

CITY OF ANTIGO
INVITATION TO BID
for
“2018 Amron Sanitary Sewer Replacement”

The City of Antigo is accepting bids for **Replacement of a Sanitary Sewer**

60 LF of 10” CIPP Sanitary Sewer
290 LF of 10” PVC Sanitary Sewer - Open Cut

Specifications are available in the Public Works Office, 700 Edison Street, Antigo, WI 54409. Bids will be accepted until 10:10 a.m., on April 18, 2018, and should be submitted in a sealed envelope marked “**2018 Amron Sanitary Sewer Replacement**” to the Clerk-Treasurer’s Office at the above address. Bids will be opened and read aloud in the Public Works Department after 10:10 a.m.

The City of Antigo reserves the right to reject any or all bids and to accept the bid deemed most advantageous to the City.

Charley Brinkmeier

Project Description

The City of Antigo has discovered a sanitary sewer pipe in need of replacement in the 800 Block of Amron Ave. The sewer is approximately 350 long and 12 feet deep and services Amron Corporation which discharges a rather large amount of sanitary sewer. Amron Corporation will not be able to reduce the amount of flow during construction. By-pass pumping will be required. Also, based on the video there is some ground water infiltrating into this sanitary sewer which will require de-watering. Clermont St was paved in 2017 so we are requiring a cured in place lining (slip lining) for 60 feet west of the centerline of Clermont St then open trench construction for the rest of the project. This project is going to be a lump sum bid for all the following specifications.

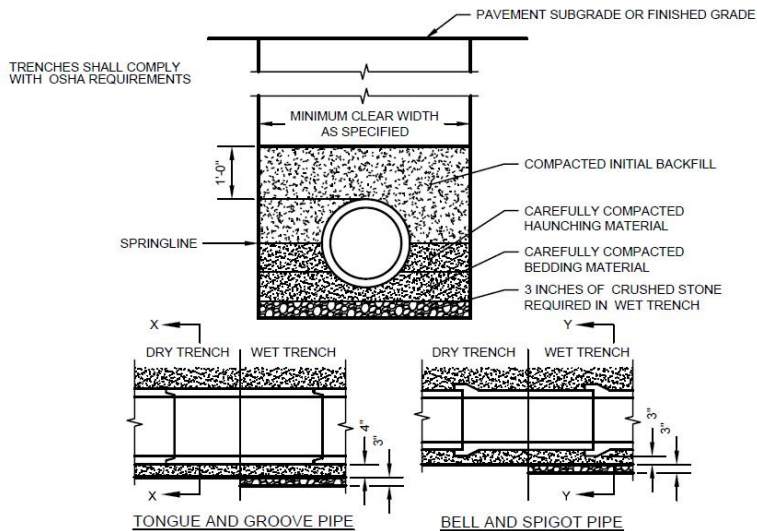
City of Antigo will be responsible for:

- 1) Slope calculation
- 2) Seeding
- 3) Replacement of disturbed asphalt

Contractor will be responsible for:

- 1) Detour – barricades
- 2) Dewatering
- 3) By-pass pumping
- 4) Erosion Control - inlet protection
- 5) Coordination with CIPP contractor
- 6) Removal and installation of new sanitary sewer
- 7) Restoration except seeding

◆ Amron Sanitary Sewer Notes



GENERAL NOTES:

1. BEDDING AND HAUNCHING MATERIAL SHALL BE WELL-GRADED 3/4 TO 1/4 INCH CRUSHED STONE OR OTHER NON-COHESSIVE MATERIAL NOT SUBJECT TO MIGRATION AND FREE OF DEBRIS, ORGANIC MATERIAL, AND LARGE STONES.
2. BEDDING MATERIAL TO BE PLACED BEFORE SETTING PIPE, 4 INCH MINIMUM UNDER BARREL WITH 3 INCH MINIMUM UNDER BELL.
3. INITIAL BACKFILL SHALL BE DENSELY COMPACTED, NON-COHESSIVE FINELY DIVIDED MATERIAL FREE OF DEBRIS, ORGANIC MATERIAL, AND LARGE STONES.
4. IN ROCK OR OTHER UNCOMPRESSIBLE MATERIALS, THE TRENCH SHALL BE OVEREXCAVATED A MINIMUM OF 6-INCHES AND REFILLED WITH GRANULAR MATERIAL.

CLASS "B" EMBEDMENT FOR RIGID PIPE DETAIL

NO SCALE

BID PROPOSAL

The undersigned hereby declares that he has examined the annexed contract and bond and that they are familiar with the requirements of the Engineer and the committee and that they will agree to do all the work necessary to complete construction of the work herein contemplated, and they will furnish all labor and material, equipment and tools for the complete performance of the work as called for in the plans and specifications, and they hereby agree to complete the work for the following sums-to-wit:

Approximately 60 lineal feet of ten inch (10") Sanitary pipe CIPP

Approximately 290 lineal feet of ten inch (10") Sanitary pipe PVC

Bidder acknowledges that the above estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids and final payment for all Unit Price Bid items will be based on actual quantities provided, determined as provided in the Contract documents.

60 LF 10" CIPP Lining	\$ _____ LF	\$ _____	Sub Total
290 LF 10" PVC	\$ _____ LF	\$ _____	Sub Total
		\$ _____	Total

Completion Date: September 15th 2018

Attached hereto find check or bid bond in the amount of \$ _____ equivalent to 5% of the bid, which I agree to forfeit if I fail to enter into the contract, within ten days of notification of award.

Company: _____

Bidder Signature _____

Address: _____

PHONE: _____ Date: _____

2018 Contract for the

City of Antigo

This agreement is between the **City of Antigo** herein called "CITY" and
herein called "CONTRACTOR".

The City and Contractor, agree as follows:

1) **Scope of Work : Remove and install 350 LF of 10" Sanitary pipe in the 800 Block of Amron Ave. Workmanship is to be completed by the attached specifications, details and industry standards**

2) **Insurance.** The Contractor shall not commence work under this contract until he/she has obtained all insurance required under this agreement and such insurance has been approved by the City. Nor shall the Contractor allow any subcontractor to commence work on a subcontract until all similar insurance required of the subcontractor has been so obtained and approved.

Worker's Compensation
and Employer's Liability:

Statutory

General Liability:

Bodily Injury, including death	\$1,000,000 each person \$ 1,000,000 each occurrence
Property Damage Or Combined Single Limit	\$1,000,000 each occurrence \$1,000,000 each occurrence

Independent Contractor's (if applicable)
(contingent liability):

Bodily Injury, including death	\$1,000,000 each person \$1,000,000 each occurrence
Property Damage	\$1,000,000 each occurrence

Automobile Liability:

Bodily Injury, including death	\$1,000,000 each person \$1,000,000 each occurrence
Property Damage	\$1,000,000 each occurrence

Professional Liability
(if applicable)

\$ 1,000,000 indicating if claims
made type of policy

Performance and Payment Bond
(if applicable)

Contract Amount

An umbrella policy of \$1,000,000 may be used to satisfy the above requirements. The City of Antigo must be named as an additional insured with a copy of the endorsement

forwarded to the City Clerk-Treasurer's Office. No insurance shall be canceled without notifying the City in writing thirty (30) days prior to cancellation.

- 3) **Proof of Insurance.** The Contractor shall furnish the City with proof of insurance which shall consist of a certificate of insurance.
- 4) **Performance/Payment Bond.** The City may require a Performance Bond and Payment Bond in an amount of the estimated work to be completed for the faithful performance of this contract and for the payment of all persons performing labor and furnishing materials in connection with this contract.
- 5) **Owner's Right.** The City may utilize their employees and equipment to perform any part of the work described in this contract upon proper verbal notification and approved by the contractor.
- 6) **Term.** The term of this contract shall be effective beginning on _____ 2018, and shall continue until _____ 2018
- 7) **Termination.** In the event of unsatisfactory work by the Contractor, as judged by the City, the City shall give written notice to the Contractor identifying the deficiencies. If unsatisfactory work continues, the City upon second written notice, may declare this agreement null and void. The City may also terminate this agreement for any reason upon a 90-day written notice.

8) **Contract Binding Upon Succession.** All of the provisions and agreements of this contract shall inure to the benefit of and binding upon the heirs, executors, administrators, representatives, successors, and assigns of the respective parties hereto as fully as upon the said parties.

Company Name : _____

Authorized Signer: _____ Date: _____

Address : _____

Phone : _____

In Witness whereof, the parties hereto have signed this Agreement.
This agreement will be effective on

City of Antigo

Contractor

Mayor

Attest:

Witness:

Address for giving notice

Address for giving notice

700 Edison Street

Antigo, WI 54409

Phone: (715) 623-3633

Specifications for Cured in Place Pipe Lining

1. Repair area an industrial, ten inch (10") continuous sanitary sewer in a state of deterioration. Any questions could be answered by Charley Brinkmeier, at (715) 623-3633 extension 132.
2. Acceptance of bid will be based from price and start date.
3. The City of Antigo reserves the right to reject any and/or all bids and to accept the bid deemed most advantageous to the City.
4. Current Videos are available at under 2018 Amron Sanitary folder on the City's FTP site:

The site can be accessed by downloading FTP Voyager from Solarwinds and using the following information to obtain the videos.

Or use the following information in your Chrome address bar.

<ftp.antigo-city.org>

username: antigofiles

password: antigodocs2014

5. Successful Bidder will be responsible for:
 - ◆ Making the watertight connections
 - ◆ Coordinating with affected industry 24 hours in advance of work being completed
 - ◆ Connecting active laterals so flow enters liner, boot if needed
 - ◆ Repairing any defects in the liner
 - ◆ Any bypass pumping that is needed
 - ◆ Any dewatering that would be needed
 - ◆ Thorough cleaning of the sewer main line
 - ◆ Televising sewer after cleaning but before liner and then again after liner installation
 - ◆ Providing inspection logs
 - ◆ Leakage testing
 - ◆ Cleaning construction material each day
 - ◆ Traffic control – conform to State/Federal regulations for safety
 - ◆ **Obtaining water for project, at contractor's expense at the Water Plant.**
 - ◆ Root cutting, debris disposal and coring of laterals
 - ◆ Cutting off of any protruding service connections

Construction Specifications

DEWATERING

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

- A. Applicable provisions of Division 1 shall govern the work of this section.

1.02 APPLICABLE PUBLICATIONS

- A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
 - 1. Wisconsin Administrative Code (WAC), Department of Natural Resources Environmental Protection Regulations, Current Edition.

1.03 DESCRIPTION OF WORK

- A. The work under this section shall cover furnishing all materials and labor to keep all excavations free of water during the preparation of the subgrade, to keep all concrete and masonry work free of water through the time period specified herein, and to keep the excavation free of water during backfilling.

1.04 RELATED WORK ELSEWHERE

- A. Temporary Utilities - Division 1
- B. Excavation, Trenching and Backfilling for Utilities - Division 2
- C. Structural Excavation, Backfill and Compaction - Division 2
- D. Erosion Control - Division 2

1.05 SHOP DRAWINGS (NONE)

1.06 PERMITS AND APPROVALS

- A. The Contractor shall contact the Department of Natural Resources for a well construction and operation permit for all wells installed or operated for pumping groundwater to lower the watertable for which the single or aggregate capacity may be in excess of 70 GPM. The Department of Natural Resources address is as follows:

Wisconsin Department of Natural Resources
Private Water Supply Section
P.O. Box 7921
Madison, Wisconsin 53707

- B. The Contractor shall contact the Department of Natural Resources for a Wisconsin Pollutant Discharge Elimination System (WPDES) Permit No. WI-0046566-2 for discharges from pumping groundwater to lower the water table or dewater excavations. The Department of Natural Resources district office of jurisdiction for the project area is the office for contact.

PART 2 PRODUCTS AND MATERIALS

2.01 GENERAL

- A. The Contractor shall furnish dewatering sumps, wells, discharge pipe, and pumping equipment as may be required to adequately dewater the work.

2.02 PUMPING EQUIPMENT

- A. Pumping equipment shall be capable of running continuously except for conditions which may be approved by the City.

2.03 WELLS

- A. For the purposes of compliance, the provisions of chapter NR 812 apply to all new and existing drill holes to be utilized for the purpose of dewatering and the following:
 - 1. Wells governed under chapter NR 141 do not apply, unless they are high capacity wells, and shall not be used for the purpose of dewatering.

PART 3 CONSTRUCTION METHODS

3.01 WATER LEVELS

- A. Water levels shall be maintained at a level below all open excavations for structures and below the level of concrete until the concrete has been in place for 14 days or until test cylinders show the concrete strength to be at least 3,000 pounds per square inch or until high-early-strength concrete has been in place for 6 days or until test cylinders show the strength of the concrete to be at least 3,000 pounds per square inch. Water levels will be allowed to rise on structures prior to the concrete attaining its strength provided that water levels are raised uniformly on each side of walls.
- B. Water levels shall be maintained at a minimum level of 6 inches below the invert elevation of a pipe during placement.

- C. The Contractor shall supply potable water at the City's Discretion to any home or business whose private well is within 300 feet of construction dewatering. Potable water shall be supplied until the amount of water supplied has returned to pre-existing conditions or until the home or business is connected to the public water system.

3.02 WELLS

- A. For the purposes of construction and installation, and abandonment, the provisions of chapter NR 812 apply to all drillholes and wells.
- B. For the purpose of operation for wells used for dewatering, these operations shall be in accordance with the requirements of these specifications, the City and all local, municipal, and state codes, rules and regulations.

3.03 DISCHARGE LINE

- A. Discharge line shall be at a location approved by the City.

3.04 DISPOSAL OF WATER

- A. All water discharged from work sites shall be disposed of in such a manner to minimize erosion and sedimentation. Water must be discharged to a hard surface such as metal sheeting, wood sheeting, concrete, etc., so that erosion at the discharge point is eliminated.
- B. Temporary and permanent erosion and sedimentation control measures shall be performed by the Contractor during construction to control water pollution, erosion and siltation, through the use of intercepting embankments, berms, dikes, dams, settling basins, sodding, planting and other erosion control devices or methods.

3.05 SAMPLING AND MONITORING

- A. Sampling and monitoring shall be performed by the Contractor in accordance with WPDES permit requirements. The cover letter accompanying the permit shall specify which parameters shall be monitored to assure compliance with water quality standards or treatment technology based standards.
- B. Samples representative of the discharge shall be collected after treatment and prior to discharge to the environment. When treatment efficiency reporting is required, the influent sample shall be collected before the water passes through the treatment unit.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

- A. Dewatering shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule.

4.02 DEWATERING

- A. Dewatering, Lump Sum. When so provided, payment for dewatering shall be made at the contract lump sum price bid.
- B. Dewatering, Inclusive. When no quantity is provided, dewatering shall be considered inclusive to payment for work associated with the related utility or construction.

END OF SECTION

SITE GRADING

PART 5 GENERAL

5.01 APPLICABLE PROVISIONS

- A. Applicable provisions of Division 1 shall govern work of this section.

5.02 APPLICABLE PUBLICATIONS

- A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
 - 1. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, current edition, and current Supplemental Specifications.

5.03 DESCRIPTION OF WORK

- A. The work covered under this section shall consist of furnishing all material, equipment, and labor required to execute the site grading for this project.

5.04 RELATED WORK ELSEWHERE

- A. Excavating, Trenching and Backfilling for Utilities - Division 2

- B. Structural Excavation, Backfill and Compaction - Division 2
- C. Seeding and Sodding - Division 2
- D. Erosion Control - Division 2

5.05 SHOP DRAWINGS (NONE)

PART 6 PRODUCTS AND MATERIALS

6.01 TOPSOIL

- A. Topsoil or salvaged topsoil shall conform to Section 625 of the State of Wisconsin, Department of Transportation Standard Specifications.

PART 7 CONSTRUCTION METHODS

7.01 PROTECTION OF EXISTING UTILITIES

- A. Locate existing underground utilities in the areas of work before starting grading operations and provide adequate means of protection during earthwork operations. Should uncharted or incorrectly charted piping or other utilities be encountered during grading, consult the Engineer immediately for directions as to procedure. Cooperate with the Owner, and public and private utility companies in keeping their respective services and facilities in operation.
- B. Repair damaged utilities to the satisfaction of the utility owner.

7.02 PRESERVATION OF TREES AND SHRUBS

- A. Trees and shrubs to be preserved shall be thoroughly protected from scarring or other injury during grading operations. Excavation operations shall not disturb the original ground around trees within a distance of one foot or twice the diameter of the tree, whichever is greater. Exposed roots resulting from excavation shall be cut cleanly and covered with humus-bearing soil.
- B. When necessary or required by the Contract Documents, trees or shrubs around which embankment is placed shall be protected by tree wells built in accordance with detailed drawings or as laid out in the field by the Owner or Engineer.

7.03 TOPSOIL

- A. General. Topsoil shall be stripped and placed in accordance with Subsection 625.3 of the State of Wisconsin, Department of Transportation Standard Specifications.
- B. Salvaged Topsoil. Topsoil shall be stripped to a minimum depth of 6 inches in all areas of cut or fill, except within roadway limits topsoil shall be stripped full depth. Stockpile topsoil in storage piles in areas shown, or where otherwise directed.

Construct storage piles to freely drain surface water. Cover or sprinkle water on storage piles if required to prevent windblown dust. Any appreciable volume left in the stockpile after properly placing shall become the property of the Owner and left in the pile. In any event, the pile shall be smoothed and seeded. All piles which are to be left for seven or more days shall be stabilized as indicated in the Erosion Control - Division 1.

- C. Placing Topsoil. All areas disturbed by the Contractor's activities shall be topsoiled to the depth specified in Seeding and Sodding - Division 2, shown on the contract drawings, or specified in Special Conditions - Division 1.

7.04 GRADING

- A. General. All areas within the project limits shall be graded to the finished grades, lines and details less an allowance for topsoil and/or sod depth, pavement, base and structures.
- B. Construction Methods. Grading shall be performed in accordance with Sections 205, 206, 207, and 208, of the State of Wisconsin, Department of Transportation Standard Specifications. If borrow is needed to provide the grades and elevations required, a borrow area will be selected by the Owner. The borrow area shall be restored to smooth lines, topsoiled with a minimum of 6 inches of salvaged topsoil and seeded.
- C. Tolerance. Finish earth grades shall be in reasonably close conformity with the lines, grades and thickness shown on the contract drawings or established by the Engineer with particular concern for drainage and appearance. Finish earth grades along buildings or structures, under and adjacent to pavements and in drainageways shall be within 0.10 foot of those staked or shown on the contract drawings. Grades in all other areas shall be within 0.50 foot unless drainage considerations require more accuracy.

7.05 DRAINAGE

- A. During construction, ditches and channels shall be drained by keeping the excavation areas and embankment sloped to the approximate section of the final earth grade. If existing surface drainage must be interrupted, temporary drainage shall be provided.
- B. Construction in and adjacent to flowing streams shall be performed to avoid washing, sloughing or deposition of materials into the channel which may obstruct or impair stream flow, or which may result in contamination and/or silting of the stream.
- C. Precautions shall be taken to preserve, protect, and continue service of all existing tile drains, sewers, and other subsurface utilities; repair any damage to drains, sewers, and utilities.

PART 8 MEASUREMENT AND PAYMENT

8.01 GENERAL

- A. Site Grading shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Conditions - Division 1.
- B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Conditions - Division 1.

8.02 SITE GRADING

- A. Site Grading, Square Yards. When so provided, payment for site grading shall be made at the contract square yard price bid.
- B. Site Grading, Lump Sum. When so provided, payment for site grading shall be made at the contract lump sum price bid.
- C. Site Grading, Inclusive. When no quantity is provided, site grading shall be inclusive to payment for work associated with related utility or infrastructure improvement.

END OF SECTION

SECTION 02316

EXCAVATING, TRENCHING AND BACKFILLING FOR UTILITIES

PART 9 GENERAL

9.01 APPLICABLE PROVISIONS

- A. Applicable provisions of Division 1 shall govern work of this section.

9.02 APPLICABLE PUBLICATIONS

- A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
 - 1. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards, Current Edition.
 - 2. Code of Federal Regulations (CFR), Title 29, Chapter XVII - Occupational Safety and Health Administration (OSHA), Department of Labor, Part 1926 Regulations, Current Edition.

3. Wisconsin Administrative Code (WAC), Department of Natural Resources, Environmental Protection, Regulations, Current Edition.
4. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition, and current Supplemental Specifications.

9.03 DESCRIPTION OF WORK

- A. The work under this section shall include all excavating, trenching, and backfilling for utilities as specified herein.

9.04 RELATED WORK ELSEWHERE

- A. Dewatering - Division 2
- B.
- C.
- D.

9.05 SHOP DRAWINGS (NONE)

PART 10 PRODUCTS AND MATERIALS

10.01 INSITU BACKFILL MATERIAL

- A. Previously excavated soil free of organic debris, clay balls, and aggregate larger than 1-1/2 inches as approved by the Engineer.

10.02 IMPORTED GRANULAR BACKFILL (TRUCKED BACKFILL) MATERIAL

- A. Imported granular fill (trucked backfill) shall be sand conforming to State of Wisconsin, Department of Transportation, Standard Specifications Subsection 209.2.2, Grade No. 1 Granular Backfill or well-graded sand and gravel conforming to Subsection 305.2.2.1 of said State Standard Specification 1-1/4 inch dense graded base with not more than eight percent (8 percent) by weight passing a No. 200 sieve.

10.03 CASING MATERIAL

- A. Casing pipes shall be welded steel pipe 1/4-inch thick, Grade B, meeting the requirements of ASTM A139 or reinforced concrete pipe meeting the requirements of ASTM C76 Class IV, Wall B.
- B. Bituminous joint compound for reinforced concrete casing pipe shall be durable plastic coal-tar bituminous binder or compound that will adhere to the concrete

surface and form a watertight fit or seal between the surfaces when coated with the same binder or compound and pressed together during the installation.

PART 11 CONSTRUCTION METHODS

11.01 SURFACE OBSTRUCTIONS

- A. Structures, sidewalk, driveways, curb and gutter, trees, shrubs, lawns, signs, fences, utilities, survey monuments, pavements, culverts and other appurtenances which are adjacent to the right-of-way or work easements, shall be carefully protected against damage. In the event of damage or inadvertent injury or removal of these surface features by failure of the Contractor to exercise reasonable precautions or proper construction techniques, he shall bear the full cost and responsibility for resulting damages and shall replace or repair such damage as early as possible. No allowance for extra payment or time lost will be allowed for such interferences that the Contractor could have suspected or anticipated during pre-bid site inspection and interpretation of the bidding documents.
- B. Clearing, grubbing, and removal of all pavements, sidewalks, curbs, signs, poles, fences, etc., shall be done only as necessary for the completion of the work. Brush, trees, shrubs, concrete, rubble and other removals, which are not intended to be replaced, shall be disposed of by the Contractor off the work site, and is included in the unit price bid for the respective utility.
- C. Obstructions, which are intended to be reset, shall be stored and protected by the Contractor. Fences, signs, mailboxes, trees, shrubs, structures, and similar features requiring removal, shall be restored to their original position except where permanent removal is indicated.
- D. Monuments for land surveys encountered in the path of work shall be carefully protected from movement. Should removal be necessary, the Contractor shall notify the Engineer in advance. The Contractor will be held responsible for re-establishing monuments lost due to his negligence or failure to notify the Engineer at least 24 hours in advance of disturbing.

11.02 SUBSURFACE OBSTRUCTIONS

- A. The approximate location and size of sewers, drains, culverts, gas mains, water mains, survey monuments, electric and telephone conduits and other underground structures shown on the drawings are based on records available to the Owner or surface markings indicating their existence.
- B. The Contractor shall use caution in excavating and trenching so that the exact location of underground structures, both known and unknown, may be determined; he shall be held responsible for the repair of such structures when broken or otherwise damaged during construction.

- C. The Contractor shall make arrangements with the utility companies for any relocation of interfering utilities. No extra cost due to unexpected delays or coordination work shall be incurred on the Owner except for authorized utility alterations performed by the Contractor as provided below.
- D. When the Engineer permits the Contractor to make a change to avoid a utility relocation, the Engineer shall determine whether the change constitutes extra work as defined in the General Conditions.
- E. Any underground utilities or other structures, which the Contractor wishes to have moved to facilitate construction, shall be arranged with the owner of such structures. The Contractor shall pay all costs of the accommodation.
- F. In the event that there is any question as to whether any of the above enumerated obstructions, underground utilities or other structures cross or pass through the space occupied by the completed structures of this contract, the Engineer's decision shall be binding upon the Owner and the Contractor.
- G. During the construction of the pipe lines, it may be necessary to cross under certain sewers, drains, culverts, water lines, gas lines, electric conduits and other underground structures. Where necessary, the flow in drains or culverts shall be diverted so that the excavation is kept dry during the progress of the construction work. Every effort shall be made to prevent damage to such underground structures. Wherever such structures are disturbed or broken, they shall be restored to a condition equal to or better than existing, at no additional cost to the Owner.
- H. The Contractor shall use sand or gravel backfill beneath said structures. This backfill shall be deposited and thoroughly compacted by mechanical means in layers not to exceed 6 inches in depth.

11.03 EXCAVATION

- A. General. All excavation of every description and of whatever substances encountered shall be performed to the depths indicated or as otherwise specified.
 - 1. During excavation, material suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. All excavated materials not required or suitable for backfill shall be removed and wasted as specified. Grading shall be done as may be necessary to prevent surface water from flowing into trenches or other excavations and any water accumulated therein shall be removed by pumping or by other approved methods.
 - 2. Sheet piling and shoring shall be placed as may be necessary for the protection of the work and for the safety of personnel. Unless otherwise indicated, excavation shall be by open cut.

- B. Trench Excavation. Trenches shall be of the necessary width for proper laying of pipe and shall conform to WAC requirements. The banks of pipe trenches shall conform to OSHA requirements and the Contractor is responsible for all safety requirements of said codes.
1. Care shall be taken not to overexcavate. The bottom of the trenches shall be accurately graded to provide uniform bearing and support for each section of the pipe. Bell holes and depressions for joints shall be dug after the trench bottom has been graded, and in order that the pipe rest on the prepared bottom for as nearly its full length as practicable, bell holes and depressions shall be only of such length, depth, and width as required for properly making the particular type of joint. Stones shall be removed as necessary to avoid point bearing.
 2. Except as hereinafter specified for wet or other unstable material, overdepths shall be backfilled as and with materials specified for, backfilling the lower portion of trenches. Whenever wet or otherwise unstable material that is incapable of properly supporting the pipe is encountered in the bottom of the trench, such material shall be overexcavated to a depth to allow for construction of a stable pipe bedding. The trench shall be backfilled to the proper grade with suitable approved materials.
 3. Trench Width. The width of the trench at and below the top of the pipe shall be such that the clear space between the barrel of the pipe and the trench wall shall not be less than 6 inches nor exceed 8 inches on either side of the pipe, unless otherwise approved by the Engineer in writing. The width of the trench above that level shall be as wide as necessary for sheeting and bracing and the proper performance of the work.
 4. Excavation for Appurtenances. Excavation for manholes and similar structures shall be sufficient to leave at least 12 inches clear space between the outer surface of structure and the bank or timber that may be used to hold and protect the banks. Any overdepth excavation below such appurtenances that has not been directed will be considered unauthorized and shall be refilled with sand, gravel, or concrete, as directed, at no additional cost to the Owner.
 5. Rock Excavation. Rock excavation shall be defined to include all hard, solid, rock in ledges, bedded deposits and unstratified masses, all natural conglomerate deposits so firmly cemented as to present all the characteristics of solid rock, and masonry or concrete structures not shown on Plans. Shales, hard pan, masonry and concrete rubble, boulders less than one cubic yard which are not a part of or attached to substrata of rock, shall not be considered rock excavation. The rock shall be excavated to a minimum overdepth of 6 inches below the trench depths indicated or specified.
 6. Blasting. The following will be required if blasting is used.
 - a. Filing a Blast Plan with the Owner.

- b. Performing a preblast survey of adjacent properties with a copy of the video tape(s) provided to the Owner.
 - c. Obtaining all necessary permits.
 - d. Notifying the local property owners, fire department, police department, and the State of Wisconsin.
 - e. Providing a copy of the Blasting Company's safety program to the Owner.
 - f. Providing a separate certificate of insurance for the Blasting Company equal to insurance requirements for the General Contractor for the project, naming the Contractor, Owner and Engineer as additional insured's.
 - g. Provide seismographic survey information to the Engineer, in written form, upon completion of the blasting.
7. Embedment. Embedment for utilities shall be as specified in the respective utility specification section.
- C. Protection and Removal of Utility Lines. The Contractor shall notify all affected utility companies at least three consecutive working days preceding his construction operations to coordinate his work regarding poles, wires, valve boxes and other surface obstructions and to determine the location of gas, water main, power, light, telephone or telegraph conduit or service connection thereto or any other subsurface structure that crosses or passes through the space occupied by any of the proposed improvements. The Contractor shall make advance arrangements with the utility companies for any relocation of interfering utilities so as not to delay construction.
- D. If water mains or drain pipes are inadvertently broken, they shall be repaired by cutting in neatly a similar piece of pipe and connecting with properly sized "mission" coupling furnished with stainless steel "shear rings". All material, parts, labor and equipment necessary for the repair of water services, watermain, sewer laterals, and storm sewer shall be included in the unit price bid for the utility being placed.
- E. Contractor shall remove and dispose of properly any existing utility pipe, planned to be abandoned, which may conflict with proposed utility installation. All costs relating to excavation, removal and disposal of existing abandoned utility pipe shall be considered incidental and included in the unit price bid for the respective utility.
- F. All costs relating to excavation, removal and disposal of existing manholes planned to be removed shall be included in the unit price bid for "Remove Manhole."
- G. The bid item "Abandon Manhole" shall include all costs relating to excavating and removal of existing manholes to 2' below subgrade. As well as plugging and grouting ends of existing pipes in manhole and filling and compacting remaining structure with Type I backfill.

- H. The Contractor shall plug and grout the ends of any abandoned utility pipe where it enters and exits the proposed utility trench. All cost relating to plugging and grouting abandoned utility pipe shall be considered incidental and included in the unit price bid for the respective utility.
- I. Interruptions of Services. Interruptions of utility services to existing buildings or facilities which become necessary either directly or indirectly due to work required under this contract shall be coordinated with the Owner through the Engineer. If the down time for connections is limited by them as to duration and time (weekend, nights or holidays), the Contractor shall perform the work during the designated period at no additional cost to the Owner.

11.04 BACKFILLING

- A. Bedding. Compacted granular material shall be provided as bedding for all ductile iron watermain and concrete storm sewer. Place as Class B bedding as shown in Detail. Utilize Class II bedding as shown in Detail for PVC watermain, sanitary sewer, laterals, water services, coated steel, storm sewer, and polyethylene storm sewer. Clean coarse sand may be sorted from the excavation and used as bedding material by the Contractor.
- B. Types of Backfill. Backfill for sanitary sewers, water mains, storm sewers, culverts, and drainpipes is the material placed between the bedding and the ground surface. Debris, frozen material, organic matter, unstable material, or stones greater than 8 inches in diameter shall not be suitable for backfill. Large clods and stones not exceeding 8 inches in diameter, when allowed for use as backfill, shall not be placed within two feet of the top of the pipe. Backfill shall be of the following types:
 - 1. Type I Backfill:
 - a. Type I backfill shall be used where shown on the contract drawings, and unless directed otherwise shall extend from the top of the embedment to the underside of surface restoration.
 - b. Type I backfill shall be used under and around all existing underground structures, tunnels, conduits, and pipes crossing the excavation. Such backfill shall extend underneath and on all sides to a structure, tunnel, conduit or pipe.
 - c. Type I backfill shall be selected fill material consisting of granular subbase course, base course or approved existing sand. The backfill material shall be mechanically compacted in 6-inch layers, from a distance of one foot above the pipe to the surface. The degree of compaction shall be to 95 percent maximum dry density per modified proctor (ASTM D1557).
 - 2. Type II Backfill:
 - a. Type II backfill shall be used where shown on the contract.
 - b. Type II backfill shall be suitable excavated material, or other approved material, placed in uniform layers and mechanically

compacted. The following compaction percentages based on the maximum dry density per modified proctor (ASTM D1557) for the materials are required:

- 1) For fine grained soils (more than 50 percent passing the No. 200 sieve).

Zone III: From bottom of surface restoration to 3 feet below - 91 percent

Zone II: From bottom of Zone III to top of the embedment - 88 percent

Zone I: Specified as embedment

- 2) For coarse grained soils (less than 50 percent passing the No. 200 sieve).

Zone III: From bottom of surface restoration to 3 feet below - 93 percent

Zone II: From bottom of Zone III to top of the embedment - 90 percent

Zone I: Specified as embedment

3. Type III Backfill:

- a. Type III backfill shall be used in all areas where shown on the Plans. Backfill material shall be suitable excavated material placed, from top of embedment to the bottom of surface restoration, in 12 to 18 inch layers and consolidated by jetting, spading, tamping, or puddling, to the approval of the Engineer, to insure complete filling of the trench.

4. Type IV Backfill:

- a. Utilize Type III Backfill with the following jetting: at least a 1-1/2 inch jetting hose, equipped with a regulating valve which permits the hydrant valve to be fully open during use, with a minimum 1-1/2 inch diameter pipe nozzle at least 6 feet long shall be used. During the flooding operation, the nozzle shall be inserted as deeply into the backfill as is possible without damaging the sewers, water mains, or foundations. The insertions shall be made at intervals of 5 feet or less and maintained until the backfill is saturated. Depressions caused by flooding shall be backfilled until there is no further settlement.

C. Silty Clay Material.

1. For non-seeded areas. Clean coarse sand may be sorted from the excavation and used in the top 12-inches of the trench up to the sub-grade of the road. Additionally, no silty clay material shall be placed in the bottom of the trench to 12-inches above the top of pipe. If sand is not available in the trench, suitable material for bedding shall be brought in from other locations at no additional cost. Non-seeded areas include; roadway, curb and gutter, driveways, sidewalks and parking lots.

2. For seeded areas. Silty clay shall be placed in the top 12-inches of the trench up to the sub-grade of the topsoil. No silty clay material shall be placed in the bottom of the trench to 12-inches above the top of pipe. If sand or silty clay material is not available in the trench, suitable material for bedding and topsoil sub-grade shall be brought in from other locations at no additional cost. Seeded areas include any area that will get topsoil and be seeded.
- D. Trucked Backfill. All material, designated by the Engineer, as unsuitable for backfill shall be disposed of by the Contractor. Suitable soils, approved by the Engineer, shall be trucked in by the Contractor for use as backfill from the top of the bedding to the top of the trench.
 - E. After Settlement. Should after settlement occur, succeeding any of the above backfilling methods, the Contractor shall scarify the surface of the fill material and place additional fill material in the same manner as herein described so that the surface elevation conforms to that shown on the Plans. No additional compensation shall be allowed for repairing filled areas where after-settlement occurs.
 - F. Backfill Placement. The excavated space around and above underground structures, tunnels, conduits and pipes not filled with embedment material and where select fill backfill is not shown or specified may be backfilled by machine.
 - G. Backfilling work shall be done in such a way as to prevent dropping of material directly on top of any conduit or pipe through any great vertical distance. In no case shall backfilling material from a bucket be allowed to fall directly on a structure or pipe and in all cases, the bucket shall be lowered so that the shock of falling earth will not cause damage.
 - H. Lumps shall be broken up and if there are any stones, pieces of crushed rock or lumps, which cannot be readily broken up, they shall be distributed throughout the mass so that all interstices are solidly filled with fine material. Stones, lumps and clods shall also be placed to maintain a 2 foot minimum separation distance from the top of the pipe or structure. No frozen material shall be used for backfilling.

11.05 TESTING

- A. Prior to any construction of road base the utility trenches in all proposed streets shall be test rolled in the presence of the Engineer. Test rolling shall be performed with a fully loaded dump truck to check for deflection or rutting. Where tests indicate that the trench does not conform to the compaction specified, the trench shall be re-worked until it does conform. All costs associated with Test Rolling shall be considered incidental to the unit price bid for the respective utility.

- B. If, after continued re-working of the trench, proper compaction cannot be proved by test rolling, an independent testing laboratory will perform compaction and density tests at locations determined by the Engineer. Where these tests indicate that the trench does not conform to the compaction specified, the trench shall be replaced or re-worked until it does conform. All costs associated with Laboratory and density testing shall be considered incidental to the unit price bid for the respective utility.

11.06 REMOVAL OF WATER

- A. General. Removal of water shall be in accordance with Dewatering - Division 2 of these specifications as they apply to the work.
- B. At all times during the excavation period and until its completion and acceptance at final inspection, ample means and equipment shall be provided with which to remove promptly, and dispose of properly, all water entering any excavation or other parts of the work. The excavation shall be kept dry and groundwater levels shall be kept low enough to prevent a quicksand condition from ruining the trench bottom.
 - 1. No water shall be allowed to rise over or come in contact with concrete or masonry until the concrete and mortar have attained a set satisfactory to the Engineer and, in any event, no sooner than 12 hours after placing, or as specified in Dewatering - Division 2 or Cast-in-Place Concrete - Division 3, whichever is most restrictive.
 - 2. Water pumped or drained from the work hereunder shall be disposed of in a suitable manner without damage to adjacent property, to other work under construction, or to street pavements or municipal parks or property. Water shall not be discharged onto streets without adequate protection of the surface at the point of discharge. No water shall be discharged into sanitary sewers. No water containing settleable solids shall be discharged into storm sewers.
- C. Damage. Any and all damage caused by dewatering the work shall be promptly repaired by the Contractor. Dewatering shall be done as required at no additional cost to the Owner.
- D. Approvals. Approval from the Department of Natural Resources, Private Water Supply Section is required for all dewatering wells which singly or in aggregate produce 70 or more gallons per minute.

11.07 BORING AND JACKING

- A. General. Where shown, directed or specified, the pipeline shall be installed in a casing pipe and constructed by auguring or jacking beneath railroads, highways, or other structures. Casing pipes may be constructed by boring or by jacking. Where boring or jacking is used, all operations and materials shall conform to the

regulations of the Highway Departments, railroad company, or other agency having jurisdiction over the crossing. The approval by the agency having jurisdiction over the crossing of all materials and methods shall be obtained prior to construction.

- B. Boring. Boring shall be carried out with the proper equipment and procedure such that the carrier pipe and the casing pipe can be installed to the grades specified without disturbance to the adjacent earth. All equipment and procedure shall be subject to prior approval by the Engineer.

- C. Jacking
 - 1. Complete Shop Drawings of the jacking pipe, jacking frame, jacking head, reaction blocks, and complete jacking installation shall be submitted to the Engineer for approval before the equipment and materials are ordered by the Contractor.
 - 2. The jacking pit shall be of adequate length to provide room for the jacking frame, the jacking head, the reaction blocks, the jacks, auger rig, and the jacking pipe. The pit shall be sufficiently wide to allow ample working space on each side of the jacking frame. The depth of the pit shall be such that the invert of the pipe, when placed on the guide frame, will be at the elevation desired for the completed line. The pit shall be tightly sheeted and kept dry at all times. The jacking frame shall be designed so that it applies a uniform pressure over the entire pipe wall area of the pipe to be jacked.
 - 3. The reaction blocks shall be adequately designed to carry the thrust of the jacks to the soil without excessive soil deflection and in such a manner as to avoid any disturbance of adjacent structures or utilities. Adequate protective railings shall be provided at the top of the pit at all times.
 - 4. Hydraulic jacks shall be used in the jacking operation, and extreme care shall be taken to hold the pipe to exact line and grade. Excavation at the heading shall be advanced manually or with an auger and shall not exceed one foot ahead of the casing pipe.

PART 12 MEASUREMENT AND PAYMENT

12.01 GENERAL

- A. Excavating, trenching, and backfilling for utilities shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule.

- B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule.

12.02 EXCAVATING, TRENCHING AND BACKFILLING FOR UTILITIES

- A. Excavating, Trenching and Backfilling for Utilities, Inclusive. When no quantity is provided, excavating, trenching and backfilling for utilities shall be included in the payment for contract work related to the associated utility. This payment shall include all work defined as Excavating, Trenching, and Backfilling for Utilities.
- B. Bedding. Existing clean, coarse sand will be acceptable for bedding, if found. It is anticipated not all areas will have suitable sand in the excavated material. The cost of bringing in suitable material for bedding, excavating, removal of excess or unsuitable material, trenching, bedding, backfilling, and compacting shall be included in the contract unit price for the respective utility or lateral.

12.03 ROCK EXCAVATION

- A. Rock Excavation, Cubic Yard. Measurement for rock excavation shall be per cubic yard, as determined by in-field elevations of material removed. The pay width for rock excavation in open cut shall be the actual width of the excavated trench, but not to exceed the outside diameter of the pipe plus 24 inches. The pay quantity for manholes and structures shall be 12 inches beyond the outside neat lines of the proposed manhole or structure. Payment shall be made at the contract unit price bid per cubic yard of rock removed.

12.04 IMPORTED GRANULAR BACKFILL (TRUCKED BACKFILL)

- A. Imported Granular Backfill (Trucked Backfill), Cubic Yard. Trucked Backfill will be paid by the cubic yard of approved soil hauled in as measured in the truck. If the quantity of unsuitable material removed is minor, that is if additional material is not required to be hauled in to replace it, the costs to remove and dispose of the material shall be considered incidental and included in the various bid items for the construction of the utility.

12.05 BORE AND JACK

- A. Bore and Jack, Lineal Foot. Measurement for bore and jack shall be per lineal foot of bore and jack installed. Payment shall be made at the contract unit price bid for bore and jack installed.

END OF SECTION

SANITARY SEWER

PART 13 GENERAL

13.01 APPLICABLE PROVISIONS

- A. Applicable provisions of Division 1 shall govern the work of this section.

13.02 APPLICABLE PUBLICATIONS

- A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
 - 1. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards, Current Edition.

13.03 DESCRIPTION OF WORK

- A. The work under this section shall cover furnishing and installing all pipe and fittings for the sanitary sewer as shown on the contract drawings and as specified herein.

13.04 RELATED WORK ELSEWHERE

- A. Excavating, Trenching and Backfilling for Utilities - Division 2
- B. Sanitary Sewer Manholes - Division 2

13.05 SHOP DRAWINGS

- A. Contractor shall submit such product literature and catalog cuts of materials to be supplied to relate these materials to the specifications. Information shall be in conformance with requirements of Submittals - Division 1 of these specifications.
- B. Contractor shall submit such Shop Drawings and details required for the construction and installation of the materials. Shop drawings and details shall indicate the intended materials arrangement, dimensions, major support requirements, plot area and intricate or detailed construction requirements.

PART 14 PRODUCTS AND MATERIALS

14.01 PIPE

- A. PVC Pipe. Four inch to 15 inch diameter pipe shall be Type PSM SDR-35 and meet the requirements of ASTM D3034. Pipe over 15 inch diameter shall meet the requirements of ASTM F679. Pipe shall be of the bell and spigot type and meet the requirements of ASTM D3034 Type PSM SDR-35.

14.02 PIPE JOINTS

- A. General. Manufacturer's instructions for making joints shall be followed. The use of joints as specified herein shall not relieve the Contractor of the responsibility of meeting testing specifications.
- B. PVC Pipe. Pipe joints shall be chemically welded conforming to ASTM D2564 or elastomeric seals (rubber gaskets) conforming to ASTM F477 and joint assembly conforming to ASTM D3212.

PART 15 CONSTRUCTION METHODS

15.01 GENERAL

- A. All construction shall be done in conformance with ■Standard Specifications for Sewer and Water Construction in Wisconsin● except as may be modified herein.
- B. Plastic pipe shall be installed in accordance with ASTM D2321.

15.02 LINES AND GRADES

- A. All lines and grades will be given on the contract drawings, as directed by the Engineer. The Contractor shall be responsible for the preservation of line and grade stakes when set. The Contractor shall keep the Engineer informed reasonably in advance of the times and places that stakes will be required in order that the work may be done without inconvenience to the Engineer or delay to the Contractor.
- B. The Contractor shall at his own expense, furnish and place in position, as directed by the Engineer, all necessary equipment and material for locating the work from the line and grade stakes given by the Engineer consisting of either a laser or batter boards. When batter boards are used, a minimum of three (3) adjacent boards with two (2) string lines shall be used to determine grade. It shall be the Contractor's responsibility to check grade stakes in advance of the excavation reporting any discrepancies to the Engineer.
- C. The Contractor assumes responsibility for pipe laid to non-conforming grade and shall relay same at his expense if ordered by the Engineer.

15.03 EXCAVATION

- A. Excavation shall conform to Excavating, Trenching, and Backfilling for Utilities - Division 2, except as modified herein.

15.04 UNSTABLE SOIL

- A. If in the opinion of the Engineer the trench bottom is of unstable material, the Engineer may direct the Contractor to excavate the unstable material and replace same with 3/4 inch washed stone. Washed stone used in such cases shall be considered incidental and included in the price bid for sanitary sewer unless bid or specified otherwise.
- B. Where the condition is unusually severe, the Engineer may order the placement of a concrete cradle, which shall be paid for at the unit price bid.

15.05 EMBEDMENT

- A. Embedment for the sewer pipe shall depend upon whether the pipe is rigid, semi-rigid or flexible.
- B. Rigid pipe, including clay, concrete, PVC and ABS composite, and ductile iron pipes, shall be embedded in accordance with ASTM C12. Class B embedment, in accordance with this specification and detail drawings, shall be used unless specified otherwise.
- C. Flexible and semi-rigid pipe, including PVC pipe, shall be embedded in accordance with ASTM D2321. Class II embedment, in accordance with this specification and contract drawings, shall be used unless specified otherwise. The Class II embedment material shall be placed in maximum lifts of 6 inches and extend a minimum of 12 inches above the top of the pipe.
- D. The contractor shall furnish and install all bedding. All bedding costs shall be considered incidental and included in the price bid for sewer and lateral. Clean coarse sand may be sorted from the excavation and used as bedding material by the Contractor.

15.06 INSTALLATION

- A. The Contractor shall have sufficient and adequate equipment on the site of the work for unloading and lowering pipe into the trench. Extreme care shall be exercised by the Contractor in handling all pipe so as to prevent breakage. Under no circumstances shall they be dropped into the trench or so handled as to receive hard blows or jolts when being moved.
- B. Before lowering and while suspended, the pipe or fittings shall be inspected for defects. All materials used in the work must pass field inspection.
- C. Unless otherwise ordered, pipe shall be laid with the bell ends facing upgrade.
- D. Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line.

- E. Joints shall be lubricated, cemented, or otherwise made in strict conformance with these specifications and manufacturer's instructions.
- F. Sewers to be stubbed out from new manholes shall end with a pipe bell end and have the end plugged to prevent the entrance of soil and water. The cost of plugs shall be included in the unit price bid of the sanitary sewer.
- G. All sanitary sewer main and laterals must be insulated if the depth of cover is six feet (6') or less in areas where snow is expected to be removed.

15.07 LATERALS OR CONNECTIONS

- A. Wyes or tee branches for lateral service connections shall be placed to service each building site as directed by the Engineer. All deep connections shall be fitted with riser pipes when ordered by the Engineer. Risers shall not exceed a 1:1 slope and shall be paid for per foot of pipe length as sanitary lateral.
 - 1. Sanitary laterals shall be SDR 35. All laterals shall be installed up to the right-of-way line and be embedded in materials in accordance with ASTM C12 or ASTM D2321 for rigid, semi-rigid or flexible as specified.
 - 2. Minimum grade of lateral shall be 1/8 inch per foot. Maximum grade of lateral shall be 1/2 inch per foot.
 - 3. All unconnected sanitary laterals shall be capped and have the ends marked by a metal fence post buried vertically, flush with the ground directly over the end of the lateral. The cost of the fence post and cap shall be included in the unit price bid for sanitary lateral.
 - 4. All sanitary laterals must be insulated if the depth of cover is 6 feet or less when rock is present. If the depth of hard rock is 4-1/2 feet or less, the rock shall be removed to at least 5-1/2 feet of cover and the service insulated.
- B. Where new sewer is to be installed to replace existing sanitary sewer, service laterals shall be extended from the old sanitary lateral and connected to the new main. Minimum grade of lateral extensions shall be 1/8 inch per foot. Maximum grade of lateral extensions shall be 1/2 inch per foot. Lateral extensions which require a grade in excess of 1/2 inch per foot to connect new sewers to existing service laterals shall be installed with a riser section. Connection to existing laterals shall be made with a Mission, Clow, Fernco, coupling or equal. The cost of all special fittings required to make the connections of service laterals to the new sanitary sewer and the connections to the lateral shall be included in the bid.
 - 1. Approximate locations of existing laterals are shown on the contract drawings. The Contractor shall verify the locations of all existing locations. The Contractor shall coordinate, with the Engineer, verification that existing laterals that are encountered are live and that all live laterals are connected to the new sewer main.
 - 2. Temporary connections to existing laterals shall be made with pipe of the same size using a fernco fitting or approved equal.

- C. Cut-in type saddle wyes and tees will be allowed on existing sanitary sewers where service laterals are to be connected to the sewer. The saddle fitting shall be PVC with a gasket for sewer service. This shall be fastened to the existing pipe by means of stainless steel bands, with stainless steel bolts and nuts. Shop drawing submittals required on cut-in saddles.
- D. Lateral Connection Adaptors. Field connections to existing laterals shall be with a Fernco fitting or approved equal. If the lateral to be connected is of a different size, the adaptor fitting shall be specifically designed for the connection and must be approved by the Engineer.
- E. A complete and accurate tabulation of the length, location, depth, etc., of each lateral installed shall be kept by the Contractor. This record shall be the property of the Owner.

15.08 WATER/SEWER LINE CROSSING

- A. Wherever the sewer crosses above water main with less than a clear vertical separation of 18 inches (outside of pipe to outside of pipe) or below the water main with less than a clear vertical separation of 6 inches (outside of pipe to outside of pipe), the sewer shall be constructed equal to water main pipe. One full pipe length shall be centered on the water main crossing and shall be pressure tested.
- B. The type of pipe material and/or joints shall not change between manholes.

15.09 STRUCTURE SEALS

- A. Plastic pipe shall be provided with approved water stops where encased in the walls of manholes.

15.10 PIPES TO BE CLEANED

- A. The interior of all pipes shall be carefully freed from all dirt, concrete and superfluous material of every description as the work progresses. If, in the opinion of the Engineer, the pipe contains an excess of material, the pipe shall be cleaned by the Contractor at no additional expense to the Owner.

15.11 TESTING

- A. General. The following tests shall be performed by the Contractor in the presence of the Engineer. The Contractor shall be responsible for providing all labor, materials and equipment for the testing.
- B. Infiltration Test. The sanitary sewer and all connections and laterals shall be measured for infiltration at points designated by the Engineer. The tests for infiltration shall be conducted in a manner as approved by and under the direction

of the Engineer. Infiltration shall be measured using either the water test or the low pressure air test. The sewer and connections shall have a rate of infiltration less than 200 gallons per inch of pipe diameter per mile per day.

1. Water Test. The test shall be performed using a minimum positive head of 2 feet of water. Maximum allowable exfiltration shall be 200 gallons per inch of pipe diameter per mile per day.
2. Low Pressure Air Test. Sewer lines shall be air tested in accordance with ASTM C828, entitled ■Standard Practice for Low Pressure Air Test of Vitrified Clay Pipe Lines• or NCPI Bulletin entitled ■Low Pressure Air Test for Sanitary Sewers• or ■Cherne Discussion No. 6 - Air Test Specifications•. The air test shall be made in the presence of the Engineer. All equipment necessary for said air test shall be provided by the Contractor and approved by the Engineer.

C. Televising. No air test will be required on the new sewer with active lateral installed. All lines not air tested shall be televised with all said televising costs included in the related sanitary sewer item. When sewer line flows are above the minimum requirements (generally not more than 1/4 of the pipe diameter) or inspection of the complete periphery of the pipe is necessary to effectively conduct the inspection and sealing operations, one or more of the following methods of flow control shall be used at no extra cost to the Owner:

1. Plugging or Blocking: A sewer line plug shall be inserted into the line at a manhole upstream from the section to be inspected, tested and/or sealed. The plug shall be so designed that all or any portion of the sewage flows can be released. During the inspection portion of the operation, flows shall be shut off or substantially reduced in order to properly inspect the pipe at the invert. After the inspection is complete, flows shall be restored to normal or not more than 1/3 of the pipe diameter during the joint testing and joint sealing operation.
2. Pumping and Bypassing: Where pumping is required, in the opinion of the Engineer, to assure completion of the inspection and sealing work, the Contractor will be required to furnish pumping equipment, conduits, etc. All costs for flow control, temporary pumping, etc., shall be inclusive to testing and shall be included in the unit price bid for the related sanitary sewer item. No bypassed wastewaters will be allowed to be discharged to surface drainage facilities.
3. Liability: Contractor shall be liable for damages to private or public property which may result from sewer flow control operations.
4. The television camera used for the inspection shall be one specifically designed and constructed for such inspection. Lighting for the camera shall be suitable to allow a clear picture for the entire periphery of the pipe. The camera shall have a minimum resolution of 600 lines and shall provide a color picture. Picture quality and definition shall be to the complete satisfaction of the Engineer and if unsatisfactory, equipment shall be removed and no payment made for unsatisfactory inspection. The camera

shall be moved through the line in either direction at a uniform slow rate by means of cable winches at each manhole. Contractor shall provide to the Engineer a VHS video tape record of the inspection as well as a type written report of the inspection.

5. Measurement for location of defects as shown on the contract drawings shall be at the ground level by means of a meter device. Marking on cable or the like which would require interpolation for depth of manhole, etc., will not be allowed. Measurement meters shall be accurate to 0.2 of a foot. A measuring target (or the sealing packer) in front of the television camera shall be used as an exact measurement reference point and the meter reading shall show this exact location of the measurement reference point.
- D. Deflection Test. All polyvinyl chloride pipe installations shall be tested for deflection by using a rigid ball or mandrel and shall be performed in accordance with ASTM D2321 and without the use of mechanical pulling devices. Deflection may not exceed 5 percent if tested within 30 days of placement of final backfill or 7.5 percent if tested more than 30 days after final backfill is placed. Final backfill must be in place prior to testing.
- E. Alignment. Sewer pipe will be inspected for alignment by the use of mirrors, flashlights or lamps. Sewer lines shall permit a through view of at least half the pipe diameter between manholes.
- F. Acceptance. If any of the tests are not met, the Contractor shall, at his own expense, determine the source of the problem and repair or replace all defective materials.
1. Collapsed, fractured or pipe whose structural integrity is questionable as determined by the Engineer shall be replaced in a manner suitable to the Engineer.
 2. The sewer line shall be considered acceptable when all of the above provisions are complied with.

15.12 MAINTAINING SANITARY SEWER SERVICE

- A. The Contractor shall provide adequate equipment and facilities to provide bypass pumping for all elements of work requiring interruption to flow in the sanitary sewer. Provide backup or standby capabilities satisfactory to the Owner. The Contractor shall be responsible for damages to private or public property due to sewer backup while controlling sewage flow.
- B. Under no circumstances will bypassing of untreated wastewater to any storm drainage facility or surface water course be allowed.
- C. The Contractor shall notify the Owner seven (7) days in advance of sewer sections which will not be useable in order to allow time for the Owner to notify residents. Interruptions shall then be verified at least 24 hours in advance.

1. Interruptions of service shall be limited to eight (8) hours.
 2. All existing sanitary laterals shall be permanently reconnected within two days after initial disconnection of the main line sewer bypass. These existing sanitary laterals shall be temporarily reconnected if the permanent reconnection cannot be accomplished immediately after disconnection.
- D. All costs for flow control, temporary pumping, etc., shall be inclusive to the unit price bid for sanitary sewer.
- E. All costs associated with temporarily connecting proposed sewers to existing sewers or manholes, shall be included in the unit price bid for sanitary sewer.

15.13 REPAIR OF DEFECTIVE PIPE FOR SANITARY SEWER REHABILITATION PROJECTS

- A. General. The work includes furnishing all materials, equipment and labor to excavate and repair leaking joints, shears, cracked pipe, etc., for the purpose of eliminating existing or previously observed infiltration of groundwater. All sewer defects shall be repaired watertight and to the satisfaction of the Engineer. All applicable sections of these specification shall apply except as specified below. The Contractor shall locate or make arrangements for locating all structures and underground utilities prior to beginning any excavations. Where existing wyes, tees, risers or service connections are encountered in sewer to be replaced, they shall be replaced with new fittings and piping within the limits of the excavation at no change in the contract price. Where piping is to be removed, excavations shall extend to a depth below the bottom of the pipe, suitable for placement of new bedding.
- B. Pipe Repair. All defective pipe shall be removed. Where the length of defective pipe is noted in the Plans, the Contractor shall remove the length of pipe shown along with any other pipe observed to be defective after excavation. The Contractor shall generally remove the entire length of pipe in which the defect occurred. Where joints are to be repaired, a minimum of one-half of the upstream pipe and one-half of the downstream pipe shall be removed. Where pipe shears are located near joints and where shear displacement has occurred, both upstream and downstream sections of sewer shall be replaced.
- C. Existing pipe 16 inches in diameter and less shall generally be repaired by cutting and removing existing pipe between joints. All cuts shall be made perpendicular to the direction in which the pipe is laid. New sanitary sewer shall be connected to existing sanitary sewer with the use of a Mission, Clow, Fernco, or equal band seal coupling, with stainless steel sleeves. Adjustable stainless steel shear rings shall be provided wherever available. New piping shall be air tested prior to placement of backfill.

- D. Existing pipe larger than 16 inches in diameter shall generally be repaired by removing existing piping at existing joints. Sections of piping shall be removed by cutting off the existing upstream spigot end. The upstream bell end of the pipe shall be removed and the downstream bell end shall remain. Any jointing material shall be removed from the downstream bell. A new plain end piece of pipe shall then be inserted in the existing bell and the pipe joint sealed with Daubert 301, Mastik or equal as per manufacturer's recommendations. The new upstream plain end piece of pipe shall be jointed to existing piping with an external pipe joint wrapping equal to MacWrap as manufactured by the MarMac Manufacturing Company, Inc.; Cadilloc as manufactured by Cadilloc, Inc.; or equal. Whenever any portion of existing concrete cradle or concrete backfill must be removed, piping shall be replaced to the inside of the manhole wall.
- E. Existing pipe that is laid in concrete cradle shall be repaired by cutting and removing existing pipe between joints. Concrete cradle below the repaired pipe shall be removed. The new pipe shall be butted against the existing pipe and repaired as indicated on the detail drawings.

PART 16 MEASUREMENT AND PAYMENT

16.01 GENERAL

- A. Sanitary sewer shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule.
- B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid.

16.02 SANITARY SEWER

- A. Sanitary Sewer, Lineal Foot. Measurement for sanitary sewer shall be per lineal foot of a specific diameter sewer installed. Payment shall be made at the contract unit price bid per lineal foot of the respective diameter sewer. Contractor shall furnish and install all bedding, fittings, caps, couplings, bypass pumping, and appurtenances required to complete the project. All said costs shall be included in the respective sanitary sewer bid items.
- B. Service Laterals, Lineal Foot. Measurement for laterals shall be per lineal foot of a specific size lateral installed. Payment shall be made at the contract unit price bid per lineal foot of each size lateral installed.
- C. Connect to Existing Sanitary Sewer Main, Each. This bid item involves connecting the new PVC Sewer Main or Manhole to the existing sewer main at locations shown on the plans. Payment shall be at the unit price per each connection and shall include but not be limited to: furnishing all labor, equipment, adaptors, or unions necessary to make a code compliant connection.

- D. Connect to Existing Sanitary Sewer Lateral, Each. This bid item involves connecting the new sanitary sewer lateral to the existing lateral pipe at a point shown on the plans. Payment shall be at the unit price per each connection and shall include but not be limited to; furnishing all labor, adaptors, or unions necessary to make the connection.
- E. Insulation, Square Foot. Measurement for insulation shall be per square foot of insulation installed. Payment shall be made at the contract unit price bid per square foot of insulation installed.

16.03 TESTING

- A. Sewer shall be installed and pass tests before any sewer installation payments shall be made. All costs associated with testing shall be considered inclusive to payment for work associated with the related sewer construction, unless specified in the Bid Schedule.
 - 1. The Contractor is responsible for furnishing and operating all sewer testing equipment.

END OF SECTION

SALVAGE EXISTING PAVEMENT AND BASE

PART 17 GENERAL

17.01 APPLICABLE PROVISIONS

- A. Applicable provisions of Division 1 shall govern work of this section.

17.02 APPLICABLE PUBLICATIONS

- A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
 - 1. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, 1996 Edition, and current Supplemental Specifications.

17.03 DESCRIPTION OF WORK

- A. The work covered under this section shall include all equipment, supervision, and labor necessary to salvage the existing pavement and base as indicated on the Contract Drawings and specified herein and in accordance with Section 410 of the State of Wisconsin, Department of Transportation, Standard Specifications.

17.04 RELATED WORK ELSEWHERE

- A. Earthwork - Streets and Roadways - Division 2
- B. Site Grading - Division 2
- C. Aggregate Base Course - Division 2

17.05 SHOP DRAWINGS (NONE)

PART 18 PRODUCTS AND MATERIALS

18.01 SALVAGED MATERIAL

- A. Salvaged material shall consist of existing asphaltic pavement and aggregate base course processed, by crushing, milling, or pulverizing, to its original particle size with 97 percent passing a 2-inch sieve.

PART 19 CONSTRUCTION METHODS

19.01 SALVAGE AND REGRADE EXISTING ASPHALT PAVEMENT

- A. The existing asphalt surface shall be milled or pulverized to the full depth or to a maximum depth of 6 inches. The depth of the pavement and base varies and extreme care shall be taken to prevent penetration into the subgrade of the roadway.
- B. The existing salvaged pavement shall be graded and compacted. In the presence of the Engineer, the Contractor shall test roll the salvaged pavement with a loaded tandem dump truck. If deemed necessary by the Engineer, the Contractor shall remove the salvaged pavement and base, excavate to subgrade, and reinstall the salvaged material. Subgrade shall be 12 inches below the proposed cross section, unless otherwise defined in the Contract Drawings or Special Conditions - Division 1. The total base required shall be supplemented with aggregate base course or excess salvaged pavement if available.
- C. If deemed necessary by the Engineer, excess or unsuitable salvaged pavement shall be removed and stockpiled at the Owner's storage site. Any salvaged pavement contaminated by the Contractor with unsuitable material, shall be hauled off site, and disposed of by the Contractor.

19.02 SALVAGE EXISTING ASPHALT PAVEMENT AND BASE

- A. The existing asphalt surface shall be milled or pulverized to the depth of the existing asphalt pavement. The depth of the pavement and base varies and extreme care shall be taken to prevent penetration into the subgrade of the roadway.

- B. The salvaged pavement and aggregate base shall be removed, hauled, and stockpiled at the Owner's storage site.