SECTION 1205 – MANHOLES AND INLETS

1205-1 DESCRIPTION

These items shall consist of the construction or installation of manholes and inlets, in accordance with these specifications, at the specified locations and Standard Details and conforming to the lines, grades, and dimensions shown on the plans or required by the ENGINEER.

1205-2 MATERIALS

1205-2.1 CONCRETE. Plain and reinforced concrete used in this work shall conform to the requirements of Section 501, "Portland Cement Concrete Pavement."

1205-2.2 MORTAR. Mortar shall be a compound of one (1) part Portland Cement to two (2) parts of sand by volume to which lime may be added not to exceed 10 percent of the cement by weight.

1205-2.3 PRECAST REINFORCED CONCRETE PIPE MANHOLE. Precast reinforced concrete manhole risers and top sections shall conform to ASTM C478.

All barrel-to-barrel joints shall be sealed using a Cretex P2 gasketed joint for 48-inch manholes, a Cretex CX-4 joint for all other sizes of manholes, or an exterior seal by Press-Seal Gasket Corporation EZ Wrap and EZ Stik No. 4 primer, Cretex Speciality Products “Mac Wrap” for all sizes of manholes, or an approved equal. The height of the manhole shall be shown on the plans and the diameter shall be 48 inches minimum or larger if recommended by the manhole fabricator and approved by the ENGINEER.

Steps shall not be placed in sanitary sewer, storm sewer, or air release manholes or inlets unless specified. If specified, the manhole steps to be furnished and installed shall be rubber coated over steel reinforcing of the type manufactured by the Delta Products (Delta-Surefoot Company) or approved equal.

1205-2.4 PRECAST REINFORCED CONCRETE PIPE MANHOLE WITH MONOLITHIC BASE. Precast reinforced concrete risers and top sections shall conform to ASTM C478. Manhole bases shall extend a minimum of 6 inches past the exterior manhole wall, except bases below M.S.L. elevation 1626 (NGVD29), which shall extend 12 inches past the exterior manhole wall. The base and the bottom section shall be cast monolithically with precast flow lines. The pipe connections to the manhole shall be Press-Seal Gasket Corporation model Press-Boot or an approved equal. All barrel to barrel joints shall be sealed using a Cretex P2 gasketed joint for 48-inch manholes, a Cretex CX-4 joint for all other sizes of manholes, an exterior seal by Press-Seal Gasket Corporation EZ Wrap and EZ Stik No. 4 primer, Cretex Specialty Products "Mac Wrap" for all sizes of manholes, or an approved equal. If specified, the barrel to casting joint shall be sealed using Cretex Specialty Products "Internal Chimney Seal" or an approval equal. All barrel sections below M.S.L. elevation 1628 (NGVD29) shall be restrained using three outside Cretex pipe joint ties equally spaced or an approved equal. The

height of the manhole shall be shown on the plans and the diameter shall be 48 inches minimum or larger if recommended by the manhole fabricator and approved by the ENGINEER.

Steps shall not be placed in sanitary sewer, storm sewer, or air release manholes or inlets unless specified. If specified, the manhole steps to be furnished and installed shall be rubber coated over steel reinforcing of the type manufactured by the Delta Products (Delta-Surefoot Company) or approved equal.

1205-2.5 MANHOLE CASTINGS.

(a) Sanitary Sewer, Storm Sewer, and Water Main Manhole Castings. Manhole frames and covers shall be of the type manufactured by the Neenah Foundry Company Number R-1733, East Jordan Iron Works Number 1205 or Municipal Castings, Inc. Number 301 with concealed pick holes and self sealing Platen lid or approval equal. All manhole castings shall be installed so they shall be centered over the flow line.

(b) Sanitary Sewer, Storm Sewer, and Water Main Floating Manhole Castings. Floating manhole frames and covers shall be of the type manufactured by Neenah Foundry Company Number R-1955-1 with concealed pick holes and self-sealing Platen lid or approved equal.
All manhole castings shall be installed so they shall be centered over the flow line.

1205-2.6 INLET CASTINGS. Inlet castings shall be of the type manufactured by the Neenah Foundry Company with Type V grates and NDDOT Style Backs, East Jordan Iron Works with Vane Grates and a Type T2 Back for Type 24-inch and a Type T5 Back for Type 36 inches or larger, or an approved equal. All bolts to be temper finish, double heat treated 1038 S.A.E., Grade 5, Cad-Dichromate Plated.

(a) Type 24" Castings. Type 24" Castings shall be Neenah Foundry Number R-3030, East Jordan Iron Works Number 7010 with round base, or approved equal.

(b) Type 36" Castings. Type 36" Inlet Castings shall be a Neenah Foundry Number R-3295, East Jordan Iron Works Number 7030, or approved equal.

(c) Type 72" Castings. Type 72" Castings shall be Neenah Foundry Number R-3295-2, East Jordan Iron Works Number 7031, or approved equal.

(d) Type 108" or Larger Castings. Type 108" or Larger Castings shall be Neenah Foundry Number R-3295-3, or East Jordan Iron Works Number 7032 with additional inner sections, or approved equal.

(e) Catch Basin Castings. Catch basin castings shall be Neenah Foundry Number R-2573 with concave grate or approved equal.

1205-2.7 SLOTTED DRAIN INLET. Slotted drain inlets shall be of a quality equal to the type manufactured by Contech Construction Products with the modified hugger band under the minimum requirements in design, material, and workmanship conforming to the latest standards of AASHTO M36 and AASHTO M111.

1205-2.8 REINFORCING STEEL. Reinforcing steel used in this work shall conform to Subsection 501-2.10.

1205-2.9 AIR RELEASE VALVE. All air release valve taps, made into all sizes and classes of PVC and ductile iron water mains, shall be reinforced with a tapping saddle. Tapping saddles shall be a minimum of 2-bolt stainless steel skirted or complete gasket type. An O-ring single bolt stainless steel saddle is not acceptable. The automatic air release valve shall be a 1-inch APCO No. 200 or Valmatic Model 38 for water and APCO No. 400 or Valmatic Model 48 for sewer or an approved equal. The corporation stop shall be a Mueller No. H-15000 for copper water pipe or an approved equal.

1205-2.10 PRECAST REINFORCED CONCRETE MANHOLE BASES. Precast reinforced concrete manhole bases shall conform to ASTM C478. The bases shall extend a minimum of 6 inches past the exterior manhole wall, except bases below M.S.L. elevation 1626, which shall extend 12 inches past the exterior manhole wall. Base thickness shall be as follows: Manholes with inside diameters up to and including 48"- 6" thick, 54" thru 102"- 8" thick, 108" and 120" - 12" thick. Precast Air Release Manhole bases shall be 2 inches thicker than the base thicknesses listed above.

1205-2.11 PRECAST REINFORCED CONCRETE MANHOLE COVERS. Precast Reinforced Concrete Manhole Covers shall conform to ASTM C478. Cover thickness shall be as follows: Manholes with inside diameters up to and including 48"- 6" thick, 54" thru 102"- 8" thick, and 108" and 120"- 12" thick.

1205-3 CONSTRUCTION REQUIREMENTS.

1205-3.1 EXCAVATION. Excavation for catch basins, manholes, inlets, and pipe junctions shall be done in a manner to provide adequate room for the construction of the item according to details shown on the plans. When necessary the excavation shall be adequately shored or sheeted to insure safe and satisfactory construction and backfilling.

1205-3.2 PRECAST REINFORCED CONCRETE PIPE MANHOLES AND INLETS. Unless otherwise specified, standard reinforced concrete sewer pipe shall be used for this purpose. When this type of construction is used, the bottom precast section shall be set in a full mortar bed and the joints between sections and around pipes shall be filled with mortar.

1205-3.3 CONCRETE CONSTRUCTION (CAST IN PLACE). The composition, consistency, placing, form work, curing and protection of the concrete shall conform to the requirements of Section 701. No finishing of the concrete will be required except the filling of honeycombed areas.

1205-3.4 CONCRETE BASE. The bottoms of all manholes and inlets shall be of concrete. The thickness and other dimensions of the base shall be as specified on the plans. The invert channel shall be the true shape of the lower half of the pipe or sewer.

Pipe or tile placed in concrete for inlet or outlet connections shall extend through the walls a sufficient distance to allow for connections, and the concrete shall be carefully constructed around them so as to prevent leakage along their outer surface. The inside ends shall be flush with the inside walls, and the pipe shall be of the same size and kinds as those with which they connect on the outside.

1205-3.5 CASTINGS. All manhole, inlet, and catch basin castings shall be placed with a minimum of 1/2 inch of grout between the manhole inlet or catch basin, but not adjusted to grade unless specified on the plans. Total allowance for adjustment shall be from 0 to 6 inches. Castings requiring adjustment to grade shall be paid for under Section 1206 "Castings and Adjustment."

1205-3.6 SLOTTED DRAIN INLET. Slotted drain inlets shall be constructed in compliance with Standard Details 1313A & 1313B. The CONTRACTOR shall furnish all equipment, labor, and materials, including the connection to the inlet or manhole, flowable fill for bedding and curb and gutter, all of which shall be considered incidental to the price for slotted drain.

1205-3.7 BACKFILL. Backfill shall be deposited in horizontal layers not over 6 inches in depth (loose) and each layer compacted, this process being repeated to the elevation of the finished grade as designated on the plans. Compaction shall be secured by watering each layer if dry (the water content of the material used shall not exceed the optimum moisture content) and tamping with approved mechanical rammers. The backfill shall be compacted to a density equal to the requirements specified for the pipe trench common to the manhole or inlet.

1205-3.8 CLEANING. All manholes and inlets shall be thoroughly cleaned of any accumulation of silt, debris, or foreign matter of any kind, and shall be free from such accumulations at the time of the final inspection.

1205-3.9 MARKING MANHOLES AND INLETS. The CONTRACTOR will be required to furnish and install a "Tee" or "U" steel fence post having a minimum length of 5½ feet located 1 foot from the edge of the casting in line with the steps of the manhole or in line with the face of the curb of an inlet.

The cost of the steel fence post and installation shall be considered incidental to other bid items.

1205-3.10 POLYVINYL CHLORIDE PIPE TO MANHOLE ADAPTERS. The CONTRACTOR shall install a PVC to MH adapter in the wall of any manhole connected to PVC sewer pipe. The PVC Manhole Adaptors shall be equal to the product and manufactured by GPK Products, Inc. or an approved equal.

The cost of the PVC Manhole Adaptor and the installation shall be considered incidental to the bid item for "Concrete Manhole."

1205-3.11 INLET STAKES. Section 100, Subsection 116, shall be strictly followed. The same line and grade stakes set by the ENGINEER for the construction of each inlet shall be saved and used by the CONTRACTOR to set the inlet castings to line and grade.

1205-4 MEASUREMENT AND PAYMENT

1205-4.1 CONCRETE MANHOLE. Concrete manholes including casting shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Concrete Manhole" complete in place and accepted by the ENGINEER.

1205-4.2 CONCRETE MANHOLE WITH MONOLITHIC BASE. Concrete manholes with monolithic base including casting shall be measured on an individual basis (EA) and paid for at the unit price bid for "Concrete Manhole With Monolithic Base" complete in place and accepted by the ENGINEER.

1205-4.3 CONCRETE DROP MANHOLE. Concrete Drop Manhole including casting shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Concrete Drop Manhole" complete in place and accepted by the ENGINEER.

1205-4.4 AIR RELEASE VALVE AND MANHOLE. Air Release Valve and Manhole including castings shall be measured as a complete unit on an individual unit basis (EA) and paid for at the unit price bid for "Air Release Valve and Manhole" complete in place and accepted by the ENGINEER.

1205-4.5 TYPE 24" INLET. Type 24" Inlet, including casting, shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Type 24" Inlet" complete in place and accepted by the ENGINEER.

1205-4.6 TYPE 24" INLET/MANHOLE. Type 24" Inlet/Manhole, including casting, shall be measured on an individual unit basis (EA) and be paid for at the unit price bid for "Type 24" Inlet/Manhole" complete in place and accepted by the ENGINEER.

1205-4.7 TYPE 36" INLET. Type 36" Inlet, including casting, shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Type 36" Inlet" complete in place and accepted by the ENGINEER.

1205-4.8 TYPE 72" INLET. Type 72" Inlet, including casting, shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Type 72" Inlet" complete in place and accepted by the ENGINEER.

1205-4.9 TYPE 108" OR LARGER INLET. Type 108" Or Larger Inlet, including casting, shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Type 108" or Larger Inlet" complete in place and accepted by the ENGINEER.

1205-4.10 CATCH BASIN. Catch Basins including castings shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Catch Basin" complete in place and accepted by the ENGINEER.

1205-4.11 REMOVE EXISTING CATCH BASIN OR INLET. Removing catch basins or inlets shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Remove Existing Catch Basin or Inlet" complete and accepted by the ENGINEER. This item is to include removing entire concrete structure and backfilling excavation with bedding material. Any salvaged casting shall be taken to the yard at the City of Mandan Public Works Facility at 411 6th Avenue SW.

1205-4.12 thru 4.18 (SIZE) INCH SLOTTED DRAIN. Slotted Drain shall be measured by the linear foot (LF) basis for "(Size) Inch Slotted Drain" complete in place and accepted by the ENGINEER.

SECTION 1206 – CASTING AND ADJUSTMENT

1206-1 DESCRIPTION

This item shall consist of furnishing and adjusting new castings on existing manholes in accordance with this section, the details and plans at the locations indicated on the plans, or as directed by the ENGINEER. This item includes adjusting new castings installed within the same project.

This item shall include the resetting of manhole frames and covers, inlet frames and covers, City water works valve boxes, or other accessories requiring adjustment to new lines and grades where such accessories are public property. Unless otherwise indicated on the plans, adjustments, replacements, and repairs to private property shall be exempt from this item.

This item shall include the furnishing of new castings, grating, or covers specifically indicated on the plans. The CONTRACTOR, however, will be required to replace, at its own expense, any damaged parts resulting from its operations.

1206-2 MATERIALS

1206-2.1 Materials shall conform to Subsection 1205-2.

1206-2.2 Flexible Foam Expansion Joint materials shall meet the requirements of ASTM D5249, TYPE 2, ASTM D1752, Sections 5.1 through 5.4 with the compression required modified to 10 psi and 25 psi maximum. This material shall be non-gassing and shall be compatible with hot pour joint sealants.

1206-3 CONSTRUCTION REQUIREMENTS

1206-3.1 GENERAL. The methods of construction shall conform insofar as applicable to the requirements of Section 1205.

Existing manholes, inlets, and valve boxes shall be adjusted to the elevation, grade, or dimensions as indicated on the plans and Standard Details or as ordered by the ENGINEER. The structures are assumed to be clean prior to the beginning of the adjustment construction unless otherwise agreed to by the CONTRACTOR and the ENGINEER. Castings shall be carefully removed and reinstalled by the CONTRACTOR as indicated. If the height of a rectangular casting is to be increased, the addition may be of solid concrete block or concrete as specified in Section 501. Solid concrete block shall not be used to increase the height of circular casting. In the event that the top part of the existing structure is weak and faulty, it shall be replaced as directed by the ENGINEER and the extension completed. Where the casting, grating, or cover is to be lowered, the masonry or concrete shall be removed to sufficient depth so that a seat of proper dimensions may be reconstructed to receive the casting, grating, or cover at the new grade. Castings shall be set in full mortar beds or otherwise secured as shown on the plans. Mortar shall be in accordance with Subsection 1205-2.2. Casting shall be

set accurately to correct elevation and line so that no subsequent adjustment will be necessary.

Upon completion of the adjustment, all surplus material shall be removed, and the structure and the site of the work shall be left in a neat and clean condition. The entire structure shall be thoroughly cleaned of any accumulation of silt, debris, or foreign matter of any kind and shall be free from such accumulations at the time of final inspection.

1206-3.2 WATER STOP BOX EXTENSION. Water service stop boxes are found within the area of construction very frequently. Adjustments in elevation that can be accomplished within the range of the adjustment sleeve of the stop box shall be considered incidental to the contract bid items. The CONTRACTOR is required to use due care in making these adjustments.

If the stop box cannot be extended to the proper grade within the above limits, it shall be adjusted by removing the lid and adding the required length and diameter of standard weight pipe with a standard pipe coupling and replacing the lid. The maximum adjustment shall be 2 feet under Bid Item 1206-4.10. Adjustments over 2 feet will be paid for under Section 126 of the Standard Specifications.

1206-3.3 WRAPPED UTILITY BOXES. Utility structures, excluding manholes, encased in concrete sidewalks and pavements, shall be wrapped with a Flexible Foam Expansion Joint. Wrapped structures include valve boxes, hydrants, curb stop boxes, street light poles and foundations, traffic signal foundations, pedestrian signal pole foundations, and street signs.

Minimum thickness of the Flexible Joint will be 1/2 inch used on curb stop boxes, hydrants, street signs, pedestrian signal foundations, and valve boxes. Minimum thickness for larger structures shall be 3/4 inch to 1 inch maximum.

1206-3.4 CASTING ADJUSTMENTS. All new and existing manholes located in concrete pavement surfaces shall have floating manhole castings installed as shown in standard details 1315A and 1315B. The casting shall be installed as shown on the detail.

All new and existing manholes outside the roadway surface shall have standard manhole castings and shall be paid for under Section 1206-4.17 Adjust Manhole Casting in Unpaved Area.

Valves, curb box extensions, and inlets shall confirm to the construction methods, and the measurement and payment shall meet the requirements of Section 1206.

1206-4 MEASUREMENT AND PAYMENT

1206-4.1 ADJUST MANHOLE CASTING IN ASPHALT PAVEMENT. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Adjust Manhole Casting" complete as detailed and accepted by the ENGINEER.

1206-4.2 FURNISH AND ADJUST MANHOLE CASTING IN ASPHALT PAVEMENT. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Furnish and Adjust Manhole Casting in Asphalt Pavement" complete as detailed and accepted by the ENGINEER.

1206-4.3 ADJUST TYPE 24" INLET CASTING. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Adjust Type 24" Inlet Casting" complete as detailed and accepted by the ENGINEER.

1206-4.4 FURNISH AND ADJUST TYPE 24" INLET CASTING. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Furnish and Adjust Type 24" Inlet Casting" complete as detailed and accepted by the ENGINEER.

1206-4.5 ADJUST TYPE 36" INLET CASTING. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Adjust Type 36" Inlet Casting" complete as detailed and accepted by the ENGINEER.

1206-4.6 FURNISH AND ADJUST TYPE 36" INLET CASTING. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Furnish and Adjust Type 36" Inlet Casting" complete as detailed and accepted by the ENGINEER.

1206-4.7 ADJUST TYPE 72" INLET CASTING. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for Adjust Type 72" Inlet Casting" complete as detailed and accepted by the ENGINEER.

1206-4.8 FURNISH AND ADJUST TYPE 72" INLET CASTING. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Furnish and Adjust Type 72" Inlet Casting" complete as detailed and accepted by the ENGINEER.

1206-4.9 ADJUST TYPE 108" OR LARGER INLET CASTING. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Adjust Type 108" or Larger Inlet Casting" complete as detailed and accepted by the ENGINEER.

1206-4.10 FURNISH AND ADJUST TYPE 108" OR LARGER INLET CASTING. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Furnish and Adjust Type 108" or Larger Inlet Casting" complete as detailed and accepted by the ENGINEER.

1206-4.11 ADJUST VALVE BOX IN ASPHALT PAVEMENT. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for "Adjust Valve Box" complete as detailed and accepted by the ENGINEER.

1206-4.12 WATER STOP BOX EXTENSION. This item shall be measured on an individual basis (EA) and paid for at the unit price bid for "Water Stop Box Extension" complete in place and accepted by the ENGINEER.

1206-4.13 WRAPPED UTILITY BOXES. This item shall be measured and paid at the unit price bid per each (EA) “Wrapped Utility Box” complete in place as detailed and accepted by the ENGINEER.

1206-4.14 ADJUST VALVE BOX IN CONCRETE. This item shall be measured on an individual basis (EA) and paid for at the unit price bid for “Adjust Valve Box in Concrete” complete as detailed and accepted by the ENGINEER.

Valve boxes located outside of concrete or paved areas, such as in street boulevards, shall be measured and paid for at one-half the unit price bid for “Adjust Valve Box.”

1206-4.15 ADJUST MANHOLE CASTING IN CONCRETE. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for “Adjust Manhole Casting in Concrete.

1206-4.16 FURNISH AND ADJUST MANHOLE CASTING IN CONCRETE. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for “Furnish and Adjust Manhole Casting in Concrete” complete as detailed and accepted by the ENGINEER.

1206-4.17 ADJUST MANHOLE CASTING IN UNPAVED AREA. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for “Adjust Manhole Casting in Unpaved Area” complete as detailed and accepted by the ENGINEER.

1206-4.18 FURNISH AND ADJUST MANHOLE CASTING IN UNPAVED AREA. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for “Furnish and Adjust Manhole Casting in Unpaved Area” complete as detailed and accepted by the ENGINEER.

1206-4.19 ADJUST VALVE BOX IN UNPAVED AREA. This item shall be measured on an individual unit basis (EA) and paid for at the unit price bid for “Adjust Valve Box in Unpaved Area” complete as detailed and accepted by the ENGINEER.