

OCTOBER 20, 2023

**RE: HANSEN AVENUE STREET & UTILITY IMPROVEMENTS
PHILIP, SOUTH DAKOTA
SPN #15952**

**BID LETTING: TUESDAY, OCTOBER 31, 2023, 1:00 PM
(MOUNTAIN TIME)**

ADDENDUM NUMBER 1

The following modifications are to be made to the plans and specifications for the Hansen Avenue Street & Utility Improvements Project.

SPECIFICATIONS

Section C-410 Bid Form shall be removed in its entirety and replaced with the attached bid form.

Section 26 32 13.16 – paragraph 1.07C.3 shall be added:

3. Guardian Series generator and transfer switch as manufactured by Generac shall be considered as an approved equivalent.

Section 33 05 61 shall be removed in its entirety and replaced with the attached Section 33 05 61.

Section 33 32 11 – paragraph 1.03B shall be removed in its entirety and replaced with the following:

- B. The power supply (from the VFD's) is three-phase, 120 / 240 volt. The motors shall have a maximum speed of 1800 R.P.M. and a maximum rated power of 2.0 horsepower.

Section 33 32 11 – paragraph 1.05B shall be removed in its entirety and replaced with the following:

- B. The pump manufacturer shall have a factory-trained service representative within 300 miles of the point of installation.

Section 33 32 11 – paragraph 2.01M shall be added:

- M. Hydromatic – S3N as manufactured by Pentair shall be considered an approved equivalent.

Section 33 32 11 – paragraph 2.05F.4 shall be added:

4. DM1 series as manufactured by Eaton shall be considered an approved equivalent.

Section 33 32 11 – paragraph 2.05K.4 shall be added:

4. Model HMI5070LB by Maple Systems shall be considered an approved equivalent.

Section 40 05 62-78 – paragraph 2.02B shall be added:

- A. Brass ball valves shall be of the size as shown on the plans or as directed by the Engineer. Valves shall have FIPT with steel handle. Valves shall be Model LFB6000 as manufactured by Watts or equal.

Section 40 05 62-65 – paragraph 2.04 and paragraph 2.05 shall be added:

2.04 AIR RELEASE VALVE

- A. Air Release and vacuum valve shall allow unrestricted venting or re-entry of air through the valve during filling or draining of the piping, to prevent water column separation or pipeline collapse due to vacuum.
- B. The air and vacuum valve shall be of a single body, double orifice design. The large orifice shall expel air during the filling of the pipeline as well as allow the entrance of air during the draining of the pipe. The small orifice shall allow the continuous venting of air pockets as they accumulate in the pipeline.
- C. All internals shall be easily removed through the top cover without removing the main valve from the lines.
- D. The valve inlet shall be 2-inch NPT and outlet shall be 1.5 inch NPT.
- E. The body shall be reinforced nylon with a polypropylene float and stainless steel interior components.
- F. The air-release / vacuum valve shall be as manufactured by A.R.I. Model D-025 Combination Air valve or approved equal.

2.05 SERVICE SADDLES

- A. Water service saddles shall be used on the piping for the ball valve connections.
- B. Water service saddle bodies and bands shall be cast from brass alloy as per ASTM B-62. Water service saddle bands shall be bolted with silicon bronze bolts, nuts and washers. Saddle body shall be furnished with female NPT threads.
- C. Water service saddles shall be as manufactured by Ford Meter Box Company, Inc., A.Y. McDonald MFG. Co. or approved equal.

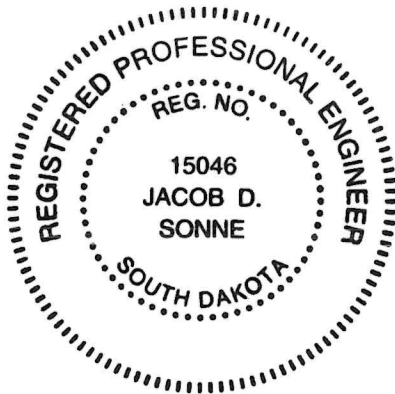
Section 40 05 62-65 – paragraph 3.01 shall be removed in its entirety and replaced with the following:

3.01 VALVE INSTALLATION

- A. All valves shall be installed in locations as shown on the plans or as directed by the Owner's Resident Project representative. Pipe saddles and isolation ball valves shall be used where accessories are tapped into pipe.
- B. The valve and joints shall be installed in accordance with the manufacturer's recommendations.
- C. The outlet of the Air release valve shall be piped with floor level draining into the nearest floor drain or as directed by the Project Representative.

Section 40 73 13 – paragraph 2.01D shall be added:

- D. The pressure gauge shall have a range of 1 – 60 psi.




Jacob D. Sonne, Project Engineer
Schmucker, Paul, Nohr & Associates

The undersigned hereby acknowledges receipt of Addendum Number 1 to the plans and specifications for the HANSEN AVENUE STREET & UTILITY IMPROVEMENTS PROJECT.

FIRM NAME _____
BY _____
TITLE _____
DATE _____

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

BID FORM
HANSEN AVENUE UTILITY AND STREET IMPROVEMENTS
SPN #15952

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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

- 1.1 This Bid is submitted to:
 - 2 The Finance Office at 140 S Howard Ave, 4th Flr, PO Box 408, Philip, South Dakota 57567
- 2.1 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

- 2.1 The following documents are submitted with and made a condition of this Bid:
 - A. Required Bid security
 - B. DBE Subcontractor Solicitation Information Form
 - C. Form 6100-3 (DBE Subcontractor Performance Form)
 - D. Form 6100-4 (DBE Subcontractor Utilization Form)
 - E. Certification Regarding Debarment, Suspension, Ineligibility, and Voluntary Exclusion
 - F. Non-Collusion Affidavit
 - G. Statement of Qualifications
 - H. Certification of States Sales Tax License

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

- 3.1 *Unit Price Bids*
 - A. Bidder will perform the following Work at the indicated unit prices:

Bid Schedule A

Item #	Description	Quantity	Unit Price	Total Price
1	Mobilization (Schedule A)	1 LS		
2	Remove & Salvage Gravel Surfacing	27 SY		
3	Remove & Salvage Gravel Surfacing	4,063 SY	(By Others)	
4	Remove, Salvage, and Reset Speed Limit Sign	1 EA	(By Others)	
5	Remove & Dispose of Asphalt Surfacing	402 SY		
6	Remove & Dispose of Existing Culvert	50 LF		
7	Remove & Dispose of Existing Culvert	28 LF	(By Others)	
8	Remove & Dispose of Existing Concrete	28 SY	(By Others)	
9	Remove & Dispose of Wood Fence	43 LF	(By Others)	
10	Remove & Dispose of Chain Link Fence	150 LF	(By Others)	
11	Remove & Dispose of Woven Wire Fence	195 LF	(By Others)	
12	Remove & Dispose of Tree (12"-24")	2 EA	(By Others)	
13	Remove & Dispose of Septic Tank	6 EA	(By Others)	
14	Remove & Dispose of Cleanout	8 EA	(By Others)	
15	Remove & Dispose of Yard Hydrant	2 EA	(By Others)	
16	Remove & Dispose of Curb Stop Box	1 EA		
17	Remove & Dispose of Curb Stop	3 EA	(By Others)	
18	Remove & Dispose of Manhole	1 EA	(By Others)	
19	48" Sanitary Sewer Manhole (0-10')	5 EA		
20	Sanitary Sewer Manhole Extra Depth	8.4 VF		
21	8" PVC Sanitary Sewer Main	836 LF		
22	8" x 4" Sanitary Sewer Wye	15 EA		
23	4" PVC Sanitary Sewer Service Pipe	497 LF		
24	Tracer Wire Access Box for Sewer Service	15 EA		
25	Ground Rod for Sewer Service	15 EA		

Bid Schedule A

Item	Description	Quantity	Unit Price	Total Price
26	Post Televising Sanitary Sewer Main	836 LF		
27	6" PVC Water Main	1,254 LF		
28	Encasement Pipe for Water Main	31 LF		
29	Fire Hydrant Assembly	2 EA		
30	Yard Hydrant Assembly	1 EA		
31	12" x 6" Tapping Sleeve	2 EA		
32	6" MJ Gate Valve w/ Box	5 EA		
33	6" MJ Tee	2 EA		
34	6" MJ 22.5° Bend	2 EA		
35	6" MJ 45° Bend	1 EA		
36	6" MJ 90° Bend	1 EA		
37	Tracer Wire Access Box for Water Main	2 EA		
38	Ground Rod for Water Main	4 EA		
39	6" x 1" Service Saddle w/ Corp Stop	16 EA		
40	1" Curb Stop w/ Box	16 EA		
41	1" Water Service Pipe	552 LF		
42	4' x 6' Type B Storm Inlet	1 EA		
43	2' x 3' Type B Storm Inlet	2 EA		
44	18" RCP Storm Sewer	308 LF		
45	24" RCP Storm Sewer	53 LF		
46	18" RCP Flared End	3 EA		
47	24" RCP Flared End	1 EA		
48	Concrete Cable Mat (8' x 8')	1 EA		
49	Gravel Base Course	2,230 TN		
50	Geotextile Fabric Separator	5,009 SY		

Bid Schedule A

Item	Description	Quantity	Unit Price	Total Price
51	Asphalt Surfacing	820 TN		
52	Salvage, Stockpile and Place Topsoil (ROW)	1,218 CY		
53	Unclassified Excavation and Embankment (ROW)	719 CY		
54	Embankment from Borrow (ROW)	2,594 CY		
55	Salvage, Stockpile and Place Topsoil (Lot Grading)	2,486 CY		
56	Unclassified Excavation and Embankment (Lot Grading)	4,302 CY		
57	Embankment from Borrow (Lot Grading)	2,408 CY		
58	Concrete Curb and Gutter	1,993 LF		
59	Concrete Approach Pavement	16 SY		
60	Clearing and Grubbing	1 LS		
61	Traffic Control Signs	197 SF		
62	Type III Barricades	12 EA		
63	Traffic Control, Miscellaneous	1 LS		
64	Erosion Control Blanket	6,629 SY		
65	Silt Fence	1,266 LF		
66	Inlet Protection	2 EA		
67	Culvert Protection	2 EA		
68	Seeding and Fertilizing	4.2 Acre		
69	Mulching	2.8 Acre		

Total For Bid Schedule A Items 1 - 69 Inclusive _____

Bid Schedule B - Lift Station and Force Main

Item #	Description	Quantity	Unit Price	Total Price
1	Mobilization (Schedule B)	1 LS		
2	3" Force Main with Tracer Wire	705 LF		
3	6" Bored PVC Casing Pipe	150 LF		
4	3" 11.25° Bend	3 EA		
5	3" 90° Bend	1 EA		
6	Tracer Wire Access Box	1 EA		
7	Tracer Wire Ground Rod	1 EA		
8	Core Drill and Connect Force Main to Manhole	1 EA		
9	Lift Station Wet Well and Appurtenances	1 LS		
10	Lift Station Pumps, Pipe, Fittings, Rails, Trash Basket, Controls and Related	1 LS		
11	Valve Vault, Pipe, Fittings, Valves, Hatch and Related Items	1 LS		
12	Electrical Work and Materials	1 LS		
13	Gravel Surfacing	64 TN		
14	Rock Surfacing	8 TN		

Total For Bid Schedule B - Lift Station and Force Main Items 1 - 14 Inclusive _____

Total For Bid Schedules A and B Inclusive _____

Bid Schedule C - Generator

Item #	Description	Quantity	Unit Price	Total Price
1	Automatic Stand-By Generator, Transfer Switch, Generator Electrical Work and Related Items	1 LS		

Total For Bid Schedule C - Generator Items 1 - 1 Inclusive _____

Total For Bid Schedules A, B, and C Inclusive _____

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.

ARTICLE 4—TIME OF COMPLETION

- 4.1 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.
- 4.2 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 5—BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.1 *Bid Acceptance Period*

- A. This Bid will remain subject to acceptance for ~~60~~**30** days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.2 *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.

5.3 *Receipt of Addenda*

- A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number	Addendum Date

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.1 *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

EJCDC® C-410, Bid Form for Construction Contract.

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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 the 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.

6.2 *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 6.02.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)

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SECTION 33 05 61 CONCRETE MANHOLES

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. The General Provisions of the Contract, including General and Supplementary Conditions, apply to the Work specified in this Section.
- B. Related Work Specified Elsewhere:
 - 1. Trenching, Backfilling and Compacting - Section 31 23 33
 - 2. Manhole Inserts - Section 33 01 30.84
 - 3. Sanitary Sewer Piping - Section 33 31 00

1.02 DESCRIPTION OF WORK

- A. The Work covered under these specifications shall include the furnishing of all material, labor, tools, and equipment necessary to furnish, install, and construct complete in place all manholes as shown on the drawings and specified herein.
- B. When the term "manhole" is used in these specifications, it shall mean a structure which is placed on a sewer line to permit entry, inspection, cleaning, and repair of the pipeline or placed as part of the storm sewer system to allow for inspection and inflow into the system.

1.03 MEASUREMENT AND PAYMENT

- A. The wet well and valve vault shall be measured in units for the size and type as specifically called for in the Bid Form. The price bid for each manhole, complete in place, shall be full compensation for furnishing all materials, labor, equipment and incidentals necessary to construct and place in satisfactory operating condition the manholes, including castings, covers, concrete foundations, access hatch, excavation, backfill, rock base and related items.
- B. Manholes shall be measured in units for the size and type as specifically called for in the Bid Form. The price bid for a standard 48" sanitary sewer manhole, complete in place, shall be full compensation for furnishing all materials, labor, equipment and incidentals necessary to construct and place in satisfactory operating condition the manholes, including castings, concrete adjusting rings, covers, cone section, excavation, backfill and rock base. The price shall include full compensation for adjusting the top of the casting to grade.
- C. For sanitary sewer manholes that are greater than 10 feet, measurement and payment of the additional manhole depth, when specifically called for on the Bid Form, shall be made to the nearest 0.1 foot for additional depth. Depth of manholes shall be measured from the invert of the outlet pipe to the top of the casting.
- D. Storm manholes, junction boxes or inlets shall be measured in units as specifically called for in the Bid Form. The price bid for a storm sewer manhole of different dimensions, complete in place, shall be full compensation for furnishing all materials, labor, equipment and incidentals necessary to construct and place in satisfactory operating condition the manholes, including castings, concrete adjusting rings, covers, cone section, excavation, backfill and rock base. The price shall include full compensation for adjusting the top of the casting to grade.

- E. Measurement for core drilling existing manholes shall be measured by the nominal diameter of pipe installed in the connection as indicated on the Bid Form. Payment for the core drilling of existing manholes shall be considered full compensation for furnishing all materials, labor, equipment and incidentals necessary to perform the work.
- F. Inside manhole drop system will be paid for based on each drop installed. Payment shall be considered full compensation to furnish and install all necessary materials and equipment required for the installation of the inside drop system.
- G. The removal and disposal of manholes and septic tanks will be measured on a per each basis. Payment for the removal and disposal of existing manhole and septic tank structures shall be paid for at the unit price as indicated on the Bid Form.

1.04 JOB CONDITIONS

- A. Existing underground utilities, as shown on the drawings, are located in accordance with available data, but locations may vary and cannot be guaranteed. The exact locations shall be determined by the Contractor as work proceeds. Excavation work shall be done carefully to avoid damaging existing work.
- B. Contractor shall provide for protection, temporary removal and replacement or relocation of said obstructions as required for the performance of the work required in these contract documents.

1.05 SUBMITTALS

- A. The Contractor shall submit for review copies of shop drawings for the materials as specified herein in accordance with the requirements of Section 01 33 23.

PART 2 PRODUCTS

2.01 MANHOLES

- A. Manholes shall be constructed of precast concrete with bases, rings, and covers according to the dimensions and details as shown on the plans or as called for in the specifications.
- B. The materials used for precast manhole section and bases shall be of the size as shown on the drawings and shall conform to ASTM C-478.
- C. Sanitary manhole benches and inverts are required as shown in the plans. If the Contractor desires the benches and inverts to be precast, they shall conform to the requirements in Part 3 of these specifications.

2.02 WET WELL ACCESS HATCH

- A. Access hatches shall be single door as shown on the plans similar to the Series S1R access door as manufactured by Halliday Products or approved equal.
- B. Access doors shall have a minimum clear opening as shown in the plans. Access door frame shall be provided with sliding nut rails on the hinge side to attach the required accessories. The concrete cover shall be reinforced as required.

- C. Angle frame shall be 1/4" aluminum with strap anchors bolted to the exterior. Door leaf shall be 1/4" aluminum diamond pattern plate with stainless steel hinges bolted to the underside and shall pivot on torsion bars for ease of operation. The door shall open to 90 degrees and lock automatically in that position. A vinyl grip handle shall be provided to release the cover for closing. Doors shall be built for a minimum live load of 150 pounds per square foot and equipped with a snap lock and removable handle. Hardware shall be cadmium plated and factory finish shall be mill finish with bituminous coating applied to the exterior of frame.
- D. The manufacturer's protective grating panel shall be provided for fall protection. The protective grating panel shall be 1 inch aluminum "I" bar grating with safety orange powder-coated finish and a 300 psf rating. Grating shall be hinged with tamper proof stainless steel bolts and shall be supplied with a positive latch to maintain the unit in an upright position. Grating shall have a 6-in. viewing area on each lateral unhinged side for visual observation and limited maintenance access. Grating support ledges shall incorporate nut rail with a minimum of four stainless steel spring nuts. A padlock hasp for owner-supplied padlock shall be provided.
- E. Provide locking hasp and master keyed vandal and weather resistant padlock on each hatch.

2.03 MANHOLE SEALANTS

- A. Flexible gasket material shall be used to make a watertight seal between the manhole wall and casting. The gasket material shall be ConSeal CS-102 as manufactured by Concrete Sealants, Inc., New Carlisle, Ohio; or approved equal. The gasket material shall conform to the minimum standards below:
 - 1. Specific gravity at 77° F shall be 1.15 to 1.50.
 - 2. Ductility at 77° F shall be 5.
 - 3. Cone penetration with 150 g for 5 sec at 77° F shall be 50 to 100 mm.
 - 4. Cone penetration with 150 g for 5 sec at 32° F shall be 40 mm.
 - 5. Flash point, C.O.C shall be 350° F.
 - 6. Fire point, C.O.C shall be 375° F.
- B. The manhole wall joints shall be sealed with a pipe gasket. The gasket shall be Reduced Friction Seal by Press-Seal Gasket Corporation or equal that conforms to the following minimum requirements:
 - 1. Tensile strength shall be 1,800 psi.
 - 2. Elongation at break shall be 425%.
 - 3. Hardness shall be less than 2.
 - 4. Oven-age tensile reduction shall be 20%, max.
 - 5. Compression set shall be a decrease of 20% max of original deflection.
 - 6. Water absorption shall cause an increase of 5% max of original weight.
 - 7. Ozone resistance testing conforming to ASTM D1149 shall cause no cracks.
 - 8. Splice strength shall conform to ASTM D 2527 Class 3.

- C. An external joint seal shall be installed on each section joint of the wet well in accordance with the manufacturer's recommendations. External joint seals shall consist of a collar at least 9" wide attached to the perimeter of each joint. The external joint seal shall be Geotex 401 by Propex Operating Company or equal that conforms to the following minimum requirements:

1. Tensile strength (grab) shall be 120 lb.
2. Elongation shall be 50%.
3. CBR puncture shall be 310 lb.
4. Trapezoidal tear shall be 50 lb.
5. UV resistance % retained at 500 hrs shall be 70%.
6. Apparent opening size shall be 0.212 mm.
7. Permittivity shall be 1.7 per sec.
8. Water flow rate shall be 140 gpm per square foot.

2.04 PIPE OPENING GASKET

- A. Unless otherwise shown on the plans, the pipe opening in the manhole wall shall be made watertight with a rubber gasket assembly meeting the requirements of ASTM C-923 and the following minimum requirements:

1. Chemical resistance in 1N sulfuric acid and 1N hydrochloric acid shall cause no weight loss.
2. Tensile strength shall be 1,200 psi.
3. Elongation at break shall be 350%.
4. Hardness shall be less than 2.
5. Oven-age tensile strength reduction shall be 15%.
6. Compression after 22 hours at 70° F shall be a decrease of 25% max of original deflection.
7. Water absorption shall cause an increase of 10% max of original weight.
8. Ozone resistance testing conforming to ASTM D1149 shall be rated at 0.
9. Low temp brittle point shall be -40° F with no fracture.
10. Tear resistance shall be 200 lbf / in.

2.05 WET WELL BASKET STRAINER

- A. The trash basket shall be composed of stainless steel and shall retain solids with a diameter larger than 2 inches. The channel rail system shall be composed of stainless steel. All hardware, lifting chain and fasteners shall be composed of stainless steel. The trash basket shall be Series B4A manufactured by Halliday Products or approved equal.

2.06 MANHOLE LINER

- A. The wet well for the lift station shall be lined as specified in Section 33 01 30.84.

2.07 PORTABLE HOIST – Not used.

2.08 LADDERS AND STEPS

- A. Steps when called for on the detailed drawings and specifications shall be polypropylene covered as manufactured by American Step Company or approved equal.

2.09 MANHOLE CASTINGS

- A. Gratings and covers shall be of the standard design of the manufacturer. All castings shall be of uniform quality, free from blow holes, shrinkage, cracks, distortion, or other defects affecting strength and appearance. They shall be smooth and well cleaned.

- B. Metal used in the manufacture of castings shall conform to ASTM A48-76, Class 35B for gray iron or ASTM A536-80, Grade 65-45-12 for ductile iron.
- C. All castings shall be manufactured true to pattern; component parts shall fit together in a satisfactory manner. Round frames and covers shall have continuously machined bearing surfaces to prevent rocking and rattling.
- D. All cast dimensions may vary 1/2 the maximum shrinkage possessed by the metal or plus or minus 1/16 inch per foot.
- E. All weights shall not exceed the manufacturer's published weights by plus or minus 5%.
- F. All castings shall meet the load bearing requirements of 16,000 pounds. The proof load test results shall be furnished upon request. The proof load test procedure shall be in accordance with Federal Specification A-A 60005.
- G. Unless shown otherwise on the plans, the manhole casting shall be Model R-1733 as manufactured by Neenah Foundry Company; Model 1261, as manufactured by Deeter Foundry Company; or approved equal. Covers shall be solid with concealed pick holes.

2.10 DROP INLET CASTINGS

- A. Unless shown otherwise in the plans, the drop inlet castings shall be Model R-3067-V as manufactured by Neenah Foundry Company or approved equal.
- B. Drop inlet castings shall be installed at locations as called on the plans or directed by the Owner.
- C. Drop inlet castings shall be model and grate as called for on the plans. The casting and grates as called for in the plans are based on the intake flow properties of the grate. Grates with similar intake properties will be considered for review as approved equal.

2.11 CONCRETE ADJUSTING RINGS

- A. Concrete adjusting rings shall be used to provide flexibility in the elevation of the top of the castings. Each casting should be placed on two adjusting rings unless otherwise shown in the plans or if limited by the constructability of the manhole. The thickness of the rings shall be a maximum of 2 inches. The inside diameter of the rings shall match the inside diameter of the casting or structure on which the ring rests.

PART 3 EXECUTION

3.01 LOCATIONS

- A. Manholes shall be constructed at the locations, elevations and grades indicated on the plans.

3.02 EXCAVATION

- A. The requirements of Section 31 23 33 shall apply to the excavation, backfilling and compaction for manholes.

3.03 GENERAL CONSTRUCTION

- A. Concrete shall be placed and shaped in sanitary manholes in such a manner to create a smooth, accurately shaped invert channel in accordance with the plan elevations. The floor and invert channel of the manhole shall be constructed in such a manner as to drain into the invert properly.
- B. Sanitary sewer invert channels and benches shall be precast or field constructed by the following methods:
 - 1. Hand formed directly with stiff concrete.
 - 2. Formed using a section of PVC of the required size, shape and length and pouring concrete against the pipe used as a form that stays in place.
 - 3. Constructed by laying full section sewer pipe straight through the manhole and cutting out the top half after the concrete for the manhole benches are placed.
- C. The interior floor of storm manholes or storm water inlet structures without precast flow channels shall not be less than four (4) inches below the opening for the lowest invert.
- D. Manholes shall be built up so that the cover, when placed, will be at the grade required in the plans or as set by the Engineer.

3.04 PRECAST CONCRETE MANHOLES

- A. Monolithic precast concrete manholes shall be constructed in accordance with the details shown on the plans, as required by ASTM Specification C478 and as specified hereinafter.
- B. Monolithic concrete and precast concrete manholes shall have offset cones; that is, one side shall be vertical.
- C. Precast base sections may be a base riser section and separate base slab or base section with integral floor.
- D. Precast concrete manholes shall be placed using present acceptable construction methods.
- E. The openings in monolithic precast manhole sections shall be sealed using a rubber sleeve gasket to make a flexible watertight connection.
- F. All lifting holes in the manhole walls shall be carefully grouted with non-shrunk grout prior to backfilling.

3.05 BACKFILLING

- A. After completion of footings, walls, and other construction below the elevation of the final grades and prior to backfilling, all forms shall be removed and the excavation cleaned of all trash and debris.
- B. The Contractor shall protect the manhole from all elements and from displacement during backfill operations. If any displacement of a manhole occurs, the Contractor shall repair all resulting damage and return the manhole to the original position required at his own expense.
- C. The backfill material shall conform to the requirements of Section 31 23 33. The backfill shall be brought up evenly on all sides of the precast structural section throughout its full depth.

3.06 CASTING PLACEMENT

- A. The manhole casting and cover shall be carefully centered and sealed in the opening manhole wall casting.

3.07 SURFACE FINISH

- A. The surface of the area shall be finished and smoothed to the lines and grades as shown on the plans.
- B. The requirements for the surface finish of the surrounding area shall conform to the requirements of the specifications relating to the surface to be replaced.

* * * END OF SECTION * * *

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