupling shall consist of one (1) steel sleeve, two (2) end ring followers, two (2) rubber compound gaskets and sufficient bolts to properly compress the gaskets to make a watertight coupling.
- C. Couplings for PVC to PVC connections shall be the restrained type which grip the pipe or otherwise be mechanical restraints to hold the joint together. Couplings shall be Dresser Style 38, Mueller Maxi-Range, Romac Industries Style 501, or approved equal.
- D. The sleeve shall be ASTM A53, ASTM 512 or carbon steel or ASTM 536 ductile iron with a minimum yield of 30,000 psi. The steel sleeve shall have a minimum wall thickness of one quarter (1/4) inch and a minimum length of seven (7) inches. The carbon steel sleeves shall be furnished with a fusion bonded epoxy with a minimum dry thickness of 12 mils suitable for potable water service. Ductile iron sleeves may be furnished with the manufacturer's standard shop coating or coal tar varnish coating.
- E. The end rings shall be Ductile Iron, ASTM A536 or steel, AISI C1018, and of such design to provide confinement of the gaskets. The end rings shall be furnished with fusion bonded epoxy with a minimum dry thickness of 12 mils or a coal tar varnish coating.
- F. The coupling bolts and nuts shall be stainless steel. The manufacturer shall furnish information as to recommended torque for the proper tightening of the bolts.
- G. Gaskets shall be minimum grade 30 gaskets composed of new crude or synthetic rubber base compounded with other products to produce a material which will not deteriorate from age, from heat, or exposure to air under normal storage conditions. It shall also possess the quality of resilience and ability to resist cold flow of the material so that the joint will remain sealed and tight indefinitely when subjected to shock, vibration, pulsation and temperature or other adjustments of the pipe line.
- H. The couplings shall be assembled on the job in a manner to insure permanently tight joints under all reasonable conditions of expansion, contraction, shifting and settlement, unavoidable variations in trench gradient, etc.

2.04 GRAVITY PVC SEWER PIPE AND FITTINGS

- A. Polyvinyl Chloride pipe and fittings installed above 20 feet of bury depth shall be SDR 35 conforming to the requirements of ASTM Specification D 3034 for Rigid Poly (Vinyl Chloride) Sewer pipe.
- B. Polyvinyl Chloride pipe and fittings installed at or below 20 feet of bury depth shall be SDR 26 conforming to the requirements of ASTM Specification D 3034 for Rigid Poly (Vinyl Chloride) Sewer pipe.
- C. Gasketed type joints shall be made with rubber gaskets conforming to the requirements of ASTM F-477.
- D. Fittings for Polyvinyl Chloride (PVC) gravity sewer fittings shall be of PVC with material and dimensions conforming to the requirements of ASTM Specification D 3034. Strap on wye fittings

may be used where called for in the plans. The Strap on wye fittings shall conform to the aforementioned requirements.

- E. Inserted lateral wye connections shall be used where called for in the plans. The rubber sleeve and gasket shall conform to ASTM F 477. The band, screw and housing shall be composed of stainless steel. The connection shall be made for the exact pipe to which it is being connected. The inserted lateral wye connection shall be by Inserta Fittings Company or approved equal.

2.05 TRANSITION COUPLINGS FOR GRAVITY PIPING

- A. Couplings used for transitions between piping of different materials shall be made from elastometric polyvinyl chloride (PVC). Clamp bands, band screw and shear ring shall be made from stainless steel. Shear ring shall be a minimum of 0.012 inches thick. Couplings shall provide an infiltration proof, exfiltration proof and root proof joint. Couplings shall be designed as a flexible coupling specifically for the sizes and types of materials being joined.
- B. Transition couplings and adaptors for new and existing piping shall be RC Series "Strong Back" as manufactured by Fernco, Inc., "Amazon Heavy Duty" as manufactured by Indiana Seal or approved equal.

2.06 SOLVENT WELD SCHEDULE 40 PVC PIPE

- A. Solvent weld Schedule 40 pipe shall be used where approved in the plans. Pipe shall conform to ASTM D 1785 and ASTM D 2665.

2.07 BEDDING MATERIAL

- A. Borrowed granular bedding material for pressurized pipe installation shall conform to the gradation indicated below.

<u>Sieve Opening</u>	<u>Bedding Material (Percent Passing)</u>
No. 4	95-100
No. 16	45-85
No. 50	10-40
No. 100	2-10
No. 200	< 5

- B. Bedding material for gravity pipe installation shall be crushed rock, size 67 Coarse Aggregate, ASTM C33 conforming to the gradation indicated below.

<u>Sieve Opening</u>	<u>Bedding Material (Percent Passing)</u>
1"	100
3/4"	90-100
3/8"	20-55
No. 4	0-10
No. 8	0-5

2.08 TRACER WIRE SYSTEM

- A. Conductor: Tracer wire with pipe that is installed by open trench shall be #12 AWG Copper Glad Steel, High Strength with a minimum 380-pound breaking strength. Tracer wire installed with pipe that is directionally drilled in place shall be #12 AWG Copper Clad Steel, Extra High Strength with minimum 1,150-pound breaking strength. Conductor shall be insulated with low density high molecular weight polyethylene insulation suitable for direct bury applications per ASTM D-1248. The minimum insulation thickness shall be 0.030. Tracer wire shall have high molecular weight polyethylene insulation rated for direct burial at 30 volts. All wire shall be spark tested at 7500 VDC. The color of the insulation shall be green.
- B. Splices and or Connectors: The tracer wire shall be connected to the ground rod using a three-way connector. All connectors shall be dielectric silicon filled to seal out moisture and corrosion and shall be installed in a manner to prevent any uninsulated wire exposure.
- C. Tracer Wire Access Box: Tracer wires shall be terminated using a terminal box suitable for flush burial with a 5 inch tall cast iron top, integral brass terminals and a minimum 12 inch long ABS bottom section. Lid for tracer wire access box shall be single terminal. Tracer wire box shall be intended for traffic. Tracer wire access box shall be Copperhead Industries Snakepit Roadway or approved equal.
- D. Grounding Rod: Grounding rods shall be a magnesium drive-in grounding rod. The rod shall be 18.5 inches long and have a diameter of 1.315 inches. The rod shall have 20 feet of red 12 AWG copper clad steel tracer wire factory installed on the end. The breaking pounds of the wire shall be a minimum of 450 and the minimum insulation thickness shall be 0.30 mil.

2.09 PIPING INSULATION

- A. Sheet insulation shall be a minimum thickness of 2 inches. The material shall be rigid extruded polystyrene insulation board with a minimum compressive strength of 40 psi.

PART 3 EXECUTION

3.01 GENERAL

- A. The areas to receive piping shall be examined for defects that may adversely affect the execution and quality of Work. Prior to the start of piping installation, all measurements shall be checked for deviations from allowable tolerances for piping.

3.02 BURIED PIPING INSTALLATION

- A. All piping and fittings shall be laid true to line and grade as shown on the plans. Each section of pipe shall be so laid and fitted together that when complete the piping will have a smooth uniform flow line. The inside of all pipe shall be cleaned before installation and kept thoroughly clean during and after placing the pipe. Pipe ends shall be cleaned inside and outside.
- B. All pipe and fitting shall be examined for defects before being lowered into the trench. The interior and exterior protective coating shall be inspected and field repaired, if required, and possible accordance with applicable standards.
- C. The pipe shall be handled and installed in accordance with manufacturer's recommendations and the requirements of AWWA C600 for Ductile Iron pipe, ASTM D2774 for PVC pressure piping and ASTM 2321 for PVC gravity sewer piping.

- D. When pipelaying is not in progress, including the noon hours, the open ends of pipe shall be closed. No trench water, animals, or foreign material shall be permitted to enter the pipe.
- E. Borrowed granular bedding material shall be used with all piping. The general requirements for placement shall be as shown on the plans or directed by the engineer.
- F. The bedding material under and around the pipe shall be deposited in layers not to exceed six inches (6") and carefully compacted to a degree of compaction at least equal to 90% maximum dry density as determined by Standard Proctor Test, ASTM Test Designation D698 throughout the entire depth of each layer. Where the pipe has a protective coating, care shall be taken not to damage the coating.
- G. The pipe shall be laid upon properly placed bedding material so that the barrel of the pipe will have a bearing for its full length. Bell holes and depressions for joints shall be excavated after the trench bedding has been graded.
- H. After each pipe has been graded, aligned, and placed in final position on the bedding material and shoved home, sufficient pipe embedment material shall be deposited and compacted under and around each side of the pipe and back of the bell or end thereof to hold the pipe in proper position and alignment during subsequent pipe joining and embedment operations.
- I. The Contractor shall provide and maintain all necessary means and devices at all times to remove and dispose of all water entering the trench during the process of pipelaying. The trench shall be kept dry until the pipelaying and jointing are completed. Removal of water shall comply with Section 31 23 33.
- J. Thrust blocks or restraining fittings to restrain pressurized piping shall be installed as per the requirements of Section 33 05 09.33.
- K. Service lines shall be laid with a minimum of a 2% slope. Service lines shall be installed to a minimum depth of eight (8) feet near the property line if sufficient grade is available, unless approved by the Owner or Engineer.
- L. There shall be no 90° bends between the connection to the existing service line and the sewer main.
- M. Some portions of the sewer lines will be laid at a greater depth than is required for the service connections. In such instances, at the direction of the Field Engineer, the sewer connection shall be extended by the contractor from the wye to the proper elevations for the service connection. The riser pipe shall be installed at an angle of not more than 45° to the horizontal, extending from the wye towards the premises to be served so that substantially all the riser is outside of the main sewer ditch and no excessive load due to trench filling and settlement will be transmitted to the wye. No separate payment will be made for risers.
- N. During installation of the sewer services, the Contractor shall confer and work with the Owner to determine which services are truly live and which may be no longer an active service. The cost of verifying the status of service lines for those locations shall be incidental to the cost of the project.

3.03 BYPASS PUMPING

- A. The Contractor shall provide temporary bypass pumping as required to allow for the construction of sanitary sewer main and manholes while maintaining the Owner's collection system in continuous operation.

- B. The Contractor shall be responsible for any damage resulting from a back-up of sewage during the installation of the facilities.
- C. Wastewater flows shall not be conveyed in open trenches or in the trench excavation, and at no time shall wastewater be allowed on the ground surface or other places which may constitute a health hazard. Bypassed sewage must be returned to the system for treatment or transported to an acceptable treatment facility.

3.04 TESTING AND CLEANING

- A. All piping shall be tested in accordance with Section 33 31 25.
- B. All piping shall be cleaned and televised in accordance with the requirements of Section 33 31 30.

3.05 TRACER WIRE

- A. Tracer wire, ground rods and access boxes shall be installed in accordance with the details shown in the plans or directed by the Engineer.
- B. Tracer wire shall be installed at the bottom half of the pipe and secured (taped/tied) as shown in the plans.
- C. Tracer wire system must be installed as a single continuous wire, except where using approved connectors.
- D. Any damage occurring during installation of the tracer wire must be immediately repaired by removing the damaged wire installing a new section of wire with approved connector(s) at the Contractor's expense.
- E. Tracer wire must be properly grounded at all dead ends. Tracer wire shall not be connected to existing conductive pipes. The tracer wire shall be grounded using an approved waterproof connection with the grounding rod buried at the same depth as the tracer wire.
- F. The Contractor shall connect the wires to the access box terminals and carefully insert the wires into the access box for storage.
- G. All tracer wire shall be tested by the Contractor upon completion of the pipe installation and backfilling. All installed wire shall be located using low frequency (512 Hz) line tracing equipment, witnessed by the Engineer or Owner prior to acceptance.
- H. The following shall not be allowed or accepted:
 - Looped wire or continuous wire installation, that has multiple wires laid side-by-side or near one another
 - Wire terminations within the roadway
 - Connecting tracer wire to existing conductive utilities

* * * END OF SECTION * * *