

PAVEMENT AND STORM SEWER SPECIFICATIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Storm sewers, 60 inches in diameter and smaller.
- B. Pavement for local roads.
- C. Audio-DVD/CD taping of existing and new storm sewer interiors.

1.2 STANDARDS

- A. All materials and construction shall be in accordance with the Standards and Specifications of the City of Perrysburg (the City) Department of Public Service/Utilities, and/or the American Society for Testing and Materials (ASTM), and/or the Wood County Engineer, and/or the Ohio Department of Transportation (ODOT) Construction and Material Specifications (CMS). In case of conflict, City Standards and Specifications shall take precedence.
- B. All references to Standards and Specifications are to the latest edition, unless otherwise noted.
- C. The City's Pavement and Storm Sewer Standard Details apply to these specifications.

1.3 PRE-CONSTRUCTION MEETING, INSPECTION, AND PERMITS

- A. The Department of Public Utilities (419-872-8050), shall be notified seven calendar days prior to the beginning of actual construction.
- B. Any work within the City's public rights-of-way requires a Street Opening Permit which is obtained from the Departments of Public Utilities, at 211 East Boundary Street, 419-872-8050.
- C. All storm sewer installation and testing shall be inspected by the City or its representative.
- D. The City or its representative shall be present during all storm sewer TV inspection and taping.

1.4 DEFINITIONS

- A. Bedding: Material placed under, beside and directly over the pipe for the full width of the trench, from a depth of 4 inches below the outside bottom of the pipe barrel, when the pipe is laid on its final grade, up to a horizontal plane a distance of 12 inches above the top of the pipe barrel.

1.5 REGULATORY REQUIREMENTS

- A. Construction operations shall comply with the City's Noise and Vibration Control Ordinance, Section 634.11, as follows:
  - 1. No person shall use any pile driver, shovel, hammer derrick, hoist tractor, roller or other mechanical apparatus operated by fuel or electric power in building or construction operations between 10:00 p.m. and 6:00 a.m. of the next day in a residential area or within 500 feet of a school or church, except for temporary conditions approved by the Service-Safety Director.
  - 2. No person shall perform any construction or repair work on any structure or building, or perform any excavation or road work, when such work entails the use of any power operated construction type device in such a manner that the noise created thereby substantially exceeds the noise customarily and necessarily attendant to the reasonable and efficient performance of such equipment.
  - 3. Whoever violates any of the provisions of this section is guilty of a minor misdemeanor for a first offense and a misdemeanor of the fourth degree for any subsequent offense. Punishment shall be as provided in Ordinance Section 698.02.
- B. In accordance with Ordinance 1040.07, Rule 24 of the City's Streets, Utilities, and Public Services Code, "The sewer contractor shall be required, for two years after the completion of the work, to make all necessary repairs, including filling and seeding if settlement occurs." The sewer contractor is the Contractor responsible for the performance of the Work.

1.6 QUALITY ASSURANCE

- A. Pipe Sewers, Manholes and Appurtenances:
  - 1. The manufacturer shall furnish an affidavit indicating that all pipe, fittings, manholes, catch basins and appurtenances have been manufactured and tested in accordance with the requirements of the applicable referenced Standards. A copy of the affidavit, indicating the project on which the material is to be used, shall be forwarded to the City prior to construction.
  - 2. All pipes, fittings, manholes, catch basins, and appurtenances shall be appropriately marked for identification purposes. The materials and methods of manufacture, and completed pipes, fittings, manholes, catch basins, and appurtenances shall be subject to inspection and rejection at all times. The City has the right to make inspections.
- B. Pipe Sewer Inspection:
  - 1. Contractor shall have a minimum of 5 years experience in inspection of pipeline sewers in addition to TV-DVD/CD and summary reports.
  - 2. Perform Work in accordance with the latest standards for TV-DVD/CD recording procedures.

- 3. Operation of equipment shall be controlled from above ground.
- 4. The City shall have access to view monitor at all times.
- 5. Inspection shall include pipe sewers from manhole to manhole.
- 6. New sewers and existing sewers shall have its own separate DVD/CD and separate documentation.
- 7. Label new and/or existing accordingly for all documentation.

1.7 RESTORATION

- A. All existing features that are disturbed due to construction activities, such as mailboxes, shrubs, bushes, guardrails, pavement markings, swales, sewers, catch basins, curbs, seeded areas, etc., shall be replaced to their original condition, unless otherwise specified, in accordance with current ODOT specifications and to the satisfaction of the City. Existing survey monuments, bench marks, property corner points, and control points damaged or disturbed by construction shall be replaced by a registered land surveyor, licensed in the State of Ohio.
- B. Restoration of street openings shall be in accordance with the City's Standard Street Opening Repair Details.
- C. In existing streets, provide a temporary pavement upon completion of backfilling operations and maintain same until the permanent pavement can be placed. Temporary pavement shall be a minimum 2-inch thick asphalt concrete mix in accordance with ODOT Item 614.13.
- D. Regrade and reshape all road shoulders and all ditches and swales from existing high points to existing drainage structures or other outlets along the proposed improvement. Ditches which are reshaped shall have reasonable side slopes. Vertical or steep slopes will not be permitted.
- E. Seed all disturbed earth areas using the hydroseed method or placement of sod, both seed mixture and sod type shall be as approved by the City.

1.8 DESIGN REQUIREMENTS

- A. PVC Plastic Pipe and Fittings: Sewers 36 inch in diameter and smaller shall be of PVC plastic pipe and fittings, or other material as approved by the City.
- B. Concrete Pipe and Fittings: Sewers greater than 36 inch in diameter shall be Reinforced Concrete Pipe (RCP), ASTM C76 of Classes noted on Drawings, spigot and socket pattern, pipes of greatest lengths commercially available; ASTM C443 rubber gasket joints with gasket confined in a groove. Branches on fittings in the main line for connections shall be of the same material and incorporate joints as specified for the type of pipe which will be connected. Branches shall be cast with the concrete pipe by the pipe manufacturer and shall not be done in the field;

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maximum allowable depths (ground surface to invert) and the maximum allowable trench widths (at the top of the pipe) for the various classes and sizes of ASTM C76 reinforced concrete pipe shall be as follows:

<u>ASTM C76</u>		<u>CLASS II</u>		<u>CLASS III</u>	
Pipe Diameter	Depth	Trench Width	Depth	Trench Width	
42 inch	12'	6'-3"	16'	6'-3"	
54 inch	13'	7'-6"	16'	7'-6"	
60 inch	14'	8'-0"	18'	8'-0"	

  

<u>ASTM C76</u>		<u>CLASS IV</u>		<u>CLASS V</u>	
Pipe Diameter	Depth	Trench Width	Depth	Trench Width	
42 inch	25'	6'-3"	35'	6'-6"	
54 inch	25'	7'-6"	35'	8'-0"	
60 inch	27'	8'-0"	35'	8'-6"	

- C. Manholes shall not be designed or constructed to be located within the landscaped islands of cul-de-sacs.

1.9 SEWER INSPECTION SYSTEM REQUIREMENTS

- A. Camera:
  1. Capable of operation in 100 percent humidity conditions.
  2. Specifically designed and constructed for intended service.
  3. Resolution: 500 lines per inch; color image.
  4. Provided with built-in lighting system.
  5. Provide remote operation of lighting system and camera.
  6. Provide with pan and tilt rotating head capabilities.
  7. Footage Meter: Provide equipment with a footage meter so that the location of the camera and point of observation is known at all times.
- B. Monitor:
  1. Located inside mobile TV studio large enough to accommodate a minimum of four people to view the monitor at all times.
  2. Capable of providing a color picture.
- C. DVD/CD Recorder:
  1. Compatible with closed circuit TV to allow for direct recording during inspection.

PART 2 PRODUCTS

2.1 PIPE MATERIAL

- A. PVC Plastic Pipe and Fittings:
  1. ASTM **D3034** (6" thru 15" pipe sewer at manufacturer's recommended depth).
  2. ASTM **F679** (18" thru 21" pipe sewer at manufacturer's recommended depth).

3. ASTM **F794** Ultra Rib (24 " thru 30" for depth up to 22'), **ASTM F949** A-2000 (24" thru 36" for depths up to 22'), or **ASTM F1803** Vylon (24" thru 36" pipe sewer at manufacturer's recommended depth), as applicable and approved by the City, for the sizes involved, minimum pipe stiffness of 46 psi at 5 percent deflection when tested in accordance with ASTM D2412, ASTM D3212 elastomeric gasket joint (integral bell), push-on type with bell designed to retain the gasket to prevent pull-out during making of the joint.
4. An exception shall be made for ASTM D3034 PVC plastic fittings 8 inches in size and smaller, with such fittings to have a minimum wall thickness of SDR 35 as defined in Section 7.4.1, and elastomeric joints and minimum socket depths in accordance with Sections 6.2 and 7.3.2; to be molded in one piece using ASTM D1784 having a cell classification of 12454-B or C, or 12364-A; ASTM F477 gaskets having a minimum cross sectional area of 0.20 sq. In.

- B. Concrete Pipe and Fittings: ASTM C76 of Classes noted on Drawings, spigot and socket pattern, pipes of greatest lengths commercially available; ASTM C443 rubber gasket joints with gasket confined in a groove.

2.2 MANHOLES AND CATCH BASINS

- A. Materials:
  1. Precast Concrete Sections: ASTM C478.
  2. Cast-In-Place Concrete: ODOT Class C concrete.
  3. Concrete Fill: ODOT Class F concrete.
  4. Rubber Gasket Joints: ASTM C443.
  5. Manhole Steps: ASTM C478.
  6. Castings: ASTM A48, Class 30B heavy duty gray iron.
  7. Mortar: ASTM C270, Type S with no masonry cement; compose using two parts Portland cement to two parts sand by volume.
  8. Stone Fill: Standard size number 67 stone or as otherwise approved.
  9. Grout: Non-shrinking and non-corrosive: Five Star Grout by Five Star Products, Inc.; Sealtight 588 Grout by W.R. Meadows, Inc.; or as approved.
- B. Components:
  1. Bases: Integral or separate base riser and base slab; openings for pipe to be preformed or cored by manufacturer, with openings exceeding pipe outside diameter by more than 6 inches cause for rejection, provide transition sections when base is greater than 48 inches diameter.
  2. Walls: Vertical precast concrete riser sections with rubber gasket joints.
  3. Tops: Eccentric cone top section narrowing down to a minimum 3-inch high vertical neck with an inside diameter of not less than 24 inches and outside diameter not less than that of grade rings, except reinforced flat slab top for manholes and catch basins too shallow to accommodate a

cone section; design flat slab tops to withstand H-20 traffic loading and submit design calculations to the City upon request. Provide grade rings for a minimum height of 4 inches and a maximum height of 12 inches as required to set castings at proper elevation; ring inside diameter equal to the top section access opening, and outside diameter not less than the outside diameter of the casting frame.

4. Manhole Steps: Aluminum or reinforced polypropylene.
5. Rear Yard catch Basin: ASTM C14, class 2 Non-reinforced concrete pipe with knockouts as indicated.
6. Manhole and Catch Basin Frames and Covers or Grates:
  - a. Manhole Frame and Cover: East Jordan Iron Works, Inc. (EJWI) Catalogue 1040 with solid lid type B or as approved; machined surface, frame with 24 inch diameter clear opening, and 7 inch height, Lids to have "CITY OF PERRYSBURG, OHIO" – "STORM" cast into top.
  - b. Manhole and/or Catch Basin Flat Frame and Grate: East Jordan Iron Works, Inc., Catalogue No. 1040 frame with Type M1 flat grate, or as approved; machined surface, frame with 24 inch diameter clear opening, and 7 inch height.
  - c. Catch Basin Inlet Frame and Grate in Roll Curb: Neenah Foundry Company, R-3501 inlet for roll type curb, or as approved; inlet grate shall be either TR (flow right) or TL (flow left) as required for each application and shall conform to contour of curb section.
  - d. Catch Basin Inlet Frame and Grate in Straight Face Curb and Curb and Gutter: Neenah Foundry Company, R-3274-A curb box with Type C grate; or as approved; curb box to conform to contour of curb section; picture of a "FISH" and "DUMP NO WASTE" – "DRAINS TO RIVER" cast into top of curb box; provide flat curb plate as required; complete with anchor bolts for embedment in concrete curb.
  - e. Catch Basin Frame and Convex Grate in Front Lawn Area: Neenah Foundry Company, R-1643 with Type B standard convex grate, or as approved; machined surface, frame with 24 inch diameter clear opening, and 7-1/2 inch height.
  - f. Catch Basin Frame and Grate in Rear Lawn Area: Neenah Foundry Company, R-5901-E frame with R-2564 grate, or as approved.

2.3 BEDDING MATERIALS

- A. Granular: ODOT Item 703, Size No. 67 or No. 57 crushed limestone.
- B. Concrete Encasement: ODOT Class C concrete.

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### 2.4 BACKFILL

- A. Earth Backfill: Excavated earth material. Use finely divided material, free of stones 3 inches or greater in any dimension, to at least 3 feet above pipe top.
- B. Granular Backfill: ODOT Item 304, crushed limestone.
- C. Controlled Density Fill (CDF): A mixture of Portland cement, fly ash, and selected granular materials with a compressive strength of 100 psi; Kuhlman Corporation "K-Krete", or as approved.

### 2.5 LOCAL ROADS

- A. Asphalt Concrete Pavement:
  - 1. 1-1/2 inches ODOT Item 448, Type 1 (medium traffic) Surface Course, PG 64-22.
  - 2. 2 inches ODOT Item 448, Type 2 (medium traffic) Intermediate Course, PG 64-22.
  - 3. 10 inches ODOT Item 304, Aggregate Base (placed in 2 lifts).
  - 4. On aggregate base, apply ODOT Item 408 Prime Coat at rate of 0.35 gallons per square yard. Installation to be as directed by the City.
  - 5. ODOT Item 407; apply tack coat at the rate of 0.04 gallons per square yard to be placed between intermediate and surface courses and joints.
  - 6. Sealer for Contact and Mating Surfaces and Joints: Comply with ODOT Items 401.14 and 401.17.
  - 7. Pavement Sealer: When requested by and as approved by the City.
- B. Concrete Driveways and Parking Areas:
  - 1. Pavement: ODOT Item 452 Non-Reinforced Portland Cement Concrete Pavement.
    - a. Commercial Drives: minimum 9 inch thick or match existing
    - b. Residential Drives: minimum 6 inch thick or match existing
  - 2. Reinforcement: Match existing.
  - 3. Hook Bolts:
    - a. Provide 5/8-inch hook or deformed bolts where new abuts existing.
    - b. Furnish and install at 30 inches center-to-center where new abuts existing longitudinally.
    - c. When thickness is less than 10 inches, as determined by the City, furnish and install at 20 inches center-to-center where new abuts existing transversely.
    - d. When thickness is greater than 10 inches, as determined by the City, furnish and install at 26 inches center-to-center where new abuts existing transversely.
- C. Concrete Curbs: ODOT Item 609.04; Class C concrete.

- D. Pipe Underdrains: ODOT Item 605 using pipe 706.06, 706.07, 706.08 or 707.41.

### 2.6 MONUMENT ASSEMBLY (IN PAVED AREAS)

- A. Neenah Foundry Company, R-1978-A2 with bolted lid.

### 2.7 CURB RAMP DETECTABLE WARNING TRUNCATED DOMES

- A. Materials:
  - 1. Follow current ODOT Specifications 712.14 as modified herein:
  - 2. Truncated Domes: Shall consist of cast-in-place reinforced polymer composite tiles.
  - 3. Material supplied shall be red color, and installed by pressing tiles into place in the freshly poured concrete.
  - 4. Material supplied and installed shall meet ODOT Standard Drawings and current approved products as listed at: <http://www.dot.state.oh.us/Divisions/Engineering/Roadway/DesignStandards/roadway/Pages/Approved%20Products.aspx> (DETECTIBLE WARNINGS)
- B. Concrete: ODOT Class C.

## PART 3 EXECUTION

### 3.1 STORM SEWER PIPE AND FITTINGS

- A. Install PVC plastic pipe and fittings in accordance with ASTM D2321 and the requirements of these specifications.
- B. Install concrete pipe within the maximum allowable depths (ground surface to invert) and the maximum allowable trench widths (at the top of the pipe) as specified in 1.8.B.
- C. Excavate trenches to a depth of 4 inches below the outside bottom of the pipe barrel and bell when the pipe is laid on its final grade to allow for bedding material.
- D. Place bedding material (ODOT No. 67 or No. 57 crushed limestone) under, beside, and to 12 inches over the pipe sewer for the full width of the trench; place in 6 to 12-inch layers, loose measure, and work the crushed stone around the pipe to provide even support, to fill all voids, and to lightly compact the crushed stone (by hand).
- E. Install pipe at a minimum 10 feet horizontal distance from water mains and hydrants, and lay pipes at a minimum 18 inches vertical distance from water mains at their crossing, both as measured between the outside of the pipe walls. At crossings, install one full length of pipe so both joints will be as far from the main as possible.

- F. From the top of the bedding to a point 5 feet below the adjacent ground level, backfill trenches in and within 5 feet of the edge of existing and proposed paved or stoned streets, alleys, and parking areas with granular material (ODOT No. 304 crushed limestone). Place the crushed limestone material in maximum 36-inch layers, loose measurement. Mechanically level the crushed stone and compact each layer with an excavator-mounted vibratory plate compactor that produces a rated compactive force of at least 9 psi. Each layer to receive a minimum of two complete passes, except where CDF is indicated on the Drawings.
- G. The top 5 feet of the trench shall be backfilled with granular material (ODOT No. 304 crushed limestone). Place the crushed limestone material in maximum 12-inch loose layers and mechanically compact to not less than 100 percent of the maximum dry unit weight as determined in accordance with ASTM D698 (Standard Proctor), except where CDF is indicated on the Drawings.
- H. For trenches within 5 feet from the edge of existing and proposed paved or stoned streets, alleys, and parking areas, backfill with compacted granular material as specified above for trenches coming within same.
- I. For backfilling trenches yard and grass areas, replace as much of the excavated material as possible. Until backfilling has progressed to a depth of at least 3 feet over the top of the pipe barrel, use finely divided material, free of stones 3 inches or greater in any dimension, boulders and other harmful debris, and place in 18-inch layers, loose measurement, and compact by mechanical tamping. Place remainder of backfill in maximum 12-inch layers, loose measurement, and compact by mechanical tamping.
- J. For backfill trenches within 5 feet of existing and proposed sidewalks and driveways, replace as much of the excavated material as possible. Until backfilling has progressed to a depth of at least 3 feet over the top of the pipe barrel, use finely divided material, free of stones 3 inches or greater in any dimension, boulders and other harmful debris, and place in 12 inch layers, loose measurement, and compact by mechanical tamping. In no case shall the camaction be less than 92% as determined by the Standard Proctor Test.
- K. Changes in pipe material to meet City Specifications shall occur only at manholes and catch basins.

### 3.2 MANHOLES AND CATCH BASINS

- A. All manholes and catch basins shall be installed without sumps or traps.
- B. Install base with top surface level; install on cushion of approved compacted granular material, minimum of 3 inches thick.

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- C. For pipe connections, fill area between pipe and opening with grout, inside and outside of structure.
- D. Install wall sections plumb and level. When walls include steps, install with steps in the center of a traffic lane or between lanes where possible when in pavement, and, when outside pavement, with steps located away from the pavement edge unless the manhole is within a ditch line, then locate steps on the high side of the ditch slope.
- E. Set grade rings in a full bed of mortar and mortar the interior of the grade rings to provide a smooth common surface from frame to top.
- F. Set casting frames firmly on top of grade rings with a full leveling bed of 1:1 cement mortar; in paved areas, make casting top 1/4 inch below top of pavement surface; in unpaved streets and alley areas, set the cover not to exceed 1 inch above the ground surface. On right-of-way and in ditches cover elevation shall be as approved by the City.
- G. If not integrally cast with the base, after pipe installation provide an Class F concrete invert having a depth equal to 1/2 the sewer pipe diameter and sloping upward toward walls approximately 3 inches; trowel concrete smooth. For concrete inverts integrally cast with the base, fill any void between base and wall with Class F concrete to match top of shaped invert.
- H. Encase all manhole frames located in pavement in concrete extending from a horizontal plane 4 inches below the lowest grade ring up to the top of the frame, unless otherwise shown or noted. Make the concrete encasement circular in plan by using a minimum 48-inch diameter steel casing ring as a form, centered on the frame.
- I. For rear yard catch basin, pour a 4 inch thick Class C concrete base upon compacted subgrade. Install catch basin pipe to finish grade, bell end up, upon base; connect pipes, and backfill; set frame and grate.
- J. Each lot shall have direct access to a rear yard catch basin, per the standard details.
- K. Manholes and catch basins shall be located no further than 15 feet behind back of curb or edge of pavement unless approved by City of Perrysburg.

### 3.3 SERVICE CONNECTIONS

- A. Provide for existing and future houses and businesses; minimum 6 inches in diameter unless otherwise shown; maximum two service connections per lateral; install at 1 percent slope.
- B. New pvc pipe sewers 27 inch diameter and less: connect to the main sewer by providing an appropriate sized manufacturer wye.

- C. New pvc pipe sewer connections: greater than 27 inch diameter: for services up to 15 inch diameter connect to the main sewer by making a direct connect by providing an inserta tee manufactured by Inserta Fittings, or as approved by the City, for up to 8 inch diameter services, connect to the main sewer by using an appropriate size stainless steel sewer pipe saddle, as manufactured by General Engineering Company.
- D. Existing pvc sewer pipe sewer connections: for up to 15 inch diameter services, connect to the main sewer by making a direct connect by providing an inserta tee manufactured by Inserta Fittings.
- E. New and existing concrete pipe sewers 12 inch diameter and larger: for 6 and 10 inch diameter services connect to the main sewer by providing a Kor-N-Tee pipe to pipe lateral connector as manufactured by NPC. Hole shall be cored by using a diamond bit drill of the appropriate size. For 12 inch and 15 inch diameter, connect to the main sewer by providing an inserta tee manufactured by Intera Fittings.
- F. Install 3 feet minimum into each lot, or as otherwise noted, true to line and on at least 1 percent grade with a minimum depth of 5 feet at the plug or the maximum depth possible for main sewers less than 5 feet deep.
- G. Provide riser sections of pipe and fittings between the main line sewer connection and that portion installed on at least a 1 percent grade where depths to the main sewer invert exceed 12 feet. Fix riser in place for its full height by providing thoroughly tamped pipe embedment material as shown.
- H. Close service connections not immediately connected to an existing sewer with a sewer pipe plug. Plug shall be specifically designed for use with the pipe, shall be for use as a permanent or temporary plug, shall be watertight, and shall be removable without damaging the pipe.
- I. Do not backfill the ends of service connections until the location is referenced in accordance with the detail on the Drawings. Provide a 2-inch square oak pole accurately placed over the terminus of each service connection and extending vertically flush with the surface of the ground so that it can be located.

### 3.4 CONNECTIONS TO STRUCTURES AND PIPES

- A. Connect new sewers to structures through stubs, wall castings, wall sleeves, etc. provided for same, or make an opening at the proper elevation in the wall of the structure, insert the pipe, and neatly and permanently close the opening around the pipe with grout.
- B. Make connections watertight.

- C. Where necessary, reshape the bottoms of existing structures to give a smooth flow in all directions.
- D. Connect unlike types and sizes of pipe using proper adapter or connector by Fernco, Inc., Joints, Inc., or as approved.

### 3.5 SEWER INSPECTION

- A. Preparation:
  - 1. Upon successful completion of all testing verify with the City new and existing sewers to be TV inspected.
  - 2. Flush and clean sewer interiors to remove sludge, dirt, sand, stones, grease, debris, and other materials from the pipe to ensure clear view of interior conditions.
  - 3. Contractor shall intercept debris at downstream manhole, remove and disposed at an approved location off-site. Provide written documentation to the City indicating disposal site location.
  - 4. Provide materials, labor, equipment, power, and maintenance to implement a temporary by-pass pumping system around the work area for time required to complete TV inspection.
  - 5. Coordinate with the City proposed time and duration of by-pass pumping.
- B. Closed-Circuit TV (CCTV) Camera System:
  - 1. Use equipment specifically designed and constructed for closed-circuit sewer inspection.
  - 2. Utilize camera with pan and tilt capabilities to view entire sewer and each lateral connection at multiple angles.
  - 3. Provide appurtenances and artificial lighting as required to enhance the quality of the inspection.
  - 4. Use equipment capable of traveling upstream and downstream.
- C. Inspection Operations:
  - 1. The camera shall be moved through the pipe sewer in either direction at a moderate rate (at no time shall the speed be greater than 30 feet per minute).
  - 2. The camera shall be stopped when necessary to permit proper documentation of the sewer's condition.
  - 3. All service connections and inlets shall be noted on the tape.
  - 4. Manual winches, power winched, TV cable and powered rewinds or other devices that do not obstruct the camera view or interfere with proper documentation of the sewer conditions shall be used to move the camera through the sewer line.
  - 5. When manually operated winches are used to pull the television camera through the sewer, telephones or other suitable means of communication shall be set up between the two manholes on the section being inspected to insure good communications between members of the crew.
  - 6. Documentation made during inspection operations must conform to the following guidelines:

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- a. Meet minimum standards for CCTV inspection of sewers as prepared by the National Association of Sewer Service Companies (NASSCO).
- b. Log Sheet: A written log sheet must accompany each DVD/CD.
- c. For new sewers, Contractor shall utilize and make reference to manhole numbering as shown and indicated on the project Drawings.
- d. For existing sewers, Contractor shall prepare and provide a map indicating manhole numbering.
- e. Reference to new and existing manhole numbers on the DVD/CD, summary report, and pictures shall be consistent with the numbering sequence on the Drawings and on the map provided by Contractor.

### 3.6 LOCAL ROADS (UNLESS OTHERWISE APPROVED OR DIRECTED)

- A. Prepare subgrade in accordance with ODOT Item 203. Where it is necessary to construct pavement subgrade in fill, remove the existing topsoil beneath the proposed subgrade.
- B. Asphalt Concrete Pavement:
  1. ODOT Item 304; construct a 10-inch thick aggregate base in two equal lifts.
  2. ODOT Item 408; apply prime coat at the rate of 0.35 gallons per square yard to the aggregate base. Installation to as be directed by the City.
  3. ODOT Item 448; construct a 2-inch thick asphalt concrete intermediate course.
  4. ODOT Item 448; construct a 1-1/2-inch thick asphalt concrete surface course.
  5. ODOT Item 407; apply tack coat at the rate of 0.04 gallons per square yard to be placed between intermediate and surface course and joints.
  6. Pavement sealer; apply as instructed by manufacturer.
- C. Concrete Driveways and Parking Areas: ODOT Item 452.
- D. Concrete Curbs: ODOT Item 609.04 Type 2 Combination Curb and Gutter or Type 6 Curb.
- E. Pipe Underdrains: ODOT Item 605.03, and as shown on ODOT Standard drawing DM-1.2 and approved Drawings.

### 3.7 MONUMENT ASSEMBLY (IN PAVED AREAS)

- A. Place Type C monuments in accordance with ODOT Item 604, and Standard Construction Drawing RM-1.1.

### 3.8 CURB RAMP DETECTABLE WARNING TRUNCATED DOMES

- A. Material to be supplied shall meet ODOT's Office of Roadway Engineering Services Truncated Domes Approved List.

- B. Installation shall be in accordance with ODOT's latest Standard Construction Drawings for New Curb Ramps (with Truncated Domes) BP-7.1 and Retrofitted Curb Ramps BP-7.2.
- C. All curb ramps/retrofitted curb ramps shall include new ODOT Class C concrete where truncated dome material is to be installed.
- D. The City will approve proposed material to be installed.

### 3.9 FIELD QUALITY CONTROL

- A. The City may check compaction of the bedding and backfill at any time.
- B. All testing shall be in the presence of the City or its' representative.
- C. For compacted bedding and backfill in trenches and for concrete work, the City may require the employing a testing laboratory to make tests on Site.
  1. The City will pay for required testing that meets the City bedding and backfilling specifications.
  2. Contractor shall pay for any retesting required to meet specifications.
- D. Deflection Test:
  1. Test 8-inch diameter and larger PVC plastic pipe for a maximum deflection of 5 percent not less than 30 days after final full backfill has been placed, as determined by the City.
  2. Conduct deflection tests with a representative of the City present.
  3. Repair or replace pipes exceeding a deflection of 5 percent and then retest until satisfactory test results are obtained. Retesting shall not take place prior to 30 days after the pipe repair/replacement and backfill have occurred. For sewers requiring retesting for deflection and previously tested for leakage, upon obtaining satisfactory deflection test results, retest the affected sewer section for leakage.
  4. Conduct tests by pulling an approved deflection probe, having a diameter not less than 95 percent of the base inside diameter or average inside diameter of the pipe depending on which is specified in the ASTM Specification, including the appendix, to which the pipe is manufactured, through the sewer line without mechanical pulling devices. Have a proving ring with an inside diameter equal to the outside diameter of the probe available at the time the probe is used to verify that the probe has the proper diameter by inserting the probe into the ring. The pipe shall be measured in accordance with ASTM D2122.
  5. Deflection Probe: By Wortco, Inc., Burke Concrete Accessories, Inc., or as approved; designed specifically for testing the deflection of the type and size of pipe subject to test, and complying with the following:

- a. Odd number (no less than 9) of 1/2 inch by 3/16 inch bar stock runners equally spaced on edge around and welded to the circumference of two minimum 1/4 inch thick circular steel plates.
- b. Distance between plates, out-to-out, of not less than 2 inches smaller than the nominal diameter of the pipe to be tested, with runners extending approximately 1-1/2 inches beyond each plate being bent inward for this distance at approximately 30 degrees.
- c. Continuous 3/4-inch threaded rod through the center of the plates, having a hex nut drawn tight against the inside face of each plate, and extending each side as required for providing a 3/4-inch ferrule loop insert or similar piece for attaching the pulling medium.

### 3.10 MAINTENANCE OF TRAFFIC

- A. Two-way traffic shall be maintained at all times on dedicated roads. If construction along dedicated roads interferes with traffic, Contractor shall provide two flaggers and other traffic control devices in accordance with the latest edition of the Ohio Manual of Uniform Traffic Control Devices.