CITY OF HASTINGS

ADDENDUM NO. 3

January 14, 2026

SANITARY SEWER IMPROVEMENT E SOUTH ST

Contract No. HU 2025-104

1. *Addendum No. 3 (this addendum) overrides previous addendums no. 1 & 2 which therefore do not need to be acknowledged.*
    a. *New Bid Opening Date: February 4, 2026*
2. *Contract to include the following AIS Agreement included in this Addendum No. 3.*
    a. *AIS compliance documentation is required for all iron and steel materials used in this project.*
3. *Proposal Revision 1 – Replaces previous versions.*
4. *Specification Section 3 Revision 1 – Replaces previous versions (complete and return for bid).*
5. *Plan Set Drawing SR-089 Rev. 2 For Bid - Replaces previous versions.*

CITY OF HASTINGS

By Keith Miller, P.E.

Title Engineer

The undersigned bidder hereby certifies that the revision set forth in this addendum have been incorporated in their bid and are a part of the contract documents.

Signed _____

Title _____

Firm _____

Date _____

THIS ADDENDUM No. 3 MUST BE ACKNOWLEDGED & RETURNED WITH YOUR BID DOCUMENTS

AMERICAN IRON AND STEEL (AIS) AGREEMENT

City of Hastings
Contract: HU 2025-104
Sanitary Sewer Improvement E South St.

The Contractor acknowledges to and for the benefit of the City of Hastings ("Purchaser") and the Nebraska Department of Transportation (the "State") that it understands the goods and services under this Agreement are being funded with monies made available by the Nebraska Department of Transportation that have statutory requirements commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Contactor pursuant to this Agreement. The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State. Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

FORMAL PROPOSAL FOR
SANITARY SEWER IMPROVEMENT E SOUTH ST
CITY OF HASTINGS
Formal Contract No. HU 2025-104
REVISION 1

City of Hastings
1228 N Denver Avenue
Hastings NE 68901

BID OPENS: February 4, 2026 @ 1:30 PM

SEALED BIDS MUST BE RECEIVED NO LATER THAN 1:30 PM SAME DAY. BIDS RECEIVED AFTER THAT TIME WILL NOT BE ACCEPTED.

We, the undersigned, being familiar with all parts of these documents, being Notice to Bidders, Bid Proposal Price Sheets, Contract Document Forms, Plans and Specifications, Affidavit, Material List, and all other parts of this document, do herein submit our proposal to furnish, install, and perform all tasks required to complete said project area(s) for the total costs; including all necessary state and local sales taxes, and any other required taxes.

Completion Date: ***September 1, 2026***

Project will be awarded to one Contractor

Item	Description	Qty	Unit	Qty Price	Total Price
1.	8” PVC SDR-35 Sanitary Sewer Main	439	LF		
2.	48” Dia. Manhole Cone	1	EA.		
3.	60” Dia Manhole Cone	1	EA.		
4.	48” Dia. Manhole Base	1	EA.		
5.	60” Dia Manhole Base	1	EA.		
6.	48” Dia. Manhole Section	7.95	VF.		
7.	60” Dia Manhole Section	12.77	VF.		
8.	Ring and Cover	2	EA		
9.	6’x6’ Concrete Manhole Collar	2	EA.		
10.	8”x 4” PVC Tee	2	EA.		
11.	8” PVC Cap	1	EA.		
12.	6” HDD PVC Service Line	228	LF		
13.	4” HDD PVC Service Line	354	LF		
14.	1-1/2” PVC Service Line	140	LF		
15.	Concrete/Asphalt Paving Removal	8	SY		
16.	Concrete/Asphalt Paving Replacement	8	SY		
17.	Saw Cut	80	LF		

TOTAL PRICE:	
	$_____
In Words	

FORMAL PROPOSAL FOR
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CITY OF HASTINGS
Formal Contract No. HU 2025-104
REVISION 1

For purposes of sales/use tax, this project falls under Nebraska Sales and Use Tax Regulation 1-017 for Contractors. By definition, a contractor is "any person who repairs property annexed to, or who annexes property to, real estate, including leased property, by attaching building materials to the annexed property or improvement being built or repaired, or who arranges for annexation of property." Please refer to www.revenue.nebraska.gov/salestax.html for additional information.

For calculating this proposal:

- All contractors are to include sales/use tax on materials in the bidder's prices if applicable.
- **Option 1 contractors must separately state materials, sales tax, labor, and other charges on all invoices for the project. Any invoices submitted that do not include this required breakdown of the charges will not be accepted for payment. (This requirement does not apply to Option 2 or 3 contractors.)**
- The sales/use tax rate on building materials is 7.0% for projects within Hastings' city limits and 5.5% for projects outside of city limits.
- Contractor labor charges for this proposal are not subject to sales/use tax per the Nebraska Department of Revenue Notice to Contractors effective October 1, 2007.
- In submitting this bid, the bidder certifies that he will comply with all applicable laws, ordinances, and codes of the City of Hastings and the Sate of Nebraska.
- **Sewer Main Project is tax exempt.**

What contractor option have you registered with the Nebraska Department of Labor (must select one)?
Please refer to https://dol.nebraska.gov for additional information.

Option 1 _____
Option 2 _____
Option 3 _____

Is Nebraska Sales/Use Tax included in the above item no. 1 (must select one)?

Yes _____ No _____

Is Nebraska Sales/Use Tax included in the above item no. 2 (must select one)?

Yes _____ No _____

Any modification of bid proposal will be considered non-conformance of the bid. All exceptions to the proposal shall be noted as an exception to the bid.

Exceptions: No ☐ Yes ☐ (If yes, list on ***"Instructions to Bidders"*** page)

Liquidated Damage: The Contractor shall pay a fee of $100.00 per working day for failure to perform work within either the specified project period or the contract completion date in accordance with Paragraph 1.806 and 1.807 of the general conditions and Paragraph 2.002 of the Special Provision.

City of Hastings may at its own discretion delete any project area prior to award of contract.

FORMAL PROPOSAL FOR
SANITARY SEWER IMPROVEMENT E SOUTH ST
CITY OF HASTINGS
Formal Contract No. HU 2025-104
REVISION 1

In submitting this proposal, it is further understood that the City of Hastings reserves the right to reject any or all proposals, whether the price is the lowest or not, and may waive any informalities and may accept the proposal which best suits its needs. It is further understood that this proposal may not be withdrawn for a period of sixty days (60) days after the bids are opened.

All bid documents, including proposals, bid bonds, etc., must be submitted with original signatures. No copies will be accepted.

OFFICIAL NAME & ADDRESS

Firm Name	Signature
Address	Typed or Printed Name
City, State, Zip	Title
Phone No.	Date
Fax No.	Email Address

SECTION 3
SANITARY SEWERS TECHNICAL SPECIFICATION
CITY OF HASTINGS
REVISION 1



SECTION 3-0 - SCOPE OF WORK

3.001 The work covered by this section of the specifications consists of furnishing all labor, plant, equipment, appliances and materials, and performing all operations necessary to construct and complete sanitary sewers and appurtenances in strict accordance with these specifications, the applicable drawings, and subject to the terms and conditions of the contract.

Section 3-1 - Materials

3.101 Polyvinyl Chloride Gravity Sewer Pipe and Fittings. All polyvinyl chloride gravity sewer pipe and fittings shall comply with the requirements and specifications of the latest revision of the following standards:

1. ASTM D-3034 SDR26 sewer pipe conforming to ASTM D-3034 for 8" (200 mm) through 15" (380 mm).

2. ASTM F-679 for nominal pipe size 18" (460 mm) through 36" (910 mm).

3. ASTM F-794 pipe stiffness – 46 PSI 4" (100 mm) through 36" (910 mm).

4. ASTM F – 1803 pipe stiffness – 46 PSI 18” (450mm) through 36” (910 mm).

The PVC pipe and fittings shall be joined with integral bell and spigot type rubber gasketed joint. All PVC joints shall comply with the requirements and specifications of the latest revision of ASTM F-477, "elastomeric gaskets for joining plastic pipe". All pipe shall be made of PVC plastic having a cell classification of 12454-C, or 12364-C as defined by ASTM D-1784. The fittings shall be made of P.V.C. plastic having a cell classification of 12454-C, or 12364-C as defined by ASTM D-1784.

All PVC sanitary sewer pipe shall be green in color.

3.102 Flexible Pipe Coupling. Flexible couplings shall comply to ASTM D 5926. Properly select the appropriate coupler based on manufacturer’s intended use. Encase flexible couplers in concrete or utilize strong back couplers (stainless steel stiffening band) with proper backfill.

3.103 Precast Manholes.

a. Precast Manhole Sections conforming to ASTM C478. Concrete used in the construction of manholes shall utilize an "Az" life factor design. The minimum cover over the inner reinforcing steel (z), measured from the steel surface to the inside of the pipe wall, shall be such that the product of the Alkalinity (A) of the cover concrete, expressed as calcium carbonate equivalent, multiplied by the minimum cover in inches

(z) shall be no less than 0.50. In achieving the design Az factor, the alkalinity content of the components and the thickness of steel cover may both be varied, provided that the minimum provisions of ASTM C76 are met: and provided that the actual inside diameter of the section is not less than the nominal inside diameter (size) of section.

b. Top Sections consist of eccentric cone or flat tops with adjusting rings. Flat tops have a minimum thickness requirement of 8 inches.
c. Joint Gaskets constructed of rubber conforming to ASTM C443 and suitable up to 13 psig.
d. Joint Sealant consisting of butyl rubber conforming to ASTM C990 is required where gaskets are not utilized.
e. Concrete Adjusting Ring class H-20 with interior diameter of 24" minimum height of 4 inch required and maximum of 12 inches. Required when manholes are installed under roadway.
f. Precast Base Sections require pipe to manhole connectors conforming to ASTM C923.

3.104 Manhole Base. Manhole bases are installed in place and constructed integral with the bottom manhole section. The base shall be a minimum of 5" thick reinforced concrete with #4 (1/2") grade 60 bars on 12" centers each way. The base shall be set upon 12" thick, 1-1/2" crushed limestone compacted subgrade base. The pipe penetration shall be properly encased in concrete both inside and outside of the manhole. The invert shall be properly grouted for the required flow path.

3.105 Manhole Drop. Constructed wherever shown on the plans or whenever the invert of the entering sewer is 24 inches or more above the invert of the manhole. The drop will consist of size-on-size pipe, (1) tee fitting and (1) 90-degree elbow. Drop to be constructed outside of the manhole encased in formed concrete. Refer to standard details for more information.

3.106 Manhole Steps. Manhole steps shall not be installed.

3.107 Sanitary Sewer Main Cleanout. Construct of same size and material specification as the main it is installed on. Cleanout consists of a wye fitting with riser with threaded adaptor and plug. Protect cleanout with a cast iron ring and cover with concrete collar. Ring and cover conforming to ASTM A-48 constructed of gray cast iron Class 35B. Minimum clear opening of 10-5/8 inches and a minimum height of 6-inches weighing no less than 60 pounds.

3.108 Manhole Rings and Covers. Constructed to ASTM A48 standard and shall be H-20 rated Class 35B gray cast iron machined ring and cover with gasket. The ring and cover shall have a clear opening of 24-inches and weigh no less than 380 pounds. It shall contain a pick hole and have a "SEWER" marking casted into the iron.

3.109 Concrete Anchors. Heavy-duty anchors designed for fastening into concrete that are ½" diameter by 4-1/4" long hex nut expansion wedge anchors. Anchor manhole ring with (4) equally spaced anchors.

3.110 Grout. Grout where required shall consist of equal parts of sand and cement with sufficient water to produce the proper consistency.

3.111 Concrete. 47B Mix required unless specified on plans. Concrete mix shall comply with the Nebraska Department of Roads 47-B Mix design utilizing six and one half sack of cement (4000psi compressive strength at 28 days).

3.112 Concrete Reinforcement. Grade 60 steel rebar in various diameters.

3.113 Flowable Fill. Ready-mix product comprised of sand, cement, fly ash, water, and air entrainment per the following table:

Table 3.113

Flowable Fill Mix Design	
Sand	3028 Lbs.
Cement	65 Lbs.
Fly Ash	200 Lbs.
Water	40 Gal.
Air Entrainment	3-1/2 Oz.

3.114 Sanitary Sewer Services.

A. Gravity Service

1. 4" (100 mm) service pipe shall be utilized on all service connections unless otherwise noted.

2. Main Size x 4" (100 mm) service tees shall be utilized unless otherwise specified.

3. Sanitary sewer services shall be PVC. PVC sewer pipe and fittings shall be SDR26 ASTM D3034 or Sch 40 PVC for 4" (100 mm) and 6" (150 mm) sizes. Provide SDR35 ASTM D3034 or heavier for 8" (200 mm) pipe. All PVC fittings shall comply with this specification. All joints shall be gasproof, watertight, and rootproof. All PVC sewer service pipe and fittings shall be surrounded with a six inch (6") (150 mm) gravel bedding as specified. When required, provide restraint joint pipe for bore applications such as Certa-Lok.

4. All sewer services shall be constructed and installed by the Contractor as indicated on the drawings. Any work to be done on the customer side of the property line, except for connecting to existing services, shall be done by a licensed plumber. All service line work to be completed between the main and the property line may be done without the services of a licensed plumber. This work shall be deemed to be done by a sewer main Contractor. All service line work to be done by a sewer main Contractor shall be limited to the work as indicated on the drawings and within these contract documents, or as directed by the Engineer.

B. Pressurized Service

1. Pressure rating minimum of 200 PSI.

2. Material:

a. PVC Pipe and Fittings: SDR 21 or Sch. 40 conforming to ASTM D1784.

b. HDPE Pipe and Fittings: PE4710 Pressure Pipe conforming to ASTM D2239. Fittings constructed of brass with pack joint connection for PE pipe.

3. Testing: Hydrostatic Pressure Test in accordance with AWWA C605-13 or latest revision.

a. Test duration of 2 hour at a test pressure of 1.5 times the sustained working pressure with maximum pressure drop of 2psi.

3.115 Tracer Wire and Warning Tape. Tracer wire and warning bury tape shall be installed with sanitary sewer services. Owner will provide all materials with contractor installation subsidiary.

3.116 Submittals. The Contractor shall provide to the Engineer the following submittals, shop drawings, certifications and other related documents for review and approval:

1) Provide catalog cuts showing weights, dimension and sizes of all pipe materials, fittings, glands, bolts, adaptors, etc. to be utilized on this project.

2) Provide catalog cuts showing weights, dimensions and sizes of all manholes, manhole steps, ring and cover to be utilized on this project.

4) Provide sieve analysis of all bedding materials.

5) Provide catalog cuts of sealants used to seal profile pipe with approved manufacturer procedures.

SECTION 3-2 - CONSTRUCTION METHODS

3.201 Excavation. The ditch shall be excavated along the lines designated by the Engineer and to the depth given by him. The Contractor shall furnish, at his own expense, all planks, stakes, spikes, grade boards, and twine that may be required. The Engineer shall have the right to limit the amount of trench that may be opened in advance of the line of work. Should the trench be excavated to a greater depth than that given by the Engineer, the Contractor shall refill to grade, at his own expense, with good, well-tamped material. The width of the trench shall be approximately one (1) foot (300 mm) greater in the clear than the external diameter of the pipe to be laid therein. Trenches, where required, shall be properly sheeted and braced. The bottom of the trench under each pipe shall be shaped to receive the bottom quadrant of the pipe barrel. Bell holes shall be excavated so that, after placement, only the barrel of the pipe receives bearing pressure from the trench bottom. Excavation around existing utilities and structures shall be limited to minimum invasive practices such as utilization of properly sized trench safety equipment in-leu of benching.

Whenever wet or unstable soil that is incapable of properly supporting the pipe as determined by the Engineer, is encountered in the trench bottom, such soil shall be removed to the depth and length determined by the Engineer, and the trench backfilled to grade with suitable in-situ soil.

All grading in the vicinity of trench excavation shall be controlled to prevent surface water from flowing into the trench. Any water accumulating in the trench shall be removed by pumping or other approved method. Material excavated from the trenches shall be stacked in an orderly manner

a sufficient distance back from edge of trenches to avoid overloading and prevent slides or cave-ins. Materials unsuitable for backfilling shall be wasted by the Contractor as directed by the Engineer.

A minimum of one (1) foot (300 mm) of topsoil (unless otherwise noted on the plans) shall be removed in any and all area covered by vegetation. This topsoil shall be stockpiled separately from the material removed from the remainder of the trench. After the pipe is installed and the trench backfilled to an elevation one (1) foot (300 mm) (unless otherwise noted on the plans) below grade, the topsoil shall be replaced and compacted as previously described.

Excavation will not be classified. Whatever material is encountered shall be excavated to the proper grades and, if in any locations such material is not sufficient to provide a uniform, even bed for the pipe, the trench shall be excavated at least three (3) inches (76 mm) deeper than the grade at the bottom of the pipe and the space thus excavated shall be refilled with earth or sand and thoroughly compacted. Before any excavation is begun, the Contractor shall contact Diggers Hotline at 1-800-331-5666.

3.202 Protection of Existing Utilities. The accuracy of location of existing underground utilities as shown on the plans is not guaranteed. It shall be the duty of the Contractor to locate these utilities in advance of excavation and to protect same from damage after uncovering. No house service lines are shown on the plans. The Contractor shall contact the owners of the utilities for assistance in locating these service lines. Any expense incurred by reason of damaged or broken lines shall be the responsibility of the Contractor.

The Contractor shall not begin any excavation until the utility locate is completed. Diggers Hotline can be found online or by phone at 811 or 800-331-5666.

3.203 Tunneling. Tunneling, when necessary, shall be done under the supervision of the Engineer. Jacking or boring may be permitted where indicated in the plans. Before proceeding with boring or jacking, the Contractor shall submit to the Engineer for his approval a plan sketch showing the frame, bracing, pit details, etc. Whenever a steel casing is required, joints shall be welded with full strength welds. The Contractor shall maintain proper joint alignment and use full penetration welds.

3.204 Pipe Laying and Jointing. The placement and embedment of the sewer pipe shall comply with the appropriate specifications as noted below:

1) All polyvinyl chloride sewer pipe shall comply with the latest revision of ASTM D-2321.

The installation of all sewer pipes shall also comply with the following:

Pipe shall be protected at all times against impact shocks and free fall. Laying of pipe in finished trenches shall be commenced at the lowest point, with the spigot ends on bell-and-spigot pipe and tongue ends on tongue-and-groove pipe pointing in the direction of the flow. Pipe shall be set firmly to line and grade, and preparatory to making pipe joints, all surfaces of the pipe to be jointed shall be cleaned and dried. Joints shall be made tight to meet requirements of this specification.

Sewer trenches shall be kept free from water by a method approved by the Engineer. The Contractor shall not pump sewage into a street or pump to a storm sewer unless authorized by the

Engineer. Sanitary sewage must be returned to the sanitary sewer by means of pipe and hoses unless it is impossible to do so. Then disposal must be approved by the Engineer

When spiral or longitudinal closed profile pipe is provided, the Contractor shall seal the ends of all cuts of the closed profile pipe with a manufactured approved sealant and adhere to manufacturer's written procedures for sealing the open space. The closed profile pipe shall be installed in all manholes in such a manner the cut ends of the pipe are permanently sealed. In addition, the Contractor shall permanently seal all closed profile openings at a location 2' - 3' outside of the manhole. Any time a cut pipe is utilized, the ends shall be sealed and a second seal placed 2' - 4' away from the cut end.

3.205 Manhole Construction

All manholes shall be constructed as indicated on the drawings. When installing manholes on sewers that are in service, provide the necessary means to avoid service interruption. The contractor shall insure that all elevations, as noted on the plans, are strictly adhered to. Any deviation of elevations shall be brought to the immediate attention of the Engineer or his representative. All manholes shall be installed straight and plum. All pick openings and pipe entrances shall be fully grouted and finished in a workman like manner. Any through piping shall have the top cut out of the pipe and the floor of the manhole sloping outward from the opening in pipe to the walls.

3.206 Pipe Bedding. All sewer main shall be installed using bedding detail III or IV as noted on special plan detail sheets. The space between the pipe and sides of the excavation shall be filled and compacted with granular bedding as specified. The bedding material shall extend as a minimum 12 inches (300 mm) above the top of all PVC and VCP sewer mains before the trench box is moved. A bench shall be constructed to allow the trench box to set above the top of the sewer main.

If other construction practice is desired, it shall be submitted in writing to the Engineer for review and approval. In the event a different construction practice is desired, the procedure shall be reviewed with respect to trench width, soil loads, and live loads such as H-20 traffic loading.

VCP sewer pipe shall adhere to bedding detail III as per ASTM C-12 with appropriate maximum depth of installation.

PVC sewer pipe shall adhere to bedding detail III and have a minimum modulus of soil reaction (E') of 100 PSI or greater, and have a maximum depth for deflections of 5% or less, and comply with applicable requirements set forth in Unibell Recommended Standard UNI-B-5 latest revision.

DIP shall adhere to bedding detail IV with appropriate pressure class and associated maximum depth of installation, and comply with latest revision of AWWA C150/A21.50 and applicable sections of AWWA C600-87.

The granular bedding shall have the following gradation:

Sieve Size	Minimum % Retained on Sieve	Range
1.0 inch	-0-	
No. 4	34%	± 5%
No. 10	63%	± 10%
No. 30	88%	± 5%
No. 200	98.5%	± 1.5%

Note: Granular bedding is similar to NDOR Type ABX sand and gravel aggregate

The granular bedding shall be placed around all VCP and compacted to a minimum of 90% optimum proctor density for depths of 4 feet to 30 feet. Trench width shall adhere to 118 MCP technical bulletin (118 Sheet 2 of 2).

The granular bedding for PVC pipe shall be compacted to a maximum of 80% optimum proctor density for depth 4 feet to 16 feet and 90% optimum proctor density for depths 17 feet to 30 feet.

The granular bedding for DIP shall be compacted to 80% of optimum proctor density for depths up to 30 feet.

Trench width shall be kept to a minimum and as noted within these specifications or as noted in the drawings.

If in the event the bedding material cannot be properly compacted, then the Contractor shall provide a coarse aggregate bedding complying with the following gradation.

Sieve Size	Minimum % Retained on Sieve	Range
1 1/2 inch	-0-	
3/4 inch	20%	± 5%
3/8 inch	47%	± 10%
No. 10	80%	± 10%
No. 200	95%	± 5%

Note: Coarse aggregate bedding is similar to a NDOR crushed rock base course material.

3.207 Trench Backfilling. Trench backfill shall conform to following:

1) All sewer pipe shall be bedded as noted above. Bedding process shall be accomplished by introducing backfill material in layers not to exceed 6 inches in depth and compacted.

2) Upon bedding of pipe, fill may be introduced suitable to the type of method that will be used for compaction, i.e., compactor, hydraulic vibrator, etc. Lift thickness will be

determined in field by inspector and job foreman with a maximum loose lift thickness of 12 inches. Once backfill has reached a depth of 5' below final grade all backfill will be tamped with a motorized vibratory sheepsfoot, to provide a consistent compacted trench.

3) Compaction tests to be taken 7' to 8' below top of trench or beginning 2-3' to 4' above top of pipe, which ever is deeper, then taken in 2' to 3' increments, with final test taken 1' below surface at final grade. Tests to be taken at 50 to 100 lineal foot (15 M to 30 M) of trench, to be determined on job site. Tests to be taken around manholes on all four sides 4' to 5' out from manholes at same depths as tests taken in trench. Contractor will be required to make excavation for tests.

4) Test results for compaction shall meet or exceed following:

   a. 95% standard proctor density for terraces.

   b. 98% standard proctor density for driveways, sidewalks, and streets.

   c. Assumption that moisture content (±) 3% of optimum failure of test to reach these minimum results will require recompaction by Contractor.

5) No unsuitable material will be allowed in backfilling, i.e., rock, saturated soils, excessively dry soils, concrete, grasses, etc. Contractor will be required to remove such material from the job site and replace with adequate amounts of approved material. The Contractor shall supply suitable backfill material from an approved borrow site acceptable to the Engineer at the unit price in the proposal.

   Any backfill found unstable because of plastic soils will have to be replaced by the Contractor with suitable material. No additional compensation will be granted.

6) Water settling will not be permitted.

7) The select bedding material shall be granular fill as noted in specification 3.206.

8) If proper compaction requires additional soil to be brought to the site by the Contractor, all expenses for this additional soil shall be considered subsidiary to the pipe installation.

9) The Contractor shall hand tamp around all manholes with hand tampers or pad tampers "Jumping Jacks" to insure proper compaction.

10) In the event settlement of any backfill associated with the project is encountered, the Engineer shall notify the Contractor in writing to repair all defects, including settlement and associated street repair, if it is discovered within the three (3) year maintenance period. No extra monies will be paid for repairs caused by settlement of the backfill.

3.208 Trench Wall Support. All trenches shall be braced or sheeted as to local soil conditions dictate and in full observation of OSHA, as well as local, State of Nebraska, and other Federal requirements. There shall be sufficient tamped cover over pipe to protect in removal of shoring material.

A full depth trench box shall be used for all sewer main installations. At the Contractor's discretion, wood or steel shoring can be used. All wood or steel shoring shall be cut off at the top of the sewer main and the lower section left in place.

3.209 Acceptance Testing. Upon completion of sewers, each pipe line and manhole will be lamped, checked for flow and freedom from accumulated earth or debris, and checked for the general requirements of the specifications. The Contractor shall furnish such tools, hose and other equipment necessary for making such tests, and shall be present during the inspection to note any deficiencies that may exist. Before final acceptance, all sewers shall be clean, shall comply with the specifications and all contract documents and shall be acceptable to the Engineer and municipal authorities. City of Hastings Engineering Inspector or representative is to be present to witness all testing.

3.210 Exfiltration Test. Exfiltration test of the sewer lines shall be conducted upon completion of a section of wastewater line in accordance with ASTM F1417 and by the following method as directed by the Engineer:

After a manhole to manhole section of wastewater line has been backfilled and cleaned, pneumatic plugs shall be placed in the line at each manhole and inflated to 25 psig. Low pressure air shall be introduced into this sealed line until the internal air pressure reaches 4 psig greater than the average back pressure of any ground water that may be over the pipe. At least two minutes shall be allowed for the air pressure to stabilize.

After the stabilization period (3.5 psig minimum pressure in the pipe), the air supply shall be disconnected. The portion of line being tested shall be termed "Acceptable" if the time required in minutes for the pressure to decrease from 3.5 psig to 2.5 psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than the time shown for the given diameters in Table 1 below:

Table 1: Sewer Main Low Pressure Test per ASTM F1417

PVC Pipe Diameter in Inches

Pipe Diameter Inches	Minimum Time, Minutes:Seconds	Length for Minimum Time, Ft.	Time for Longer Length:Seconds
8	7:34	298	1.520 L
10	9:26	239	2.374 L
12	11:20	199	3.418 L
15	14:10	159	5.342 L
18	17:00	133	7.692 L
21	19:50	114	10.470 L
24	22:40	99	13.674 L
27	25:30	88	17.306 L
30	28:20	80	21.366 L
33	31:10	72	25.852 L
36	34:00	66	30.768 L

The following alternative method of exfiltration may be used with prior approval of the Engineer:

Plug the lower end of a section of wastewater line and fill with water. Let the water stand for approximately four hours and then fill the line again. After the line has reached its maximum absorption, refill to the original depth; after one hour, record the new level of water in the manhole and convert to gallons; and then subtract the actual manhole loss previously determined for one hour to set actual line loss. Pipe leakage allowance shall be 100 gallons per inch diameter per mile per day (1 liter per mm diameter per Meter per day).

3.211 Television Inspection – Sanitary Sewer Lines. Television (TV) inspection recorded digitally on DVD media shall be required on completion of all sewer main lines. The TV inspection shall include on screen measurement along the pipe being inspected – starting with zero at the first manhole of any run of pipe being inspected. In addition to the DVD, a written report shall be provided noting defects, service connection(s), sags, and other anomalies. The written report shall also denote the time, date, starting manhole number and station, direction of camera travel, and ending manhole number and station.

The Contractor shall provide a DVD and written report of the inspection. Video (VHS) will not be permitted.

Contractor shall furnish the name of firm proposed to do the television (TV) inspection on the subcontractor designation sheet. One copy of the DVD shall be given to City of Hastings for their files. Cost of TV inspection and DVD will be subsidiary to bid. Contractor will not be paid retention until television inspection is received.

3.212 Separation from Water Mains.

Horizontal Separation. Whenever possible, sewers should be laid at least ten (10) feet (3 M), horizontally), from any existing or proposed water main. Following should be true if conditions prevent a lateral separation of ten (10) feet (3 M) to a water main if:

1) It is laid in a separate trench.
2) It is laid in the same trench with the water mains located at one side on a bench of undisturbed earth.
3) In either case the elevation of the crown of the sewer is at least eighteen (18) inches (450 mm) below the invert of the water main.

Vertical Separation. Whenever sewers must cross under water mains, the sewer shall be laid at such an elevation that the top of the sewer is at least eighteen (18) inches (450 mm) below the bottom of the water main. When the elevation of the sewer cannot be buried to meet the above requirement, the water main shall be relocated to provide this separation or reconstructed with slip-on or mechanical-joint cast iron pipe, for a distance of ten (10) feet (3 M) on each side of the sewer. One full length of water main should be centered over the sewer so that both joints will be as far from the sewer as possible.

Special Conditions. When it is impossible to obtain proper horizontal and vertical separation as stipulated above, the water main should be constructed of slip-on or mechanical-joint cast iron

pipe, and the sewer constructed of mechanical-joint cast-iron and both services should be pressure tested to assure water-tightness.

3.213 Deflection Testing. Deflection tests shall be performed on all flexible pipe (i.e., P.V.C.). The test shall be conducted after the final backfill has been in place at least 30 days to permit stabilization of the soil-pipe system. No pipe shall exceed a deflection of five percent (5%). If deflection exceeds five percent (5%), replacement or correction shall be accomplished as approved by the Engineer. A rigid ball or mandrel shall be used for the deflection test. It shall have a diameter not less than ninety-five percent (95%) of the nominal inside diameter of the pipe. The pipe shall be measured in compliance with ASTM D 2122, "Standard Test Method of Determining Dimension of Thermoplastic Pipe and Fittings". The test shall be performed without mechanical pulling devices.

3.214 Pipe Plug. The Contractor shall utilize a water tight mechanical plug or cap of appropriate size to secure the open end of the pipe from debris entering into the pipe. This shall be strictly enforced at the end of each day, during any breaks lasting more than 30 minutes or unscheduled stoppage which the pipe may be left unattended for more than 30 minutes. Buckets, duct tape and other methods will not be allowed.

3.215 Abandonment.

a. Sewer Main: Properly seal off ends of pipe and fill pipe with flowable fill unless otherwise noted on plans.

b. Manhole: Remove manhole and properly dispose of material. If the sewer line remains in service, provide necessary means to avoid service interruption.

c. Sewer Service: Cap off sanitary sewer service at the sewer main.

3.216 Services. Services installed on private property shall be designed, permitted, and constructed by a licensed plumber, meeting all applicable standards and codes.

SECTION 3-3 - METHOD OF MEASUREMENT AND BASIS OF PAYMENT

3.301 Sewer Pipe in Place. Sewer pipe shall be measured and paid for at the contract unit price for lineal foot for various sizes, including excavation and backfill complete in place. Sewer pipe shall be measured for payment after installation of the sewer, through all line manholes, through the walls of structures and existing manholes, and shall include the portion of all wyes considered as main line sewer. Such payment shall be full compensation for all labor, plant, equipment and materials necessary for a complete and accepted project, including removal of all debris, and final cleanup of the job.

3.302 Fittings and Tees. Fittings and tees shall be paid for at the contract unit price for various size fittings and tees.

3.303 Manhole Section. To be paid for at the contract unit price measured from flow line to top of barrel sections plus concrete adjusting rings (where required).

3.304 Sales Tax Exemption. City will furnish sales tax exemption to successful bidder.

END OF SECTION

