

# SECTION 300 – STORM SEWER AND SUMP PUMP DRAIN SYSTEMS

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### **Section 301 – General**

The standards and requirements found in this section are for the materials and construction of storm sewer and sump pump drain systems with in the Village of New Lenox, Illinois. **All materials must be American made.**

### **Section 302 – Materials**

The following shall be the permitted materials for the storm sewer and sump pump drain systems:

#### Section 302.01 – Pipe:

1. Storm Sewer:
  - a. Public Storm Sewer
    - i. Reinforced concrete pipe (ASTM C76) with rubber ring gaskets joints (ASTM C443). Pipe class must be equal to or greater than the requirements of Article 550.03 of the IDOT Standard Specification except that the minimum allowable pipe class shall be Class III
    - ii. Reinforced concrete elliptical pipe, (ASTM C507) with rubber ring gasket joints (ASTM C443). Pipe class must be equal to or greater than the requirements of Article 550.03 of the IDOT Standard Specification except that the minimum allowable pipe class shall be Class III
  - b. Private Storm Sewer
    - i. Reinforced concrete pipe and concrete elliptical pipe. Pipe class must be equal to or greater than the requirements of Article 550.03 of the IDOT Standard Specification.
    - ii. High Density Polyethylene (HDPE) Pipe, Corrugated exterior Smooth wall interior conforming to AASHTO M294, Type S or ASTM F2306 with bell and socket joint provided with manufacturer installed gasket conforming to ASTM F477 and ASTM D3212. This pipe material must be submitted for approval for use by the Village Engineer. Each project shall be considered on an individual basis.

2. Sump Pump Drain:
  - a. Public Sump Pump Drain
    - i. Poly Vinyl Chloride (PVC) Pipe SDR 35 (ASTM D-3034)
  - b. Private Sump Pump Drain
    - i. Poly Vinyl Chloride (PVC) Pipe SDR 35 (ASTM D-3034)

Section 302.02 – Structures:

1. Inlet, Catch Basin, Manhole:
  - a. Public Inlet, Catch Basin, Manhole
    - i. Precast Reinforced concrete (ASTM C478) – 5” wall thickness minimum.
  - b. Private Inlet, Catch Basin, Manhole
    - i. Precast Reinforced concrete (ASTM C478) – 3” wall thickness minimum.
  - c. All storm sewer structures shall have PSX: Direct Drive rubber boot connectors for all RCP pipe connections as manufactured by Press Seal Corporation. The space inside of the rubber boots (inside the structure), shall not be filled with mortar or concrete.

Section 302.03 – Trench Backfill:

All trenches for reinforced concrete pipe storm sewers falling under or within five (5) feet of proposed or existing paved surfaces, or structures shall be backfilled with select granular material conforming to the gradation of CA 7. Recycled concrete materials may be substituted for natural stone provided that the recycled material originates from an IDOT approved source and conforms to the gradation of CA-7

All trenches for HDPE pipe storm sewers falling under or within five (5) feet of proposed or existing paved surfaces, or structures shall be backfilled with granular material in accordance with the manufacture’s specification and approved by the Village Engineer.

**Section 303 – Design Requirements**

Section 303.01 – General

An adequate system of storm water drainage shall be constructed and installed, consisting of pipes, storm water detention facilities, tiles, swales, manholes, inlets and other necessary facilities that will adequately drain the subdivision and protect roadway pavements and buildings from flooding. The storm water drainage system shall be in compliance with Village's Storm Water Management Ordinance, the Standard Details, and all other applicable ordinances enacted by the Village and subject to the approval by the Village Engineer.

A Field Tile Study indicating the existing location of all field files within the proposed development shall be provided. All upstream field tile shall be terminated at a storm sewer structure and incorporated into the proposed storm sewer system. All field tile that is to be taken out of service shall be removed using approved methods and plugged with a clay plug at the exterior boundary of the development.

Computations for the storm sewer system for on-site and off site drainage shall be presented with the final plat for approval. These computations shall include a plan and analysis of the existing downstream conveyance from the site discharge location to the nearest downstream tributary water way. The existing subsurface or surface drainage system shall be evaluated with regard to existing capacity or capability to properly convey the low flow groundwater and site runoff storage facility release without damage to downstream structures and land use on adjacent properties. If the outfall subsurface or surface drainage systems prove to be inadequate, it will be necessary to modify the existing systems or construct new systems which will not conflict with the existing systems and will not impact the existing agricultural land use. Existing subsurface systems shall only be used with extended detention design.

Whenever any stream or important surface drainage course is located in any area which is being subdivided, the subdivider shall reserve an adequate drainage right-of-way as determined by the Village and the Illinois Department of Transportation, Division of Water Resources along each side of the stream for the purpose of widening, deepening, sloping, improving, or protecting the stream.

The storm sewer system shall be designed in accordance with the Storm water Management Ordinance using a ten (10) year storm frequency or other methods approved by the Village Engineer. Culvert design and capabilities shall be determined according to the Illinois Department of Highways Standard Design Methods using a twenty-five (25) year storm frequency.

#### Section 303.02 – Storm Sewer System

The Storm Sewer System shall be designed for the 10-year event using the Modified Rational Method. Hydraulic Grade Line (HGL) calculations shall be included that provide two feet of freeboard between the 10-year HGL and the proposed rim elevations for all structures within the system.

The minimum allowable pipe size shall be twelve (12) inches for the entire storm sewer system. Ten (10) inch storm sewer shall be permitted in the subsurface low flow drainage system only.

The minimum velocity under design conditions shall be two (2) fps and the maximum velocity under design conditions shall be ten (10) fps.

Provide vertical and horizontal clearance between water main and storm sewer in accordance with “Standard Specifications for Water and Sewer Main Construction in Illinois”. Every attempt must be made to place water over sewer.

The storm structure configuration shall be constructed in the following scenario: Inlet to Catch Basin to Manhole to discharge location.

Storm structure with three or more pipes connected must be a minimum of four (4) feet in

diameter.

The maximum diameter of a curb line structure is two (2) feet in diameter and the depth from rim to invert cannot exceed four (4) feet.

Storm Structures that are four feet or larger in diameter must have steps and a minimum 24 inch diameter opening in the casting.

Flared end sections shall conform to the IDOT detail and shall be installed with galvanized steel grates. Rip-Rap shall be installed around all flared end sections per the Urban Manual. Alternatives to rip-rap may be submitted on a case by case basis.

All existing drain tiles encountered on site shall be connected to the proposed storm sewer system at a storm sewer structure.

Storm sewer structures shall be provided at every other lot corner in the rear yard of all proposed developments. These structures shall be either an inlet or manhole. Structures with sumps will not be allowed unless otherwise approved by the Village Engineer.

IDOT Type 8 storm sewer grates are not permitted.

The storm sewer system shall be televised after the completion of the storm sewer, Commonwealth Edison and Nicor installations and prior to issuance of the first certificate of final occupancy.

#### Section 303.02 – Sump Pump Drain System

A sump pump collection system that meets the requirements of the Village of New Lenox Standard Details shall be provided in the front yards of all proposed residential developments. The sump pump collection system shall extend from the front of each building lot to the storm sewer system and include storm structures and/or cleanouts for maintenance purposes. Sump pump service lines from the house to the connection point shall be 4-inches in diameter and shall connect directly to the sump pump transmission sewer at a 4-inch tee or at an adjacent storm sewer structure. Sump pump services lines for respective lots shall not cross adjacent lots prior to connection to the sump pump transmission sewer. Neither sump pump transmission sewers nor service lines may be placed under roadway pavement.

The sump pump drainage system shall be subject to the approval of the Village Engineer and shall be designed in accordance with the Standard Details. The design shall be completed to avoid 90° bends. In lieu of 90° bends, two 45° bends shall be used with a minimum separation of one foot between each bend.

The sump pump collections system shall be sized as follows:

1. Single sump pump service line connections into structures can be made in

isolated locations using a four (4) inch pipe.

2. Two to four combined services shall utilize a minimum six (6) inch diameter sump pump transmission pipe.
3. A maximum of ten combined services shall utilize a minimum eight (8) inch diameter sump pump transmission pipe.

Trunk lines shall be installed a minimum of thirty (30) inches below the top of curb and follow the curb line for grade.

The trunk lines shall be installed two (2) feet behind the front property line.

The sump pump drain sewer shall be televised at the time of final inspection for acceptance of the development.

The use of bends within the sump pump drain sewer shall be minimized to aid in the televising of the sump pump transmission sewer prior to final acceptance of the subdivision.

## **Section 304 – Construction Requirements**

### **Section 304.01 – Pipe Bedding**

#### **1. Concrete Pipe**

Granular Pipe bedding material or granular cradle shall be required on all storm sewers installed within the Village of New Lenox. Granular pipe bedding shall be a minimum of four (4) inches. The trench shall be backfilled with granular material to the spring-line of the pipe. The backfilled material shall meet the IDOT gradation of CA 7. (See Detail 4)

#### **2. HDPE Pipe**

All trench preparation procedures, pipe bedding material, and trench backfill material should be in accordance with the pipe manufacture's specifications.

### **Section 304.02 – Pipe Cover**

All storm sewer pipes shall have a minimum cover of thirty six (36) inches cover. All sump pump drain trunk and service lines shall have a minimum cover of thirty (30) inches.

### **Section 304.03 – Handling of Pipe**

Storm sewer and sump pump drains shall be handled in a manner that will prevent damage. Damaged or defective material on the job site shall be rejected and replaced to the satisfaction of the Village. Methods of construction conducive to the damage of the pipe shall be corrected when called to the attention of the contractor.

### **Section 304.04 – Structures**

All structures without sumps shall be proved with a cast in place concrete fillet to provided a smooth flow between pipe sections (See Detail 3, 24)

Manholes and Catch Basins, Type A are to be constructed with steps and a cone or flat top assembly with the opening rotated as necessary to achieve optimal casting alignment.

#### Section 304.05 – Adjustments

When structure adjustments are necessary, they will be performed with a maximum of two (2) adjusting rings with a maximum total height of 12”

Adjusting rings shall be reinforced concrete for heights greater than three (3) to a maximum of twelve (12) inches. Adjusting rings of a height equal to or less than three (3) inches shall be preformed rubber.

If an adjustment is to be made to match a slope, preformed rubber tapered rings must be used.

### **Section 305 – Permit/Acceptance**

#### Section 305.01 – Open Cutting of Pavement

Open cutting of pavement is not allowed unless approved by the Village Board.

#### Section 305.02 – Storm Sewer Acceptance

1. Reinforced Concrete Pipe Storm Sewer being dedicated to the Village of New Lenox. Prior to acceptance, the reinforced concrete pipe storm sewer must be cleaned and operational. The storm sewer system shall be televised after the completion of the storm sewer, Commonwealth Edison and Nicor installations but prior to issuance of the first certificate of final occupancy.

A copy of the video tape for the televising of the storm sewer shall be delivered to the Public Works Department.

2. Reinforced Concrete Pipe Storm Sewer being privately owned and maintained:  
Prior to acceptance of the private reinforced concrete pipe storm sewer, the developer will provide a letter certifying that the private storm sewer was installed in accordance with the approved plans.
3. HDPE Pipe Storm Sewer:  
All HDPE pipe shall be deflection tested in accordance with Article 31-1.11B(4) of the “Standard Specifications for Sewer and Water Construction in Illinois”, latest edition. The deflection of the pipe shall not exceed 5.0% of the base internal diameter. The testing shall occur 120 days following installation of the final pipe or following the completion of the sites fine grading, whichever occurs

first. In no circumstance shall testing be completed sooner than 30 days following installation of the last pipe. In the event of a failure of the deflection test, the pipe run in which the failure occurred must be retested. The retest shall not be completed sooner than 30 days following the repair.

#### Section 305.03 – Sump Pump Collection System Acceptance

Prior to acceptance the storm sewer must be cleaned and operational. The sump pump drain sewer shall be televised at the time of final inspection for acceptance of the development and copy of the video tape for the televising of both the sump pump drain system shall be delivered to the Public Works Department.