

**SECTION 200:
STORM SEWER
CONSTRUCTION STANDARDS**

<u>Page No.</u>	<u>Description</u>
200-2	201 GENERAL
200-2	201.1 SPECIFICATIONS
200-2	201.2 CONNECTION TO EXISTING FACILITIES
200-3	202 MATERIALS
200-3	202.1 PIPES
200-4	202.2 GRANULAR PIPE BEDDING
200-4	202.3 GRANULAR PIPE BACKFILL
200-4	202.4 CONNECTING DISSIMILAR PIPE MATERIALS
200-4	202.5 MANHOLES
200-5	202.6 CATCH BASINS AND INLETS
200-5	202.7 CASING PIPES
200-6	203 CONSTRUCTION REQUIREMENTS
200-6	203.1 GENERAL REQUIREMENTS
200-6	203.2 MANHOLES, CATCH BASINS AND INLETS
200-7	203.3 TRENCH BACKFILL, BEDDING & BACKFILL
200-8	203.4 PIPE INSTALLATION
200-10	204 INSPECTION AND TESTING
200-10	204.1 CLEANING
200-10	204.2 VISUAL TEST
200-10	204.3 DEFLECTION TESTING FOR FLEXIBLE PIPE
200-12	290 STANDARD DRAWINGS

201 GENERAL

The standards and requirements found in this article are for the materials and construction of storm sewer systems within the City of Naperville, Illinois.

201.1 SPECIFICATIONS

All work and equipment performed and installed under this section shall be governed by and shall comply with the following specifications, manuals, and codes listed in Section 102.2. The most current editions and all subsequent revisions and alterations for the specifications are required.

201.2 CONNECTION TO EXISTING FACILITIES

No connection to an existing public storm sewer may be made without permission of the City Engineer.

202 MATERIALS

202.1 PIPES

The following materials will be permitted for storm sewer and pipe culverts. Where a particular material is specified in the plans or special provisions, no other kind of material will be permitted:

202.1.1 REINFORCED CONCRETE PIPE (RCP)

Reinforced concrete pipe shall conform to ASTM Designation C 76, Classes I, II, III, IV or V. Bituminous joints shall conform to ASTM Designations C 14 or C 76 as may be applicable. Bituminous material shall consist of a homogeneous blend of bitumen, inert filler, and suitable solvent approved by the City Engineer. Rubber gasket joints shall conform to ASTM C 433.

Reinforced concrete pipe shall also be permitted as round, elliptical, or box shaped or as Reinforced Concrete Arch Culvert.

202.1.2 NON-REINFORCED CONCRETE PIPE

Non-reinforced concrete pipe shall be allowed for pipes with a 10 inch or smaller diameter. Non-reinforced concrete pipe shall conform to ASTM Designation C 14, Class 3. Bituminous joints shall conform to ASTM Designations C 14 or C 76 as may be applicable. Bituminous material shall consist of a homogeneous blend of bitumen, inert filler, and suitable solvent approved by the City Engineer. Rubber gasket joints shall conform to ASTM C 433.

202.1.3 DUCTILE IRON PIPE (DIP)

Ductile iron pipe shall conform to ANSI A 21.51 (AWWA C-151), class thickness designed per ANSI A 21.50 (AWWA C-150), tar (seal) coated and cement lined per ANSI A 21.4 (AWWA C-104), with mechanical or rubber ring (slip seal or push on) joints. All ductile iron pipe shall be wrapped with polyethylene.

202.1.4 POLYVINYL CHLORIDE PIPE (PVC)

Polyvinyl Chloride (PVC) pipe shall conform to ASTM D 3034, type PSM. The minimum Standard Dimension Ratio (SDR) shall be 26. The pipe shall be made of PVC plastic having a minimum cell classification of 12454-C, and shall have a minimum pipe stiffness of forty-six (46) lbs. per inch (317 kPa). Joints for PVC pipe shall be flexible elastometric seals per ASTM D 3212.

202.1.5 HIGH DENSITY POLYETHYLENE PIPE (HDPE)

High-density polyethylene (HDPE) pipe shall conform to the requirements of AASHTO M 252 and M 294. Pipe and fittings shall be made from virgin PE compounds which conform to the requirements of cell class 324420C as defined and described in ASTM D 3350. Rubber gasket joints shall be used.

202.1.6 FULLY GALVANIZED CORRUGATED STEEL PIPE

Fully Galvanized Corrugated Steel Pipe may be used for residential driveway crossings only when a ditch section is present. The minimum culvert size is 12" diameter.

202.2 GRANULAR PIPE BEDDING

Bedding, other than concrete embedment, shall consist of gravel, crushed gravel, or crushed stone 1/4 inch to 1 inch in size. As a minimum, the material shall conform to the requirements of IDOT standard specifications. The gradation shall conform to gradation CA-7 or CA-11 of the Standard Specifications.

202.3 GRANULAR PIPE BACKFILL

Backfill material shall conform to the requirements of IDOT standard specifications. The gradation shall conform to gradation CA-6 of the Standard Specifications.

202.4 CONNECTING DISSIMILAR PIPE MATERIALS

Joints connecting dissimilar pipe materials shall be made with sewer clamp non-shear type couplings; Cascade CSS, Romac LSS, Fernco, Inc. Shear Ring, or approved equal. When available, a standard joint with a transition gasket may be used. The name of the manufacturer, class, and date of issue shall be clearly identified on all sections of pipe. The contractor shall also submit bills of lading, or other quality assurance documentation when requested by the City Engineer.

202.5 MANHOLES

Manholes for storm sewers shall have a minimum inside diameter of 48 inches and shall be constructed of precast concrete units in accordance with ASTM C478-05 (or latest edition) and shall conform to the City of Naperville standard detail. All manholes shall be water-tight. All visible leaks shall be sealed in a manner acceptable to the City Engineer.

202.5.1 FRAME AND COVER

Manholes shall be furnished with a self-sealing frame and solid cover (East Jordan Iron Works 1022 with Type A solid cover, or approved equal) with the word "Storm" imprinted on the cover in raised letters. All frames and lids shall meet or exceed AASHTO H-20 loading specifications. Frames shall be shop painted with asphaltic base paint.

Both the manhole frame and cover shall have machined horizontal and vertical bearing surfaces. Inverted manhole frames are not allowed.

Pick holes shall not create openings in the manhole cover.

202.5.2 STEPS

Manhole steps on maximum 16 inch center shall be furnished with each manhole, securely anchored in place, true to vertical alignment, in accordance with the Naperville Standard Details. Steps shall be copolymer polypropylene reinforced with 1/2 inch A615/A615M-05a (or latest edition) Grade 60 steel reinforcement, meeting or exceeding ASTM C 478-05 (or latest edition) and OSHA standards

202.6 CATCH BASINS AND INLETS

Catch basins and inlets shall have a minimum inside diameter of 24 inches and shall be constructed of precast concrete units in accordance with ASTM C478-05 (or latest edition) and shall conform to the City of Naperville standard detail. All catch basins and inlets shall be water-tight at all points below grade. All visible leaks shall be sealed in a manner acceptable to the City Engineer.

202.6.1 FRAME AND GRATE

Catch basins and inlets shall be furnished with a frame and grate based upon the location of the installation as listed below. All frames and grates shall meet or exceed AASHTO H-20 loading specifications. Frames shall be shop painted with asphaltic base paint. All storm sewer lids and grates shall be cast with "Dump No Waste. Drains To River."

- a) Pavement: East Jordan Iron Works 1022 Frame with Type M1 Radial Flat Grate, or approved equal.
- b) Barrier curb and gutter: East Jordan Iron Works 7220 Frame with Type M1 Grate and T1 Curb Box, or approved equal.
- c) Depressed curb: East Jordan Iron Works 5120 Frame and Grate, or approved equal.
- d) Mountable curb: East Jordan Iron Works 7525 Frame and Grate, or approved equal.
- e) Non-paved areas: East Jordan Iron Works 6527 Beehive Grate, or approved equal. Alternately, in areas where there is the likelihood of pedestrian traffic, East Jordan Iron Works 1022 Frame with Type M1 Radial Flat Grate, or approved equal may be used.

202.7 CASING PIPES

All steel casing pipe shall be bituminous coated, a minimum of 30 mils thickness inside and out, shall be of leak proof construction and capable of withstanding the anticipated loadings. The minimum wall thickness for the casing pipe shall be in accordance with Table 200-1. The steel casing pipe shall have minimum yield strength of 35,000 psi and shall meet the requirements of A139/A139M-04 (or latest edition), Grade B. Ring deflection shall not exceed 2% of the nominal diameter. The steel casing pipe shall be delivered to the jobsite with beveled ends to facilitate field welding.

**TABLE 200-1
REQUIRED CASING PIPE WALL THICKNESS**

Steel Casing Diameter	Minimum Wall Thickness (Inches)
20"- 22"	0.344
24"	0.375
28"	0.438
30"	0.469
32"	0.501
34"- 36"	0.532

203 CONSTRUCTION REQUIREMENTS

203.1 GENERAL REQUIREMENTS

203.1.1 RESPONSIBILITY FOR MATERIALS

The contractor shall be responsible for the acceptability and storage of all materials furnished by him and shall assume responsibility for the replacement of all such material found damaged in shipping or on job site or defective in manufacture. This shall include the furnishing of all material and labor required for the replacement of installed material discovered to be defective prior to the final acceptance of the work.

203.1.2 STORAGE OF PIPING MATERIALS

The interior, as well as all sealing surfaces of all pipe, fittings, and other accessories shall be kept free from dirt and foreign matter. Store pipe bundles on flat surfaces with uniform support. Pipe stored outside and exposed to prolonged periods of sunlight should be covered with canvas or other opaque material. Clear plastic sheets shall not be used. Air circulation shall be provided under covering. Keep gaskets away from oil, grease, electric motors (which produce ozone), excessive heat and direct rays of the sun. Consult the manufacturer for specific storage recommendations.

203.1.3 HANDLING OF PIPING MATERIALS

Piping materials shall be unloaded, hauled and distributed at the site of the project by the contractor. Materials shall at all times be handled properly to prevent damage in accordance with manufacturer's recommendations. Pipe and fittings shall not be thrown, dropped, or dragged. Damaged or defective material on the job site shall be rejected and replaced to the satisfaction of the City Engineer. Methods of construction conducive to the damage of sewer pipe shall be corrected when called to the attention of the contractor. All pipe and fittings shall be examined by the contractor above grade before placement in the trench.

203.2 MANHOLES, CATCH BASINS AND INLETS

203.2.1 INSTALLING STRUCTURES IN NON-PAVED AREAS

Only structures without sumps shall be permitted in non-paved areas. Straw bales shall be staked in place at each structure to prevent debris and foreign material from entering the system during construction.

203.2.2 INSTALLING STRUCTURES IN PAVED AREAS

For structures located in paved areas, a minimum of four, 2 inch diameter holes shall be drilled or precast into the structure within 1 foot of the lowest pipe invert. The holes shall be distributed equidistant around the perimeter of the structure. A one (1) foot by one (1) foot section of underdrain filter cloth material shall be sufficiently fixed to the outside of the manhole with mastic materials to prevent slippage during backfilling.

203.2.3 WATER-TIGHTNESS

Non-shrinking hydraulic cement shall be used on all interior and exterior joints within the barrel section to provide a water-tight seal between structure sections. No hydraulic cement shall be applied above the cone section or flat top.

203.2.4 PIPE CONNECTIONS

All structures without sumps shall be provided with a precast or cast-in-place concrete fillet, or bench, to provide a smooth flow between pipe sections.

The inside and outside of all pipe section connections to storm structures shall be shaped with additional mortar to provide a 3 inch collar around the pipe.

203.2.5 FRAME ADJUSTMENTS

Adjustments may be necessary to ensure that frames and grates match the elevation of the surrounding pavement or ground surface. Preformed adjusting rings of the proper dimensions needed to mate the frame to the precast structure shall be used. No more than 12 inches of vertical adjustment may be made using the minimum practical number of individual rings.

All rings shall be High Density Polyethylene Plastic (HDPE), Recycled Rubber, High Density Expanding Polystyrene, Expanded Polypropylene (EPP), or other material as approved by the City Engineer. Precast concrete rings, bricks, rocks, shims, or concrete blocks will not be allowed. Tapered adjusting rings shall be required when the frame will need to match the slope of the roadway.

A resilient, flexible, non-hardening, preformed bituminous mastic material, Conseal 102 B or approved equal, shall be used between the cone or top barrel section of the structure and the adjusting rings. A thick bead of non-hardening elastomeric joint sealant conforming to ASTM C-920, Type S, Grade NS, shall be applied between all individual rings, and between the adjusting rings and the frame. The sealant or mastic material shall be applied in such a manner that no surface water or ground water inflow can enter the structure.

All storm sewer structure frames without inside flanges shall be shaped with hydraulic cement or elastomeric joint sealant to form a fillet to the structure or adjusting rings and to maintain water-tightness.

Frame adjustments shall be completed in accordance with Sections 602 and 603 of Standard Specifications for Road and Bridge Construction, prepared by the Illinois Department of Transportation, latest edition, except as noted herein.

203.3 TRENCH BACKFILL, BEDDING & BACKFILL

Granular pipe bedding and haunching shall be required on all storm sewers installed in the City of Naperville. Initial backfill shall be required for all sewers constructed of PVC or other flexible pipe material.

203.3.1 PIPE BEDDING

Bedding, other than concrete embedment, shall consist of gravel, crushed gravel, or crushed stone. The pipe shall be laid so that it will be uniformly supported and the entire length of the pipe barrel will have full bearing. No blocking of any kind shall be used to adjust the pipe to grade except when used with embedment concrete. Bedding shall be required for all sewer construction, and shall be of a thickness equal to 1/4 of the outside diameter of the sewer pipe with a maximum thickness of 8 inches. Granular pipe bedding shall be a minimum of 4 inches in earth excavation and a minimum of 6 inches in rock excavation.

Where unsuitable material is encountered at the grade established, all such unsuitable soil shall be removed under the pipe and for the width of the trench, and shall be replaced with well compacted bedding material. The size range and resulting high voids ratio of bedding material make it suitable for use to dewater trenches during pipe installation. This permeable characteristic dictates that its use be limited to locations where pipe support will not be lost by migration of fine grained natural material from the trench walls and bottom or migration of other materials into the bedding material. When such migration is possible, the material's minimum size range should be reduced to finer than 1/4 inch and the gradation properly designed to limit the size of the voids.

Bedding materials shall be placed to provide uniform and adequate longitudinal support under the pipe. Bell holes at each joint shall be provided to permit the joint to be assembled properly while maintaining uniform pipe support. When the joint has been made, the void under the bell will be filled with bedding or haunching material.

203.3.2 HAUNCHING

The most important factor affecting pipe performance and deflection is the haunching material and its density. Place and consolidate the material under the pipe haunch to provide adequate side support to the pipe while avoiding both vertical and lateral displacement of the pipe from proper alignment. The same coarse materials as used for initial backfill shall also be used for haunching. Place haunching up to the pipe spring line.

203.3.3 INITIAL BACKFILL FOR FLEXIBLE PIPE

Initial backfill begins above the spring line of the pipe and extends to a point 6 inches above the top of the pipe and shall be CA-7 or CA-11 carefully placed so as to completely fill the space around the pipe, in 8 inch layers, loose measurements, and compacted to the satisfaction of the City Engineer.

203.3.4 SELECTED GRANULAR BACKFILL

The backfill for trenches and excavation made in existing or under proposed pavements where the inner edge of the trench is within 2 feet of the edge of the pavement, curb, gutter, curb and gutter, or sidewalk, shall be made with compacted selected granular material conforming to IDOT gradation CA-6. Selected granular backfill shall be placed in uniform layers not exceeding 6 inches (loose measure) and compacted with mechanical equipment to 95% of the standard proctor density in accordance with the applicable AASHTO or ASTM requirements.

203.3.5 DEPTH OF PIPE COVER

The depth of cover over the pipe shall be appropriate for the material and class of pipe specified for the installation. In no case shall the cover over the pipe be less than 24 inches unless specifically allowed otherwise by the City Engineer.

203.4 PIPE INSTALLATION

203.4.1 LAYING OF PIPE

All pipe shall be laid true to line and grade. Dirt and other foreign material shall be prevented from entering the pipe or pipe joint during handling or laying operations.

203.4.2 PIPE TO PIPE CONNECTIONS

All storm sewer pipe to pipe connections shall be sealed with butyl mastic to ensure water tightness. Lift holes are to be sealed using butyl mastic and concrete plugs. At no time shall connections between the storm sewer system and sanitary sewer systems be allowed.

Alternately, premium joint pipe with integral o-rings may be used.

203.4.3 END SECTIONS

Storm sewer pipes may be terminated with special end sections including flared end sections and box inlets. Any end section with an opening greater than 12 inches in diameter shall be covered with a grate whose openings are 3 inch horizontal by 8 inch vertical and is rakeable.

203.4.4 EXISTING DRAIN OR FIELD TILES

All drain or field tiles encountered during construction must be connected to the storm drainage system. The location of known field tiles shall be depicted on the final engineering plans. The connection point of all field tiles to the storm drainage system must be shown on the record drawings for storm sewers.

204 INSPECTION AND TESTING

204.1 CLEANING

Prior to acceptance, all the storm sewer and storm sewer appurtenances shall be cleaned and operational to the satisfaction of the City Engineer.

204.2 VISUAL TEST

The City of Naperville may require that storm sewer lines be inspected visually to verify accuracy of alignment and freedom from debris and obstructions. The percentage of sewer lines inspected will be designated by the City Engineer. The full diameter of the pipe for straight alignments shall be visible when viewed between consecutive manholes. The method of test shall be either photography or closed circuit television, unless a specific method is required by the special provisions and approved by the City Engineer.

204.3 DEFLECTION TESTING FOR FLEXIBLE PIPE

A mandrel test is required by the City of Naperville. The City Engineer shall randomly select portions of the project to be deflection tested. Such portions shall consist of the manhole intervals for the initial sewer construction up to 1,200 linear feet and not less than 20% of the remainder of the sewer project. The City of Naperville reserves the right to test more or less pipe if considered appropriate by the City Engineer.

The 5% deflection test for pipe sizes 6 inches to 18 inches in diameter is to be run using a nine-arm mandrel having a diameter equal to 95% of the inside diameter of the pipe as established in ASTM D-2241-96b. Table 200-2 was developed using the equations outlined in Section 31-1.11C of the Standard Specifications for Water and Sewer Main Construction in Illinois and shall be applied to testing of storm sewer pipe.

**TABLE 200-2
REQUIRED MANDREL SIZE FOR FLEXIBLE PIPE**

Nominal Pipe Size, Inches	Average Inside Diameter (PVC)	Required Mandrel Size, Inches
6	6.08	5.68
8	7.92	7.38
10	9.87	9.23
12	11.71	10.98
14	12.86	12.02
16	14.70	13.65

204.3.1 TIME OF TESTING

The individual lines to be tested shall be tested no sooner than 30 days after they have been installed by the contractor. During the first year of implementation, additional testing may be performed by the City of Naperville.

204.3.2 SEQUENCE OF TESTING

Wherever possible and practical, the testing shall initiate at the downstream lines and proceed towards the upstream lines.

204.3.3 TESTING OF ENTIRE PROJECT

In the event that the deflection exceeds the 5% limit in 10% or more of the manhole intervals tested, the total sewer project shall be tested.

204.3.4 RETEST OF FAILED SECTIONS

Where deflection is found to be in excess of 5% of the base inside diameter, the contractor shall excavate to the point of excess deflection and carefully compact around the point where excess deflection was found. The line shall then be retested for deflection. However, if the deflected pipe fails to return to the original size (inside diameter) after the initial testing, the affected segment shall be replaced.

290 STANDARD DRAWINGS

- 290.01 Storm Manhole - Type A
- 290.02 Catch Basin - Type A
- 290.03 Flat Slab Top Precast Reinforced Concrete
- 290.04 Catch Basin - Type C
- 290.05 Inlet - Type A
- 290.06 Cast Iron Steps

- 290.10 Frame & Lid or Grate
- 290.11 Frame & Grate for B-6.12 Curb & Gutter
- 290.12 Frame & Grate for B-6.12 Curb & Gutter (Depressed)
- 290.13 Frame & Grate for M-3.12 Curb & Gutter
- 290.14 Beehive Grate
- 290.15 Casting Adjustments for Structures in Paved Areas
- 290.16 Casting Adjustments for Structures Within the Curb Line

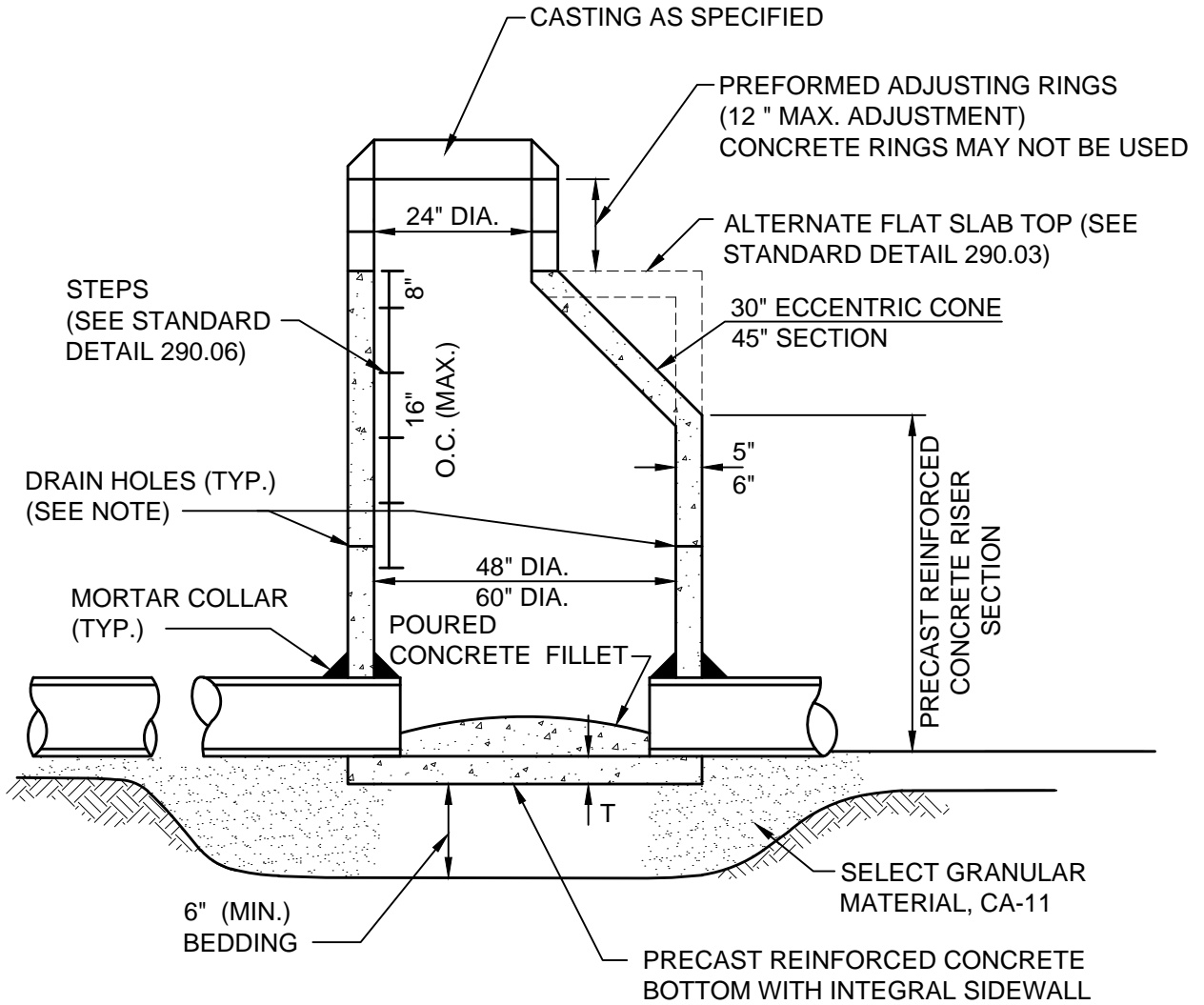
- 290.20 Storm Sewer Trench Section in Paved Areas
- 290.21 Storm Sewer Trench Section in Non-Paved Areas
- 290.22 Grating for Concrete Flared End Section

- 290.30 Sump Pump Connection
- 290.31 Sump Pump Connection to Dry Well

290.99 COMMON NAMES

All standard details in this section may be referred to by a common name in associated construction documents. The common name shall be "STORM xx" where the xx is the section of the detail number to the right of the decimal point. For instance, *Detail #290.05 Inlet – Type A* may also be referred to as "STORM 5".

WHEN MANHOLE DEPTH IS 12 FT OR LESS T = 8 INCHES
 WHEN MANHOLE DEPTH IS OVER 12 FT. T = 10 INCHES



NOTE:

A MINIMUM OF 4 PRECAST OR DRILLED 1" DIAMETER HOLES SHALL BE PROVIDED WITHIN 1' OF THE LOWEST PIPE INVERT. THE HOLES SHALL BE DISTRIBUTED EQUIDISTANT AROUND THE PERIMETER OF THE STRUCTURE. A 1' BY 1' SQUARE OF UNDERDRAIN FILTER CLOTH MATERIAL SHALL BE FIXED OVER EACH DRAIN HOLE ON THE OUTSIDE OF THE STRUCTURE WITH MASTIC MATERIAL TO PREVENT SLIPPAGE DURING BACKFILLING.



City of Naperville
**STANDARD
 DETAIL**

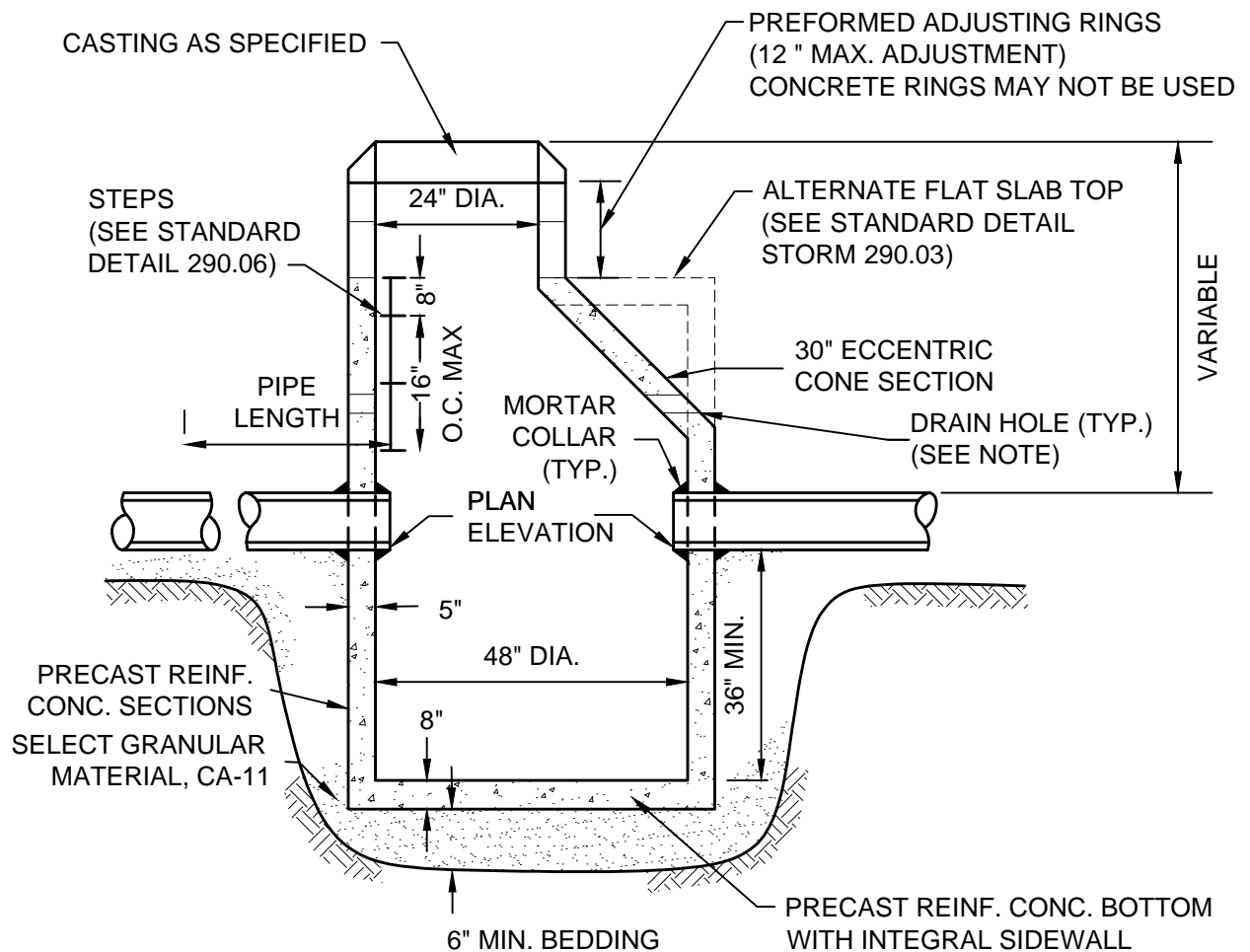
**STORM MANHOLE-
 TYPE A**

REVISED: 08/01/2018

SHEET 1 OF 1

STORM 1

290.01



NOTE:

A MINIMUM OF 4 PRECAST OR DRILLED 1" DIAMETER HOLES SHALL BE PROVIDED WITHIN 1' OF THE LOWEST PIPE INVERT. THE HOLES SHALL BE DISTRIBUTED EQUIDISTANT AROUND THE PERIMETER OF THE STRUCTURE. A 1' BY 1' SQUARE OF UNDERDRAIN FILTER CLOTH MATERIAL SHALL BE FIXED OVER EACH DRAIN HOLE ON THE OUTSIDE OF THE STRUCTURE WITH MASTIC MATERIAL TO PREVENT SLIPPAGE DURING BACKFILLING.



City of Naperville
**STANDARD
 DETAIL**

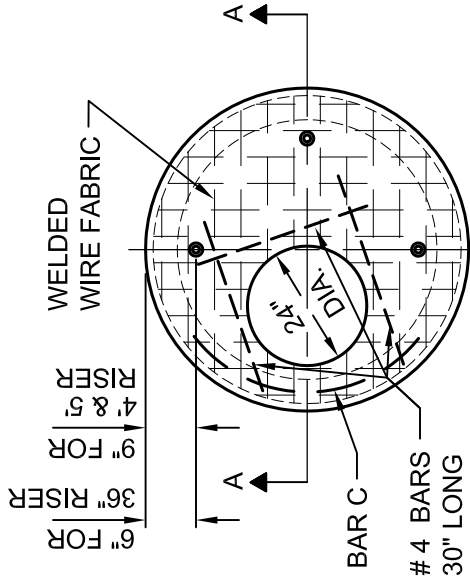
CATCH BASIN - TYPE A

REVISED: 08/01/2018

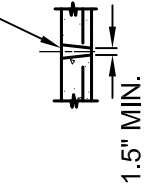
SHEET 1 OF 1

STORM 2

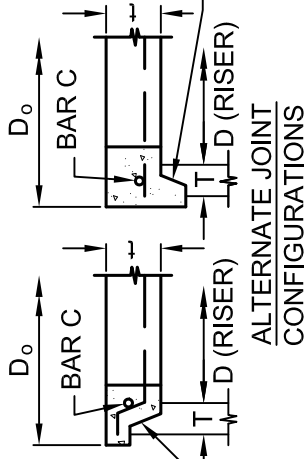
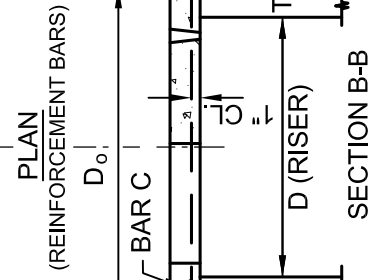
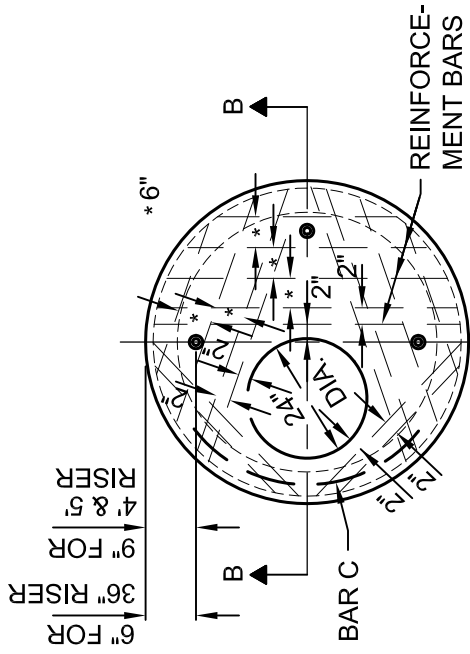
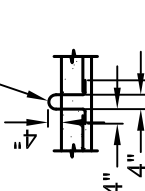
290.02



PLUG AND SEAL WITH MASTIC AFTER INSTALLATION

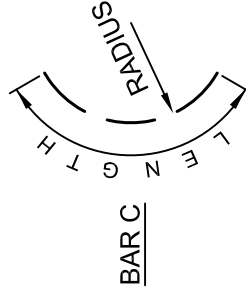


LIFTING HOLE OR LIFTING LOOP
TYPICAL
(3 REQUIRED PER SLAB)



TABLE

D	T	D _o (MIN)	t	REINFORCEMENT ^A "W.W.F. EACH OR DIRECTION	BAR SIZE	#4 Bar C LENGTH/RADIUS
3'	APPLICABLE STANDARDS	D + 21	6"	0.20 SQ. INCH/FT.	#4	48" 19"
4'	APPLICABLE STANDARDS	D + 21	5"	0.35 SQ. INCH/FT.	#5	54" 26"
5'	APPLICABLE STANDARDS	D + 21	8"	0.35 SQ. INCH/FT.	#5	60" 32"



NOTE:
ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE SHOWN



City of Naperville
**STANDARD
DETAIL**

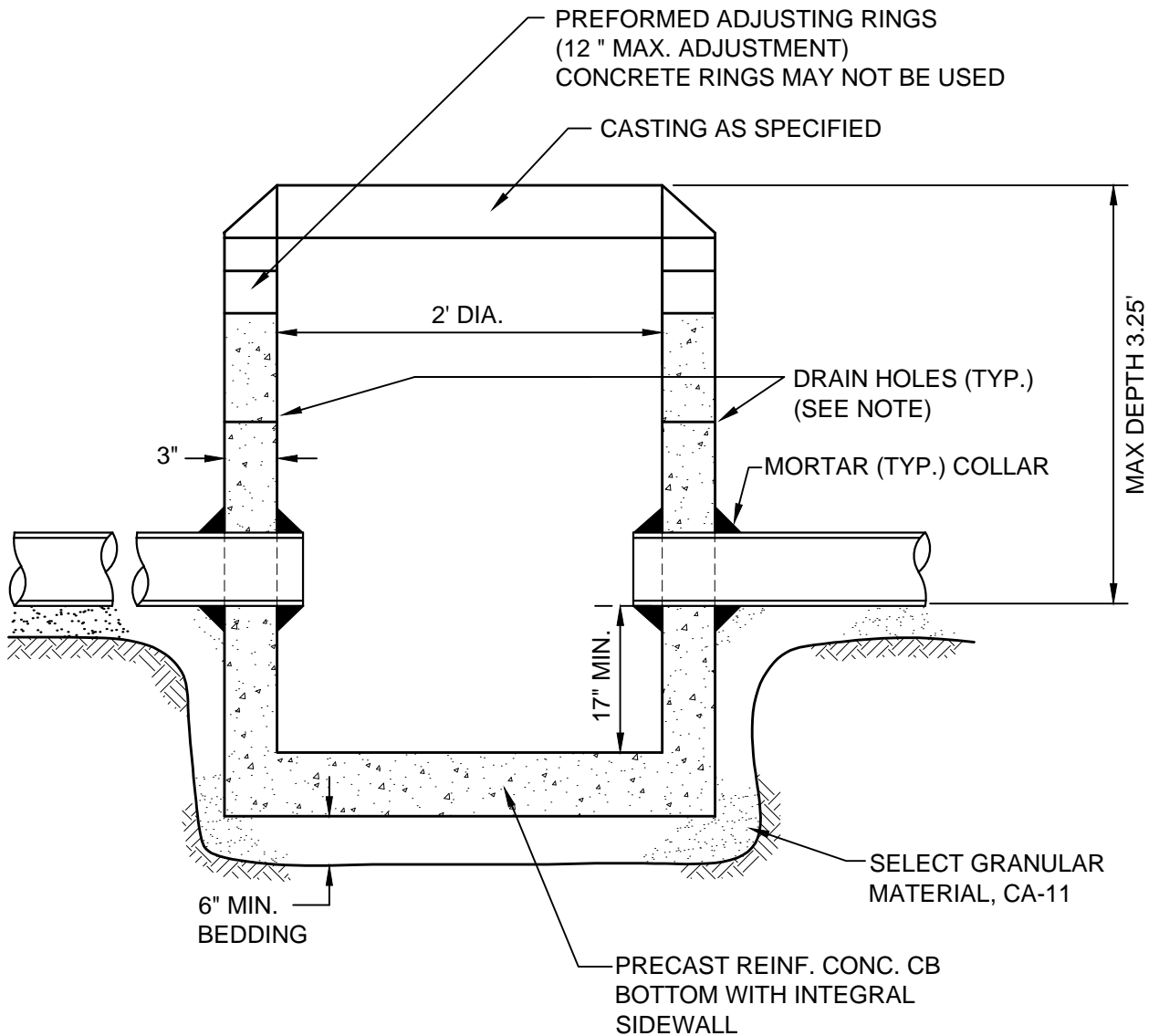
**FLAT SLAB TOP PRECAST
REINFORCED CONCRETE**

STORM 3

290.03

REVISED: 01/01/2013

SHEET 1 OF 1



NOTE:

A MINIMUM OF 4 PRECAST OR DRILLED 1" DIAMETER HOLES SHALL BE PROVIDED WITHIN 1' OF THE LOWEST PIPE INVERT. THE HOLES SHALL BE DISTRIBUTED EQUIDISTANT AROUND THE PERIMETER OF THE STRUCTURE. A 1' BY 1' SQUARE OF UNDERDRAIN FILTER CLOTH MATERIAL SHALL BE FIXED OVER EACH DRAIN HOLE ON THE OUTSIDE OF THE STRUCTURE WITH MASTIC MATERIAL TO PREVENT SLIPPAGE DURING BACKFILLING.



City of Naperville
**STANDARD
 DETAIL**

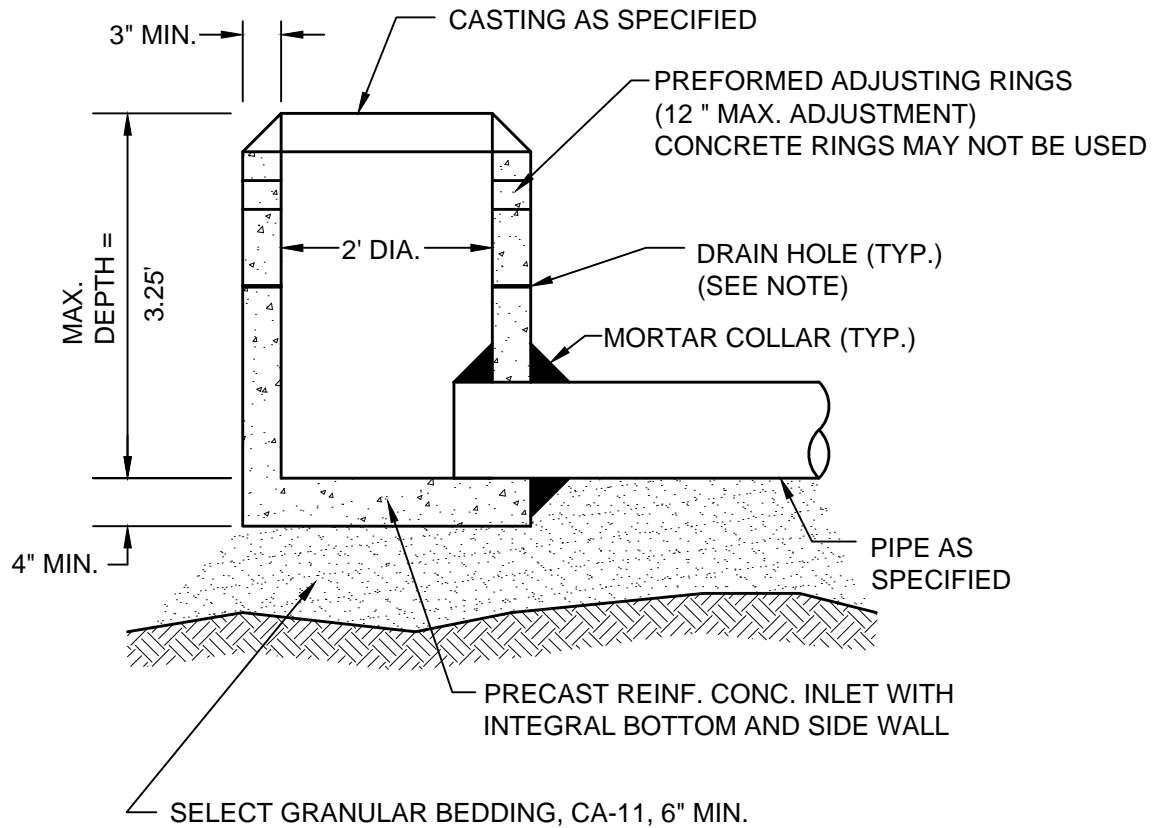
CATCH BASIN - TYPE C

REVISED: 08/01/2018

SHEET 1 OF 1

STORM 4

290.04



NOTE:

IN PAVED AREAS A MINIMUM OF 4 PRECAST OR DRILLED 1" DIAMETER HOLES SHALL BE PROVIDED WITHIN 1' OF THE LOWEST PIPE INVERT. THE HOLES SHALL BE DISTRIBUTED EQUIDISTANT AROUND THE PERIMETER OF THE STRUCTURE. A 1' BY 1' SQUARE OF UNDERDRAIN FILTER CLOTH MATERIAL SHALL BE FIXED OVER EACH DRAIN HOLE ON THE OUTSIDE OF THE STRUCTURE WITH MASTIC MATERIAL TO PREVENT SLIPPAGE DURING BACKFILLING.



City of Naperville
**STANDARD
 DETAIL**

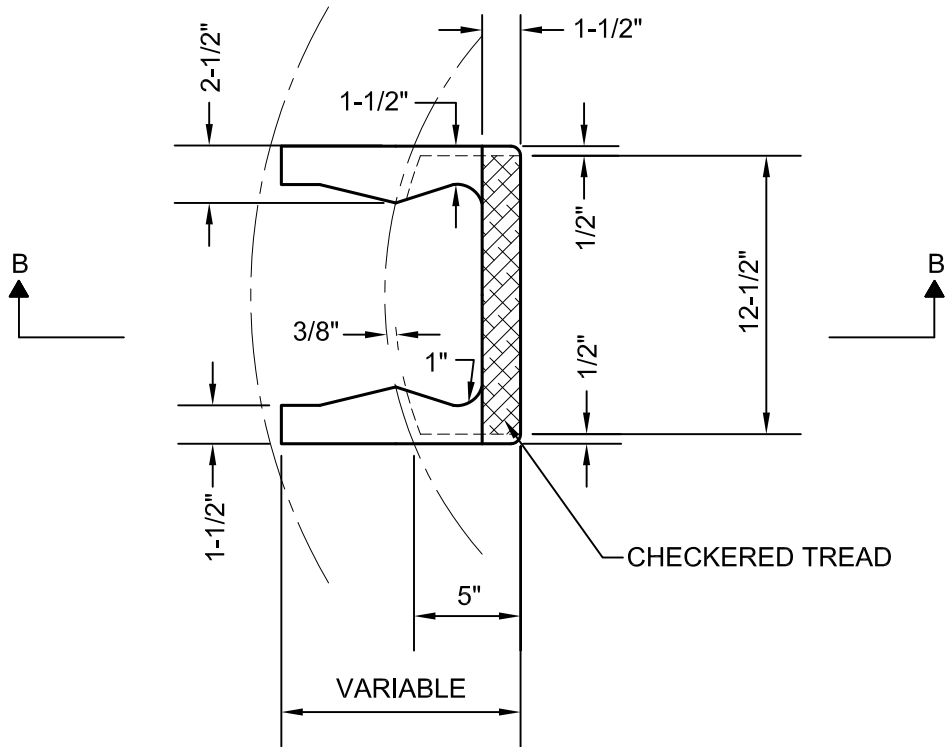
INLET - TYPE A

REVISED: 08/01/2018

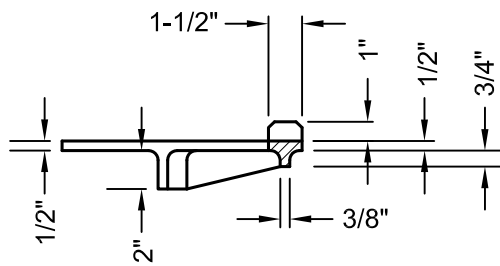
SHEET 1 OF 1

STORM 5

290.05



PLAN



SECTION B-B



City of Naperville
**STANDARD
 DETAIL**

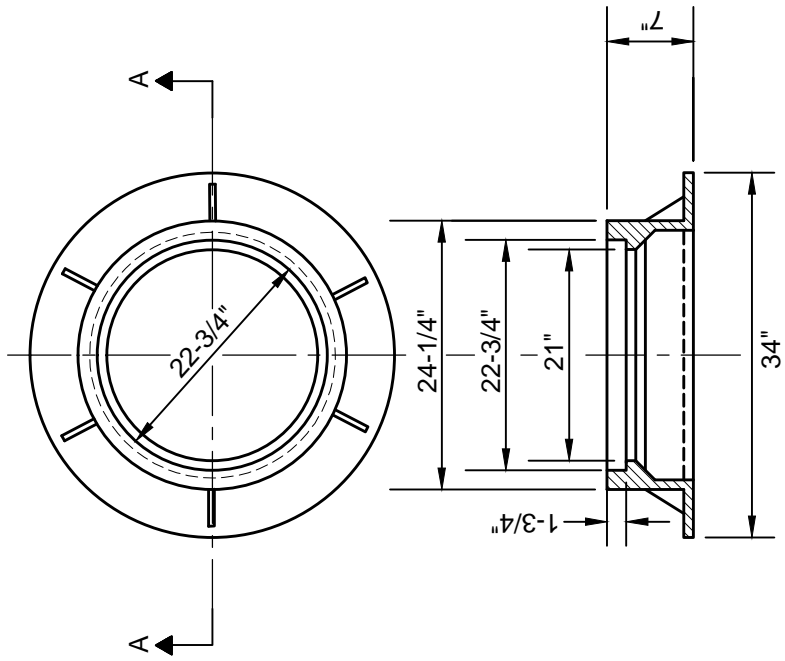
CAST IRON STEPS

REVISED: 01/01/2013

SHEET 1 OF 1

STORM 6

290.06

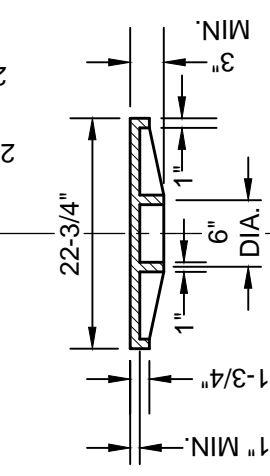
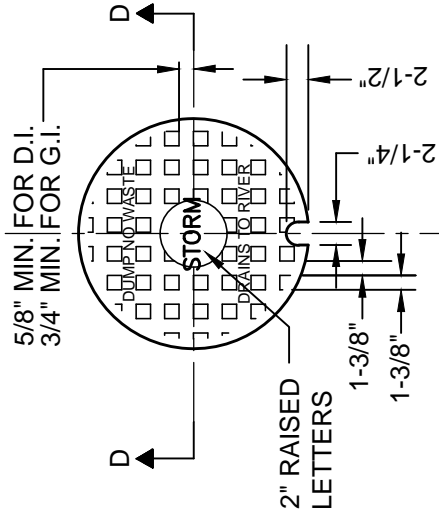


SECTION A-A CAST FRAME GRAY IRON

WT. 250 lbs.

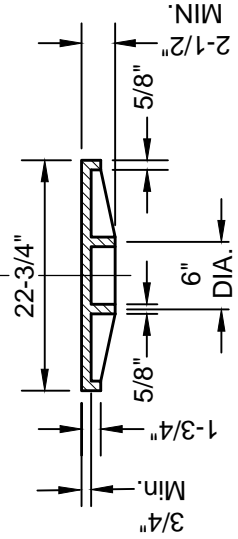
NOTES:

1. FRAME AND GRATE (LID) SHALL BE NEENAH R-2502 FOR OPEN GRATES, R-1772 FOR CLOSED LIDS; EAST JORDAN 1022-2 WITH M-1 GRATE OR TYPE A SOLID COVER, OR EQUAL APPROVED BY THE CITY ENGINEER.
2. ALL LIDS AND COVERS SHALL HAVE MACHINED SURFACES AND SEATS.
3. ALL CASTINGS SHALL BE SHOP PAINTED WITH AN ASPHALTIC BASE PAINT.
4. ALL CASTINGS SHALL INCLUDE "DUMP NO WASTE. DRAINS TO RIVER".



SECTION B-B CAST OPEN

LIDW. T. 25 lbs



SECTION D-D OF DUCTILE IRON LID

WT. 125 lbs.



**STANDARD
DETAIL**

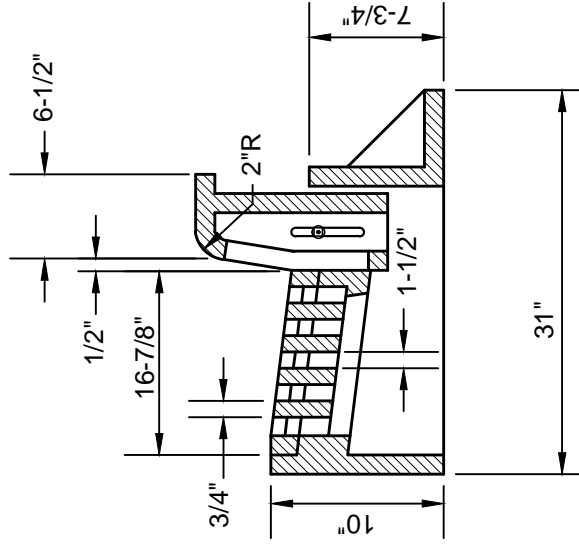
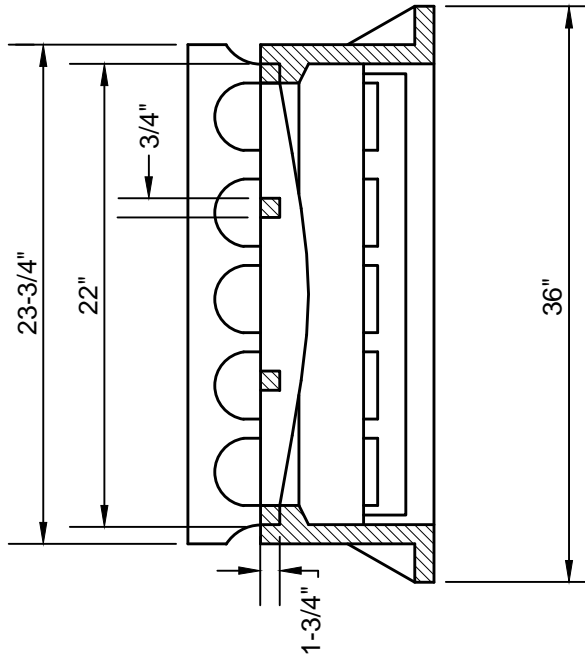
FRAME & LID OR GRATE

STORM 10

290.10

SHEET 1 OF 1

REVISED: 05/15/2015

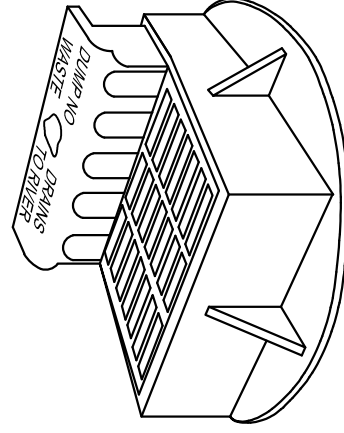


CAST FRAME AND GRATE GRAY IRON

TOTAL WT. 500 LBS.

NOTES:

1. FRAME AND GRATE SHALL BE NEENAH R-3278-A, EAST JORDAN IRON 7220, OR EQUAL APPROVED BY THE CITY ENGINEER.
2. ALL CASTING SHALL BE SHOP PAINTED WITH AN ASPHALTIC BASE PAINT.
3. SEE STANDARD DETAIL 590.20 FOR CORRESPONDING CURB.
4. ALL CASTINGS SHALL INCLUDE "DUMP NO WASTE. DRAINS TO RIVER".



City of Naperville
**STANDARD
 DETAIL**

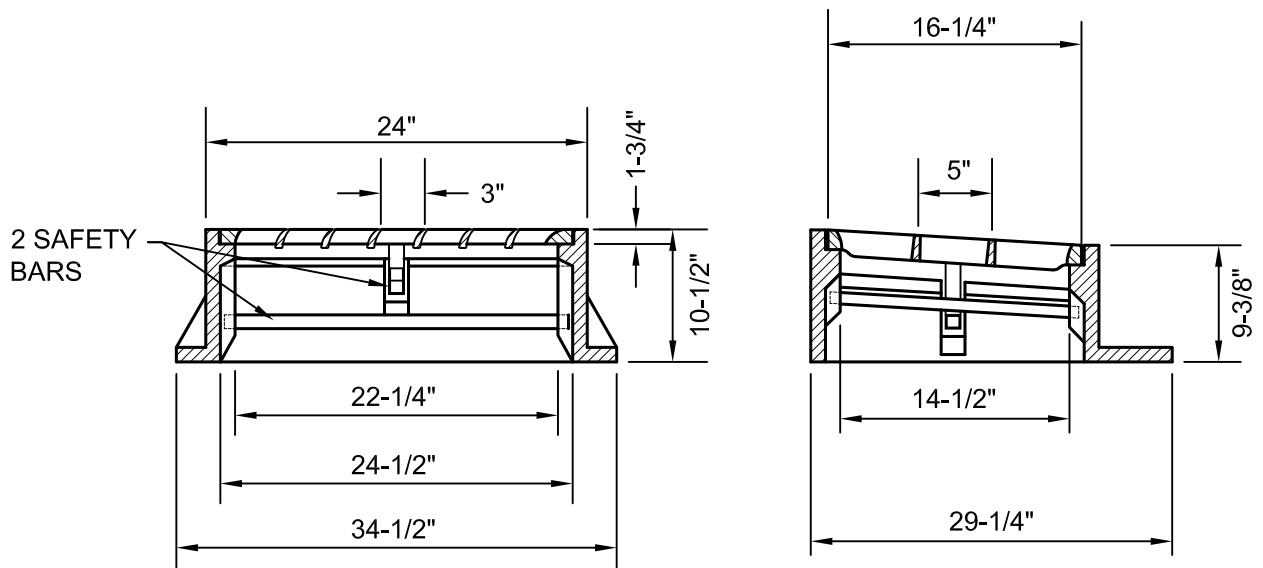
FRAME & GRATE FOR B-6.12 CURB & GUTTER

REVISED: 05/15/2015

SHEET 1 OF 1

STORM 11

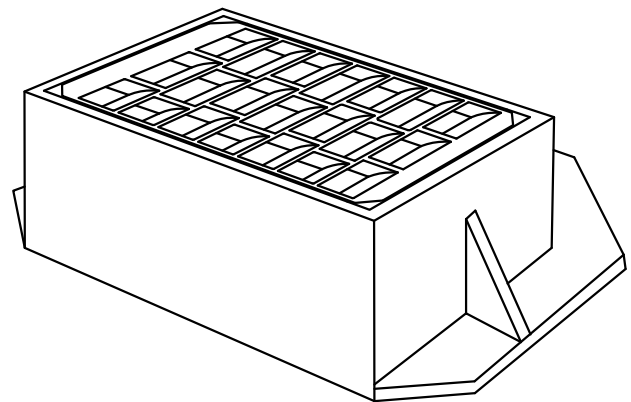
290.11



CAST FRAME AND GRATE

NOTES:

1. FRAME AND GRATE SHALL BE NEENAH R-3525-L, EAST JORDAN 5120, OR EQUAL APPROVED BY THE CITY ENGINEER.
2. ALL CASTING SHALL BE SHOP PAINTED WITH AN ASPHALTIC BASE PAINT.
3. ALL CASTINGS SHALL INCLUDE "DUMP NO WASTE. DRAINS TO RIVER".



City of Naperville
**STANDARD
 DETAIL**

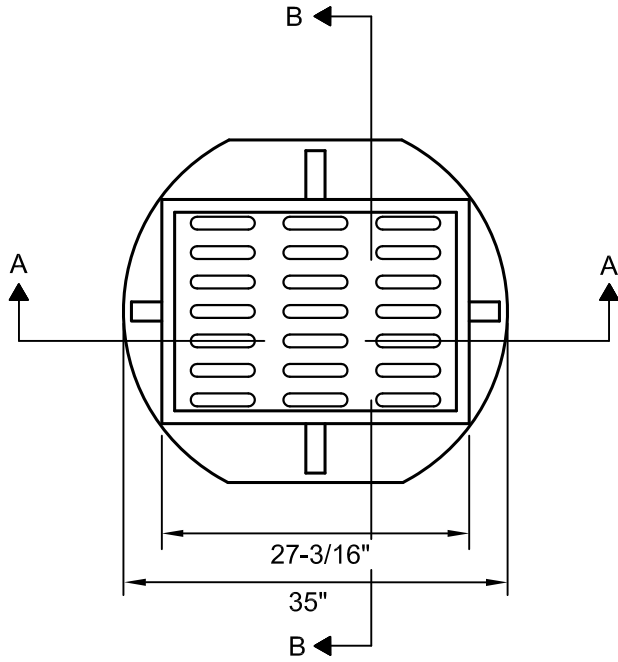
**FRAME & GRATE FOR B-6.12
 CURB & GUTTER (DEPRESSED)**

REVISED: 05/15/2015

SHEET 1 OF 1

STORM 12

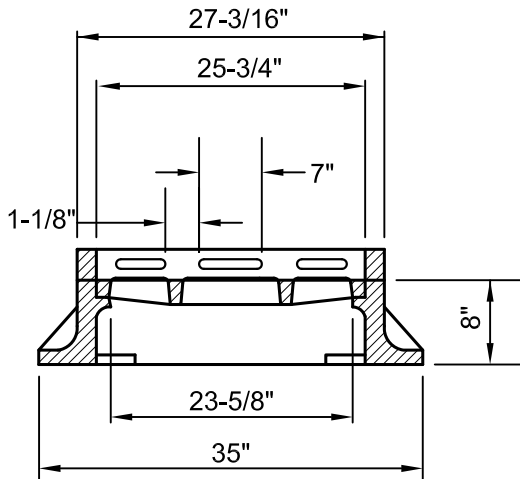
290.12



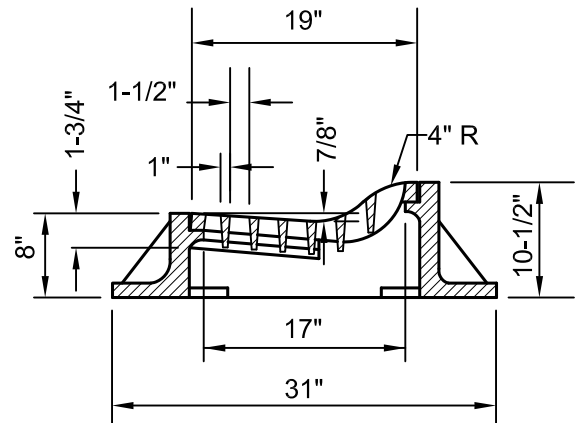
PLAN

NOTES:

1. FRAME AND GRATE SHALL BE NEENAH R-3501-P, EAST JORDAN 7525, OR EQUAL APPROVED BY THE CITY ENGINEER.
2. ALL CASTING SHALL BE SHOP PAINTED WITH AN ASPHALTIC BASE PAINT.
3. ALL CASTINGS SHALL INCLUDE "DUMP NO WASTE. DRAINS TO RIVER".



SECTION A-A



SECTION B-B



City of Naperville
**STANDARD
 DETAIL**

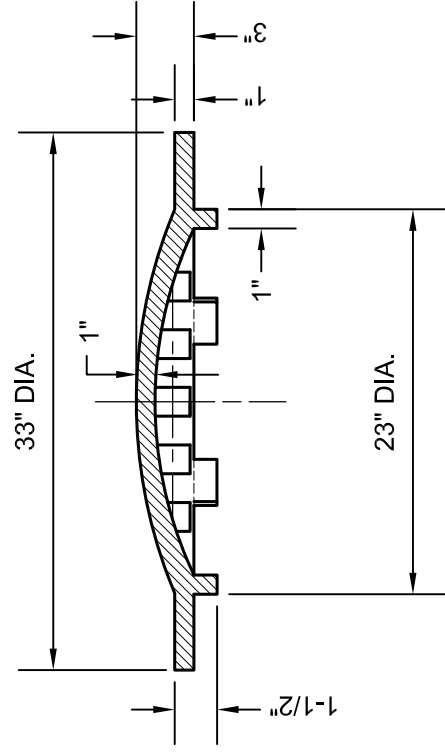
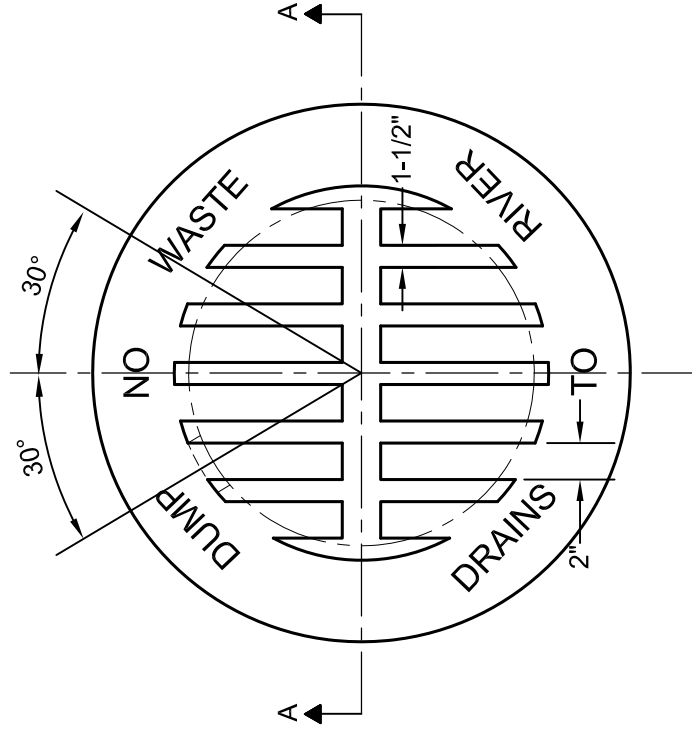
**FRAME & GRATE FOR M-3.12
 CURB & GUTTER**

REVISED: 05/15/2015

SHEET 1 OF 1

STORM 13

290.13



SECTION A-A

NOTES:

1. BEEHIVE GRATE SHALL BE NEENAH R4340B, EAST JORDAN 6527, OR EQUAL APPROVED BY THE CITY ENGINEER.
2. ALL CASTINGS SHALL BE SHOP PAINTED WITH AN ASPHALTIC BASE PAINT.
3. ALL CASTINGS SHALL INCLUDE "DUMP NO WASTE. DRAINS TO RIVER".



City of Naperville
**STANDARD
 DETAIL**

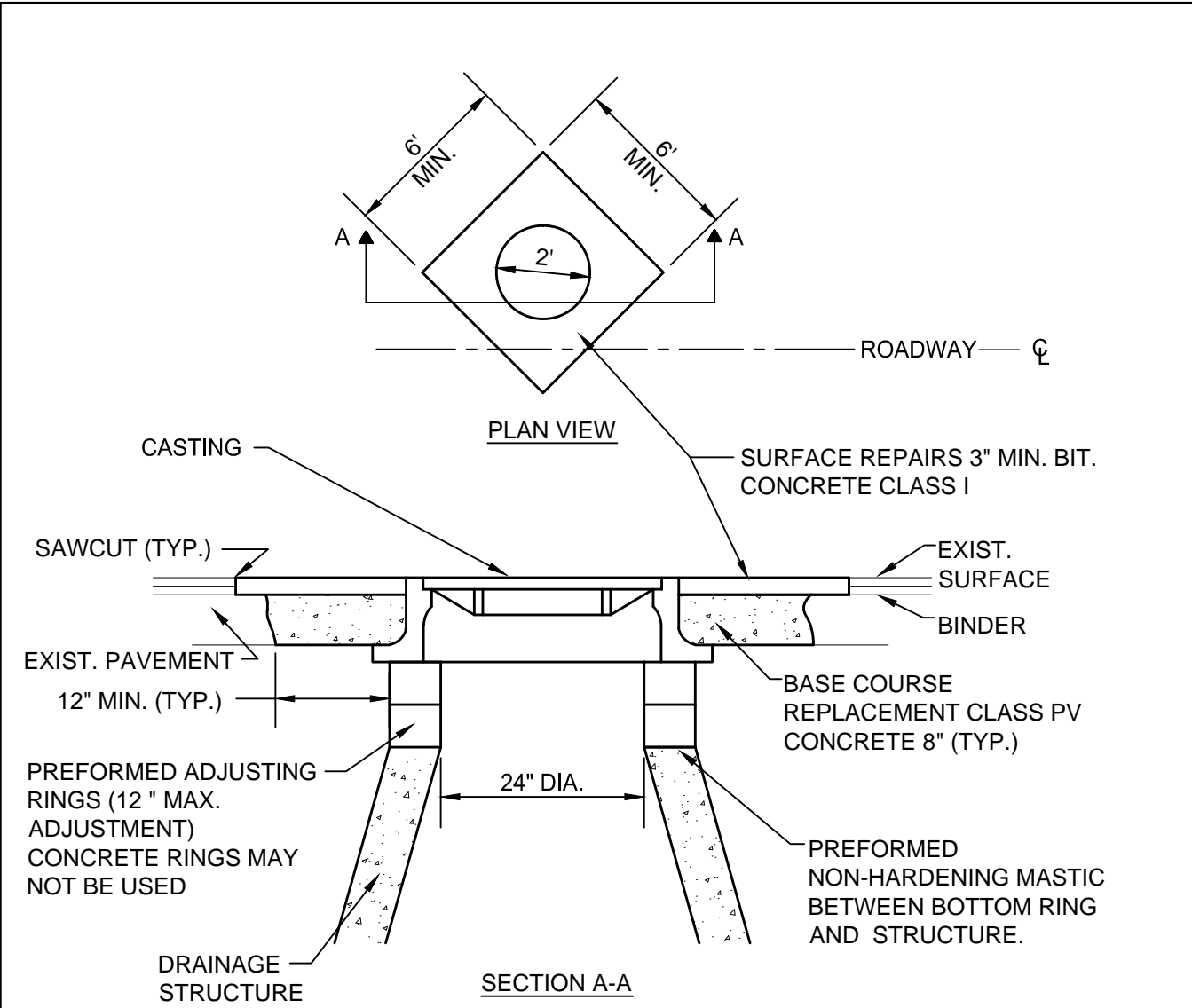
REVISED: 05/15/2015

BEEHIVE GRATE

SHEET 1 OF 1

STORM 14

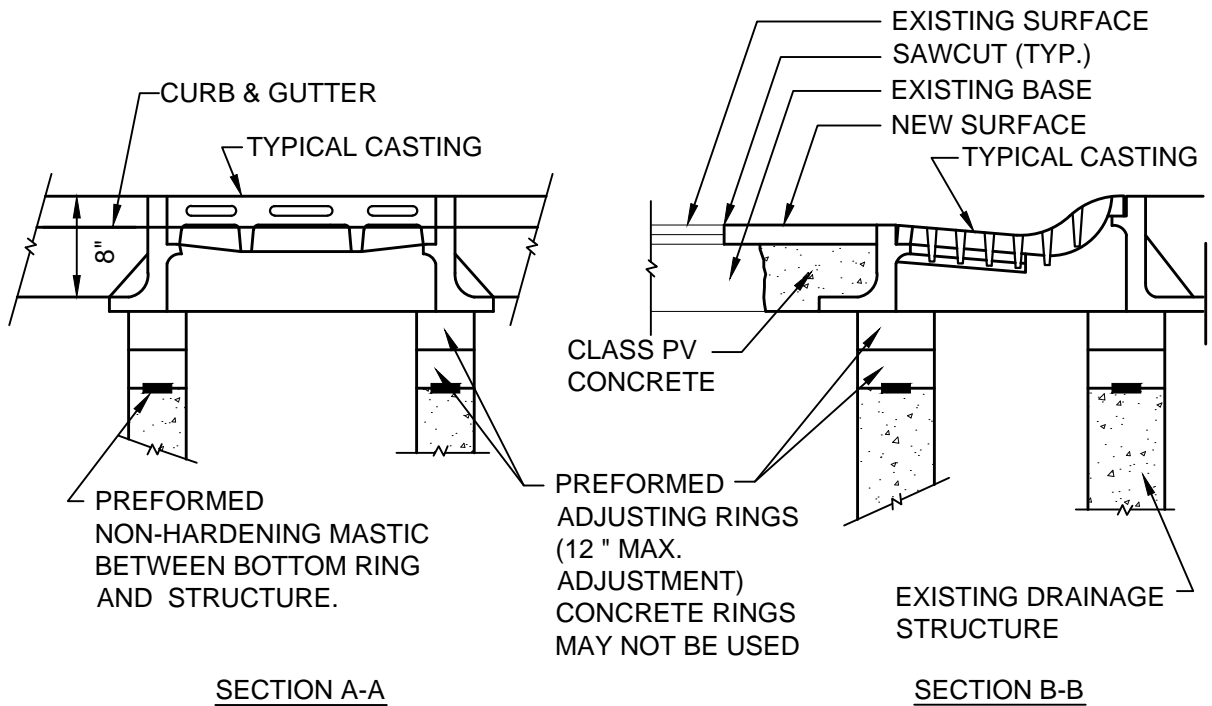
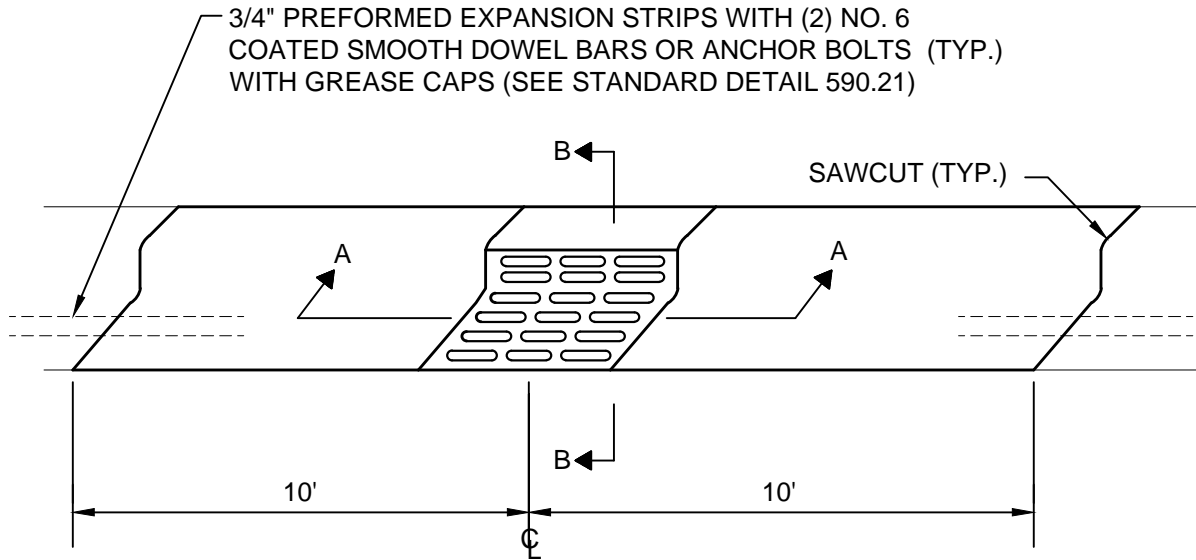
290.14



NOTES:

1. ADJUSTMENTS SHALL BE PROTECTED BY A BARRICADE WITH TWO (2) LIGHTS, OR A 1" THICK STEEL PLATE SHALL BE PROVIDED AND MAINTAINED BY THE CONTRACTOR AT LOCATIONS WHERE ADJUSTMENTS ARE LOCATED IN TRAVEL LANES UNTIL THE SURFACE RESTORATION IS COMPLETE. THE PLATE SHALL BE PROTECTED FROM SLIDING AND SHALL HAVE BITUMINOUS RAMPS AS REQUIRED.
2. WHEN ADJUSTMENTS RAISE A CASTING ABOVE THE ELEVATION OF THE EXISTING PAVEMENT SURFACE, A BITUMINOUS MIXTURE SHALL BE PLACED AROUND THE CASTING, TRANSITIONED A DISTANCE OF 1' HORIZONTAL FOR EACH INCH OF VERTICAL DISTANCE ABOVE THE EXISTING PAVEMENT. SUCH RAMPS SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL THE COMPLETION OF THE SURFACE RESTORATION.





1. REMOVE & REPLACE CURB A MINIMUM OF 10' EITHER SIDE OF STRUCTURE OR TO NEAREST EXPANSION JOINT (WHICHEVER IS CLOSEST)
2. POUR CONCRETE FILLET BETWEEN CASTING AND ADJUSTING RINGS FOR LOCATIONS WHERE THE CASTING IS LARGER THAN THE ADJUSTING RING



City of Naperville
**STANDARD
 DETAIL**

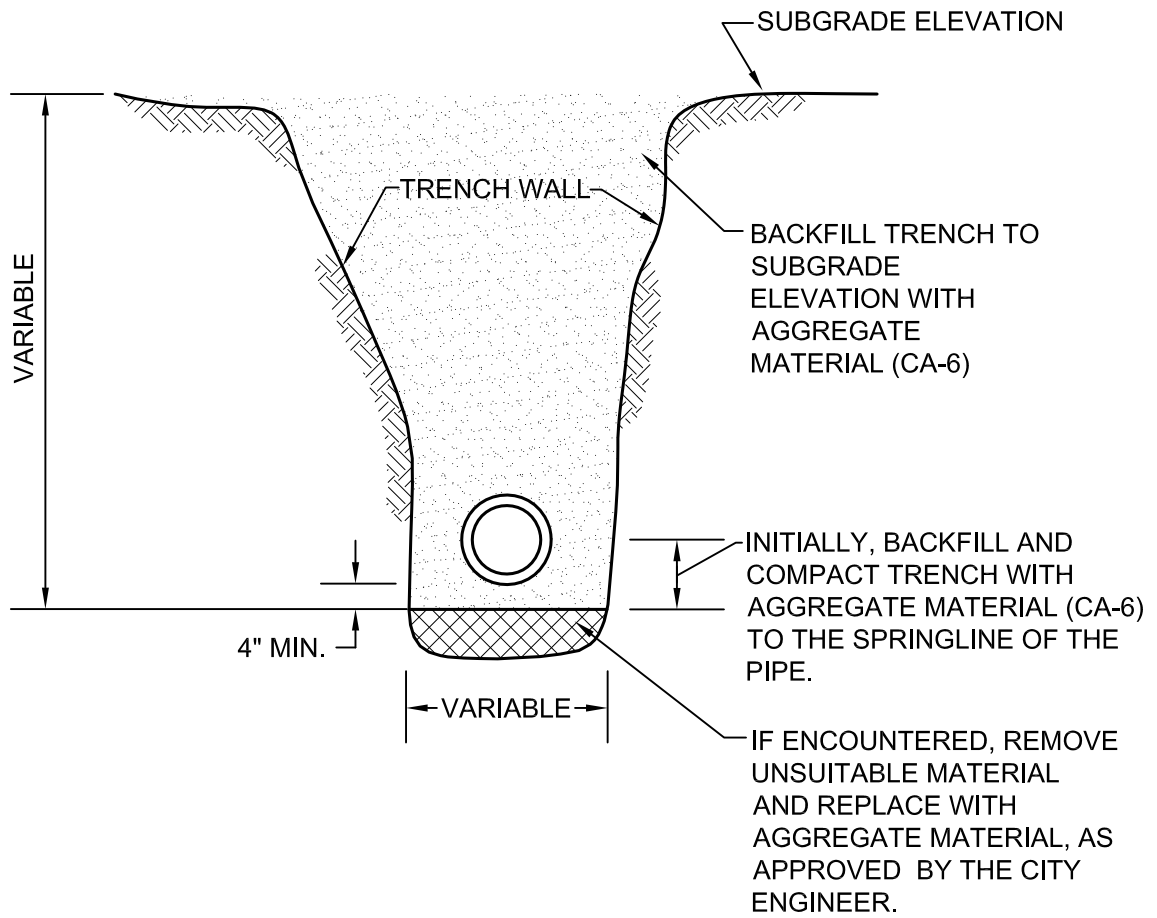
**CASTING ADJUSTMENTS FOR
 STRUCTURES WITHIN THE CURB LINE**

REVISED: 08/01/2018

SHEET 1 OF 1

STORM 16

290.16



NOTES:

1. TRENCH BACKFILL MATERIAL SHALL BE COMPACTED IN ACCORDANCE WITH SECTION 550.07 OF THE IDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
2. THIS DETAIL SHALL BE USED WHEREVER THE TRENCH IS MADE IN THE PROPOSED ROADWAY SUBGRADE, AND WHEREVER THE INNER EDGE OF THE TRENCH IS CLOSER THAN 2' TO THE EDGE OF THE PROPOSED PAVEMENT, CURB AND GUTTER, AND SIDEWALK.



City of Naperville
**STANDARD
 DETAIL**

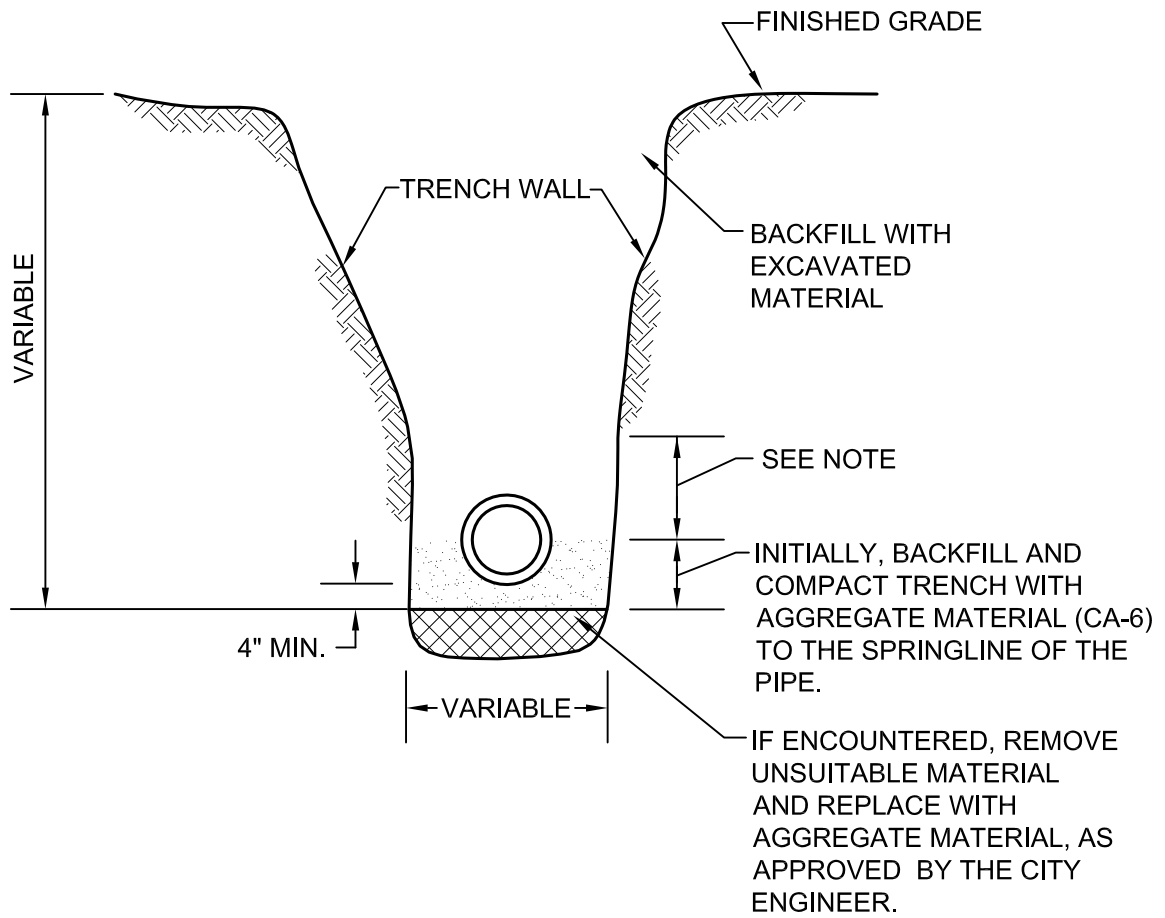
**STORM SEWER TRENCH
 SECTION IN PAVED AREAS**

REVISED: 01/01/2013

SHEET 1 OF 1

STORM 20

290.20



NOTE:

FOR PVC AND HDPE PIPE, BACKFILL WITH AGGREGATE MATERIAL (CA-6) TO 6" ABOVE THE TOP OF PIPE.



City of Naperville
**STANDARD
 DETAIL**

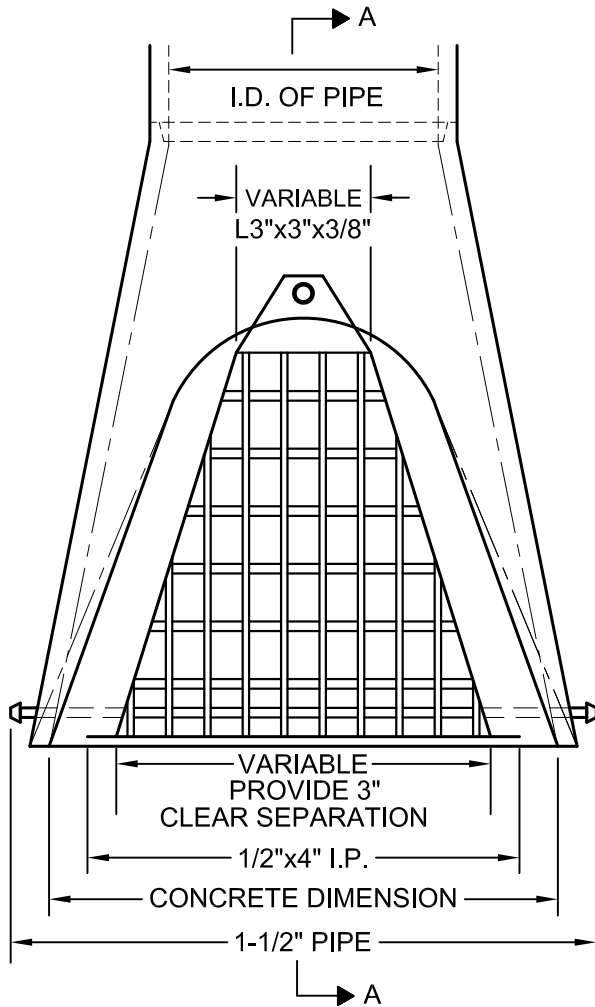
**STORM SEWER TRENCH
 SECTION IN NON-PAVED AREAS**

REVISED: 01/01/2013

SHEET 1 OF 1

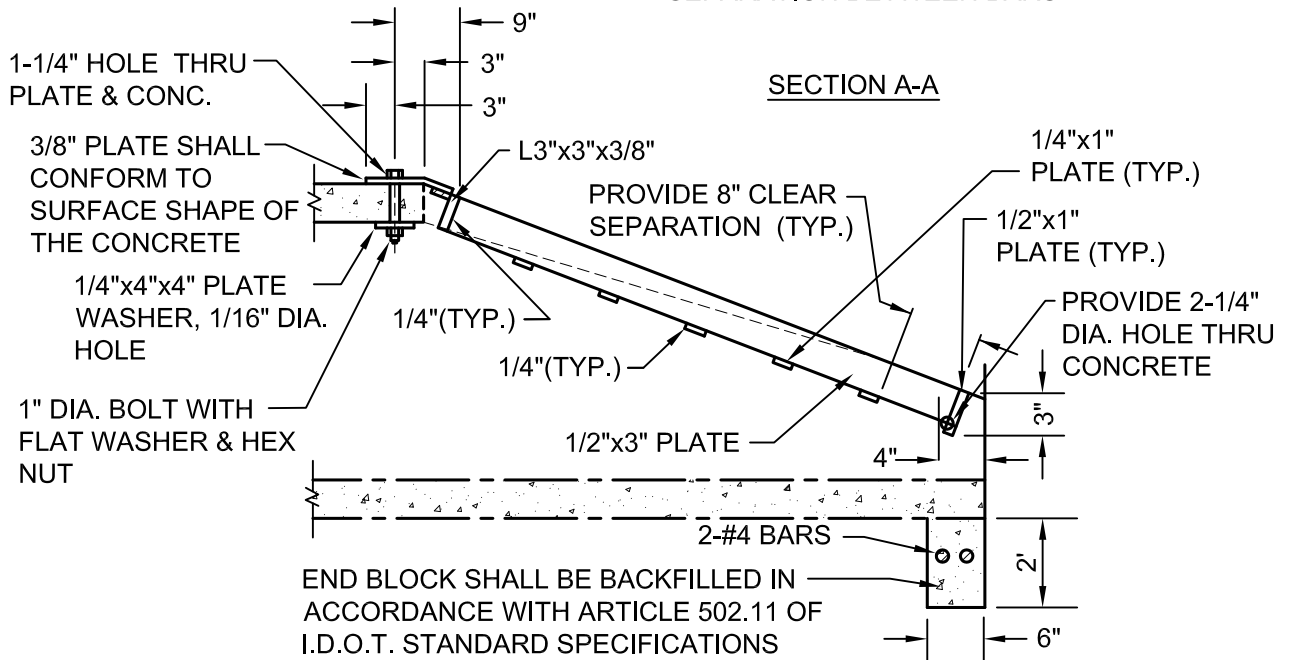
STORM 21

290.21



NOTES:

1. STRUCTURAL STEEL SHAPES AND PLATES SHALL BE IN ACCORDANCE WITH ARTICLE 710.04 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
2. GALVANIZED STEEL PIPE SHALL BE IN ACCORDANCE WITH ARTICLE 710.33 (B) OF THE STANDARD SPECIFICATIONS.
3. BOLTS, NUTS AND WASHERS SHALL BE IN ACCORDANCE WITH ARTICLE 710.33 (G) OF THE STANDARD SPECIFICATIONS.
4. ALL FABRICATION SHALL BE COMPLETED AND ASSEMBLED BEFORE GALVANIZING.
5. THE CORED HOLES IN THE PRECAST CONCRETE FLARED END SECTIONS SHALL BE TO THE DIAMETERS NOTED. IF CONE-OUT ON THE OTHER END OF THE HOLE OCCURS, THE HOLE SHALL BE FILLED WITH GROUT TO CORRECT DIAMETER OF THE HOLE.
6. ALL FLARED END SECTIONS FOR PIPE GREATER THAN 12" IN DIAMETER SHALL BE PROVIDED WITH A GRATE.
7. GRATES SHALL BE CONSTRUCTED TO PROVIDE 8" VERT. X 3" HORZ. CLEAR SEPARATION BETWEEN BARS.



City of Naperville
**STANDARD
 DETAIL**

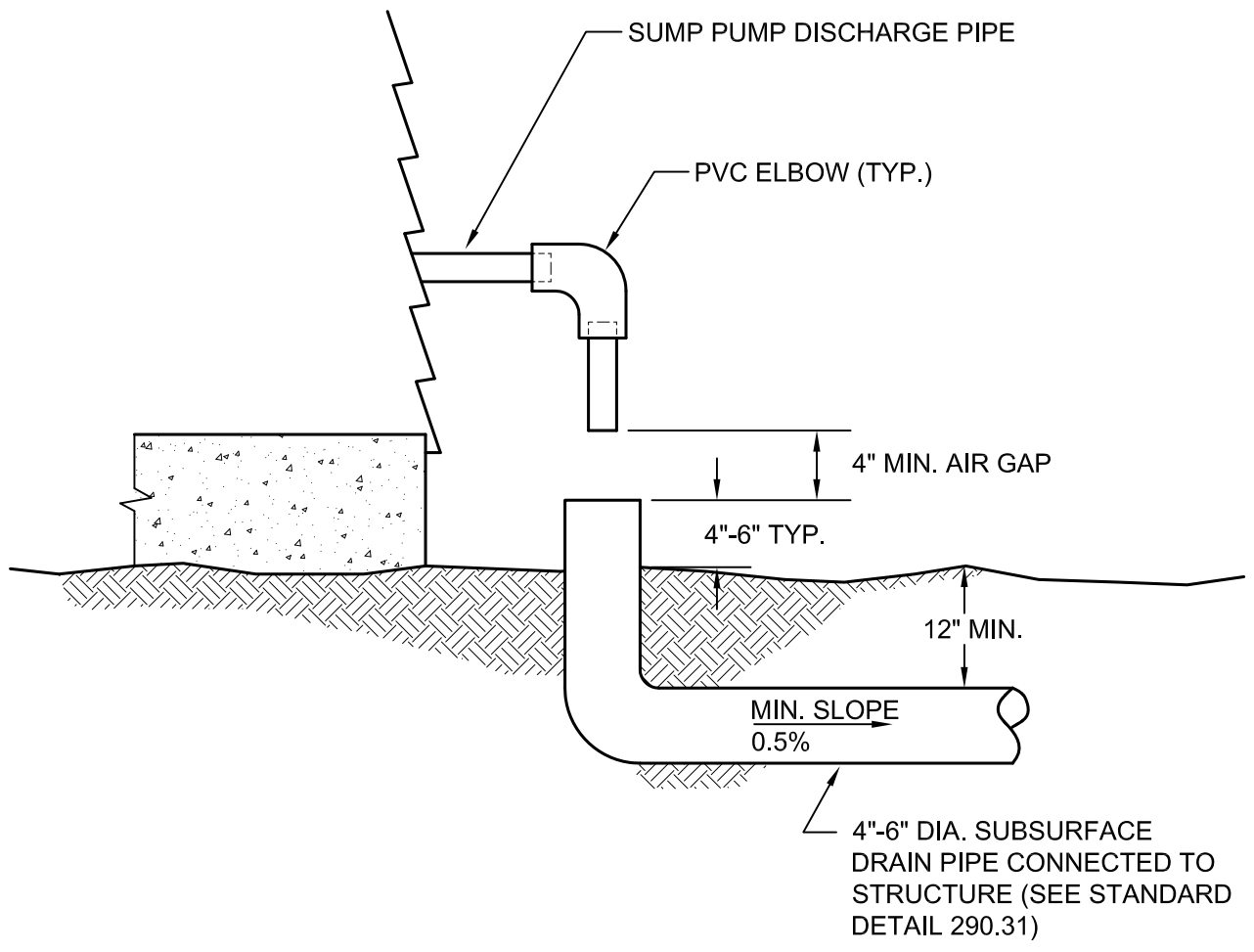
**GRATING FOR CONCRETE
 FLARED END SECTION**

REVISED: 01/01/2013

SHEET 1 OF 1

STORM 22

290.22



City of Naperville
**STANDARD
 DETAIL**

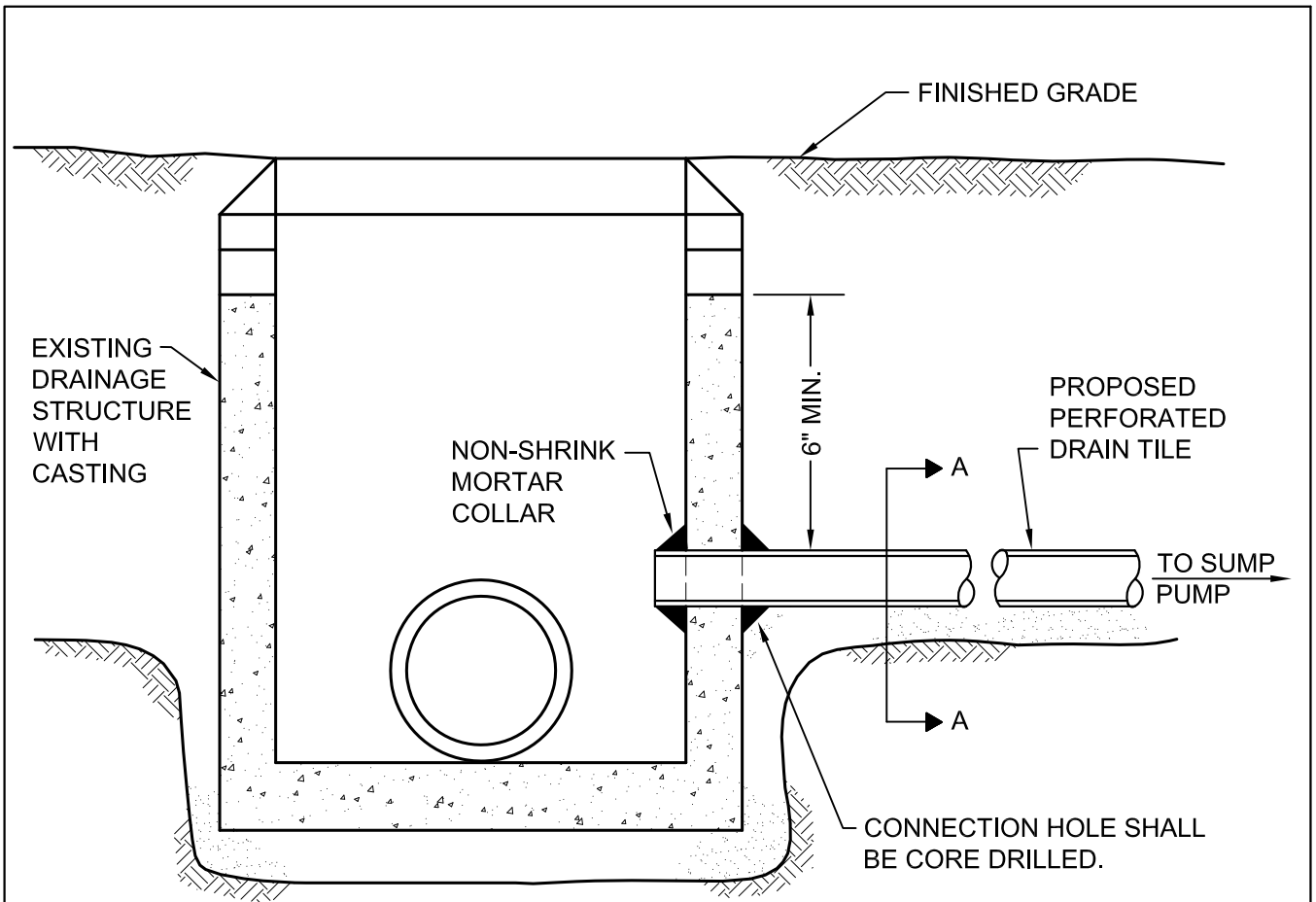
SUMP PUMP CONNECTION

REVISED: 01/01/2013

SHEET 1 OF 1

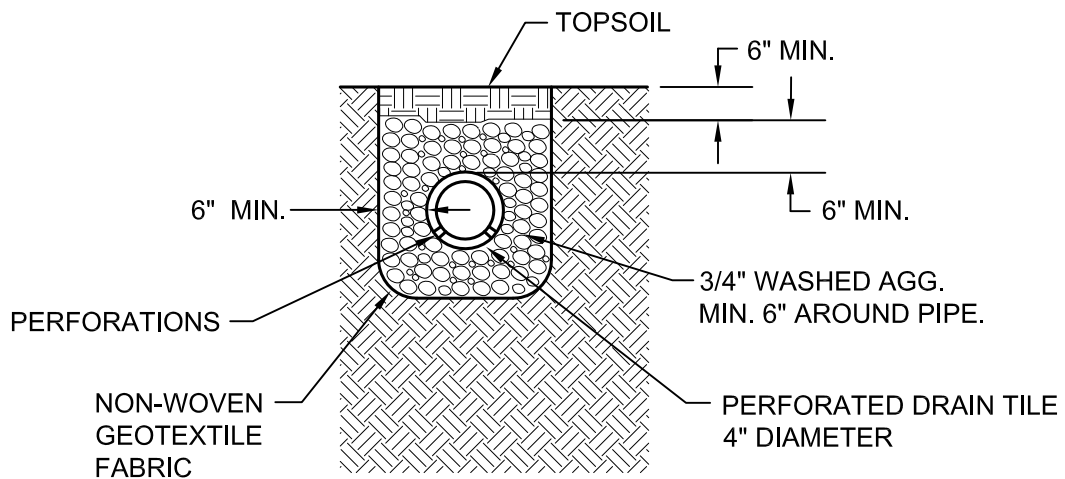
STORM 30

290.30



NOTE:

UNDERDRAIN PIPE SHALL BE 4" DIA. SCHEDULE 40 P.V.C.



SECTION A-A



City of Naperville
**STANDARD
DETAIL**

**SUMP PUMP CONNECTION
TO DRY WELL**

REVISED: 01/01/2013

SHEET 1 OF 1

STORM 31

290.31