

**STANDARD SPECIFICATION  
FOR SANITARY SEWER SYSTEMS  
GREENFIELD WASTEWATER TREATMENT AND COLLECTION DEPARTMENT**

**PART 1        GENERAL**

**1.01    SCOPE**

This specification addresses the City of Greenfield standards for materials and installation of sanitary sewers and manholes. The Contractor/Developer shall be responsible for all labor, material and equipment required to complete the work as specified.

**1.02    DEFINITIONS**

The following definitions/abbreviations shall apply,

ASTM - American Society for Testing and Materials, latest edition

City - City of Greenfield

Engineer - Greenfield City Engineer

IDOH - Indiana Department of Highways

NPDES - National Pollutant Discharge Elimination System

**1.03    SUBMITTALS**

- A.    Product data sheets shall be submitted on all Contractor supplied materials including pipe, manholes, pipe couplings, wyes, tees, and other miscellaneous products proposed for use.
- B.    Submit certified sewer testing results.
- C.    Record drawings shall be supplied to the City within 90 days of the completion and acceptance of the sanitary sewers. The record drawings shall be submitted as hard copy as well as CAD drawing file.

#### 1.04 QUALITY ASSURANCE

##### A. Codes and Standards

1. Comply with ASTM and IDOH Standard Specification standards to the extent indicated by reference herein. All references shall imply the latest revision.
2. Comply with requirements of Greenfield authorities having jurisdiction for work along property lines and on public property.

##### B. Installers Qualifications

Contractor shall have no less than three years experience in the installation of sanitary sewers systems of the type required.

#### 1.05 PROJECT CONDITIONS

Should unknown active utilities be broken during excavation work, stop work immediately. Do not proceed further with work until decision has been reached regarding repair, removal or relocation of utilities. Notice must be made to the Greenfield Wastewater and Collection System Department.

#### 1.06 SEQUENCING AND SCHEDULING

Contractor shall submit proposed detailed construction sequence including schedule for bypass pumping and connection to existing sanitary sewer system.

### **PART 2 PRODUCTS**

#### 2.01 MAINLINE SEWERS

Pipe for mainline sewers shall be a minimum 8-inch diameter or larger as indicated for the particular project. Unless otherwise approved by the City, the mainline sewers shall be PVC pipe conforming to ASTM D 3034 (SDR 35) with cell classification 12454 "B" or "C". Pipe shall be the integral wall bell and spigot type with elastomeric seal joints.

#### 2.02 BUILDING LATERALS

Pipe for building laterals shall be a minimum 6-inch PVC meeting the requirements of ASTM D 3034, SDR 35. Pipe shall have flexible gasket push-on compression type joints. Cleanouts shall be provided for each lateral. Cleanout shall be 6-inch diameter minimum.

#### 2.03 MANHOLES

- A. Manholes shall be precast concrete complying with ASTM C 478. The minimum inside diameter shall be 48 inches. Manhole sections shall be jointed with rubber type O-ring gaskets. A 6-inch minimum width of butyl rubber coating on exterior of manhole shall be applied at each joint to prevent leakage.

- B. Manhole steps shall conform to ASTM C 478. Manholes shall be furnished with steps placed a maximum 16 inches apart with the first step placed no greater than 2 feet below the top of the frame.
- C. Joint seal system for the setting of a manhole casting shall be Infi-Shield Uniband or equivalent. The manufactured joint seal shall be made of a high quality EPDM rubber with a minimum thickness of 60 mils that meets or exceeds ASTM C 923. The joint shall have 2-inch wide mastic strips on the top and bottom of the roll. The mastic shall be non-hardening butyl rubber sealant that meets or exceeds ASTM D 0990-94. The seal shall be designed to prevent leakage of water into the manhole.
- D. Precast concrete adjustment rings or rubber riser rings equivalent to Infra-Riser Multi-Purpose Rubber Adjustment Risers may be used to adjust casting height. The adjusting rings shall not exceed a total height of 12-inches. Non-hardening butyl rubber sealant shall be installed between cone, riser rings and casting. Sealant shall meet or exceed ASTM D 0990-94.
- E. All pipe connections to the manhole shall be contour sealed on the interior of the manhole using Preco sealer or equivalent.
- F. Manhole covers shall be Type "A" cast iron ring and cover to conform to ASTM A 48. All sanitary manholes that lay in or along a stream, swale or open storm channel shall have locking or bolt down lids with an inside seal between the lid and casting. Manholes lids shall be stamped "CITY OF GREENFIELD, SANITARY". Casting shall be East Jordan Ironworks 1020 casting and 1022 lid, or equal.

## 2.04 JOINTS

Gasket joints shall be used for PVC and Truss pipe. The gaskets shall be installed in accordance with ASTM C-425, latest revision.

## 2.05 BEDDING MATERIAL

Bedding for the mainline sewers shall be No. 8 stone. Bedding for building laterals shall be either sand or No. 8 stone.

# **PART 3 EXECUTION**

## 3.01 BONDS, LOCATES AND PERMITS

- A. The Contractor shall furnish all bonds necessary to get permits from the City of Greenfield prior to starting construction.
- B. It shall be the responsibility of the Contractor to determine the location of existing utilities 24 hours prior to any construction or excavating. The Contractor will be further responsible for maintaining operation of the active utilities. The Engineer will not be responsible for any damage caused by an erroneous location shown or by the omission of a utility location on the plans.

- C. The Developer shall be responsible for all approvals, permits and easements. The Developer shall dedicate all sanitary sewers and easements containing sanitary sewers.

### 3.02 PRE-CONSTRUCTION CONFERENCE

Prior to the beginning of any construction on the project site, a pre-construction conference will be scheduled with the City.

### 3.03 GENERAL REQUIREMENTS

- A. The current City of Greenfield Sanitary Sewer specification shall prevail as to materials and methods of construction.
- B. All future sewer installation, either connected to or extended from this system shall be constructed in accordance with these specifications.
- C. All lots shall be served by a 6-inch diameter sanitary sewer, as a minimum.
- D. Roof drains, footing drains and/or surface water drains shall not be connected to the sanitary sewer system, including temporary connections during construction.

### 3.04 EROSION CONTROL

The Contractor shall be responsible for temporary erosion control measures during construction (i.e. straw bales around storm inlets and swales which exit the site). Where required, the Contractor shall be responsible for obtaining a Storm Water NPDES permit for the project.

### 3.05 TRENCH SAFETY AND CONFINED SPACE ENTRY

The Contractor is responsible for safety at the job site. Compliance with all State and Federal safety regulation, including but not limited to construction trench safety and confined safety entry regulations, shall be the responsibility of the Contractor.

### 3.06 SEPARATION DISTANCES

- A. Sewer and Water Main Separation
  - 1. Sewers and water mains shall be laid with at least a 10-foot horizontal separation. The distance shall be measured edge to edge. In cases where it is not practical to maintain a 10-foot separation, deviation may be allowed on a case-by-case basis. Such deviation may allow installations of sewers and water mains closer provided that the water main is in a separate trench or on an undisturbed earth shelf located on one side of the sewer and at an elevation so the bottom of the water main is at least 18-inches above the top of the sewer.
  - 2. For crossings of water main and sewers, a minimum 18-inch vertical separation between the two pipe shall be provided as measured from the outside of the sewer to the outside of the water main. The crossing shall be arranged so that

the sewer joints will be equidistant and as far as possible from the water main joints.

3. Where it is impossible to obtain proper horizontal or vertical separation, as indicated above, both the water main and sewer shall be constructed of ductile iron pipe with mechanical joints complying with public water supply design standards and be pressure tested to 150 psi to assure water tightness before backfilling.

B. Other Separations

All sewers shall be a minimum 10 feet horizontally from all ditches, creeks and ponds.

3.07 TRENCHING, BEDDING AND BACKFILL

- A. The minimum trench width shall be 1.25 times the pipe outside diameter plus 12 inches. Minimum depth of cover for mainline sewers shall be 54 inches.
- B. Bedding for all sewer pipes shall be placed from 4 inches below the pipe barrel to 6 inches above the pipe.
- C. Fills placed under any street or sidewalk or within the building pad areas shall be compacted to 95% maximum density as determined by procedures outline in ASTM D 1557.
- D. All trenches within 5 foot of roadway or sidewalk shall be full-depth backfilled with granular material to conform to standard plans 92-02892-01 compacted per IDOH Standard Specification Section 211. Sanitary sewers shall be backfilled with sand or suitable material in 1-foot layers and mechanically tamped. Remainder of trench shall be filled in 6-inch layers and solidly tamped to subgrade of base of pavement.
- E. Manholes shall be placed on a minimum 6 inches of No. 2 crushed stone which has been mechanically compacted. Where unstable or poor soil conditions exist, additional No. 2 crushed stone or Class B concrete shall be placed to form a stable base. The remainder of the manhole shall be backfilled using No. 53 stone. Stone shall be placed in 12-inch lifts and mechanically compacted to 95 percent maximum dry density per ASTM D 698.
- F. Sanitary sewers not required to be backfilled with granular material may be backfilled using excavated material meeting the requirements of Class I, II or III backfill material as defined by ASTM D 2487.
- G. Prior to sewer backfilling, sewer detection tape, 2-inch wide minimum, shall be laid 1 foot below finish grade directly above all laterals.

3.08 SANITARY SEWER CONSTRUCTION

- A. The mainline sewer shall be constructed at the following minimum grades,

8-inch	0.40 %
10-inch	0.28 %
12-inch	0.22 %

15-inch	0.15 %
18-inch	0.12%
21-inch	0.10 %
24-inch	0.08%

- B. Lateral sewers shall be laid at a minimum slope of 1/4 inch per foot, unless otherwise approved by the City. Lateral connections to the mainline sewer shall be by wye or tee connections. No saddle connections will be allowed. No lateral shall directly discharge to a manhole unless approved by the City.

### 3.09 MANHOLE CONSTRUCTION

- A. The maximum distance between manholes shall be 400 feet. Manholes shall be placed where pipe align, slope, material and/or size change.
- B. Connections to all manholes (new or existing) shall be core drilled and booted. These taps shall be cored into the manhole between the spring line of the sewer or no more than 24 inches above the flow line. Manhole connections shall not protrude past the interior of the wall of the manhole.
- C. The flow channel through manholes shall be U-shaped at a minimum width equal to the diameter of the pipe extending between the pipe inverts. The benchwalls shall extend up from the flow channel. The benchwall shall have a slick finish.
- D. Joint seal system shall be installed per the manufacturer's written instructions. The top of the manhole casting and cone section shall be joint sealed with inspection prior to backfilling.

### 3.10 TESTING

- A. All sanitary sewers shall be tested for water tightness, infiltration or exfiltration. For acceptance the leakage rate shall not exceed 200 gallons per inch of pipe diameter per mile per day for all sections of the system. The exfiltration/infiltration test shall be performed with a minimum positive head of 2 feet. The air test, if used, shall as a minimum, conform to the test procedure described in ASTM C 828. The testing methods selected shall take into consideration the range in groundwater elevation projected and the situation during the test. These tests shall be observed and certified by a representative of the City Engineer.
- B. Deflection tests shall be performed on all PVC or other flexible pipe. The line shall pass a 5 percent mandrel deflection test conducted a minimum of 30 days after sewer installation. If the deflection test is to be ran using a rigid ball or mandrel, the ball or mandrel shall have a diameter equal to 95% of the inside diameter of the pipe being tested. The test shall be performed without the use of a mechanical pulling device. It shall be the responsibility of the Contractor to provide all the material, equipment and personnel to complete the testing. The deflection test must be observed and certified by a representative of the City Engineer after passing the deflection test using a certified proving ring.

- C. Where specifically specified for a given project, the Contractor shall have the sanitary sewer video taped following installation. The video tape shall include information on the line location, manhole identification, line length and size. One copy of the video tape shall be provided to the City.

### 3.11 RECORD DRAWINGS

- A. The Developer shall provide the City of Greenfield with record drawings for all sanitary sewers with services.
- B. The Contractor shall provide the City of Greenfield with all internal “As-Built” locations upon completion of the sanitary sewer installation and prior to air and mandrel testing of the sewer.

### 3.12 SITE RESTORATION

- A. All areas disturbed by any construction, on and off site, shall be restored to its original condition. Excess construction material shall be removed from the project area as directed by the Developer at the Contractor’s expense.
- B. All disturbed areas shall be seeded. All City easements shall be seeded and straw covered. Netting may be required depending upon construction location.