

SECTION 01 11 00

SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Work Included in Contract Documents
 - 2. Contract Information
 - 3. Owner's Intent and Detailed Information
 - 4. Work Under Other Contracts
 - 5. Work Sequence
 - 6. Contractor Use of Premises
 - 7. Occupancy Requirements
 - 8. Work Restrictions
 - 9. Specification and Drawing Conventions
 - 10. Notifications and Protection of Existing Facilities
 - 11. Commencement
 - 12. Completion

1.02 WORK INCLUDED IN CONTRACT DOCUMENTS

- A. Perform the work under this construction contract for Emmet Utility Extension, located in the City of Watertown, Dodge County, Wisconsin.
- B. The Work of this project, defined by the Contract Documents, consists of demolition, road reconstruction, water, sanitary sewer, storm sewer, low pressure sewer, and all incidental items necessary to complete the work as shown on the Construction Drawings and included in the Contract.
- C. All work to be executed in accordance with:
 - 1. Project Construction Drawings and General Specifications for this Contract.
 - 2. Wisconsin Department of Transportation Standard Specifications for Highway and Structure Construction, 2025 or latest Edition, and all Supplemental Specifications.
 - 3. Standard Specifications for Sewer and Water Construction in Wisconsin (SWCW), 6th Edition, with Addenda.
 - 4. Wisconsin Department of Natural Resources Technical Standards, Latest Edition.
 - 5. Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition or Latest Edition.
 - 6. City of Watertown Sanitary Sewer and Water Main Specifications
 - 7. City of Watertown Bituminous Surfacing Specifications

1.03 CONTRACT INFORMATION

- A. Type of Contract: Owner will award a Single Prime Contract.
- B. Scope of Contract:
 - 1. This Contractor is solely responsible for the Work.
 - 2. The Contract will include:
 - a. Contract Forms:
 - 1) Agreement
 - 2) Performance Bond
 - 3) Payment Bond
 - 4) Certificates
 - b. Conditions of the Contract:
 - 1) General Conditions

- 2) Supplementary Conditions
- c. Specifications:
 - 1) Division 1 - General Requirements
 - 2) Applicable Technical Sections
- d. Addenda
- e. Contract Modifications

1.04 OWNER'S INTENT AND DETAILED INFORMATION

A. North 2nd Street

1. Sawcut and remove asphalt at locations shown on the plans and as described in the bid documents.
2. Extend gravity sewer to the North with 8" SDR-35 PVC. Install 4" PVC sewer laterals to the right-of-way at all locations shown in the plans.
3. Extend water main to the North with 8" C900 PVC. Includes all hydrants, valves, and fittings as shown and described in the bid documents. Install 1" Copper services as shown and described in the bid documents.
4. Perform ditch grading and remove and replace culverts as indicated on the bid documents.
5. Remove existing base and subgrade as indicated on the bid documents. Install road base as shown in the typical road cross sections. Perform proof rolls, EBS, and fine grading. Install pavement as shown in the typical road cross sections.
6. Install gravel shoulder and restore all disturbed areas with topsoil, seed, fertilizer, seed, and mat.

B. Prospect Street

1. Sawcut and remove asphalt at locations shown on the plans and as described in the bid documents.
2. Extend gravity sewer to the North with 8" SDR-35 PVC. Install 4" PVC sewer laterals to the right-of-way at all locations shown in the plans.
3. Extend water main to the North with 8" C900 PVC. Includes all hydrants, valves, and fittings as shown and described in the bid documents. Install 1" Copper services as shown and described in the bid documents.
4. Remove existing base and subgrade as indicated on the bid documents. Install road base as shown in the typical road cross sections. Perform proof rolls, EBS, and fine grading. Install pavement as shown in the typical road cross sections.
5. Install tee turnaround at the North end of Prospect Street.
6. Install gravel shoulder and restore all disturbed areas with topsoil, seed, fertilizer, seed, and mat

C. Center Street

1. Sawcut and remove asphalt and curb at locations shown on the plans and as described in the bid documents.
2. Extend gravity sewer to the North with 8" SDR-35 PVC. Install 4" PVC sewer laterals to the right-of-way at all locations shown in the plans.
3. Extend water main to the North with 8" C900 PVC. Includes all hydrants, valves, and fittings as shown and described in the bid documents. Install 1" Copper services as shown and described in the bid documents.

4. Install concrete storm sewer as shown and described in the bid documents.
5. Perform proof rolls, EBS, and fine grading.
6. Replace removed curb sections and pavement as shown in the typical road cross sections.
7. Restore all disturbed areas with topsoil, seed, fertilizer, seed, and mat.

D. Boulder Road

1. Sawcut and remove asphalt and curb at locations shown on the plans and as described in the bid documents.
2. Install 2" HDPE low pressure sewer along the south side of Boulder Road. Install 1.5" HDPE laterals to the right-of-way at all locations shown on the plans.
3. Extend water main to the North with 8" C900 PVC. Includes all hydrants, valves, and fittings as shown and described in the bid documents. Install 1" Copper services as shown and described in the bid documents.
4. Install concrete storm sewer as shown and described in the bid documents.
5. Perform proof rolls, EBS, and fine grading.
6. Replace removed curb sections and pavement as shown in the typical road cross sections.
7. Restore all disturbed areas with topsoil, seed, fertilizer, seed, and mat.

E. Work Common to all Roads

1. Traffic Control: It is anticipated that the roads will be closed for most phases of work and that the Contractor will provide residents with access to their driveways at all times. It is expected that at least one lane will be maintained and open to traffic at all times. Flagging operations may be required to maintain traffic. Contractor will install advance notice signs of the work on the roadway at least two working days in advance of the work. Contractor shall also coordinate with residents of properties for any temporary restrictions to driveways.

1.05 WORK UNDER OTHER CONTRACTS

A. Other Work at Site:

1. Owner reserves the right to let other separate contracts for Work of the Project, or to pursue other Work at the Site with its own personnel.
2. Cooperate fully with separate contractors so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.
3. Coordinate the Work of this Contract with work performed under separate contracts.
4. These roads will be paved immediately following substantial completion under a separate contract.

B. Work Not Included:

1. Work not included is either marked "NIC," or "by others," on Drawings or is noted in each section of Specifications.
2. Provide all labor and materials required unless so specifically noted or marked.
3. Install Work indicated to be furnished by others or Owner unless specifically stipulated to be furnished and installed by others or Owner.

1.06 WORK SEQUENCE

- A.** Construct Work in multiple stages to accommodate Owner's requirements during the construction period. Coordinate construction schedule and operations with Owner and Engineer.

1. Phase 1: Install traffic control and perform demolition and removals
2. Phase 2: Maintain traffic control and install utilities
3. Phase 3: Perform roadway construction and restoration

1.07 CONTRACTOR USE OF PREMISES

- A. Confine operations at Site to the right-of-way and areas permitted under contract or as directed by Owner.
- B. Conform to site rules and regulations affecting Work while engaged in Project construction.
- C. Existing Structures:
 1. Keep existing driveways, playgrounds, or playing fields, and adjacent streets clear and available to public in accordance with Owner's or local authority's requirements.
 2. Maintain buildings in weathertight condition throughout the construction period.
 3. Protect building and occupants during construction period.
 4. Repair damages caused to existing public and private property and structures due to operations of Contractor to the satisfaction of, and at no additional cost to Owner.
 5. Take complete field measurements affecting all existing construction, wiring, piping, and equipment in this Contract, and assume responsibility for proper fit between Work and existing structures and other equipment.
- D. Construction personnel may park only in areas designated by the Owner.
- E. Damaged Property:
 1. Patch and/or clean existing improvements and restore damage of property on, or adjacent to Site occasioned by this Work, including, but not limited to, lawns, walks, curbs, pavements, roadways, structures, and utilities which are cut or damaged by operations and are not designated for removal, relocation, or replacement in the course of construction.
 2. Public Property or Utilities: Comply with laws, ordinances, rules, regulations, standards, orders of utility owner or any public authority having jurisdiction.
 3. Provide written acceptance of restoration work by authority or Owner.

1.08 OCCUPANCY REQUIREMENTS

- A. General Requirements:
 1. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.
 2. Schedule the Work to accommodate this requirement.
 3. Coordinate activities which could cause interruption to Owner's activities.
 4. Provide not less than 24 hours notice to Owner of activities that will affect Owner's operations.
- B. Owner Occupation During Construction:
 1. Owner will occupy the premises during entire construction period, with the exception of areas under construction.
 - a. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities, unless receiving written permission from Owner and authorities having jurisdiction.
 - b. Maintain existing exits, unless otherwise indicated.
- C. Owner Occupancy of Completed Areas of Construction:
 1. Owner reserves the right to place and install equipment as necessary in completed areas of the facilities and to occupy such completed areas prior to Substantial Completion in accordance with the Supplementary Conditions. Such use shall not constitute acceptance of such portions of the Work or relieve the Contractor of any obligations except for improper use or damage caused by employees or agents of Owner.

1.09 WORK RESTRICTIONS

- A. Comply with limitations on use of public streets and other requirements of City of Watertown authorities and with WisDOT or Dodge County requirements for highways.
- B. On-Site Work Hours:
 - 1. Normal business working hours of 7:00 a.m. to 7:00 p.m. Monday through Friday.
 - 2. Weekend Hours: 7:00 a.m. to 6:00 p.m. on Saturday; Sunday work is prohibited.
 - 3. Legal Holidays: Work performed on holiday is prohibited.
- C. Existing Utility Interruption: Do not interrupt utilities unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
 - 1. Notify Owner and Engineer not less than two days in advance of proposed utility interruptions.
 - 2. Obtain Owner's written permission before proceeding with utility interruptions.
- D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
 - 1. Notify Owner and Engineer not less than two days in advance of proposed disruptive operations.
 - 2. Obtain Owner's written permission before proceeding with disruptive operations.
- E. Controlled Substances: Use of controlled substances on the Project site is not permitted.

1.10 NOTIFICATIONS AND PROTECTION OF EXISTING FACILITIES

- A. Diggers Hotline – Contractor is to contact Diggers Hotline a minimum of three working days prior to construction.
- B. Section Corner Ties. Contractor shall protect existing monuments and advise the Dodge County Surveyor of any questions regarding protection of or temporary relocation of any monument. Contact John Washburn, SEWRPC, at 262-547-6721, ext. 295 or mobile 414-218-2866.
- C. Protection of Existing Facilities. Contractor shall suitably protect or maintain a safe working distance from public utilities and municipal utility infrastructure.
- D. City Contacts.
 - 1. Public Work Director/City Engineer – Andrw Beyer, 920-262-4050.
 - 2. Staff Civil Engineer – Nathan Williams, 920-262-4052.
 - 3. Water/Wastewater Utility Manager – Peter Hartz, 920-262-4075.
 - 4. Stormwater Project Manager – Maureen McBroom, 920-206-4264
- E. School and Trash Collection Conflicts. Contractor shall coordinate with Watertown Unified School District and/or their servicing school bus company to reduce conflicts. There might be summer school in session. Contractor shall also contact with the servicing trash collection company to minimize conflicts.

PART 2 PRODUCTS

- A. Owner will supply the following for installation by the contractor:
 - 1. Curb valve boxes for water services

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 28 00

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Method of Measurement
 - 2. Basis of Payment

1.02 METHOD OF MEASUREMENT

- A. Mobilization:
 - 1. Measurement and Payment for this item as follows:
 - a. Description: Work and operations necessary to move personnel, equipment, supplies, and incidentals to the project site and to establish the contractor's offices, buildings, sanitary accommodations, and other facilities necessary to work on the project. It also includes all other work and operations whose performance is required, or for costs necessarily incurred before beginning work on various items on the project site.
 - b. Measurement: By percent completion of lump sum item.
 - c. Payment: At contract unit price for percent completion. Contract will only pay one mobilization; any separate mobilization requests will be considered incidental to the work.
- B. Traffic Control:
 - 1. Measure and Pay for this work item as follows:
 - a. Description: Furnish and install traffic control signs, fencing, barricades, and warning devices, including flag persons to warn and protect workers and the public during construction and non-work hours. Includes all personnel, equipment, labor, materials, and tools to place traffic control. Written traffic control plans for each project improvement are required. Posting of traffic control to be performed in advance of any work.
 - b. Measurement: By percent completion of entire item as determined by the City.
 - c. Payment: At contract unit price for percent completion of traffic control measured.
- C. Inlet Protection (type D):
 - 1. Measure and Payment for this item as follows:
 - a. Description: Furnish, install, maintain, and remove inlet protection as indicated on the plans and specification. Includes all personnel, equipment, labor, materials, and tools required to furnish, install, maintain, and remove inlet protection.
 - b. Measurement: By each inlet protection installed, as acceptably completed.
 - c. Payment: At contract unit price for inlet protection measured.
- D. Gravel Tracking Pad:
 - 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install stone tracking pad as indicated on the plans and specifications. Includes all personnel, equipment, labor, materials, and tools required to furnish and install. Maintenance of the tracking pad is considered incidental to the Bid Item.
 - b. Measurement: By each tracking pad installed, as acceptably completed.
 - c. Payment: At contract unit price for tracking pads measured.
- E. Sediment Log:
 - 1. Measure and Payment for this item as follows:
 - a. Description: Furnish, install, and maintain sediment logs as indicated on the plans and specifications. Includes all personnel, equipment, labor, materials, and tools required to furnish and install. Maintenance of the sediment logs is considered incidental to the Bid Item.
 - b. Measurement: By lineal foot acceptably completed.

- c. Payment: At contract unit price for sediment logs measured.
- F. Sawcut Asphalt:
 - 1. Measure and Payment for this item as follows:
 - a. Description: Full depth saw cut as indicated on the plans and specifications. Includes all personnel, equipment, labor, materials, and tools required to perform saw cuts.
 - b. Measurement: By lineal feet of saw cutting performed.
 - c. Payment: At contract unit price for saw cutting measured.
- G. Mill and Remove Asphalt Pavement, Haul and Dispose (3.5" average):
 - 1. Measure and Payment for this item as follows:
 - a. Description: Mill, remove, haul, and dispose of existing asphalt materials where indicated on the plans. Includes all personnel, equipment, labor, materials, and tools required to mill, remove, haul, and dispose of existing asphalt materials.
 - b. Measurement: By square yardage of asphalt materials removed as measured by the engineer.
 - c. Payment: At contract unit price for asphalt removal measured.
- H. Remove Base and Subgrade, Haul and Dispose (14" depth):
 - 1. Measure and Payment for this item as follows:
 - a. Description: Remove, haul, and dispose of existing materials where indicated on the plans. Includes all personnel, equipment, labor, materials, and tools required to remove, haul, and dispose of existing materials.
 - b. Measurement: By square yardage of materials removed as measured by the engineer.
 - c. Payment: At contract unit price for removed materials measured.
- I. 3" Breaker Run Crushed Aggregate:
 - 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install 3" breaker run crushed aggregate as indicated on the plans and specifications. Includes all personnel, equipment, labor, materials, and tools required to furnish, place, grade, and compact the aggregate.
 - b. Measurement: By ton of aggregate acceptably installed.
 - c. Payment: At contract unit price for breaker run aggregate measured.
- J. 1.25" Crushed Aggregate Dense:
 - 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install 6" of 1.25" dense graded aggregate. Includes all personnel, equipment, labor, materials, and tools required to furnish, install, grade, and compact the aggregate.
 - b. Measurement: By ton of dense graded aggregate acceptably installed.
 - c. Payment: At contract unit price for dense aggregate measured.
- K. Geogrid:
 - 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install geogrid reinforcement as shown on the plans and specifications. Includes all personnel, equipment, labor, materials, and tools required to place geogrid.
 - b. Measurement: By square yard of geogrid installed.
 - c. Payment: At contract unit price for geogrid measured.
- L. EBS (10% of Road):
 - 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install Excavation Below Subgrade (EBS) including removal of unsuitable materials and replacement with approved material as directed. Includes all personnel, equipment, labor, materials, and tools required.
 - b. Measurement: By cubic yard of EBS completed.
 - c. Payment: At contract unit price for EBS measured.
- M. Binder Course of Asphalt (2-1/4"):
 - 1. Measure and Payment for this item as follows:

- a. Description: Furnish and install binder course asphalt pavement at the specified thickness. Includes all personnel, equipment, labor, materials, and tools to place and compact asphalt.
 - b. Measurement: By ton of binder course asphalt installed.
 - c. Payment: At contract unit price for binder asphalt measured.
- N. Ditch Grading:
 - 1. Measure and Payment for this item as follows:
 - a. Description: Perform ditch grading including excavation, shaping, and finishing of ditches as shown on plans. Includes all personnel, equipment, labor, materials, and tools required.
 - b. Measurement: By linear foot of ditch grading completed.
 - c. Payment: At contract unit price for ditch grading measured.
- O. Remove and Replace Storm Culvert, 12" CMP:
 - 1. Measure and Payment for this item as follows:
 - a. Description: Remove existing 12" CMP culvert and furnish/install new culvert including all excavation, shaping, backfilling, and connections.
 - b. Measurement: By linear foot of culvert replaced.
 - c. Payment: At contract unit price for culvert replacement measured.
- P. Remove and Replace Storm Culvert, 18" CMP:
 - 1. Measure and Payment for this item as follows:
 - a. Description: Remove existing 18" CMP culvert and furnish/install new 18" CMP culvert including all excavation, shaping, backfilling, and connections.
 - b. Measurement: By linear foot of culvert replaced.
 - c. Payment: At contract unit price for culvert replacement measured.
- Q. Surface Course of Asphalt (1-3/4"):
 - 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install asphalt surface course at the specified thickness. Includes all personnel, equipment, labor, materials, and tools to place and compact asphalt.
 - b. Measurement: By ton of surface course asphalt installed.
 - c. Payment: At contract unit price for asphalt measured.
- R. Gravel Shoulder:
 - 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install gravel shoulder material as shown on plans, including placement, grading, and compaction.
 - b. Measurement: By ton of gravel shoulder acceptably installed.
 - c. Payment: At contract unit price for gravel shoulder measured.
- S. Tack Coat:
 - 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and apply tack coat to bituminous surfaces as required for bonding layers of asphalt.
 - b. Measurement: By square yards of tack coat acceptably applied.
 - c. Payment: At contract unit price for tack coat measured.
- T. Restoration (Topsoil, Seed, Mat, Fertilizer):
 - 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install topsoil, seed, matting, and fertilizer to restore disturbed areas to original or improved condition.
 - b. Measurement: By square yards of acceptable restoration.
 - c. Payment: At contract unit price for restoration measured.
- U. Sanitary Sewer, 8-inch w/Granular Backfill:
 - 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install sanitary sewer pipe and appropriate fittings of the type, size, and material specified in the plans and specifications. Includes all labor, equipment,

materials, and tools necessary for excavation, removal and disposal of soils, placement of bedding stone, pipe cover, granular backfill, and testing.

- b. Measurement: By linear foot of sanitary sewer installed, measured along the centerline between structures.
- c. Payment: At contract unit price for sanitary sewer pipe measured.

V. Sewer Lateral, 4-inch:

- 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install sanitary lateral pipe, connections, and fittings of the size and material specified, including excavation, bedding, backfill, compaction, and restoration with all necessary labor, equipment, and materials.
 - b. Measurement: By linear foot of sanitary lateral acceptably installed.
 - c. Payment: At contract unit price for sanitary laterals measured.

W. Sanitary Sewer, 2-inch w/Granular Backfill:

- 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install 2-inch sanitary sewer with granular backfill, including excavation, removal and disposal of soils, placement of bedding stone, pipe installation, backfilling, compaction, and testing. All labor, equipment, materials, and tools are incidental to this item.
 - b. Measurement: By linear foot of sanitary sewer installed, measured along the centerline.
 - c. Payment: At contract unit price for sanitary sewer measured.

X. Sewer Lateral, 1.5-inch:

- 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install 1.5-inch HDPE sanitary lateral including excavation, bedding, backfill, tapping, and all fittings and connections. Includes all required labor, materials, tools, and equipment.
 - b. Measurement: By linear foot of lateral piping acceptably installed.
 - c. Payment: At contract unit price for sewer lateral measured.

Y. Sewer Curb Valve and Valve Box, 1.5-inch:

- 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install 1.5-inch curb valve and valve box including excavation, bedding, placement, adjustment to grade, and all associated appurtenances. Includes all labor, equipment, materials, and tools.
 - b. Measurement: By each curb valve and box acceptably installed.
 - c. Payment: At contract unit price for curb valve assemblies measured.

Z. Terminal Cleanout & Valve:

- 1. Measure and Payment for this item as follows:
 - a. Description: Furnish and install terminal cleanout assembly with valve including excavation, bedding stone, valve box placement, crushed aggregate backfill, and all required fittings. Includes all labor, equipment, materials, and tools.
 - b. Measurement: By each terminal cleanout assembly acceptably installed.
 - c. Payment: At contract unit price for terminal cleanout assemblies measured.

AA. Manhole, Sanitary, 48-inch:

- a. Measure and Payment for this item as follows:
 - 1) Description: Furnish and install 48-inch precast sanitary manhole complete with base, barrel sections, frame and cover, pipe connections, steps (if specified), and all appurtenances. Includes excavation, bedding, backfill, compaction, and surface restoration.
 - 2) Measurement: By each manhole acceptably installed.
 - 3) Payment: At contract unit price for manholes measured.

BB. Connection to Existing Sewer:

- a. Measure and Payment for this item as follows:
 - 1) Description: Furnish and install connection(s) to existing sanitary sewer including cutting/coring, fittings, boots, seals, and all incidentals required to make a watertight connection; includes excavation, backfill, and restoration.
 - 2) Measurement: By each connection acceptably completed.
 - 3) Payment: At contract unit price for sewer connections measured.

CC. Connection to Existing Water Main:

- a. Measure and Payment for this item as follows:
 - 1) Description: Furnish and install connection(s) to existing water main including tapping, fittings, sleeves, restraints, and all incidentals required to make a pressure-tight connection; includes excavation, backfill, and restoration.
 - 2) Measurement: By each connection acceptably completed.
 - 3) Payment: At contract unit price for water main connections measured.

DD. Water Main, 8-inch w/Granular Backfill:

- a. Measure and Payment for this item as follows:
 - 1) Description: Furnish and install water main pipe of the size and material indicated including trenching, dewatering, bedding, pipe installation with fittings and restraints, granular backfill, compaction, disinfection, flushing, pressure testing, and restoration. All labor, equipment, and materials are incidental to this item. Includes the removal of the existing water main in N Second Street.
 - 2) Measurement: By linear foot of water main acceptably installed along the horizontal centerline.
 - 3) Payment: At contract unit price for water main measured.

EE. Gate Valve, 8-inch:

- a. Measure and Payment for this item as follows:
 - 1) Description: Furnish and install 8-inch gate valve and valve box complete, including trenching as needed, bedding, thrust restraints, corrosion protection (if specified), granular backfill, compaction, and testing.
 - 2) Measurement: By each gate valve acceptably installed.
 - 3) Payment: At contract unit price for gate valves measured.

FF. Hydrant Assembly (6" lead, 6" gate valve, and hydrant) w/Granular Backfill:

- a. Measure and Payment for this item as follows:
 - 1) Description: Furnish and install complete hydrant assembly including hydrant, 6-inch valve, 6-inch lead, fittings, thrust blocks/restraints, bedding, granular backfill, compaction, and disinfection/testing of assembly; includes excavation and restoration.
 - 2) Measurement: By each hydrant assembly acceptably installed.
 - 3) Payment: At contract unit price for hydrant assemblies measured.

GG. Water Service, 1-inch w/Granular Backfill:

- a. Measure and Payment for this item as follows:
 - 1) Description: Furnish and install 1-inch water service from main to curb valve (or as detailed) including tapping, tubing/pipe, fittings, bedding, granular backfill, compaction, disinfection, flushing, testing, and restoration.
 - 2) Measurement: By linear foot of water service acceptably installed.
 - 3) Payment: At contract unit price for water service measured.

HH. Service Tap, Saddle, and Corporation Valve, 1-inch:

- a. Measure and Payment for this item as follows:
 - 1) Description: Furnish and install service tap assembly including saddle, corporation valve, and appurtenances per details; includes excavation and restoration; tapping permits and coordination are incidental to this item.
 - 2) Measurement: By each service tap assembly acceptably installed.
 - 3) Payment: At contract unit price for service tap assemblies measured.

II. Curb Valve and Owner Provided Valve Box, 1-inch:

- a. Measure and Payment for this item as follows:
 - 1) Description: Furnish and install curb valve complete at service location, including excavation, bedding, granular backfill, compaction, and final adjustment to finished grade. Install **City provided** Valve box at service location, including excavation, bedding, granular backfill, compaction, and final adjustment to finished grade
 - 2) Measurement: By each curb valve and box acceptably installed.
 - 3) Payment: At contract unit price for curb valve and box measured.

JJ. Remove and Replace Curb & Gutter (30"):

- a. Measure and Payment for this item as follows:
 - 1) Description: Saw cut clean joints where directed, remove existing curb and gutter, and furnish/install replacement curb and gutter to match lines and grades; includes disposal of removed material and cleanup.
 - 2) Measurement: By linear foot of curb and gutter removed and replaced.
 - 3) Payment: At contract unit price for curb and gutter removal and replacement measured.

KK. Base Repair:

- a. Measure and Payment for this item as follows:
 - 1) Description: Remove unsuitable base/subgrade to the depth directed and replace with crushed aggregate backfill; includes excavation, hauling and disposal, placement and compaction of aggregate, and restoration.
 - 2) Measurement: By cubic yard of base repair performed as verified by Owner/Engineer.
 - 3) Payment: At contract unit price for base repair measured.

LL. Storm Sewer Pipe, RCP, 12":

- a. Measure and Payment for this item as follows:
 - 1) Description: Furnish and install 12-inch RCP storm sewer including excavation, bedding, jointing, granular backfill, compaction, and connections to structures; coring and mortaring into existing structures are incidental to this item.
 - 2) Measurement: By linear foot of storm sewer pipe acceptably installed.
 - 3) Payment: At contract unit price for storm sewer pipe measured.

MM. Manhole, Storm Sewer, 60" Doghouse:

- a. Measure and Payment for this item as follows:
 - 1) Description: Furnish and install 60-inch storm manhole complete with frame and grate, including excavation, bedding, backfill, compaction, and grading adjacent to the structure; any modifications and sawcuts required to connect are included.
 - 2) Measurement: By each structure acceptably installed.
 - 3) Payment: At contract unit price for storm inlet measured.

NN. Manhole, Storm, 48"

1. Measure and Payment for this item as follows:
 - 1) Description: Furnish and install 48" storm manhole complete with frame and grate, including excavation, bedding, backfill, compaction, and grading adjacent to the structure; any modifications and sawcuts required to connect are included.
 - 2) Measurement: By each structure acceptably installed.
 - 3) Payment: At contract unit price for storm inlet measured.

OO. Catch Basin 2'x3'

1. Measure and Payment for this item as follows:
 - 1) Description: Furnish and install catch basin complete with frame and grate, including excavation, bedding, backfill, compaction, and grading adjacent to the structure; any modifications and sawcuts required to connect are included.
 - 2) Measurement: By each structure acceptably installed.
 - 3) Payment: At contract unit price for catch basin measured.

PP. Pavement Marking Line Epoxy:

- a. Measure and Payment for this item as follows:
 - 1) Description: Provide and install epoxy pavement marking line in color and width specified, including layout and all materials, equipment, and labor for installation.
 - 2) Measurement: By percentage of lump sum epoxy pavement marking line acceptably installed.
 - 3) Payment: At contract unit price for epoxy pavement marking measured.

PRODUCT DATA SHEET 0 - Non-Pay Items

Items are considered as incidental to items for which there are pay items include but are not limited to: establishing temporary mail facilities and replacement of mail boxes; periodic meetings, etc.

SCHEDULE 1 - BASIS OF PAYMENT

PRODUCT DATA SHEET 0 - Payment for each complete unit of work will be made based on the lump sum bid price for the corresponding Bid Item as listed on the Bid Schedule.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 57 00

TEMPORARY CONTROLS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Drainage control.
 - 2. Dust control.
 - 3. Erosion and sediment control.
 - 4. Noise control.
 - 5. Pollution control.
 - 6. Barriers.
 - 7. Protection:
 - a. Shoring and bracing.
 - b. Enclosures.
 - c. Installed work.
 - d. Security.
 - e. Fire protection.
 - 8. Site cleaning.
- B. Related Sections:
 - 1. Section 01 11 00 - Summary of Work
 - 2. Section 01 57 19 - Air, Land, and Water Pollution
 - 3. Section 31 25 10 - Temporary Erosion Control
- C. Measurement and Payment:
 - 1. All activities required by or relating to this section will be considered incidental.
 - 2. No direct payment will be made.
 - 3. No additional compensation or time extension will be granted due to actions brought against the Contractor for failure to comply with pollution control requirements.

1.02 QUALITY ASSURANCE

- A. Regulatory Requirements: As a minimum, comply with local, state, and federal requirements.

1.03 DRAINAGE CONTROL

- A. Maintain excavations free of water.
 - 1. Grade Site to drain.
 - 2. Provide, operate, and maintain pumping equipment.
 - 3. Protect Site from puddling or running water.

1.04 DUST CONTROL

- A. Reference: See Section 31 25 10.
- B. Execute Work by methods to minimize raising dust from construction operations.
- C. Provide positive means to prevent airborne dust from dispersing into atmosphere.

1.05 EROSION AND SEDIMENT CONTROL

- A. Reference: See Section 31 25 10.

- B. Prevent erosion and sedimentation:
 - 1. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas.
 - 2. Minimize amount of bare soil exposed at one time.
 - 3. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
 - 4. Use selective placement at construction fill and waste areas to avoid erosive surface silts or clays.
 - 5. Periodically inspect earthwork to detect evidence of erosion and sedimentation.
 - 6. Promptly apply corrective measures.

1.06 NOISE CONTROL

- A. Comply with local noise ordinances.
- B. Avoid use of tools or equipment that produce harmful noise.
- C. Restrict use of noise-making tools and equipment to hours of use that will minimize noise complaints from persons or businesses near Site.
- D. Provide noise suppression barriers or equipment used to perform the Work.

1.07 POLLUTION CONTROL

- A. Reference: See Section 01 57 19.
- B. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

1.08 BARRIERS

- A. Provide barriers as required to:
 - 1. Prevent public entry to construction areas.
 - 2. Protect existing facilities, designated plantings and trees, and adjacent properties from damage from construction activities.
- B. Construction:
 - 1. Type: Contractor's option minimum – safety fence – 4 ft high.
- C. Access: Provide barricades and covered walkways as required for public rights-of-way, for public access to, and emergency egress from existing buildings.

1.09 PROTECTION

- A. Shoring and Bracing:
 - 1. Provide temporary shoring, bracing, and protection as required for installation and protection of Work.
 - 2. Ensure adequacy of such items.
 - 3. Repair or replace damaged Work occasioned by inadequate temporary supports.
 - 4. Leave temporary shoring and bracing in place until permanent construction is complete to point where installed Work is properly supported.
- B. Installed Work:
 - 1. Provide temporary protection for installed products; control traffic in immediate area to minimize damage.
 - 2. Provide protective coverings at walls, projections, jambs sills, and soffits of openings; protect finished floors and stairs from traffic, movement of heavy objects.

3. Prohibit traffic and storage on waterproofed and roofed surfaces or on lawn and landscaped areas.
- C. Security:
 1. Provide security program and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, and theft.
- D. Fire Protection:
 1. Fire extinguishers shall be non-freeze type such as A-B-C rated dry chemical of not less than 10-pound capacity.
 2. Provide and maintain in working order during entire construction period, a minimum of 1 fire extinguisher in construction area and 1 in field office.

1.10 SITE CLEANING

- A. Keep Site neat, clean, free of debris.
- B. Prevent papers, cardboard or other debris from blowing around Site or onto adjacent property.
- C. Contractor shall provide and pay for dumpsters for collection of trash.
- D. Control accumulation of waste materials and rubbish. Collect and dispose of all trash from the Site at regular intervals.
- E. Separate and recycle applicable materials.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 01 57 19

AIR, LAND, AND WATER POLLUTION

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes general requirements for the control of pollution from construction sites and related activities.
- B. Related Sections:
 - 1. Section 31 25 10 - Temporary Erosion Control
- C. Measurement and Payment:
 - 1. All activities required by or relating to this section will be considered incidental.
 - 2. No direct payment will be made.
 - 3. No additional compensation or time extension will be granted due to actions brought against the Contractor for failure to comply with pollution control requirements.

1.02 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Conduct all operations to prevent, control and abate the pollution of air, land and water in accordance with the rules, regulations and standards adopted and established by the following agencies:
 - a. Wisconsin Department of Natural Resources
 - b. U.S. Army Corps of Engineers

1.03 SCHEDULING

- A. Schedule and conduct all operations to minimize soil erosion and prevent siltation and the resultant turbidity of public waters.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 PREPARATION

- A. Review all local conditions and regulations pertaining to air and land pollution prior to commencing operations.

3.02 PROTECTION OF WATERS

- A. Prevent pollution of flowing or impounded waters from particulate or liquid matter that may be harmful to fish and wildlife or detrimental to public use.
- B. Remove sediment from aggregate wash operations by filtration or settlement prior to discharge into public waters.
- C. Do not discharge wash water or waste from concrete mixing operations into live streams.

3.03 SPECIAL REQUIREMENTS

- A. Provide temporary bridging where stream crossings are necessary.
- B. Remove temporary bridging as soon as crossings are no longer necessary.

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Administrative and procedural requirements governing:
 - a. Products.
 - b. Delivery, storage and handling.
 - 2. The following is not included in this section: Product Substitution Procedures (Section 01 25 13).
 - 3. New products consisting of recycled materials are allowed unless stated otherwise in technical sections.
 - 4. Products shall contain no asbestos containing material (ACM).
- B. Alternates: Refer to Section 01 23 00.
- C. Measurement and Payment of Unit Items: Refer to Section 01 28 00.

1.02 PRODUCT DEFINITIONS

- A. Products:
 - 1. Unless indicated otherwise, the term "products" represents new material, machinery, components, equipment, fixtures, and systems forming the Work.
 - 2. Does not include machinery and equipment used for preparation, fabrication, conveying, or erection of the Work.
- B. Named Products: Items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature, that is current as of the date of the Contract Documents.
- C. Materials: Products that are substantially shaped, cut, worked, mixed, finished, refined, or otherwise fabricated, processed, or installed as part of the Work.
- D. Equipment: A product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

1.03 PRODUCT QUALITY ASSURANCE

- A. Source Limitations: To the fullest extent possible, provide products of the same kind, from a single source.
- B. Limited Quantities:
 - 1. When specified products are available only from sources that do not or cannot produce a quantity adequate to complete Project requirements in a timely manner, consult with Engineer for a determination of the most important product qualities before proceeding.
 - 2. Qualities may include attributes relating to:
 - a. Visual appearance.
 - b. Strength.
 - c. Durability.
 - d. Compatibility.
 - 3. When a determination has been made, select products from sources that possess these qualities to the fullest extent possible.

1.04 PRODUCT REQUIREMENTS

- A. Minimum Requirements: Comply with specifications and referenced standards.
- B. Product Provision: Provide products complete with all accessories, trim, finish, safety guards, and other devices and details needed for a complete installation and for the intended use and effect.
- C. Components: Items required to be supplied in quantity within a specification section shall be the same and shall be interchangeable.
- D. Compatibility of Options: When Contractor is given the option of selecting between 2 or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.
- E. Existing Products: Do not use materials and equipment removed from existing premises, except as specifically required or permitted by Contract Documents.
- F. Nameplates:
 - 1. Except for required labels and operating data, do not attach or imprint manufacturer's nameplates or trademarks on exposed surfaces of products that will be exposed to view in occupied spaces or on the exterior.
 - 2. Labels: Locate required product labels and stamps on concealed surfaces or, where required for observation after installation, on an accessible surface that is not conspicuous.
 - 3. Equipment Nameplates:
 - a. Provide permanent nameplate on each item of service-connected or power-operated equipment.
 - b. Locate on an easily accessible surface that is inconspicuous in occupied spaces.
 - c. Provide the following information and other essential operating data on nameplate:
 - 1) Name of product and manufacturer.
 - 2) Model and serial number.
 - 3) Capacity.
 - 4) Speed.
 - 5) Ratings.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. General Requirements:
 - 1. Deliver, store and handle products in accordance with the manufacturer's recommendations.
 - 2. Schedule and coordinate the delivery of materials to ensure personnel and equipment will be available at the Site.
 - 3. Sequence deliveries to avoid delays but minimize on-site storage.
 - 4. Prevent damage, deterioration, soiling, and loss, including theft.
 - 5. Repair or replace damaged materials at no additional cost to Owner.
- B. Packing and Shipping: Deliver products to the jobsite in manufacturer's sealed containers bearing the manufacturer's name and brand, and appropriate UL labels for fire hazard and fire resistance classification.
- C. Acceptance at Site:
 - 1. Promptly inspect shipments to ensure that:
 - a. Products comply with requirements.
 - b. Quantities are correct.
 - c. Products are undamaged.
 - 2. Replace damaged or defective materials.
- D. Storage and Protection:
 - 1. Store with manufacturer's seals and labels intact and legible.
 - 2. Store sensitive products in weather-tight, climate-controlled enclosures.

3. Cover products subject to deterioration with impervious sheet covering, providing ventilation to avoid condensation.
4. For exterior storage of fabricated products, place on sloped supports, above ground.
5. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
6. Provide off-site storage and protection when Site does not permit on-site storage or protection.
7. Protect stored materials from damage by adjacent work, falling debris, or equipment.
8. Arrange storage of products to permit access for inspection. Periodically inspect to assure products are undamaged and are maintained under required conditions.

1.06 PRODUCT SELECTION

- A. Product selection is governed by the Contract Documents, and governing regulations by previous project experience.
- B. Proprietary Specification Requirements: Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.
- C. Semi-Proprietary Specification Requirements:
 1. Where 2 or more products or manufacturers are named, provide 1 of the products indicated. No substitutions will be permitted.
 2. Where products or manufacturers are specified by name, accompanied by the term "or equal," or "or approved equal", comply with Section 01 25 13 or other Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.
 3. Contractors and suppliers will be expected to provide the specified product unless prior approval is received from Engineer's office in sufficient time to notify Bidders through addendum.
- D. Descriptive Specification Requirements: Where specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.
- E. Performance Specification Requirements:
 1. Where specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated.
 2. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.
 3. General overall performance of a product is implied where the product is specified for a specific application.
- F. Compliance with Standards, Codes and Regulations: Where the specifications only require compliance with an imposed code, standard or regulation, select a product that complies with applicable standards, codes and regulations.
- G. Visual Matching:
 1. Where specifications require matching an established sample, Engineer's decision will be final on whether a proposed product matches satisfactorily.
 2. Where no product available within the specified category matches satisfactorily but complies with other specified requirements, comply with provisions of the Contract Documents concerning "substitutions" for selection of a matching product, or for noncompliance with specified requirements.
- H. Visual Selection: Where specified product requirements include the phrase "*...as selected from manufacturer's standard colors, patterns, textures...*" or a similar phrase, select a product and manufacturer that comply with other specified requirements. Engineer will select the color, pattern and texture from the product line selected.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 CLEANING AND PROTECTION

- A. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

END OF SECTION

SECTION 01 77 00

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

- A. Administrative and procedural requirements for contract closeout, including:
 - 1. Submittals.
 - 2. Inspection procedures.
 - 3. Warranties.
 - 4. Record document submittals.
 - 5. Final cleaning.

1.02 SUBSTANTIAL COMPLETION

- A. Complete the following before requesting Engineer's inspection for certification of Substantial Completion for each phase of work. List items that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Obtain, submit releases enabling Owner unrestricted use of the Work and access to services and utilities.
 - 3. Regulatory requirements:
 - a. Where required, obtain occupancy permits, operating certificates, similar releases.
 - b. Obtain elevator inspection from State Inspector.
 - 4. Bonding and insurance:
 - a. Consent of Surety to Reduction In or Partial Release of Retainage (if Performance Bond provided).
 - b. Advise Owner of pending insurance change-over-requirements (if Builder's Risk Insurance is provided by Contractor).
- B. Inspection Procedures:
 - 1. When prerequisites are complete, submit request in writing to Engineer stating that all requirements are satisfied, and requesting inspection.
 - 2. Upon receipt of Contractor's request for inspection, Engineer will either proceed with inspection or advise Contractor of unfilled prerequisites.
 - 3. Following initial inspection, Engineer will either prepare Certificate of Substantial Completion, or advise Contractor of work which must be performed before certificate will be issued. Engineer will repeat inspection when requested and when assured that work has been substantially completed.
 - 4. Results of completed inspection will form the basis of requirements for Final Acceptance.

1.03 FINAL ACCEPTANCE

- A. Before requesting final inspection for determining date of Final Completion, complete the following:
 - 1. Submittals:
 - a. Lien Waivers (from all subcontractors and suppliers).
 - b. Certificate of Substantial Completion (AIA G704)
 - c. Contractor's Affidavit of Payment of Debts and Claims (AIA G706).
 - d. Contractor's Affidavit of Release of Liens (AIA G706A).
 - e. Consent of Surety (if Performance Bond provided).
 - 1) To Partial Release of Retainage (AIA G707A).
 - 2) To Final Payment (AIA G707).
 - f. Assurance that unsettled claims will be settled.
 - g. Proof that fees and similar obligations have been paid.
 - h. Evidence of final, continuing insurance coverage complying with insurance requirements.

- i. Certified copy of Engineer's final punch list of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance and has been endorsed and dated by Engineer.
 - 2. Warranties: Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications, similar documents.
 - 3. Miscellaneous Record Submittals:
 - a. Refer to other sections of specifications for requirements of miscellaneous record keeping and submittals in connection with actual performance of work.
 - b. Complete miscellaneous records, place in good order, properly identified and bound or filed, ready for continued use and reference.
- B. Record Drawings: Submit to Engineer a set of record prints marked to show "as-built" conditions for work of contract, when requested.
- C. Adjusting:
 - 1. Repair and restore marred exposed finishes.
 - 2. Touch up of painting of marred surfaces.
 - 3. Complete final cleaning requirements.
- D. Final Payment Request:
 - 1. Include certificates of insurance for products and completed operations where required.
 - 2. Updated final statement, accounting for final additional changes to Contract Sum.
 - 3. Final liquidated damages settlement statement, acceptable to Owner.
- E. Re-inspection Procedure:
 - 1. Engineer will re-inspect work upon receipt of notice that work, including punch list items resulting from earlier inspections, has been completed, except for items whose completion has been delayed because of circumstances that are acceptable to Engineer.
 - 2. Engineer will either prepare a certificate of final acceptance, or will advise Contractor of work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
 - 3. If necessary, re-inspection procedure will be repeated.

PART 2 PRODUCTS

2.01 CLEANING AGENTS

- A. Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned.
- B. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 EXECUTION

3.01 FINAL CLEANING

- A. Provide final cleaning, following manufacturer's written instructions.
- B. Conduct cleaning and waste-removal operations to comply with local laws and ordinances, and federal and local environmental and antipollution regulations.
- C. Employ experienced workers or professional cleaners for final cleaning.
- D. Comply with safety standards for cleaning.
 - 1. Do not burn waste materials.
 - 2. Do not bury debris or excess materials on Owner's property.

3. Do not discharge volatile, harmful, or dangerous materials into drainage systems.
 4. Remove waste materials from Site and dispose of lawfully.
- E. Clean Site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
- F. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program.
1. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 2. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 3. Remove tools, construction equipment, machinery, and surplus material from Site.
 4. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

END OF SECTION

SECTION 01 78 37

PRODUCT WARRANTIES

PART 1 GENERAL

1.01 SUMMARY

- A. Requirements include administrative and procedural requirements for:
 - 1. Warranties
 - 2. Warranty submittals
- B. Related Sections:
 - 1. Document 00 72 00- General Conditions
 - 2. Section 01 33 00 - Submittal Procedures
 - 3. Section 01 77 00 - Closeout Procedures
 - 4. Individual Technical Sections

1.02 DEFINITIONS

- A. Standard Product Warranties: Preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to Owner.
- B. Special Warranties: Written warranties required by, or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for Owner.

1.03 WARRANTY REQUIREMENTS

- A. Separate Prime Contracts:
 - 1. Each prime Contractor is responsible for warranties related to its own contract. Each Contractor shall warrant their work for labor and material for 1-year minimum. This warranty shall include material purchased directly by Owner and installed by Contractor. Warranty requirements noted in individual sections may exceed this 1-year minimum; if it does, the warranty shall apply for the stipulated time for both material and labor.
- B. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
- C. Replacement Cost: Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. Contractor is responsible for the cost of replacing or rebuilding defective Work regardless of whether Owner has benefited from use of the Work through a portion of its anticipated useful service life.
- D. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
- E. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of warranty on the Work that incorporates the products.

- F. Owner's Recourse: Written warranties made to Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which Owner can enforce such other duties, obligations, rights or remedies.
1. Rejection of Warranties: Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Contract Documents.
- G. Right of Refusal: Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

1.04 SUBMITTALS

- A. Warranty Commencement:
1. Submit duplicate, notarized copies of written warranties to Engineer prior to the date certified for Substantial Completion. Engineer's Certificate of Substantial Completion shall be the commencement date for warranties.
 2. When a designated portion of the Work is completed and occupied or used by Owner, by separate agreement with Contractor during the construction period, submit properly executed warranties to Engineer within 15 days of completion of that designated portion of the Work.
 3. For items of Work delayed beyond the date of Substantial Completion, provide updated submittal within 10 days of acceptance by Owner, listing date of acceptance as start of warranty period.
- B. Special Warranty:
1. When a special warranty is required to be executed by Contractor, or Contractor and a subcontractor, supplier or manufacturer, prepare a written document that contains appropriate terms and identification, ready for execution by the required parties. Submit a draft to Owner through Engineer for approval prior to final execution.
 - a. Execute and assemble documents from subcontractors, suppliers, and manufacturers.
 - b. Refer to individual sections of Divisions 2 through 46 for specific content requirements, and particular requirements for submittal of special warranties.
- C. Form of Submittal:
1. At final completion compile 2 copies of each required warranty and bond properly executed by Contractor, subcontractor, supplier, or manufacturer, as applicable.
 2. Organize the warranty documents into an orderly sequence based on the Table of Contents of the Project Manual.
 3. Bind warranties and bonds in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-inch by 11-inch paper.
 - a. Identify each binder on the front and the spine with the typed or printed title "Warranties and Bonds," the project title or name, and the name of Contractor.
 - b. When operating and maintenance manuals are required for warranted construction, provide additional copies of each required warranty, as necessary, for inclusion in each required manual.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

SECTION 31 11 00
CLEARING AND GRUBBING (WisDOT 201)

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Removal and disposal of trees, shrubs, brush, stumps, roots, windfalls, unsound branches and other plant life.
- B. Related Sections:
 - 1. None
- C. Unit Prices
 - 1. See Section 01 28 00 – Measurement and Payment

1.02 REFERENCES

- A. WisDOT 201 - Clearing and Grubbing

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 PROTECTION

- A. Confine operations to the areas staked or trees marked for removal.
- B. Protect all trees and plant materials that are not designated for removal.
- C. Conduct all operations in a manner that will not damage or injure surrounding plant life and property.

3.02 CLEARING OPERATIONS

- A. Cut and remove all designated trees, shrubs, bushes, windfalls and other vegetation.
- B. Prune and remove any low hanging or unsound branches.

3.03 GRUBBING OPERATIONS

- A. Remove and dispose of designated stumps, roots and other remains.
- B. Remove stumps completely.
- C. Backfill depressions with native soils and compact.

3.04 DISPOSAL OPERATIONS

- A. Obtain all permits and pay all fees for disposal.

END OF SECTION

SECTION 31 23 34

TRENCHING, BACKFILLING AND COMPACTING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Trenching for storm sewer, sanitary sewer, water main, and appurtenances, including excavation, backfill, and compaction.
 - 2. Dewatering, protection of excavation and Site, existing utilities and other obstructions, and excesses and shortages of backfill.
 - 3. Excavating, filling, stockpiling, borrow, rough and finish grading, and placement of topsoil.
 - 4. Control of surface drainage.
- B. Related Sections:
 - 1. Section 33 11 00 - Water Distribution Systems
 - 2. Section 33 31 00 - Sanitary Sewer Systems
 - 3. Section 33 34 00 - Sewage Force Mains
- C. Unit Prices
 - 1. See Section 01 28 00 – Measurement and Payment

1.02 REFERENCES

- A. ASTM:
 - 1. C136 - Standard Method for Sieve Analysis of Fine and Course Aggregate
 - 2. C331 - Standard Specification for Lightweight Aggregate for Concrete Masonry Units
 - 3. D420 - Standard Guide for Investigating and Sampling Soil and Rock
 - 4. D698 - Standard Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures using 5.5 pound Hammer and 12 inch Drop
 - 5. D1682 - Standard Test Methods for Breaking Load and Elongation of Textile Fabrics
 - 6. D2487 - Standard Test Methods for Classification of Soils for Engineering Purposes
 - 7. D6938 - Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- B. Wisconsin Department of Transportation
 - 1. 209 – Granular Backfill
 - 2. 305 – Dense Graded Base Aggregate
 - 3. 310 – Open Graded Aggregate
- C. Wisconsin Department of Natural Resources
 - 1. 1060 – Dewatering
- D. Standard Specifications for Sewer and Water Construction in Wisconsin, 6th Edition with Addenda.

1.03 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
 - 1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 - 2. Final Backfill: Backfill placed over initial backfill to fill a trench; Compactable or Non-Compactable.
- B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

- C. Suitable Materials: ASTM D2487 classified as GW, GP, SP and SW.
- D. Unsuitable Materials: Roots or other organic matter, trash, debris, frozen materials and stones larger than 3 inches, and other materials classified in ASTM D2487 not defined as Suitable Materials. Person-made fills, refuse, or backfill from previous construction.
- E. Rock: Boulders measuring 1/2 cubic yard or more and materials that cannot be removed without systematic drilling and blasting, and below ground concrete or masonry structures, exceeding 1/2 cubic yard in volume. Pavements shall not be considered rock.
- F. Unstable Materials: Too wet to support utility pipe, conduit, or appurtenant structure.
- G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- H. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- I. Topsoil: Fertile, friable, natural loam, surface soil. Free of subsoil, clay lumps, brush, weeds, litter, roots, stumps, stones larger than 1 inch in any dimension, and other extraneous or toxic matter harmful to plant growth.

1.04 MATERIAL OWNERSHIP

- A. Except for stripped topsoil and other materials indicated to be stockpiled or otherwise Owner's Property, cleared materials shall become Contractor's property and shall be removed from project site.

1.05 SUBMITTALS

- A. Provide for each bedding material:
 - 1. Name and location of source.
 - 2. Two sample gradations taken within the past 30 days from each potential source, delivered to Engineer at least 10 days prior to placement on the project.

1.06 CLASSIFICATION

- A. Excavation of materials encountered under type, difficulty to remove, or suitability for use in construction.

1.07 QUALITY ASSURANCE

- A. Where subgrade, base, bedding, or backfill does not conform to type or density specified, soil shall be replaced or reworked to conform. Contractor shall pay for cost of extra tests for reworked areas.

1.08 PROTECTION

- A. Protect existing improvements, utilities, trees and shrubs, and reference marks.

1.09 BLASTING

- A. Use of explosives is not permitted.

PART 2 PRODUCTS

2.01 MATERIAL

- A. Bedding Material: WisDOT 209. Remove all partials retained on a 1-inch screen.
- B. Granular Material: WisDOT 209.
 - 1. Use select soils complying with ASTM D2487 soil classification groups GW (well-graded gravel), GP (poorly graded gravel), SW (well-graded sand), SP (poorly graded sand), or combinations thereof. Aggregate shall pass a 3/4-inch sieve and not more than 35 percent shall be retained on a No. 10 sieve. Maximum 3 percent by weight may pass a No. 200 sieve.
 - 2. Granular Material: WisDOT 209.
 - 3. Select existing material excavated from Site may be used if it meets requirements specified. If necessary, furnish additional approved material from suitable off-site sources.
- C. Crushed Base Aggregate: WisDOT 305. (Within roadway limits)
 - 1. Recycled Crushed Concrete
 - a. From cover material to the bottom of the asphalt base pavement or topsoil grade, furnish 1-1/4-inch crushed concrete conforming to gradation per WisDOT Standard Specification 305.2.2.1.
 - 2. Crushed T.B. Limestone
 - a. From cover material to the bottom of the asphalt base pavement or topsoil grade, furnish 1-1/4-inch crushed T.B. Limestone conforming to gradation per WisDOT Standard Specification 305.2.2.1.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Prior to construction, inspect existing utility structures and surface features with Engineer and document condition.
- B. Verify with Engineer that permits necessary to do work are obtained.
- C. Verify that native materials are suitable for reuse on Site. Notify Engineer of any materials that do not appear suitable for reuse.

3.02 PREPARATION

- A. Conduct all operations within designated site limits.
- B. Verify that utilities have all been located and identified prior to excavation.
- C. Implement traffic control. Place traffic warning signs.
- D. Protect all existing structures, plantings, turf, and other facilities or natural features which are not scheduled for removal.
- E. Protect and maintain all erosion and sedimentation controls during grading operations.
- F. Protect and maintain benchmarks and survey control points from disturbance during site grading.
- G. Strip off existing topsoil from within excavation limits and stockpile. Separate vegetation from salvageable topsoil and dispose of as appropriate.
- H. Notify Engineer and regulatory agencies of location of dewatering discharges and dewatering sedimentation basins.

- I. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.03 UTILITY TRENCH EXCAVATION

- A. Excavate trenches so pipe can be laid safely and accurately to required line and grade shown on Drawings.
- B. Trench widths in ordinary soil shall be limited at top of pipe to not less than a 6-inch clearance on either side of barrel to allow for installation of bedding material between pipe and trench wall. Maximum trench width at top of pipe shall be outside pipe diameter plus 24 inches (24-inch minimum). Trench above top of pipe may be sloped, stepped or vertical to comply with state and federal regulations regarding trenches.
- C. Over-excavation below grade shall be corrected by replacing and compacting with granular material to 100 percent of Standard Proctor density.
- D. Slopes: Excavated to at least the angle of repose and as required by the Accident Prevention Division of the State Industrial Commission or OSHA, whichever is more restrictive. Brace, shore, or sheet and drain excavation to protect property and provide worker safety.
- E. Provide tight sheathing where necessary to protect nearby structures and pavements, and when trench size must be confined. Notify Engineer of unforeseen condition that requires use of sheathing. Sheathing shall be driven unless soil conditions allow sets to be placed after excavating. If placed after excavating, voids between trench wall and sheathing shall be immediately filled with sand.
- F. Removal of sheathing shall not take place until trench is backfilled. Compact backfill by flooding or jetting after sheathing is removed.
- G. Pile excavated material in a manner that will not endanger work or obstruct sidewalks, driveways, or gutters.
- H. Segregate soils in excavated material that are unsuitable for trench backfill and dispose of as specified in this Section.
- I. Dewater ground as necessary to excavate trench and install pipe. Hold ground water level to a minimum 2 feet below pipe invert.
- J. Direct surface and groundwater discharges to natural drainage channels, drains, or storm sewers. Provide energy dissipation at discharge point of dewatering wells or points. Provide dewatering sedimentation basins at discharge point of trench sump pump.
- K. Over-excavate when bottom of trench contains unstable or unsuitable material. Bring excavation up to pipe grade with compacted select granular or suitable material taken from excavation. Notify Engineer of soil conditions which may be poor bearing capacity and when organic soils are encountered. Install additional rock stabilization or geotextile fabric at direction of Engineer.
- L. Provide temporary support, remove, relocate, or reconstruct existing utilities located within trench excavation. Utility owner shall designate method employed. Use care and provide compacted fill or other stable support for utility crossings to prevent displacement, rupture, or failure.
- M. Excavate to expose existing utilities that cross in close proximity to new pipe line to determine utilities' location ahead of pipe installation to avoid grade conflict. Measure to determine utilities' location relative to new pipe line location. Engineer may order deviation from alignment, grade, and location to avoid conflict. Plan work with Engineer at preconstruction conference and coordinate activities during course of work.

- N. Install and maintain barricades, guards, and warning lights to protect persons from injury and avoid property damage.

3.04 STRUCTURE EXCAVATION

- A. Excavate to elevations and dimensions indicated, plus space required for construction operations, forming and inspection.
- B. Footings and foundation to rest on undisturbed soil, unless shown otherwise on Drawings, or required by the Engineer.
- C. Verify soil bearing capacity at base of footings exceeds 2,000 psf.

3.05 BEDDING

- A. Bedding for rigid pipes shall be in accordance with ASTM C12, Class C or better; bedding for flexible pipes shall be in accordance with ASTM D2321; Class II or better.
- B. Bedding for leachate header pipe outside of landfill shall be 3/4-inch crushed stone meeting the following gradation:
 - 1. Material shall be clean, sound, hard, dense, durable, field or quarry stone which is free from seams, cracks or other structural defects. It shall be angular material from shot rock (blasted) or crushed rock having substantially all face of which have resulted from artificial crushing.
 - 2. Gradation for 3/4-inch crushed stone (bedding):

Sieve Size	Total Percent Passing
1 inch	100
3/4 inch	90-100
3/8 inch	20-35
No. 4	0-10
No. 8	0-5

- C. Trenches dug in sandy or gravelly materials may use undisturbed earth for bedding provided surface is shaped to conform to pipe. If such substituted material is used, an appropriate credit shall be negotiated. Provide granular bedding in all other trenches from subgrade (4-inches below pipe) to a point supporting bottom 1/3 of pipe for rigid pipe and to springline for flexible pipe. Place and compact bedding so that it fills and supports pipe haunch area. For any pipes requiring Class II bedding or better, cover material should be compacted to a level 12 inches above the pipe barrel. If crushed stone chips are used as bedding and cover material, no compaction is required.

3.06 INITIAL BACKFILL

- A. Bedding for sewers and structures: Shown on the Drawings.
- B. Remove ledge rock, boulders, and large stones to provide at least 6-inch clearance from pipe.
- C. Dig bell holes in pipe bedding at each joint such that pipe barrel rests continuously on bedding.
- D. Place backfill in uniform layers not to exceed 6 inches before compaction. Tamp each layer to eliminate possibility of lateral displacement and provide uniform support. Compact to a minimum of 95 percent of Standard Proctor density.
- E. Install trench dams at locations indicated.

3.07 TRENCH BACKFILL

- A. Backfill with suitable materials selected from excavated materials. If material is unsuitable use 1-1/4" crushed aggregate.
- B. Place backfill in uniform depth layers not to exceed 12 inches before compaction. Compact each layer before placing material for succeeding layer.
- C. Compact each layer by mechanical means. Trenches shall be compacted to a minimum of 95 percent of Standard Proctor density, except to 100 percent of Standard Proctor density in upper 3 feet of boulevard areas, shoulders, and paved surfaces. If moisture content of backfill material is greater than 3 percent above optimum moisture, compact material to minimum density of 3 pounds/cubic foot less than Standard Proctor curve at that moisture content, except that minimum compaction shall be 85 percent of Standard Proctor density.
- D. Plastic Marking Tape: Installed 12 inches above underground electrical, telephone, gas conduits and 18 inches below finish grade, continuous along route of conduit.
- E. Excavated material not suitable or required for backfill shall be disposed of offsite at no extra cost to Owner.
- F. Spread salvaged topsoil uniformly over disturbed area.
- G. Use select granular backfill within any building areas. Fill other areas with material from the Site.
- H. Fill in unsurfaced areas of more than 2 feet in depth shall be placed in maximum 2-foot lifts, and mechanically compacted.
- I. Scarify slopes receiving fill to permit new fill to bond. Allow clay, heavy loams or sandy loam soils to dry before using as fill.

3.08 FINISH GRADING

- A. Finish site grading true to grade within 0.1 foot of the grade shown on Drawings.
- B. Plow, disk and drag any areas compacted by trucks, other vehicles or storage of materials to match texture of adjacent areas.
- C. Insure a minimum of 6 inches of topsoil covers all unsurfaced areas. Fertilizing, seeding and landscaping will be by others.

3.09 DEWATERING

- A. Install dewatering equipment necessary to hold groundwater level to a minimum 2 feet below bottom of excavation.
- B. Direct surface and groundwater discharges to natural drainage channels, drains, or storm sewers. Provide energy dissipation at discharge point.
- C. Conduct dewatering operations in accordance with applicable regulations and permits.
- D. Assure proper erosion control methods.

3.10 COMPACTION

- A. Provide equipment required to obtain specified compaction. Compaction shall be by mechanical means, except bedding and initial backfill may be hand or mechanically tamped. Compaction shall be

Class I under roadways and Class II in all other areas, except comply with compaction requirements of other sections where piping is installed within other work.

- B. Class I Trench Compaction shall consist of mechanically compacted backfill placed in 9-inch layers, from 1 foot above pipe to surface, each compacted to 98 percent of Standard Proctor Density (ASTM D698).
- C. Class II Trench Compaction shall consist of mechanically compacted backfill placed in 12-inch layers, each compacted to 95 percent of Standard Proctor Density (ASTM D698).
- D. Liner grade clay soils shall be compacted to 90 percent of Modified Proctor Density (ASTM D1557).
- E. Notify Engineer minimum 48 hours prior to starting compaction that requires testing.

3.11 DISPOSAL OF EXCESS AND UNDESIRABLE MATERIAL

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.
- B. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Engineer.
 - 1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

3.12 TOLERANCES

- A. Trench settlements which occur in paved surfaces or yard areas during the guarantee period that are greater than 1 inch as measured by a 10-foot straight edge shall be repaired. Trench settlements of greater than 4 inches in remaining areas as measured by a 10-foot straight edge shall be repaired.

3.13 FIELD QUALITY CONTROL

- A. Independent Testing Laboratory: Sample backfill materials, determine Moisture/ Density relationship (Standard Proctor), and perform Field Moisture/Density tests at locations determined by Engineer. Testing laboratory shall also perform gradation testing of Pipe Foundation Improvement and Bedding materials.
- B. Standard Proctor Tests: Performed exclusively for this Section and in accordance with ASTM D698.
- C. Field Moisture/Density Tests: Performed exclusively for this Section, 1 for every foot of lift in 200 lineal feet of excavation, and in accordance with ASTM D6938.
- D. Gradation Tests: Performed exclusively for this Section for material specified in Part 2 of this Section and in accordance with ASTM C136.

END OF SECTION

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SECTION 31 25 10

TEMPORARY EROSION CONTROL

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Temporary measures to control soil erosion and sedimentation.
 - 2. Furnishing, installing and maintaining erosion or sediment control devices.
- B. Related Sections:
 - 1. Section 01 57 00 – Temporary Controls
 - 2. Section 01 57 19 – Air, Land, and Water Pollution
- C. Measurement and Payment:
 - 1. All activities required by or relating to this section will be considered incidental.
 - 2. No direct payment will be made.
 - 3. No additional compensation or time extension will be granted due to actions brought against the Contractor for failure to comply with pollution control requirements.

1.02 REFERENCES

- A. Wisconsin Department of Transportation
 - 1. 628 - Erosion Control
- B. Wisconsin Department of Natural Resources Construction Standards

PART 2 PRODUCTS

2.01 MATERIALS

- A. Materials: WisDOT 628.2.

PART 3 EXECUTION

3.01 GENERAL

- A. Coordinate erosion control measures with earthwork and turf establishment operations.
- B. Complete grading, finishing, erosion control and turf establishment on a drainage area basis to prevent excessive soil erosion.

3.02 PLACING TEMPORARY EROSION CONTROL ITEMS

- A. Construct items in conformance with typical sections and elevation controls shown on the Drawings.
- B. Remove all items upon completion of the contract work.
- C. Spread and shape accumulated sediment to permit natural drainage and provide for turf establishment.

3.03 ACCEPTANCE OF WORK

- A. Maintain and repair erosion control items to insure proper function.

END OF SECTION

SECTION 31 23 10

EXCAVATION AND EMBANKMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Construction of excavations and embankments within the designated construction limits.
- B. Related Sections:
 - 1. Section 32 11 26 – Crushed Aggregate Base Course.
 - 2. 32 92 12 – Turf Establishment.
- C. Measurement and Payment.
 - 1. See Section 01 28 00 – Measurement and Payment.

1.02 REFERENCES

- A. WisDOT:
 - 1. 205 - Roadway and Drainage Excavation
 - 2. 207 – Embankment

1.03 DESCRIPTION

- A. Grade Site as directed by Engineer.
- B. Contours and spot elevations indicate finished surface grades.
- C. Construct uniform slopes between contours and spot elevations.
- D. Set Site control and grade stakes as required to ensure conformance with Drawings.

1.04 SEQUENCING AND SCHEDULING

- A. Complete topsoil removal and general grading prior to structure erection.
- B. Perform fine grading and topsoil placement after structure erection.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Granular Borrow: WisDOT 209, Grade 2, except that all material must pass the 1-inch sieve.
- B. Random fill includes all soils except those classified in ASTM D2487 as Pt, OH, OL, MH or CH. Free from ice, snow, frozen earth, trash, debris, organic material, stones larger than 3 inches in any dimension

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

- A. If present, remove ice and snow prior to grading operations.
- B. All grading shall conform to the planned grades, cross-sections and stakes.
- C. Confine operations to established limits.
- D. Protect all existing structures, plantings, turf, and other facilities or natural features which are not scheduled for removal.
- E. All tree roots exposed during excavation shall be clean cut and coated with root growth hormone.
- F. Maintain Site in a well-drained condition at all times.
 - 1. Install planned drainage facilities concurrent with embankment operations.
 - 2. Provide temporary drainage facilities to maintain existing drainage courses until permanent facilities are operative.

3.02 PREPARATION OF EMBANKMENT FOUNDATION

- A. Excavate all topsoil, root, and organic material within designated grading area and stockpile separately on site. No large stock piles are allowed on site.
- B. Separate all debris, large roots, and rocks greater than 1 inch from the topsoil and remove from Site.

3.03 EXCAVATING OPERATIONS

- A. Conform to lines, grades and slopes staked by Engineer.
- B. Provide seepage trenches for granular backfill replacement of unstable areas.
- C. Advise Engineer immediately if any unsuitable soils, wet conditions or previously undisclosed conditions are unearthed.

3.04 DISPOSAL OF EXCAVATED MATERIAL

- A. Use suitable excavated materials for embankment construction.
- B. Construct embankment layers from uniform materials.
- C. Place granular materials in upper most portion of the embankment.
- D. Mechanically mix non-uniform soils to produce uniform moisture content and density.
- E. Excavate all suitable topsoil material separately and stockpile.
- F. Do not place snow, ice, or frozen lumps in the roadbed embankment.
- G. Do not place stone, concrete or bituminous fragments exceeding 3 inches in any dimension roadbed embankment.
- H. Do not place stone, concrete, or bituminous fragments exceeding 3 inches in the upper 6 inches of roadbed embankment or within 18 inches of the structure.
- I. All surplus excavated materials shall become the property of the Contractor for disposal.

- J. All surplus excavated materials removed shall be removed from site within 2 weeks.

3.05 PLACING EMBANKMENTS

- A. Do not place material on soil which is frozen.
- B. Backfill excavations below subgrade and seepage trenches in accordance with this Section.
- C. Deposit and spread material in uniform layers parallel to the profile grade extending over the full width of the embankment.
- D. Maintain proper moisture content during placement and compaction of embankment materials.
- E. Place upper 3 feet of roadbed in maximum 8-inch layers.
- F. Place remainder of roadbed in maximum 12-inch layers.

3.06 COMPACTING EMBANKMENTS

- A. Compact upper 3 feet of embankment to not less than 100 percent of Standard Proctor Density.
- B. Compact remainder of embankment to not less than 95 percent of Standard Proctor Density.
- C. Maintain proper moisture content during placement and compaction.

3.07 FINE GRADING OPERATIONS

- A. Finish all earthwork to within 0.1 foot of the staked grade.

3.08 TOPSOIL PLACEMENT

- A. Conduct topsoiling concurrent with the grading operations.
- B. Place topsoil over all disturbed areas in accordance with Section 32 92 12.
- C. Drag topsoiled areas to remove wheel tracks and provide a uniform texture and appearance.

END OF SECTION

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SECTION 31 23 50

PREPARING THE FOUNDATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Shaping and compacting of subgrade prior to placement of base course.
 - 2. Base repair.
- B. Related Sections:
 - 1. Section 32 11 14 - Test Rolling
- C. Measurement and Payment
 - 1. See Section 01 28 00 – Measurement and Payment.
 - 2. Any activity required by or relating to this section shall be incidental to other unit price items, unless specified.

1.02 REFERENCES

- A. WisDOT 211 - Preparing the Foundation

1.03 SEQUENCING AND SCHEDULING

- A. Prepare subgrade after unstable areas have been repaired and in-place surface courses have been removed.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.01 PREPARATION

- A. Re-excavate, compact and shape the top 6 inches of subgrade area to provide smooth, stable surface for the placement of base course thereon.
- B. Compact subgrade material to 100 percent of Standard Proctor Density.
- C. Produce and maintain the necessary moisture content in the subgrade material by scarification or application of water.
- D. Continue operations until no rutting or displacement occurs under construction traffic.
- E. Provide a finished surface within 0.05 foot of the prescribed elevation at all locations.
- F. Verify that subgrade is dry and in suitable condition to begin paving.
- G. If unsatisfactory subgrade conditions exist, excavate below base elevation to 12-inches in depth, or as directed by the Town Staff.

- H. Proceed with paving only after unsatisfactory conditions have been corrected.
- I. Verify that utilities, traffic loop detectors, and other items requiring a cut and installation beneath the asphalt surface have been completed and that asphalt surface has been repaired flush with adjacent asphalt prior to beginning installation of imprinted asphalt.

END OF SECTION

SECTION 32 11 26

CRUSHED AGGREGATE BASE COURSE

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Wisconsin Department of Transportation Standard Specifications for Highway and Structure Construction, 2025 Edition, and all Supplemental Specifications, unless otherwise called for on the plans and specifications.

1.02 SUMMARY

- A. Section Includes:
 - 1. Subbase course for concrete curb and gutter, walks, driveways, pavements.
 - 2. Subbase course and base course for asphalt paving.
 - 3. Aggregate course for shoulders
- B. Related Sections:
 - 1. Section 32 12 18 -Hot Mix Asphalt Pavement

1.03 UNIT PRICES

- A. See Section 01 28 00 – Measurement and Payment

1.04 DEFINITIONS

- A. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.
- B. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

1.05 REFERENCES

- A. WisDOT - Standard Specifications for Highway and Structure Construction:
 - 1. 305 - Dense Graded Base

1.06 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during grading operations and placement of base course.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.

1.07 SUBMITTALS

- A. Base Course Delivery Tickets:
 - 1. Provide base course delivery tickets that display:
 - a. Project
 - b. Date
 - c. Ticket number
 - d. Type of material
 - e. Gross weight
 - f. Tare weight
 - g. Net weight
 - h. Accumulative total

PART 2 PRODUCTS

2.01 MATERIALS

- A. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve. 1-1/4-inch crushed aggregate; or 3-inch Traffic Bond material if approved by Owner or Engineer.
- B. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; meeting WIDOT Section 301 requirements.
 - 1. 14" thickness with the bottom 8" being 3" crushed aggregate and the top 6" being 1-1/4" crushed aggregate.
- C. Shoulders: Artificially graded mixture meeting WIDOT Section 301 requirements for 3/4" crushed stone.
- D. Crushed Aggregate Islands: Artificially graded mixture meeting WIDOT Section 301 requirements for 3/4" crushed stone. (Same as shouldering material.)

PART 3 EXECUTION

3.01 PREPARATION

- A. Protect structures, utilities, curbs, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by grading operations and placement of base course.
- B. Protect and maintain erosion and sedimentation controls during grading operations and placement of base course.

3.02 EXCAVATION FOR CURB AND GUTTER, WALKS, AND PAVEMENTS

- A. Excavate surfaces under curbs, walks, and pavements to indicated lines, cross sections, elevations, and subgrades.

3.03 SUBBASE AND BASE COURSES UNDER CURB AND GUTTER, WALKS, AND PAVEMENT

- A. Place subbase course and base course on subgrades free of topsoil mud, frost, snow, ice, or organic materials.

- B. On prepared subgrade, place subbase course and base course under curbs, pavements, and walks as follows:
1. If required, install separation geotextile on prepared subgrade according to manufacturer's written instructions, overlapping sides and ends.
 2. Place base course material over subbase course under hot-mix asphalt pavement.
 3. Shape subbase course and base course to required crown elevations and cross-slope grades.
 4. Place subbase course and base course 6-inches or less in compacted thickness in a single layer.
 5. Place base course for roadways in compacted layers consisting of four-inch thick 1-1/4-inch gradation in the lower layer, and four inches of 3/4-inch gradation in the upper layer unless otherwise approved by the Engineer. This project has different requirements; See 2.01, above.
 6. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight.
 7. Base course thickness under driveways to match existing, minimum eight inches.

END OF SECTION

SECTION 32 12 18

HOT MIX ASPHALT PAVEMENT

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Wisconsin Department of Transportation Standard Specifications for Highway and Structure Construction, 2023 Edition, and all Supplemental Specifications, unless otherwise called for on the plans and specifications.

1.02 SUMMARY

- A. Section Includes:
 - 1. Cold milling of existing hot-mix asphalt pavement
 - 2. Pulverizing existing hot-mix asphalt pavement
 - 3. Hot-mix asphalt patching
 - 4. Hot-mix asphalt paving
 - 5. Adjusting manhole castings and water valve boxes
 - 6. Pavement markings
- B. Related Sections:
 - 1. Section 32 11 26 - Crushed Aggregate Base Course

1.03 UNIT PRICES

- 1. See Section 01 28 00 – Measurement and Payment

1.04 DEFINITIONS

- A. Hot-Mix Asphalt Paving Terminology: Refer to ASTM D8 for definitions of terms.

1.05 REFERENCES

- A. WisDOT - Standard Specifications for Highway and Structure Construction:
 - 1. 211 - Preparing the Foundation
 - 2. 305 - Dense Graded Base
 - 3. 350 - Subbase
 - 4. 450 - General Requirements for Asphaltic Pavements
 - 5. 455 - Asphaltic Materials
 - 6. 460 - Hot Mix Asphalt Pavement

1.06 SUBMITTALS

- A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties. Submittals in accordance with Section 01 33 00 - including:
 - 1. Job-Mix Designs: Certification, by authorities having jurisdiction, or approval of each job mix proposed for the work.
 - 2. Job-Mix Designs: For each job mix proposed for the work.
- B. Paving mix delivery tickets

1. Furnish ticket before placing material.
2. Display on ticket:
 - a. Project
 - b. Date and Time
 - c. Asphalt Binder
 - d. Ticket Number
 - e. Type of mix
 - f. Gross weight
 - g. Tare weight
 - h. Net weight
 - i. Accumulative total

C. Material Test Reports: For each paving material for each day of paving.

1.07 QUALITY ASSURANCE

A. Manufacture Qualifications: A paving mix manufacturer approved by owner of WisDOT.

B. Testing Agency Qualifications: Qualified according to WisDOT for testing indicated.

C. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of WisDOT for asphalt paving work.

1. Measurement, quality assurance, and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

D. Preinstallation Conference: Conduct conference at project site.

1. Review methods and procedures related to hot mix asphalt paving including, but not limited to, the following:
 - a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot mix asphalt.
 - b. Review condition of subgrade and preparatory work.
 - c. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.
 - d. Review and finalize construction schedule and verify availability of materials, CONTRACTOR's personnel, equipment, and facilities needed to make progress and avoid delays.

1.08 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Tack Coat: Comply with WisDOT 455.3.2.
2. Thicker asphalt base courses may be placed if surface temperature exceeds freezing.
3. Asphalt Base Course: Comply with WisDOT 450.3.2.
4. Asphalt Surface Course: Comply with WisDOT 450.3.2.

PART 2 PRODUCTS

2.01 AGGREGATES

- A. General: Use specified materials and gradations that have performed satisfactorily in previous installations.
- B. Comply with WisDOT 460.2.2.

2.02 ASPHALT MATERIALS

- A. Asphaltic Binder: PG 58-28. Comply with WisDOT 455.2.1. Use Air Void Regression to achieve minimum of 3.0 percent air voids.
- B. Tack coat: Comply with WisDOT 455.2.5.
- C. Water: Potable

2.03 MIXES

- A. Hot Mix asphalt: Dense, hot-laid, hot-mix asphalt plant mixes approved by Engineer; designed in accordance with WisDOT specification 460 and complying with the following requirements:
 - 1. Provide mixes with a history of satisfactory performance in geographical area where project is located.
 - 2. Lower level/Binder (unless otherwise specified):
 - a. 2.25-inches of 3LT 58-28 S (19.0 mm.)
 - 3. Upper level/Surface (unless otherwise specified):
 - a. 1.75-inches of 4LT 58-28 S (12.5 mm.)

PART 3 EXECUTION

3.01 PATCHING

- A. Hot Mix Asphalt Pavement: Saw cut perimeter of patch to full depth and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade. A minimum three-foot wide path is required.
- B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseal concrete pieces firmly.
 - 1. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into adjacent sound pavement unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.
- C. Tack Coat: Apply uniformly to vertical surfaces abutting or protecting into new, hot mix asphalt paving at a rate of 0.05 to 0.15 gal./sq.yd.
 - 1. Allow tack coat to cure undisturbed before applying hot mix asphalt

2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- D. Patching: Fill excavated pavements with hot mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

3.02 REPAIRS

- A. Leveling Course: Install and compact leveling course consisting of hot mix asphalt surface course to level sags and fill depressions deeper than 1-inch in existing pavements
1. Install leveling wedges in compacted lifts not exceeding 3-inches thick.

3.03 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq.yd.
1. Allow tack coat to cure undisturbed before applying hot mix asphalt paving.
 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

3.04 HOT MIX ASPHALT PLACING

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
1. Place hot mix asphalt base course in number of lifts and thicknesses indicated.
 2. Place hot mix asphalt surface course in single lift.
 3. Spread mix at minimum temperature within 20 degrees of the temperature recommended by the asphalt manufacturer.
 4. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
 5. Regulate paver speed to obtain smooth, continuous surface free of pulls and tears in asphalt paving mat.
- B. Place paving in consecutive strips not less than 10-feet wide unless infill edge strips of a lesser width are required.
1. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete a section of asphalt base course before placing asphalt surface course.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.05 JOINTS

- A. Construction joints ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot mix asphalt course.
1. Clean contact surfaces and apply tack coat to joints
 2. Offset longitudinal joints, in successive courses, a minimum of 6-inches.
 3. Offset transverse joints, in successive courses, a minimum of 24-inches.

4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method.
5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
6. Compact asphalt at joints to a density within two percent of specified course density.

3.06 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot mix asphalt is still hot enough to achieve specified density. Continue rolling until hot mix asphalt course has been uniformly compacted to the minimum required density specified in WisDOT 460.3.3.1.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot mix asphalt is still warm
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Beveled edges while asphalt is still hot; compact thoroughly.
- F. Repairs: Remove paved areas that are defective or contaminated with foreign materials and replace with fresh, hot mix asphalt. Compact by rolling to specified density and surface smoothness.
- G. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- H. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.07 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
 1. Lower level: Plus or minus 1/2-inch
 2. Upper level: Plus 1/4-inch, no minus
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot straightedge applied transversely or longitudinally to paved areas:
 1. Lower level: 1/4-inch
 2. Upper level: 1/8-inch

3.08 FIELD QUALITY CONTROL

- A. The provisions of WISDOT Specification 460.2.8 (QPM) are removed from these specifications.
- B. The CONTRACTOR is required to maintain an in-house Quality Control Program. Qualified personnel or consultant shall operate this Program. The ENGINEER shall implement a Quality Assurance Program to reasonably assure that the specifications are adhered to. The CONTRACTOR shall notify the ENGINEER of Work stages as they progress. The presence or absence of inspection or field observations shall not relieve the CONTRACTOR from inherent responsibility to conform to the specifications.

1. At the pre-construction conference, the CONTRACTOR shall submit a proposed Job Mix Formula (JMF) for the ENGINEER's review. The JMF shall be based on properties as specified by the Project's Detailed Specifications.
2. A WisDOT HTCP Certified Mix Design Technician shall sign the JMF. If certified personnel are not available, a Professional Engineer shall sign the above statement.
3. The CONTRACTOR shall take samples under their Quality Control Program. For each mix produced, one HMA sample shall be tested once per day. Each sample shall be tested for gradation and air voids. The average of all tests shall comply with the following specifications when compared to the JMF:

19.0mm	+/- 5%
12.5mm	+/- 5%
9.5mm	+/- 5%
2.36mm	+/- 5%
Air Voids	+/- 1.3%

- C. For each mix produced, the contractor shall submit one Asphalt Binder sample to be tested for compliance. This sample shall be in a one quart can and clearly labeled.
- D. Testing Agency: CONTRACTOR shall engage qualified testing agency to perform density tests.
- E. Thickness: In-place compacted thickness of hot-mix asphalt courses will be checked by ENGINEER.
- F. Surface Smoothness: Finished surface of each hot-mix asphalt course will be observed by ENGINEER for compliance with smoothness tolerances.
- G. In-Place Density: Testing agency will determine density using nuclear density methods.
 1. Testing shall be performed the day of placement.
 2. There shall be a minimum of five density tests for every 500 tons placed. The five tests should be taken across the mat at a given location as may be designated by the ENGINEER. The average of these five tests shall meet the minimum required density conforming to Table 460-3 of the WisDOT Specifications.
 3. Density tests will not be performed on leveling courses.
- H. Mixtures with failing densities will be accepted and paid for as provided in WISDOT Section 460.5.2.2.
- I. Materials: The ENGINEER will randomly take samples of the delivered asphalt mix to be tested for compliance with the mix design. The ENGINEER will take one test per day, or minimally one test per mix.

3.09 ASPHALT THICKNESS TOLERANCE

- A. ENGINEER will determine the average thickness paved utilizing the square yards paved, minimum required density, and the tons of asphalt placed for the same area.
- B. When the calculated thickness is between 1/4-inch and 1/2-inch less than the specified Contract depth, the final payment shall be subject to a reduction according to the following formula: (Multiply the Contract unit bid price by the square of the calculated thickness, divided by the square of the specified Contract depth.)
- C. When the average depth of the core is more than 1/2-inch below the specified Contract depth, the CONTRACTOR shall be required to place, at it's expense, an asphalt overlay on the entire pavement, unless otherwise directed by the OWNER. All adjustment of underground street structures and appurtenances and/or removals required to provide for the overlay, shall be at the CONTRACTOR'S expense.

- D. The OWNER or its designee, may require CONTRACTOR to cut samples (minimum six-inch square) from the completed Work for verification of thickness. The surface shall be restored with new, well-compacted asphalt mixture of the same type as the adjacent material. All work shall be without additional compensation.

3.10 DISPOSAL

- A. Except for material indicated to be recycled, remove excavated materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow milled or excess pulverized materials to accumulate on-site.

3.11 WARRANTY

- A. CONTRACTOR is responsible for repair, at CONTRACTOR cost, of any asphalt failures (including settlement over trenches) for one year following substantial completion.

END OF SECTION

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SECTION 32 12 50

SAW CUTTING PAVEMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes full-depth sawing of old, existing concrete or asphaltic pavements, curb and gutter, driveways, sidewalks and similar work as shown on the Drawings or as directed by Engineer.
- B. Unit Prices
 - 1. See Section 01 28 00 – Measurement and Payment

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Use diamond blades for full depth saw cuts of concrete pavement.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Sawing Existing Pavement:
 - 1. Saw cut to be straight.
 - 2. Minimum depth is 2 inches.
 - 3. Remaining surface to be generally vertical for full depth.
- B. Sawing Concrete Pavement - Full Depth:
 - 1. Remove saw cutting sludge after each cut.
 - 2. Minimize sludge flow into live traffic lane.
 - 3. Clean traffic control devices of sludge daily.
 - 4. Dispose of sludge where approved by Engineer.
 - 5. Maximum cut into existing pavement is 12 inches.

END OF SECTION

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SECTION 32 16 30

CONCRETE CURB AND GUTTER (WisDOT 601)

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes construction of cast-in-place concrete facilities as follows:
 - 1. Curb and gutter.
 - 2. Curb.
- B. Related Sections:
 - 1. None
- C. Measurement & Payment:
 - 1. See Section 01 28 00 – Measurement and Payment.

1.02 REFERENCES

- A. WisDOT 601 - Concrete Curb and Gutter

PART 2 PRODUCTS

2.01 MATERIALS

- A. All materials shall be in accordance with the respective WisDOT Specifications as follows:
 - 1. Granular Materials: WisDOT 209.
 - 2. Joint Filler: WisDOT 415.2.3.
 - 3. Concrete: WisDOT 501.
 - 4. Steel Reinforcement: WisDOT 505.

2.02 ACCESSORIES

- A. All materials shall be in accordance with the respective WisDOT Specification as follows:
 - 1. Curing Materials:
 - a. Curing compounds: WisDOT 415.2.4.
 - b. Membrane curing compound: WisDOT 415.2.4.
 - c. Impervious sheeting method: WisDOT 415.3.12.3.

2.03 CONCRETE MIX DESIGNATION

- A. Concrete shall be Grade A, A-WR, A-FA or A-18.
- B. All concrete shall be air entrained.

PART 3 EXECUTION

3.01 FOUNDATION PREPARATION

- A. Excavate shape and compact foundation to the planned section and grade.
- B. Remove unsuitable subgrade soil as directed.

- C. Provide and compact granular material to the required depth as indicated on the Drawings.

3.02 INSTALLATION

- A. Forms: Provide forms that are capable of sustaining the concrete in the proper line, grade, and cross section until set.
- B. Joint Construction:
 - 1. Construct joints perpendicular to the subgrade.
 - 2. Align with similar joints in adjacent work.
 - 3. Place transverse joints at right angles to the alignment.
 - 4. Transverse Expansion Joints:
 - a. Fill with 1/2-inch preformed joint filler material.
 - b. Place as follows:
 - 1) At 300-foot intervals on all tangent sections.
 - 2) Three feet on each side of all catch basins.
 - 3) At the end of all curved sections.
 - 4) At the ends of curved portions of entrance and street returns.
 - 5) Where new construction surrounds or adjoins any existing fixed object.
 - 6) To match the locations of expansion joints in adjacent concrete pavements.
 - 5. Contraction Joints:
 - a. Provide at 10-foot intervals in curb or curb and gutter constructions.
 - b. Provide at 20-foot intervals in solid median construction.
 - c. Form or saw to a minimum 2-inch depth from all exposed surfaces.
- C. Metal Reinforcement: Provide and place as shown on the Drawings.
- D. Placing and Finishing:
 - 1. Wet foundation and inside form faces immediately prior to concrete placement.
 - 2. Fill all voids by hand tamping or internal vibration.
 - 3. Strike off to the required grade and float smooth.
 - 4. Hand-float top surface of curb face.
 - 5. Round joints and edges to 1/2-inch radii.
 - 6. Lightly brush all exposed surfaces to a uniform texture.
 - 7. Fill cavities with mortar when side forms are removed.
- E. Slip-form Machine Placement:
 - 1. Placement by an extrusion type machine in lieu of fixed forms is permitted.
 - 2. Final product must meet standards for fixed-form placement.
 - 3. Hand finish as necessary to obtain specified finish and texture.
- F. Curing and Protection:
 - 1. Provide curing for minimum 72 hour period after finishing.
 - 2. During cold weather, protect concrete from frost damage.
 - 3. Blanket Curing Method:
 - a. Cover concrete with waterproof plastic after finishing.
 - b. Envelop concrete and prevent water vapor loss.
 - c. After curing, treat exposed surfaces with treating oil.
 - d. Apply two coats totaling 0.06 gallon/square yard coverage.
 - 4. Membrane Curing Method:
 - a. Coat all exposed surfaces with curing compound within 1 hour after finishing.
 - b. Apply uniformly at a rate of 1 gallon per 150 square feet of surface area with an approved airless sprayer.
 - c. Mix as required to maintain a homogenous mixture.
 - d. Respray as directed to provide proper coating.
- G. Joint Sealing: Joint sealing is not required.

H. Backfill Construction:

1. Backfill and compact adjacent area with selected materials to the cross-section shown on the Drawings.
2. Protect concrete from damage during backfill and compaction.

3.03 TOLERANCES

- A. Finish gutter flowlines to eliminate low spots and avoid water entrapment.
- B. Deviations greater than 5/16-inch from a 10-foot straight edge on tangent lines or grades will be considered as unacceptable work.
- C. Remove and replace unacceptable work as directed.

END OF SECTION

SECTION 32 17 23
PAVEMENT MARKING (WisDOT 646)

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes application of permanent markings on pavement surfaces.
- B. Measurement & Payment:
 - 1. See Section 01 28 00 – Measurement and Payment.

1.02 REFERENCES

- A. WisDOT 646 - Pavement Marking
- B. Wisconsin Manual on Uniform Traffic Control Devices

1.03 SCHEDULE

- A. Apply paint to bituminous surface not less than 7 days after placement.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Paint: WisDOT 646.2.
- B. Glass Beads: WisDOT 646.2.
- C. Epoxy: WisDOT 646.2.

2.02 EQUIPMENT

- A. Self-propelled, pressure type applicator, subject to approval.

PART 3 EXECUTION

3.01 SURFACE PREPARATION

- A. Prepare the surface in accordance with WisDOT 646.3.

3.02 APPLICATION

- A. Apply pavement markings in accordance with WisDOT 646.3.

END OF SECTION

SECTION 32 92 12
TURF ESTABLISHMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes establishment of herbaceous ground cover on designated areas.
- B. Related Sections:
 - 1. Section 31 25 10 – Temporary Erosion Control
- C. Measurement & Payment:
 - 1. See Section 01 28 00 – Measurement and Payment.

1.02 REFERENCES

- A. WisDOT – Standard Specifications for Highway and Structure Construction:
 - 1. 625 – Topsoil and Salvaged Topsoil
 - 2. 628 – Erosion Control
 - 3. 629 – Fertilizer and Agricultural Limestone
 - 4. 630 – Seeding

1.03 SUBMITTALS

- A. Submit certified test report for each seed mixture.
- B. Submit certified test report for each fertilizer mixture.
- C. Submit certified test report for each type erosion mat.

1.04 ACCEPTANCE OF WORK

- A. Turf establishment will be accepted on a total project basis.
- B. All erosion control items must also be in place and properly maintained prior to acceptance.
- C. Once accepted, Contractor is relieved of any further maintenance or repair.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Protect seed from moisture, heat, rodents, and other damage prior to use.
- B. Deliver fertilizer in waterproof bags showing weight, chemical analysis and name of manufacturer.

1.06 SCHEDULE OF WORK

- A. Coordinate turf establishment to minimize lag time after topsoil placement.
- B. Plant seed between May 1 and September 20.

1.07 MAINTENANCE

- A. Maintain and repair all areas until acceptance.

- B. Contractor shall apply water as needed.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Topsoil: WisDOT 625.2.
- B. Mat: American Excelsior Company - Curlex Netfree; complying with WisDOT Class I Type B standards per WisDOT 628.
- C. Fertilizer: Type B complying with WisDOT 629
- D. Seed: Mix No. 40 complying with WisDOT 630.2.1.5.

PART 3 EXECUTION

3.01 SOIL PREPARATIONS

- A. Remove all undesirable weeds as directed.
- B. Loosen topsoil on all areas with 2:1 slopes or flatter prior to seeding.
- C. Cultivate to a depth of 3 inches using discs or other suitable equipment.
- D. Operate equipment at right angles to direction of drainage.
- E. Fill all washouts prior to cultivation.
- F. Finish all areas to provide a smooth, moist, even-textured foundation of uniform density.
- G. Approval of the Engineer is required prior to placing seed.

3.02 CONSTRUCTION REQUIREMENTS

- A. Applying Topsoil:
 - 1. Place in accordance with WisDOT 625.
 - 2. Provide erosion and sediment control items as specified or as needed.
 - 3. Remove all visible debris such as stones, clods of hard earth, roots, plant parts, stumps, sticks, weeds, demolition or construction debris, or any other extraneous non-earth material in excess of 1 inch in size.
 - 4. Do not place wet or muddy topsoil, when subgrade is excessively wet, or in condition that may otherwise be detrimental to subsequent Work.
 - 5. Uniformly place approved topsoil material where indicated to minimum compacted depth of 6 inches on 3:1 on steeper slopes, minimum of 8 inches on flatter slopes, and at greater depths as indicated on Drawings.
 - 6. Correct irregularities in surface resulting from placement or other operations to prevent formation of depressions or water pockets.
 - 7. Protect topsoiled areas from weather based erosion until planting operations commence.
- B. Applying Fertilizer and Conditioners:
 - 1. Apply fertilizer uniformly over the designated area using mechanical spreading devices.
 - 2. Apply at a rate of 7 pounds per 1,000 square feet.
 - 3. Apply fertilizer no more than 48 hours prior to seeding.

- C. Sowing Seed:
 - 1. Apply seed mixture over designated areas at a rate of 2.0 pounds per 1,000 square feet.
 - 2. Apply seed uniformly by mechanical or hydrospreading method.
 - 3. Firm all seeded areas with a drag or cultipacker immediately after seeding and prior to mulching.
- D. Placing Erosion Control Mats:
 - 1. Place mat within 24 hours after seeding.
 - 2. Place and secure mat in accordance with WisDOT 628.
- E. Watering
 - 1. Moisten vegetative restoration by watering or sprinkling with water if natural rainfall of at least 1.5-inch per week is insufficient. Water for 14 days after placement or as the engineer directs.
 - 2. City can provide water from designated location.

END OF SECTION

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SECTION 33 01 10

TRACER WIRE

PART 1 GENERAL

1.01 SUMMARY

- A. Provide tracer wire (locating wire) and accessories for all non-metallic mains, laterals, and services.
- B. Related Sections:
 - 1. Section 31 23 33 - Trench Excavation and Backfill
 - 2. Section 33 11 00 - Water Distribution Systems
 - 3. Section 33 31 00 - Sanitary Sewer Systems
- C. Measurement & Payment:
 - 1. See Section 01 28 00 – Measurement and Payment.

1.02 REFERENCES

- A. ASTM D1248 - Polyethylene Plastics Extrusion Materials for Wire and Cable

1.03 QUALITY ASSURANCE

- A. Provide tracer wire designed specifically for the purpose of detecting buried facilities.

PART 2 PRODUCTS

2.01 MANUFACTURER

- A. Tracer Wire:
 - 1. Copperhead Industries.
 - 2. Agave Wire.
 - 3. Or equal.
- B. Tracer Wire Access Box:
 - 1. Valvco: Part TWAB.
 - 2. Copperhead: SnakePit Lite Duty.
 - 3. Or Equal.
 - 4. Located at each hydrant and each building entrance location.
- C. Rhino 3-Rail Utility Marker Post:
 - 1. Color:
 - a. Green: Sanitary sewer.
 - b. Blue: Potable and fire water.
 - c. Purple: Cooling water, Recycle/reclaim water.

2.02 MATERIALS

- A. Open Trench Installation:
 - 1. Direct burial 12 AWG solid, 0.0808-inch diameter.
 - 2. Steel core soft drawn, high strength 380-pound average tensile break load.
 - 3. 30 mil high molecular weight, high density polyethylene, complying with ASTM D1248.
 - 4. High flexibility, stretchable to accommodate ground movement.
 - 5. Impact resistant.

6. 30-volt rating.
 7. Jacket color: Blue - water, green - sewer, brown - storm
 8. Physical, permanent, surface legend on insulating jacket, repeated a minimum of every 2 linear feet.
- B. Pipe Bursting or Horizontal Direction Drilling Installation:
1. Direct burial 12 AWG solid, 0.0808-inch diameter.
 2. Steel core hard drawn, extra high strength 1150-pound average tensile break load.
 3. 45 mil high molecular weight, high density polyethylene, complying with ASTM D1248.
 4. High flexibility, stretchable to accommodate ground movement.
 5. Impact resistant.
 6. 30-volt rating.
 7. Jacket color: Blue - water, green - sewer, purple - recycle/reclaim water.
 8. Physical, permanent, surface legend on insulating jacket, repeated a minimum of every 2 linear feet.
- C. Connectors:
1. Waterproof and corrosion-proof.
 2. Prefilled with non-hardening sealant.
 3. Lug: Tin plated high conductivity aluminum with high impact polypropylene housing.
 4. CSA certified as both Pressure Type and Direct Bury as well as waterproof and corrosion resistant.
- D. Marking Post:
1. Water:
 - a. Rhino Marking Post: Rhino TriView Flex TM Posts, BLUE (Water) (USA Blue Book Stock #70450).
 - b. Standard Legend Decals Marked: "WATER PIPELINE" (USA Blue Book #72455).
 2. Sanitary:
 - a. Provide green fiberglass post 4-foot high for manholes in easements (USA Blue Book #70457).

PART 3 EXECUTION

3.01 INSTALLATION

- A. Approved spliced connection locations: Water main tees, crosses, and copper water services.
- B. Except for approved splice connections and repairs, install in continuous manner from valve box to valve box, valve box to manhole.
- C. Install tracer wire parallel with and above centerline axis of pipe.
1. Do not spiral wrap or tape tracer wire to pipe.
 2. Do not install under service saddles.
- D. Connections to existing materials:
1. Ductile Iron: Cadweld or equal.
 2. Copper: Stainless steel strap to match copper pipe size.
 3. Seal with mastic sealer approved for underground use.
- E. Terminate tracer wires in accordance with Drawings.
1. Provide 5-pound magnesium anode a maximum of every 1000 feet and at buried pipe ends:
 - a. Attach to the main tracer wire by solder.
 - b. Remove anode protective cover.
 - c. Apply water as directed by manufacturer.
- F. Frequency of above ground markers:
1. Place pipe marker outside of roadway:
 - a. Located above pipe in areas where pipe is outside of backslope of road ditch.

- b. Every 500 to 750 feet.
- c. At bends or tees.
- d. Within 10 feet of building entrance location.

3.02 FIELD QUALITY CONTROL

- A. System Testing:
 - 1. Test continuity of conduction in the presence of the Engineer.
 - 2. Connect signal generator at wire termini and trace signal throughout the installation.
 - 3. Locate and repair all breaks in conductivity.

END OF SECTION

SECTION 33 11 00

WATER DISTRIBUTION SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Water main pipe and fittings.
 - 2. Valves and boxes.
 - 3. Hydrants.
 - 4. Services.
 - 5. Insulation.
- B. Related Sections:
 - 1. Section 31 23 34 – Trenching, Backfilling and Compacting.
- C. Measurement & Payment:
 - 1. See Section 01 28 00 – Measurement and Payment.

1.02 REFERENCES

- A. ASTM:
 - 1. A126 - Gray Iron Castings for Valves, Flanges, and Pipe Fittings
 - 2. A536 - Ductile Iron Castings
 - 3. B88 - Seamless Copper Water Tube
 - 4. B152 - Copper Sheet, Strip, Plate, Rolled Bar
 - 5. D429 - Tests for Rubber Adhesion to Rigid Surfaces
 - 6. D2842 - Test for Water Absorption of Rigid Cellular Materials
 - 7. D1248 - Polyethylene Plastics Extrusion Materials for Wire and Cable
- B. AWWA:
 - 1. C105 - Polyethylene Encasement for Ductile -Iron Pipe Systems
 - 2. C111 - Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings
 - 3. C150 - Thickness Design of Ductile Iron Pipe
 - 4. C151 - Ductile-Iron Pipe, Centrifugally Cast for Water or other Liquids
 - 5. C153 - Ductile-Iron Compact Fittings for Water Service
 - 6. C502 - Dry-Barrel Fire Hydrants
 - 7. C504 - Rubber-Seated Butterfly Valves
 - 8. C509 - Resilient-Seated Gate Valves for Water Supply Service
 - 9. C515 - Reduced-Wall, Resilient-Seated Gate Valves, for Water Supply Service
 - 10. C600 - Installation of Ductile Iron Water Mains and their Appurtenances
- C. State of Wisconsin:
 - 1. Current Edition of the Standard Specification for Sewer & Water Construction in Wisconsin.
 - 2. Current edition of WisDOT – Standard Specifications for Public Works Constructions.

1.03 SUBMITTALS

- A. Submit Certificate of Compliance for products listed under Article 1.04.
- B. Submit proposed method of joint conductivity.

1.04 QUALITY ASSURANCE

- A. Provide Certificates of Compliance from the manufacturer certifying that the following products meet the respective requirements listed in Article 1.02:
 - 1. Pipe
 - 2. Valves and Boxes
 - 3. Tracer wire

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Inspection:
 - 1. Inspect all pipe and products during the unloading process.
 - 2. Notify Engineer of any cracked, flawed or otherwise defective products.
 - 3. Remove all products found to be defective by the Engineer from the Site.
- B. Handling and Storage: Handling and storage of products shall be in accordance with Section 2.2 of AWWA C600.

PART 2 PRODUCTS

- A. See City of Watertown Specifications Section 33 11 00

PART 3 EXECUTION

3.01 CONSTRUCTION REQUIREMENTS

- A. Connection to Existing System:
 - 1. Pressure Tap:
 - a. Install tap in location shown on the Drawings.
 - b. Use approved tapping machine designed specifically for tapping under pressure.
 - c. Install tapping saddle (double-strap for services 2-inches and smaller).
 - d. Install blocking as required.
- B. Service Installation:
 - 1. Corporation Stops:
 - a. Provide watertight connection with approved tapping machine.
 - b. Install under main pressure.
 - c. Place a double wrap of Teflon tape around the threads prior to installation.
 - d. All 1" and 2" stops shall be installed using a tapping saddle.
 - 2. Poly Service Pipe:
 - a. Install pipe between corporation stop and curb stop with no joints or unions.
 - b. Bury Depth: 6 feet.
 - c. Provide minimum 1-foot of slack in the pipe to allow for settlement and movement.
 - d. Service laterals shall not be laid through rubble materials.
 - e. Tracer wire to be installed along entire service.
 - f. Tracer wire shall be tested for electrical conformity prior to acceptance.
 - 3. Curb Stop and Box:
 - a. Install adjacent to the existing curb stop location.
 - b. Verify that subgrade material is adequate to support the curb box assembly.
 - c. Install boxes plumb and centered over the tee head.
 - d. Verify that box remains plumb and properly aligned during backfill.
 - e. Adjust box cover to required grade.
 - f. Key all curb stops after backfill to ensure proper operation.
- C. Encasement:
 - 1. Comply with AWWA C105.
 - 2. Wrapping all pipe and fittings is not necessary unless unsuitable soils are encountered. If wrapping is necessary as directed by the Engineer, the following items shall apply:

3. Clean all surfaces of pipe and appurtenances prior to wrapping.
 4. Provide sufficient slack to prevent damage during backfill.
 5. Provide minimum 6-inch overlap at joints.
 6. Secure overlap and joints with compatible adhesive tape.
 7. Repair damaged wrap with tape or polyethylene patch.
- D. Backfill materials
1. Granular backfill shall be used up to the bottom of the subgrade. Native materials composed of granular, non-clay soils may be utilized as approved by the Engineer.

3.02 FIELD QUALITY CONTROL

- A. Perform the following tests upon completion of the system and prior to being placed into service:
1. Follow Section 5.5.18 of SWCW

PART 4 GENERAL NOTES

4.01 EXISTING UTILITY INTERRUPTION

- A. Do not interrupt utilities occupied by Owner or others without written permission by Engineer or Owner.
- B. Notify Owner or Engineer not less than 24 hours in advance of proposed utility interruptions.
- C. Residential water service shall not be shut down for a period longer than eight (8) hours after 8:00 p.m., or weekends without approval from Owner. Commercial water service shall not be shut down for a period longer than two (2) hours without approval from the Owner.

4.02 OPERATION OF VALVES

- A. The Owner shall operate water main valves on existing infrastructure unless the owner authorizes such practice or in emergency situations.

END OF SECTION

SECTION 33 31 00

SANITARY SEWER SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Gravity sanitary sewer pipe.
 - 2. Sanitary manholes and appurtenances.
 - 3. Service connections.
 - 4. Service pipe.
 - 5. Riser pipe.
- B. Related Sections:
 - 1. Section 31 23 30 – Excavation, Backfilling and Compacting
 - 2. Section 33 34 00 - Sewage Force Mains
- C. Measurement & Payment:
 - 1. See Section 01 28 00 – Measurement and Payment.

1.02 REFERENCES

- A. ANSI:
 - 1. A21.4 - Standard for Cement - Mortar Lining for Ductile Iron Pipe and Fittings
 - 2. A21.11 - Standard for Rubber - Gasket Joints for Ductile Iron Pressure Pipe and Fittings
 - 3. A21.51 - Standard for Ductile Iron Pipe Centrifugally Cast
 - 4. A21.53 - Standard for Ductile Iron Compact Fittings, 3-inch through 16-inch
- B. ASTM:
 - 1. A48 - Specification for Gray Iron Castings
 - 2. A74 - Specification for Cast Iron Soil Pipe and Fittings
 - 3. C76 - Specification for Reinforced Concrete Pipe
 - 4. C361 - Specification for Reinforced Concrete Low Head Pressure Pipe
 - 5. C425 - Specification for Compression Joints for VCP and Fittings
 - 6. C478 - Specification for Precast Reinforced Concrete Manhole
 - 7. C564 - Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings
 - 8. D2321 - Recommended Practice for Installation of Flexible Thermo-plastic Sewer Pipe
 - 9. D3034 - Specification for PVC Sewer Pipe and Fittings
 - 10. F477 - Elastomeric Seals for Joining Plastic Pipe
 - 11. F714 - Specification for PE Sewer Pipe and Fittings

1.03 SUBMITTALS

- A. Submit Shop Drawings for each manhole.
- B. Quality Assurance/Control Submittals:
 - 1. Submit Certificates of Compliance from manufacturers certifying that materials meet reference specifications listed in Article 1.02.
 - 2. Submit record of service connections weekly to Engineer.

1.04 HANDLING AND DELIVERY OF MATERIALS

- A. Inspect pipe and materials during unloading process and notify Engineer of cracked, flawed or otherwise defective material.

1.05 MAINTAINING SEWER SYSTEM

- A. Maintain flow in sanitary sewers on continuous basis while construction is underway.
- B. Plug sewers with inflatable plug. Provide pumps, portable generators, hoses, and related items appurtenant to the Work.
- C. Sewer service lines to individual users may be disconnected for a period not to exceed 8 hours.

PART 2 PRODUCTS

2.01 PIPE AND FITTINGS

- A. See City of Watertown Specifications Section 33 30 00

PART 3 EXECUTION

3.01 PREPARATION

- A. Line and Grade: Provide means for accurately transferring line and grade from ground surface stakes to working point in trench.
- B. Water Stops: Provide in manholes as required to prevent infiltration into system.

3.02 CONSTRUCTION REQUIREMENTS

- A. Pipe Installation:
 - 1. Comply with ASTM D2321 for PVC installation.
 - 2. Inspect pipe for defects and cracks while suspended before lowering into trench.
 - 3. Place pipe bell at upstream end of pipe length.
 - 4. Install pipe from lower to higher invert elevation at a uniform slope between manholes.
 - 5. Place plug in end of incomplete piping at end of day and when Work stops.
 - 6. Provide watertight plugs at future connection plugs.
 - 7. When water is present in trench, seals are to remain in-place while trench is pumped completely dry.
 - 8. See Section 31 23 50 for pipe foundation and backfill.
 - 9. Maximum Allowable Deviation From Staked Grade:
 - a. Alignment: 0.30 feet.
 - b. Elevation: 0.02 percent.
- B. Manhole Installation:
 - 1. Place precast manhole base on compacted granular subgrade.
 - 2. Locate steps within 1 inch of vertical alignment and within 1 inch of required vertical spacing.
 - 3. Provide monolithic base for drop manholes.
 - 4. Maximum Allowable Deviation From Staked Grade:
 - a. Alignment: 0.30 feet.
 - b. Elevation: 0.03 feet.
- C. Service Pipe:
 - 1. Extend pipe to right-of-way line.
 - 2. Install pipe at minimum 1 percent to maximum 2 percent grade.
 - 3. Place gasketed plug at end of pipe.
 - 4. Mark end of service with a 4-inch by 4-inch by 8-foot timber set 4 feet below grade.

5. Maintain a record of each service connection as follows to be submitted to City at the end of each week:
 - a. Type of service connection.
 - b. Distance from downstream manhole.
 - c. Length of riser.
- D. Riser Pipe:
 1. Extend riser from service connection at 45-degree angle above horizontal to a point 11 feet below street grade.
 2. Install riser pipe against undisturbed trench wall.
 3. Place concrete collar around service connection as shown on Drawings.

3.03 FIELD QUALITY CONTROL

- A. Remove all dirt and foreign material from pipe interior prior to testing.
- B. Gravity Sewer Pipe:
 1. Pipe Diameter 27 Inches and Smaller: Air test.
 2. Pipe Diameter Larger Than 27 Inches: Infiltration test.
- C. Perform the following tests upon completion of sewer construction and prior to any external plumbing connections:
 1. Infiltration Test:
 - a. Manholes shall be watertight, with no leakage permitted.
 - b. Place 90-degree V-notch weirs in locations directed by Engineer to measure leakage in sewer lines.
 - c. Allowable leakage rate shall be 100 gallons/day/inch diameter/mile of sewer between any adjacent manholes.
 - d. Provide corrective measures for lines exceeding the allowable leakage rate.
 2. Air Test:
 - a. Place inflatable sewer stoppers in manhole at each end of reach to be tested.
 - b. Connect 1 end of an air hose to plug used for air inlet.
 - c. Connect other end of hose to portable air control equipment.
 - d. This equipment consists of valves and pressure gages used to control the rate air flows to the test section and to monitor air pressure inside the pipe.
 - e. Connect an air hose between compressor (or other source of compressed air) and control equipment.
 - f. Add air to pipe section. Monitor air pressure so pressure inside pipe does not exceed 5.0 psig.
 - g. When pressure reaches 4.0 psig, stop air supply so internal pressure is maintained for 2 minutes.
 - h. These 2 minutes allow time for air temperature to come to equilibrium with the pipe walls.
 - i. During this time check plugs with soap solution to detect any plug leakage. If plugs are found to leak, bleed off air, tighten plugs, and begin again by supplying air.
 - j. After temperature has been allowed to stabilize for 2 minutes, disconnect air supply and allow pressure to decrease to 3.5 psig.
 - k. At 3.5 psig, start stopwatch to determine time required for pressure to drop to 2.5 psig.
 - l. Provide corrective measures for any line not meeting requirements.
 - m. Test results are usually better if sewer pipe walls are damp at time of testing.
 - n. Time shall be equal to or greater than the allowable time shown in table at end of this Section.
 3. Deflection Test:
 - a. Perform on PVC pipe at least 30 days after trench backfill has been placed.
 - b. Perform test by pulling a mandrel through each line between manholes without aid of mechanical pulling devices.

- c. Mandrel diameter: Minimum 95 percent of the base inside diameter of the pipe as follows:

Nominal Size (in.)	Base I.D.	5% Deflection Mandrel
4	3.874	3.68
6	5.742	5.46
8	7.665	7.28
10	9.563	9.08
12	11.360	10.79
15	13.897	13.20
18	16.975	16.13
21	20.004	19.01
24	22.481	21.36
27	25.326	24.06
30	28.639	27.21
33	32.224	30.61
36	35.808	34.02
42	40.401	38.38
48	46.094	43.79

- d. The line will be considered acceptable if mandrel can progress through line without binding.
e. Provide corrective measures for lines not meeting these requirements.

Time Required for a 0.5 PSIG Pressure Drop for Size and Length of Pipe Indicated

1 Pipe Diameter (inches)	2 Minimum Time (minutes:seconds)	3 Length for Minimum Time (feet)	4 Time for Longer Length (seconds)	Specified Minimum for Length (L) Shown (minutes:seconds)							
				100 feet	150 feet	200 feet	250 feet	300 feet	350 feet	400 feet	450 feet
4	1:53	597	.190 L	1:53	1:53	1:53	1:53	1:53	1:53	1:53	1:53
6	2:50	398	.427 L	2:50	2:50	2:50	2:50	2:50	2:50	2:51	3:12
8	3:47	298	.760 L	3:47	3:47	3:47	3:47	3:48	4:26	5:04	5:42
10	4:43	239	1.187 L	4:43	4:43	4:43	4:57	5:56	6:55	7:54	8:54
12	5:40	199	1.709 L	5:40	5:40	5:42	7:08	8:33	9:58	11:24	12:50
15	7:05	159	2.671 L	7:05	7:05	8:54	11:08	13:21	15:35	17:48	20:02
18	8:30	133	3.846 L	8:30	9:37	12:49	16:01	19:14	22:26	25:38	28:51
21	9:55	114	5.235 L	9:55	13:05	17:27	21:49	26:11	30:32	34:54	39:16
24	11:20	99	6.837 L	11:24	17:57	22:48	28:30	34:11	39:53	45:35	51:17
27	12:45	88	8.653 L	14:25	21:38	28:51	36:04	43:16	50:30	57:42	64:54
30	14:10	80	10.683 L	17:48	26:43	35:37	44:31	53:25	62:19	71:13	80:07
33	15:35	72	12.926 L	21:33	32:19	43:56	53:52	64:38	75:24	86:10	96:57
36	17:00	66	15.384 L	25:39	38:28	51:17	64:06	76:55	89:44	102:34	115:23
42	19:74	57	20.942 L	34:54	52:21	69:49	87:15	104:42	122:10	139:37	157:04
48	22:67	50	27.352 L	45:35	68:23	91:11	113:58	136:46	159:33	182:21	205:09

END OF SECTION

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SECTION 33 34 00

SEWAGE FORCE MAINS

PART 1 GENERAL

1.01 SUMMARY

- A. Section includes installation of sewage force main.
- B. Related Sections:
 - 1. Section 31 23 30 – Excavation, Backfilling and Compacting
 - 2. Section 33 31 00 - Sanitary Sewer Systems
- C. Measurement & Payment:
 - 1. See Section 01 28 00 – Measurement and Payment.

1.02 REFERENCES

- A. ANSI:
 - 1. A21.4 - Standard for Cement - Mortar Lining for Ductile Iron Pipe and Fittings
 - 2. A21.11 - Standard for Rubber - Gasket Joints for Ductile Iron Pressure Pipe and Fittings
 - 3. A21.51 - Standard for Ductile Iron Pipe, Centrifugally Cast
 - 4. A21.53 - Standard for Ductile Iron Compact Fittings
- B. ASTM:
 - 1. D2241 - Specification for PVC Pressure-Rated Pipe

1.03 QUALITY ASSURANCE

- A. Provide certificates from manufacturers certifying that the following materials meet the referenced requirements:
 - 1. HDPE DR 11 (IPS).

1.04 DELIVERY OF MATERIALS

- A. Inspect all pipe and materials during the unloading process.
- B. Notify Engineer of any cracked, flawed, or otherwise defective material.
- C. Remove all materials found to be unsatisfactory by Engineer from the Site.

PART 2 PRODUCTS

2.01 PIPE AND FITTINGS

- A. Provide:

Material	Class	Joint
High Density Polyethylene (HDPE)	DR11	(IPS)

- B. Provide all pipe and fittings of each material type from the same manufacturer.

PART 3 EXECUTION

3.01 PIPE INSTALLATION

- A. Inspect pipe for defects and cracks while suspended.
- B. Remove all dirt and foreign material from pipe interior prior to lowering into trench.
- C. Install pipe inside the existing six-inch host pipe.
- D. Remove all dirt and foreign material from the pipe interior prior to testing.
- E. Contractor shall provide the Sanitary District with an installation plan prior to the pre-construction meeting laying out all pit locations and connection points.

3.02 FITTING INSTALLATION

- A. Anchor fittings by means of restrained joint devices installed according to manufacturer's recommendations.

3.03 FIELD QUALITY CONTROL

- A. Perform the following tests upon completion of force main construction and prior to connection to lift station.
 - 1. Pressure Test:
 - a. Subject the entire length of force main to hydrostatic pressure test of 150 psi for a period of 1 hour.
 - b. Measure pressure at lowest pipe elevation.
 - c. Maintain constant pressure throughout test period.
 - d. Provide pumps, gages, connections and other necessary apparatus.
 - 2. Leakage Test:
 - a. Measure water volume required to maintain test pressure.
 - b. Allowable leakage shall be determined by the formula:

$$L = \frac{SD\sqrt{P}}{133,200}$$

L = Allowable Leakage in Gallons

S = Length of Pipe Tested in Feet

D = Nominal Diameter of Pipe in Inches

P = Test Pressure in Pounds/Square Inch

- B. Provide corrective measures for any line exceeding allowable leakage.

END OF SECTION

SECTION 33 41 00
STORM SEWER SYSTEMS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Storm sewer pipe.
 - 2. Manholes and appurtenances.
 - 3. Catch basins and appurtenances.
- B. Related Sections:
 - 1. Section 31 23 34 – Trenching, Backfilling, and Compacting
- C. Measurement & Payment:
 - 1. See Section 01 28 00 – Measurement and Payment.

1.02 REFERENCES

- A. ASTM:
 - 1. A48 - Specification for Gray Iron Castings
 - 2. C76 - Specification for Reinforced Concrete Pipe
 - 3. C361 - Specification for Reinforced Concrete Low Head Pressure Pipe
 - 4. C443 - Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets
 - 5. C478 - Specification for Precast Reinforced Concrete Manhole

1.03 SUBMITTALS

- A. Submit Certification of Compliance as required under Article 1.04.
- B. Provide Shop Drawings for each structure.

1.04 QUALITY ASSURANCE

- 1. Perform work in accordance with the State of Wisconsin, WisDOT, and the latest edition of standard specifications for construction.

1.05 DELIVERY OF MATERIALS

- A. Inspect all pipe and materials during the unloading process.
- B. Notify Engineer of any cracked, flawed or otherwise defective material.
- C. Remove all materials found to be unsatisfactory by Engineer from the Site.

PART 2 PRODUCTS

- A. See City of Watertown Specifications Section 33 40 00

PART 3 EXECUTION

3.01 PREPARATION

- A. Line and Grade:
 - 1. Conform to lines, elevations, and grades shown on the Drawings.
 - 2. Provide means for accurately transferring line and grade from ground surface stakes to the working point in the trench.

3.02 CONSTRUCTION REQUIREMENTS

- A. Pipe Installation:
 - 1. Inspect pipe for defects and cracks while suspended before lowering into the trench.
 - 2. Place pipe bell at upstream end of pipe length.
 - 3. Install pipe from lower to higher invert elevation.
 - 4. See Section 31 23 33 for pipe foundation and backfill procedures.
- B. Manhole and Catch Basin Installation:
 - 1. Place precast base on compacted granular subgrade.
 - 2. Install in accordance with drawing details.
 - 3. Locate steps within 1 inch of vertical alignment and within 1 inch of required vertical spacing.
 - 4. Install concrete adjusting rings to provide final horizontal and vertical adjustment within tolerances.
 - 5. Maximum horizontal tolerance: 3 inches in any direction.
 - 6. Construct watertight to prevent groundwater infiltration.
- C. Apron Installation: Tie aprons to next three pipe sections using galvanized "U" bolt fasteners.

3.03 FIELD QUALITY CONTROL

- A. Maintain a clear and clean pipe throughout and at the end of construction.
- B. Compaction testing: In accordance with ASTM D1557.

3.04 CLEANING

- A. Remove all dirt and foreign material from the pipe and structure interiors.

END OF SECTION

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