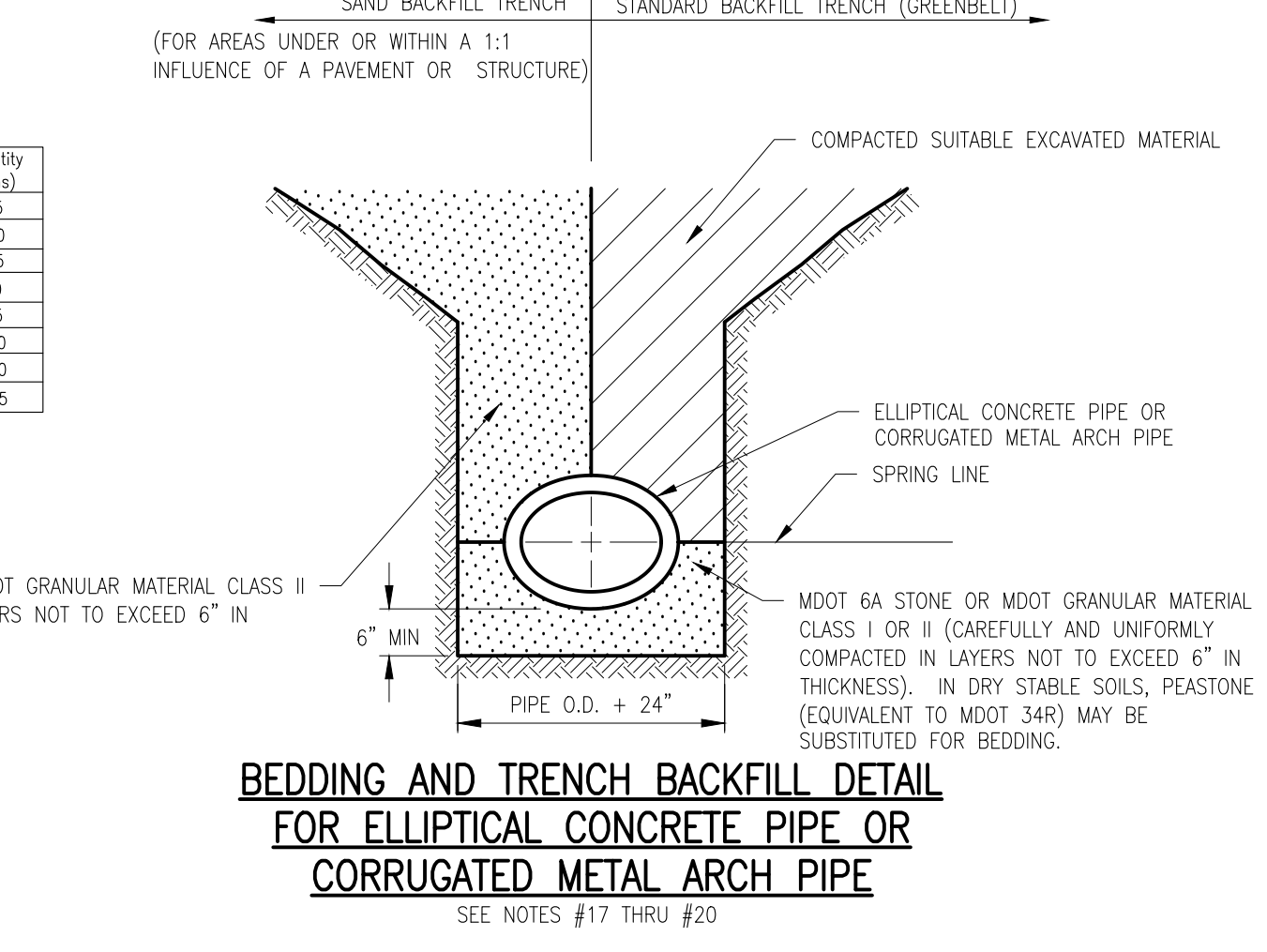
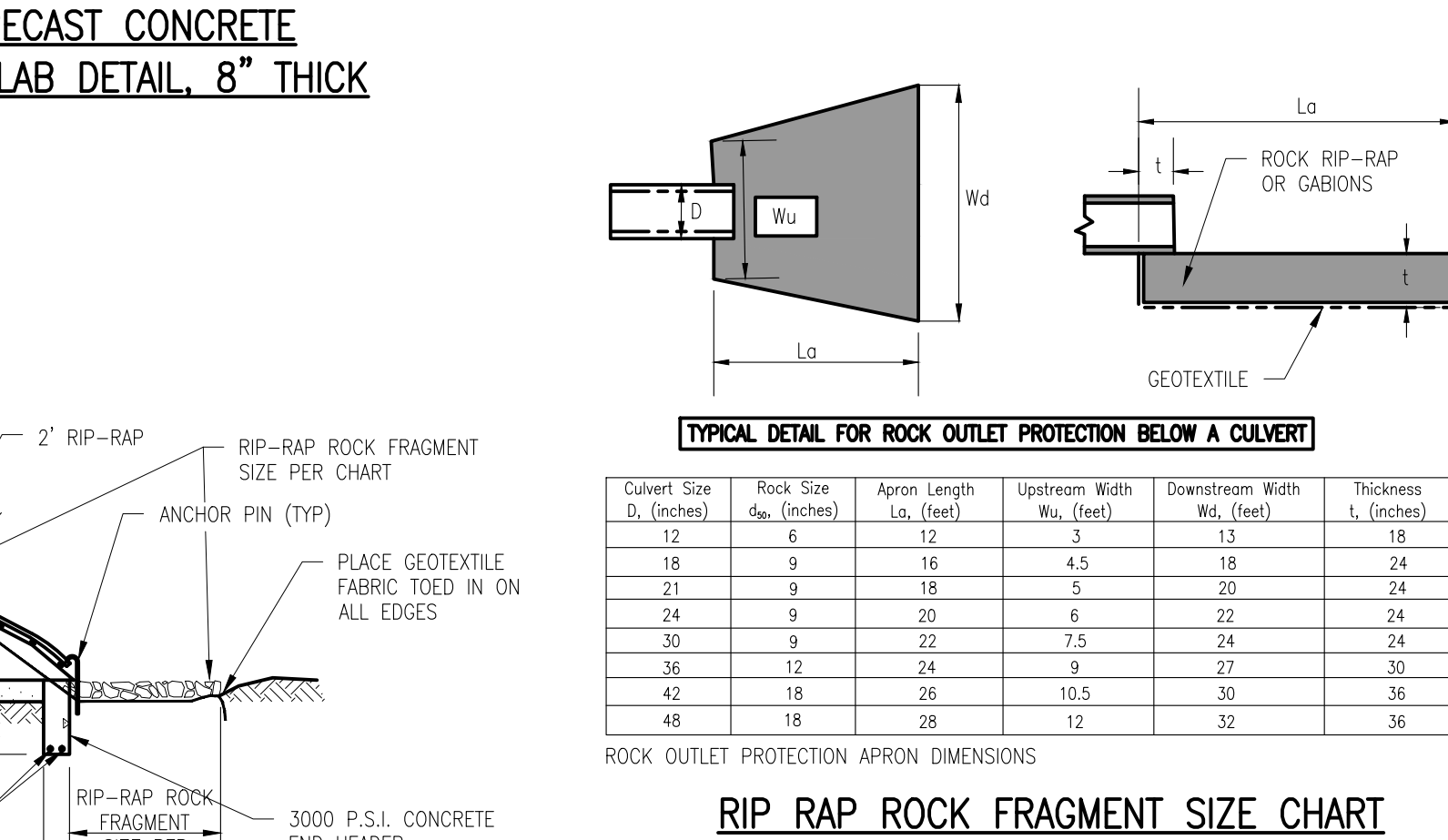
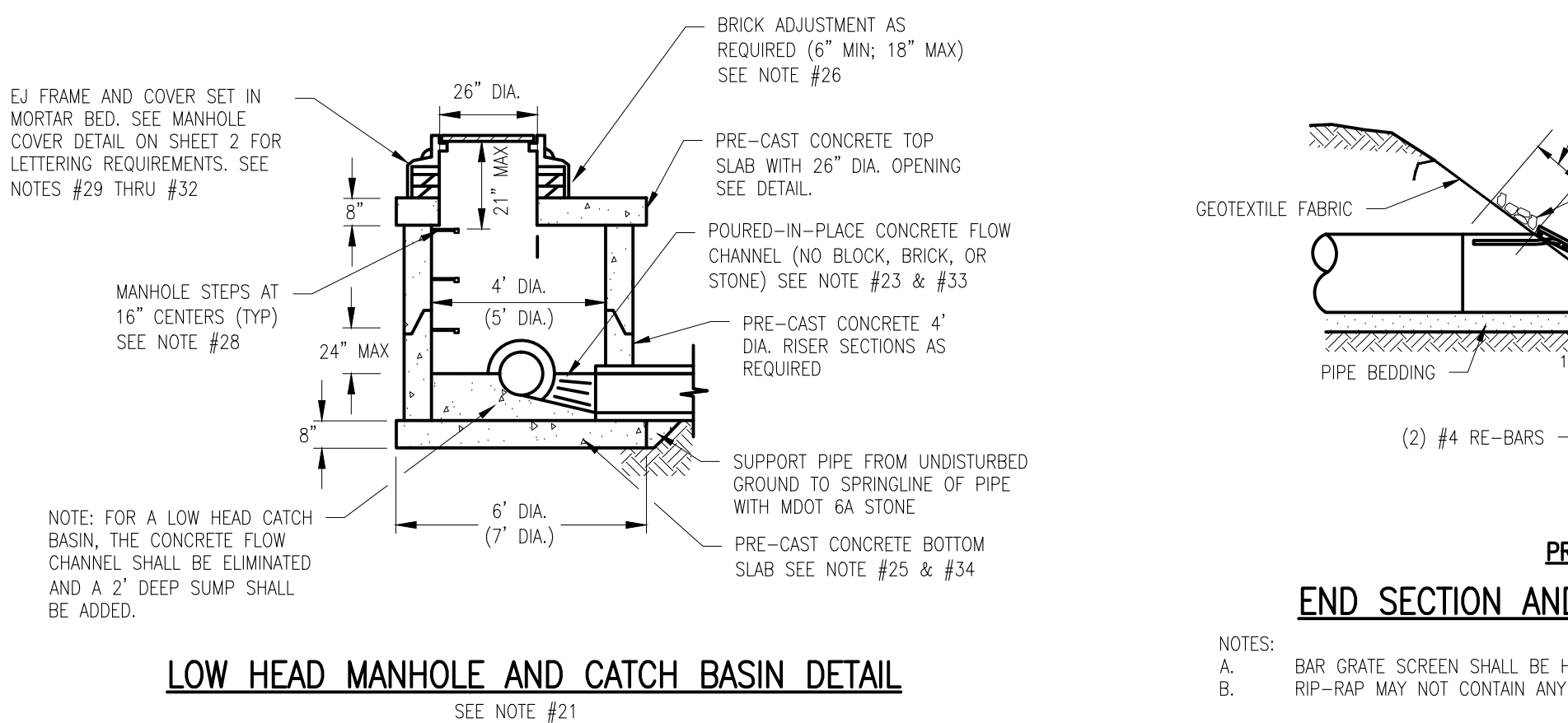
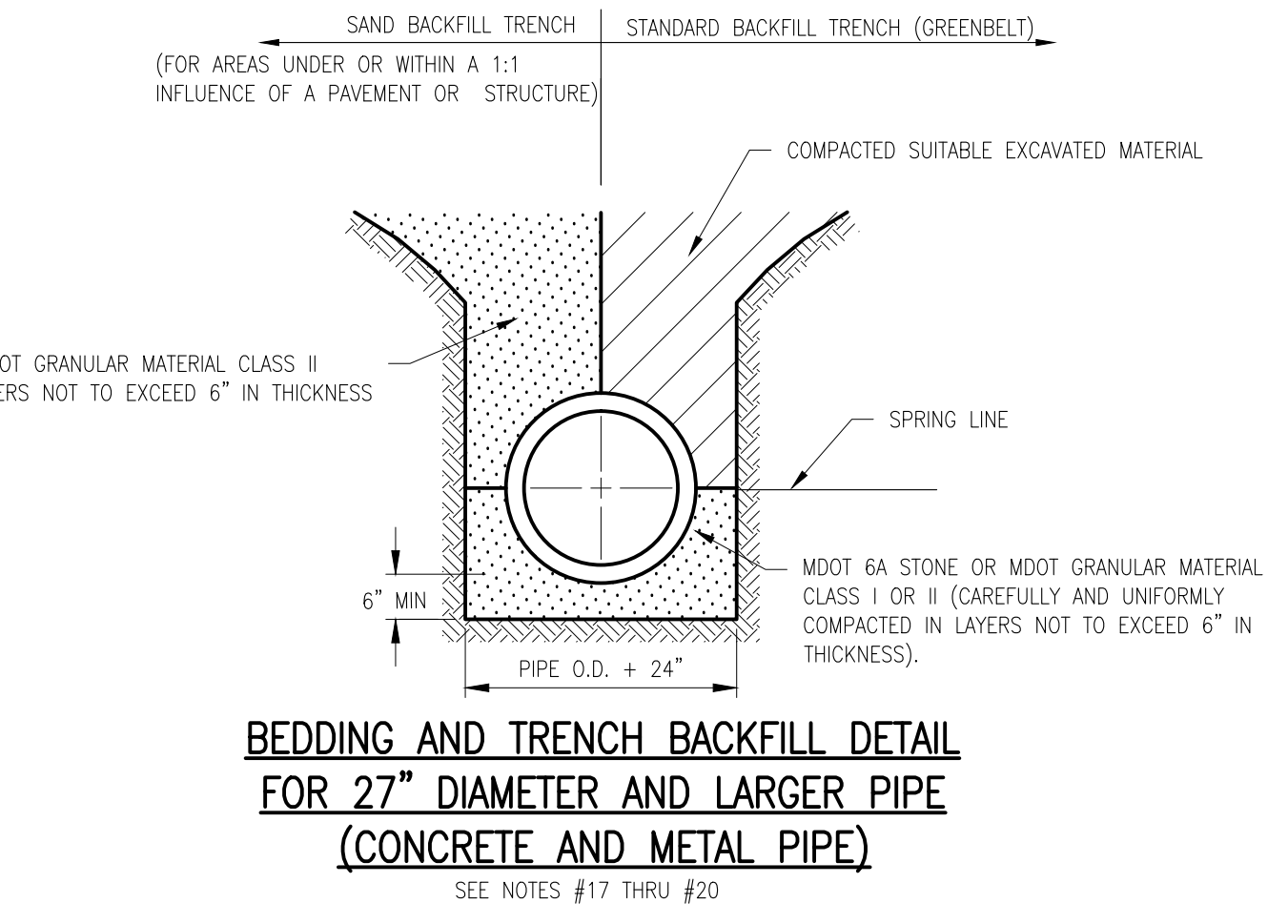
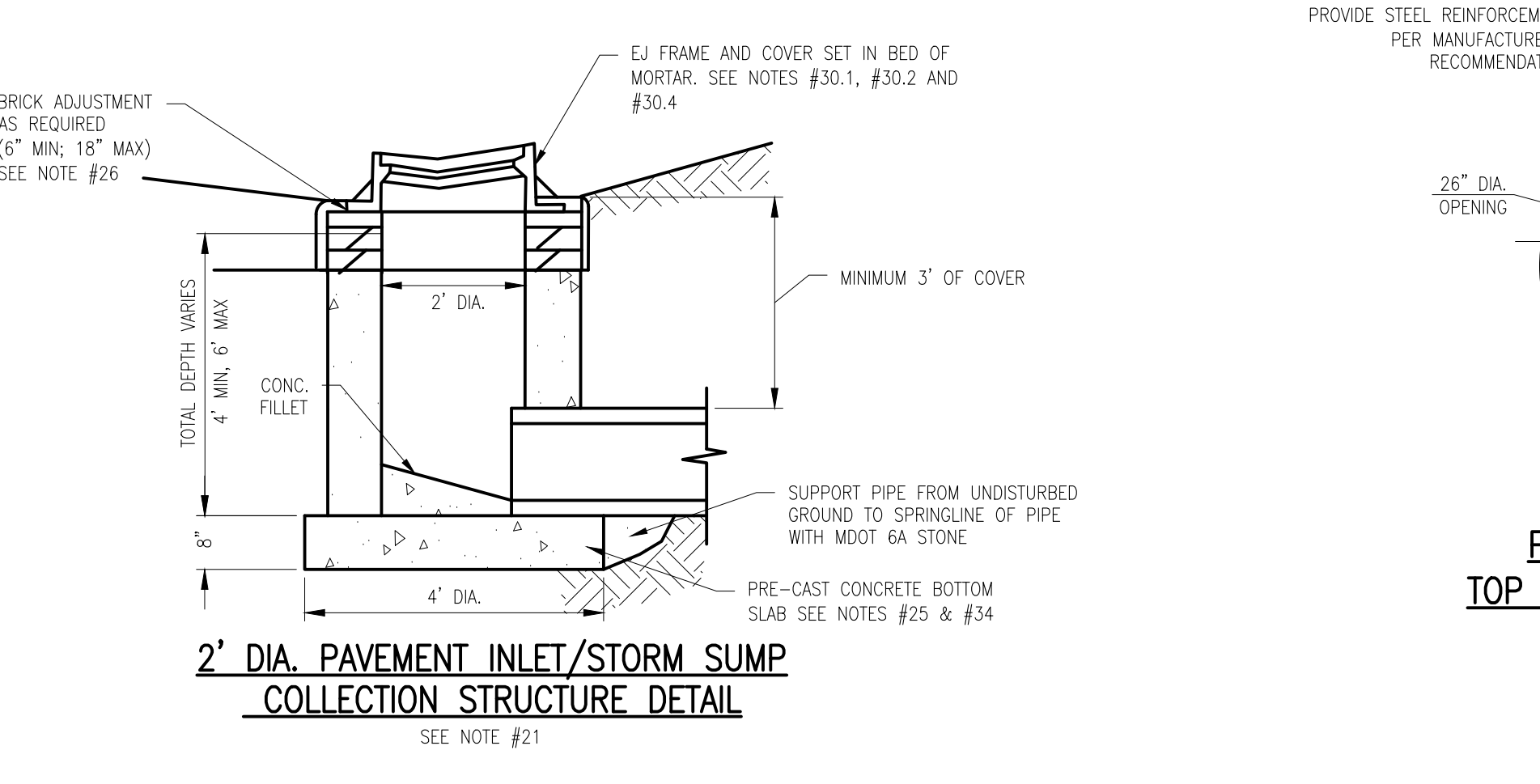
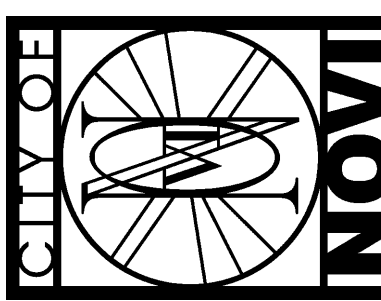


INSIDE DIAMETER	MAXIMUM PIPE SIZE FOR STRAIGHT THRU INSTALLATION	MAXIMUM PIPE SIZE FOR RIGHT ANGLE INSTALLATION
4' - 0"	24"	18"
5' - 0"	36"	24"
6' - 0"	42"	36"
8' - 0"	60"	42"





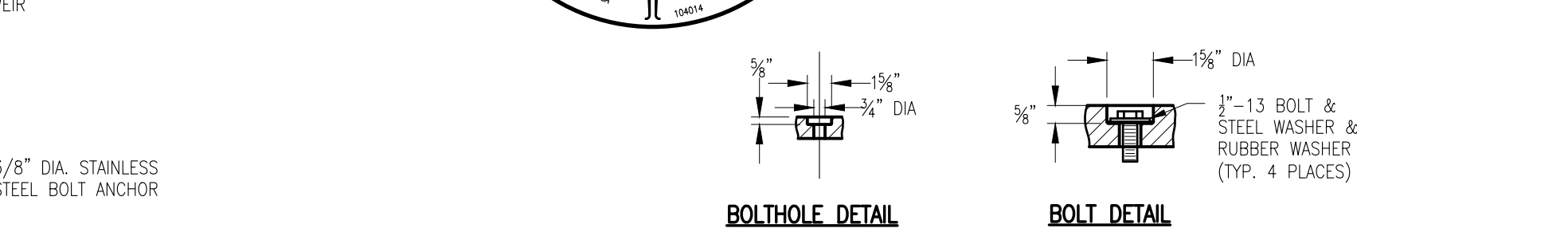
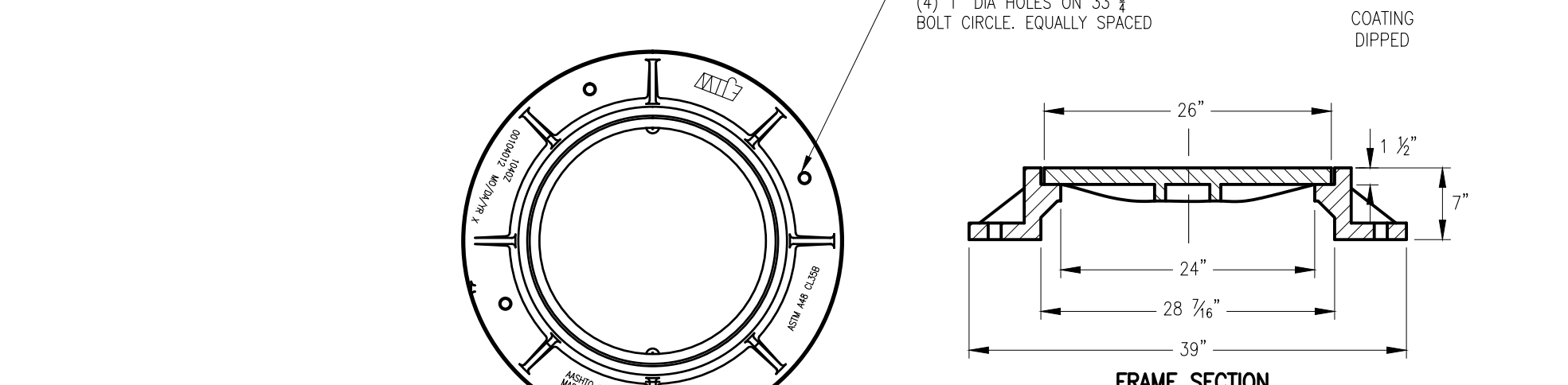
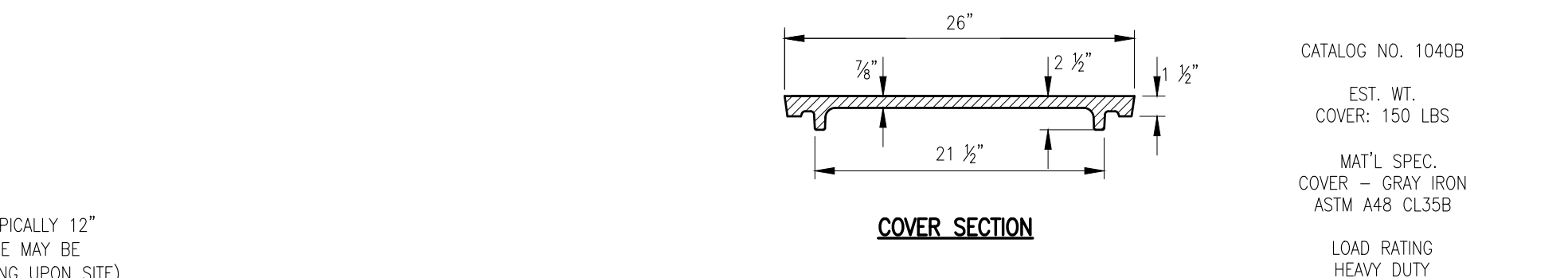
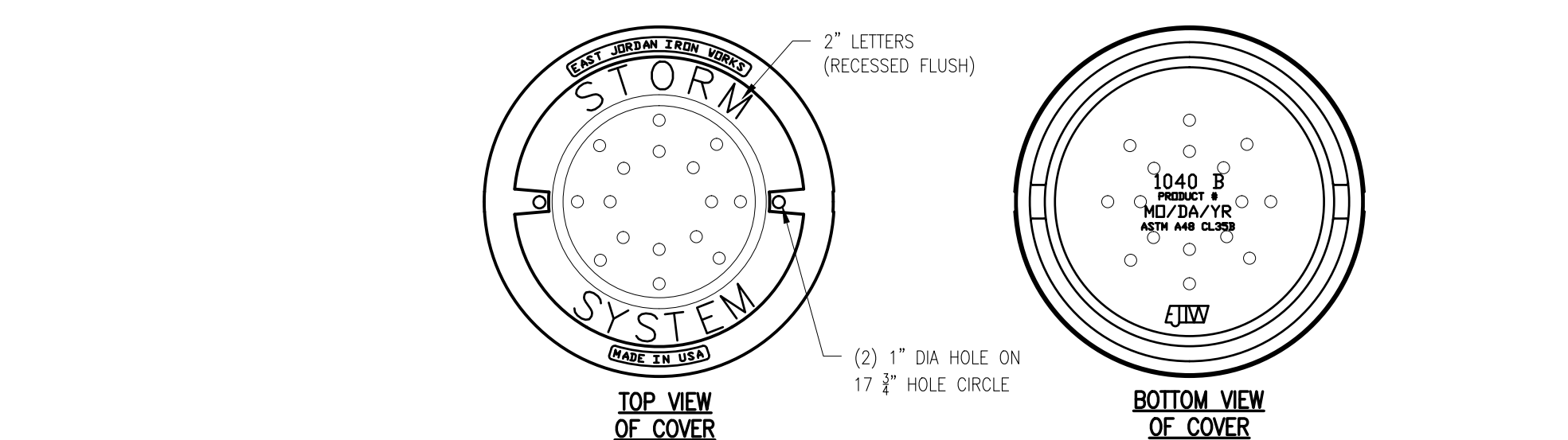
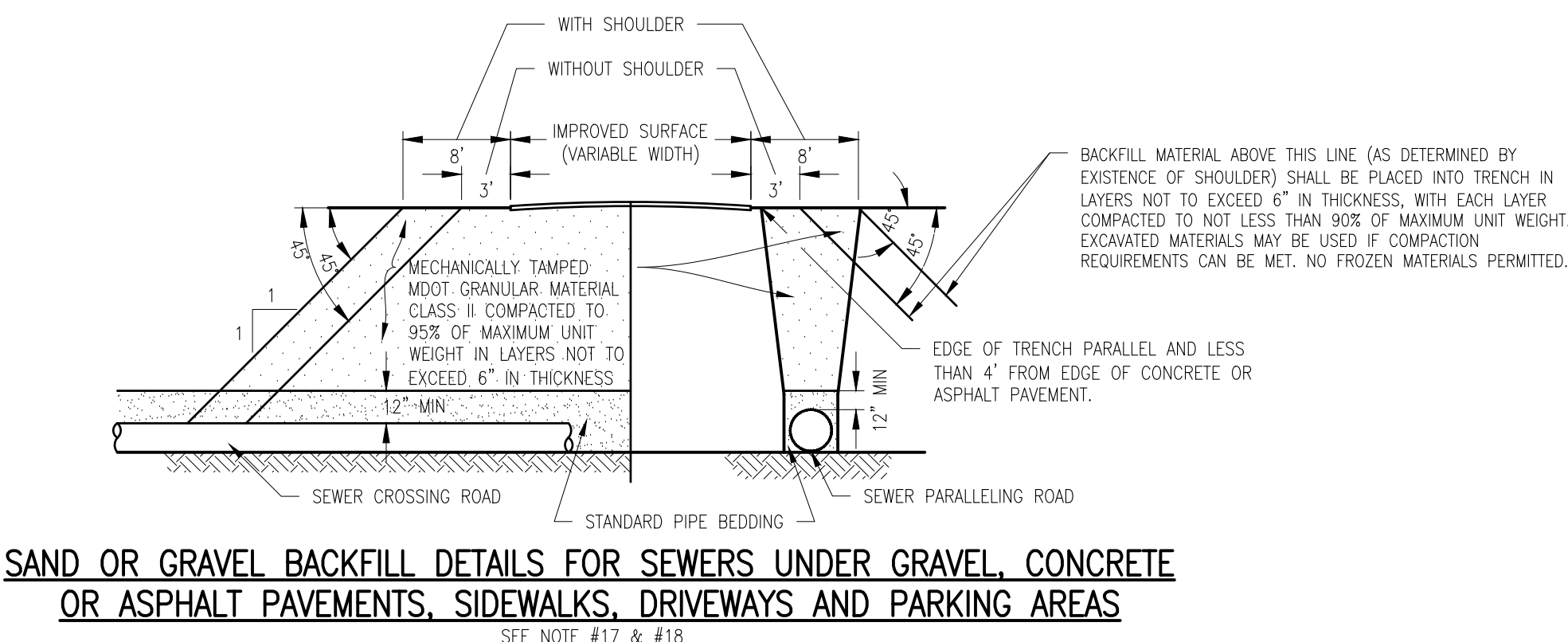
STORM SEWER CONSTRUCTION NOTES

- GENERAL NOTES:**
- All materials and workmanship shall be in accordance with the standards and specifications of the City of Novi.
 - No storm sewer is to be installed without the City's inspector present.
 - Three (3) working days prior to construction, the Contractor shall telephone MISS DIG (811 or 1-800-482-7171) for underground facilities locations and shall also notify representative of other utilities located in the vicinity of the work.
 - Trenches that are to be left open overnight shall be enclosed with suitable fencing and lighted barricades.
 - The materials specified below may be substituted with an approved equal as determined by the City. It is at the sole discretion of the City to determine if a material is acceptable and can be utilized. Written authorization must be obtained prior to ordering or installing the approved equal.
- STORM SEWER NOTES:**
- Type and class of pipe shall be as specified on plans.
 - Concrete Pipe Requirements
 - All round reinforced concrete pipe (RCP) shall meet the requirements of ASTM C76 with modified tongue and groove joints with rubber gaskets manufactured to meet the requirements of ASTM C443. Catch basin sewers shall be Class IV RCP.
 - The inside joint of pipe over 36" diameter shall be pointed with mortar upon completion of backfilling operations.
 - All elliptical reinforced concrete pipe shall meet the requirements of ASTM C507 with tongue and groove joints with bituminous (DeWitt #10) joint material meeting the requirements of C443. Elliptical concrete pipe joints shall also be wrapped per ASTM C877. In addition, elliptical concrete pipe of 42" equivalent size and larger shall require inside concrete pointing.
 - Plastic Pipe Requirements
 - Per City standards, the maximum allowable pipe size for plastic storm sewer is 12" diameter. Larger diameter plastic storm sewer may be approved by the City, depending on site conditions.
 - HDPE pipe shall meet the requirements of AASHTO M294 and ASTM D3350 with push-on type joints meeting the requirements of ASTM D3212 and F477.
 - ADP pipe shall meet the requirements of AASHTO M294 and ASTM F2306 with joints meeting the requirements of AASHTO M252, M294, or F2306.
 - Plastic pipe will not be permitted in the right-of-way.
- Bedding Requirements**
- Bedding shall be used as called for on the details.
 - Where unstable ground conditions are encountered, stone bedding shall be used as directed by the Engineer in order to provide a stable foundation for pipe and manholes.
- Backfill Requirements**
- Backfill shall be compacted above pipe or as indicated on construction drawings. Trench backfill shall be of a suitable material and shall be free of any organic materials and rocks larger than 3" in size. Backfill shall be ramped into trench and compacted with a small dozer or other approved method.
 - Where trench is within a 1:1 influence of streets, alleys, sidewalks, driveways, parking areas and structures, sand backfill shall be used which shall consist of MDOT granular material Class II compacted in layers not to exceed 6" in thickness to a density of 95% as determined by AASHTO 199.
- Drainage Structure Requirements:**
- Shop drawings shall be submitted to and approved by the City's Consultant for each proposed structure prior to installation.
 - Precast reinforced concrete sections with modified tongue and groove joint and rubber gaskets shall conform to ASTM C-478. Cone section shall be eccentric and have stud inserts cast in place with a flush top surface.
 - Pipe shall be flush with the inside wall of structure and shall not protrude more than 4" into the structure. Pipe shall be pointed up inside and outside with a smooth finish at its intersection with the structure wall.
 - No openings shall be made in precast units which would leave less than 6" of undisturbed precast structure wall between pipes (as measured between outside pipe walls) or would remove more than 40% of the circumference along any horizontal plane.
- Other Notes:**
- Precast riser placed on the concrete base shall be set in a full bed of mortar. All joints & liftholes shall be pointed up with mortar on the outside and inside.
 - Plaster all outside masonry surfaces with 1:2 1/2 masonry cement (type II) 1/2" thick.
 - All manholes and catch basins shall be 4' or 5' in diameter unless otherwise indicated on construction drawings. Larger diameter drainage structures (6", 7", 8", 10", and 12" diameter) may be needed for large storm sewer pipe or for situations where the angles between entering pipes require a larger diameter structure in order to maintain at least 6" of structure wall between the pipes. 2' diameter catch basins and inlets may be used where approved by the City Engineer.
 - Structure steps are to be installed at the plant by the manufacturer of the structure. The steps are to be 16 inches on center located 90° from the centerline of the main sewer line. The steps shall be made of No. 4 deformed steel rod encased with copolymer polypropylene plastic and meet the requirements of ASTM D4101, Type II, Grade 49108 or approved equal.
 - Manhole frame and cover shall be EJ 1040, type "B" 16 Hole Cover or as per construction drawings. Lettering shall be per detail this sheet.
 - Catch Basin and Inlet frame and cover shall be:
 - EJ 7045, type "M1" cover and type "T1" back set (with "Dump No Waste" logo) with straight face curb and gutter.
 - EJ 7065, type "M1" cover and 7060 "T1" back set (with "Dump No Waste" logo) with mountable curb and gutter and integral curb and gutter.
 - EJ 1040, type "O2" cover (beehive grate) to be used on structures located in ditches, swales and rear yard catch basins. If within 8' of road, type "N" cover (oval grate) shall be used. If 1040 casting is used in pavement, Type M1 grate must be provided.
 - EJ 1030, type "A" solid cover to be used on all 2' cleanouts and structures not located at storm water collection points. EJ 1060, type "A" solid cover may also be used on sump pump cleanout structures.
 - EJ 1030, type "O1" cover (beehive grate) to be used on all 2' structures located in ditches, swales and rear yard catch basins.
 - The City reserves the right to require a change in structure covers upon final grade and walk-through inspection if deemed necessary due to site conditions.
 - Frames shall be set in full bed of mortar and the side shall be overlapped to prevent leakage.
 - A proper channel shall be constructed within the existing manhole or other structure at which the connection is to be made to direct the flow to the existing outlet in a manner that will tend to create the least amount of turbulence. The channel shall be constructed to the same size as the inside diameter of the existing pipes, and shall be built to height of 1/3 the existing pipe diameter with a minimum of 2% slope on the benches.
 - Concrete base for manhole, catch basin, and inlet shall be MDOT grade 30P, 8" thick, 3000 psi.
 - When tapping into an existing structure a brick collar shall be placed 12" thick around the pipe and extended 12" beyond the opening. If pre-cast section is tapped, bend mesh and use as reinforcement with brick collar. Taps through structure joints or cone sections are prohibited unless approved by the City.
 - The final accessible structure prior to discharge into a forebay or detention basin shall contain a permanent 4' deep sump.
 - A 4' diameter Oil/Gas Separator Structure shall be installed prior to discharge into a forebay, detention basin or open drainage course as directed by the City.
- SUMP PUMP LEAD REQUIREMENTS:**
- All sump pump leads connected to a drain shall be pre-manufactured.
 - Sump pump leads shall be (1) PVC Sch. 40 (2) PVC Truss Pipe, or (3) approved equal, with premium joints.
 - Sump collection system pipes shall be connected at drainage structures and shall be cored or precast. Taps to 12" storm sewer may be made with a Romac saddle, KOR-N-TEE lateral connector for concrete pipe, or approved equal.
 - Ends of all 4" sump pump leads shall be temporarily capped and their location staked, witnessed and recorded.
 - All sump pump leads are to be taken to the property line, easement line or as indicated on the plan.
 - Sump pump cleanouts shall be a minimum inside diameter of 2' and be constructed at changes of alignment ends of sump pump mains or as indicated on approved plans.

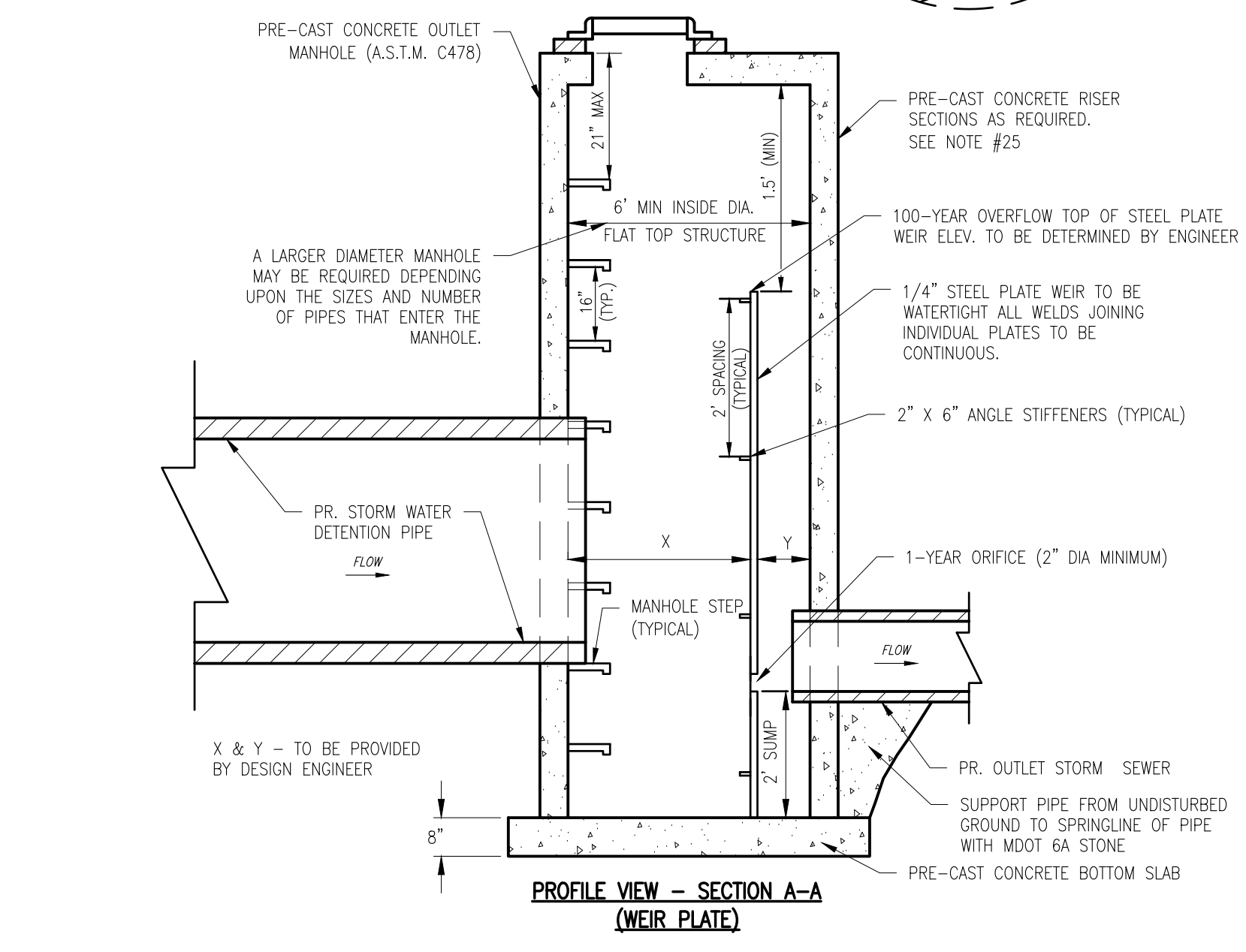
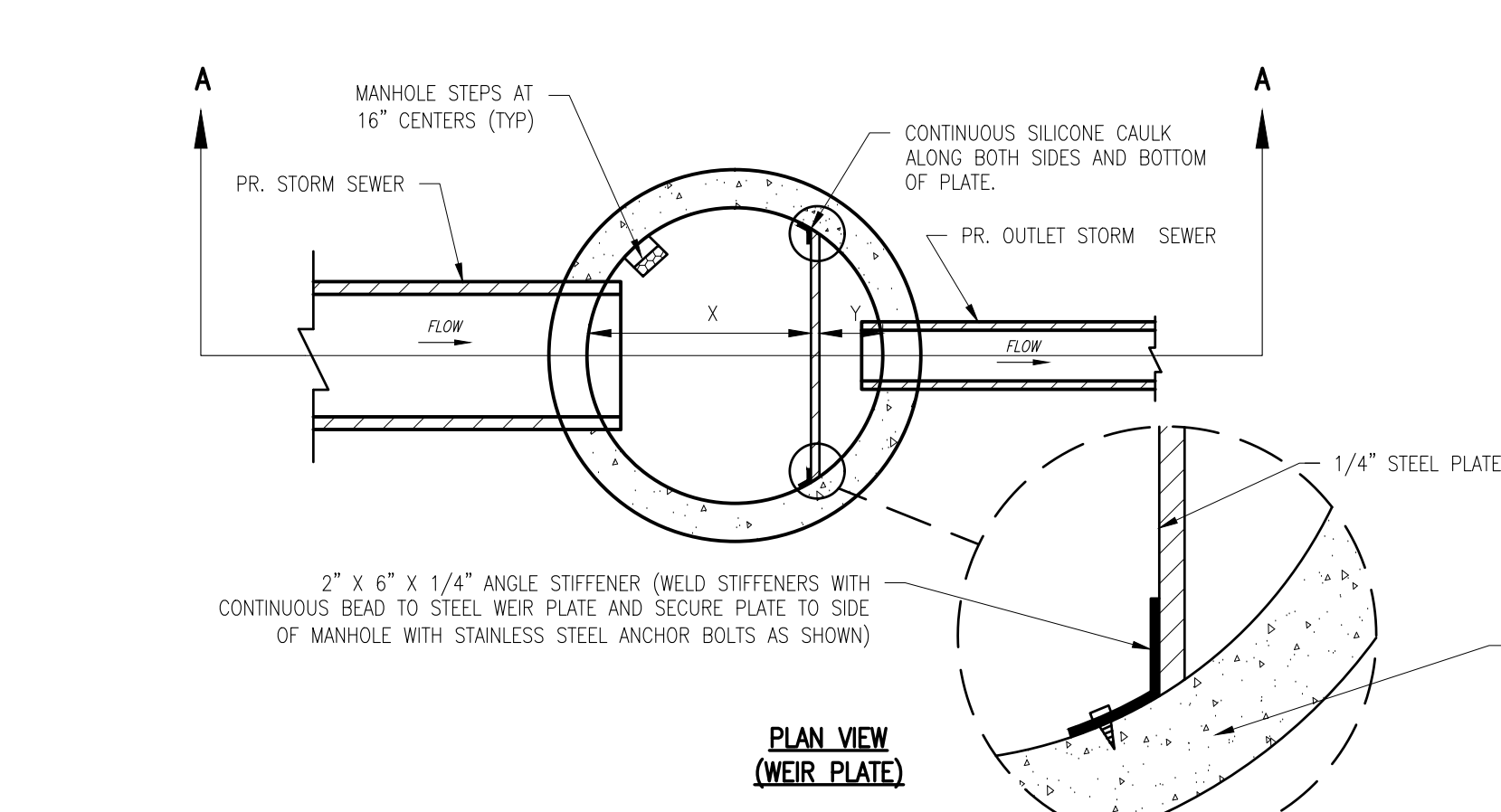
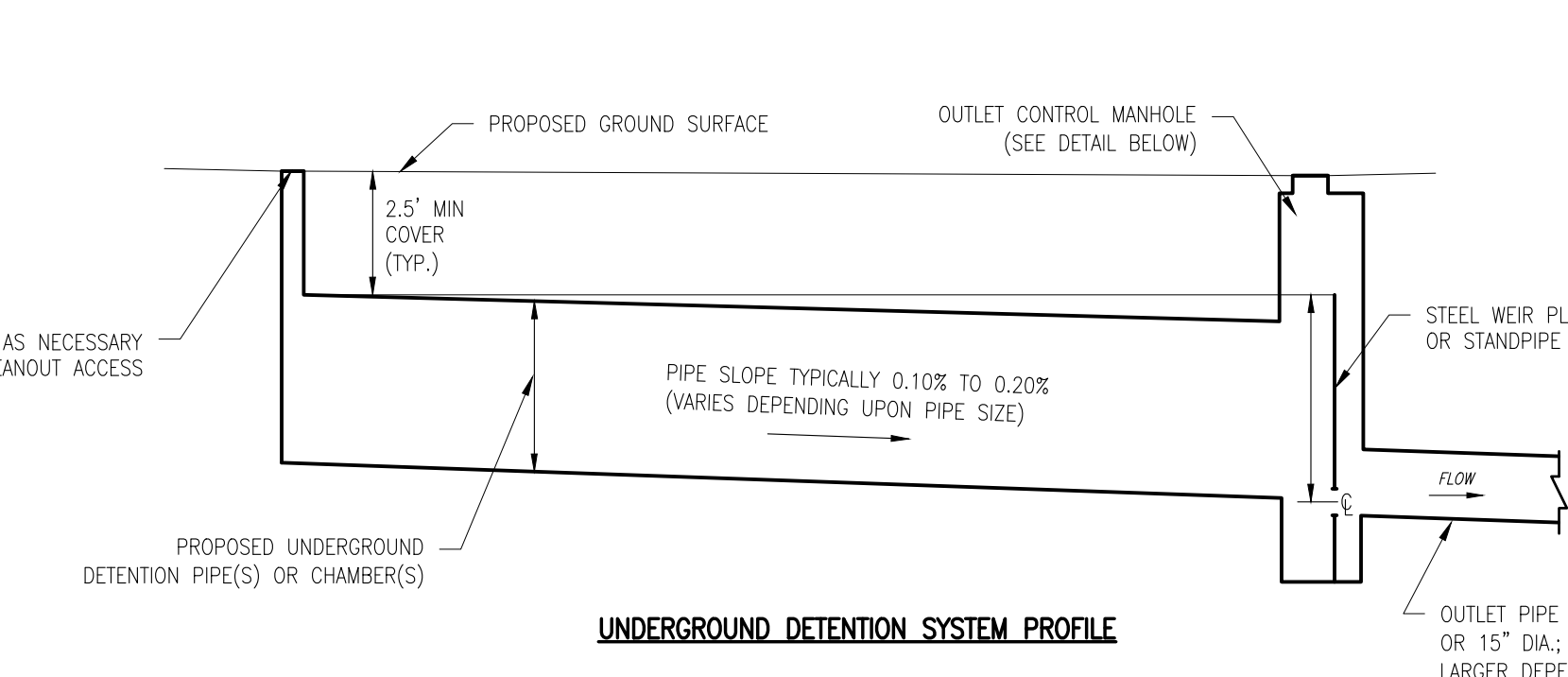
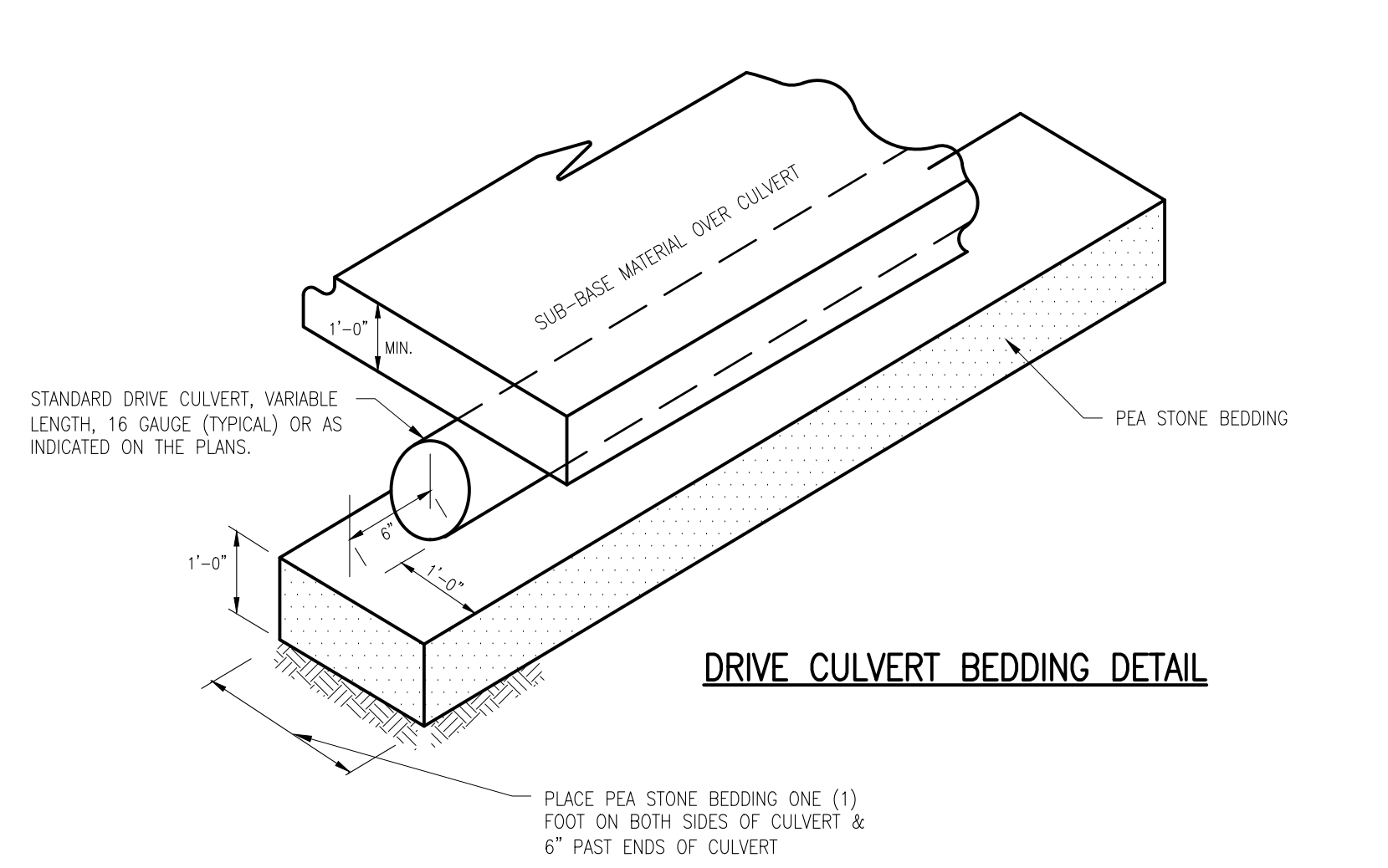
DATE	REVISIONS	SCALE	TOWN	COUNTY	CITY
JUNE 2012	SPALING DEBORAH	1/4" = 1'-0"	NOVI	OAKLAND COUNTY	NOVI
DATE	REVISIONS	SCALE	TOWN	COUNTY	CITY

CITY OF NOVI
STORM SEWER
STANDARD DETAILS

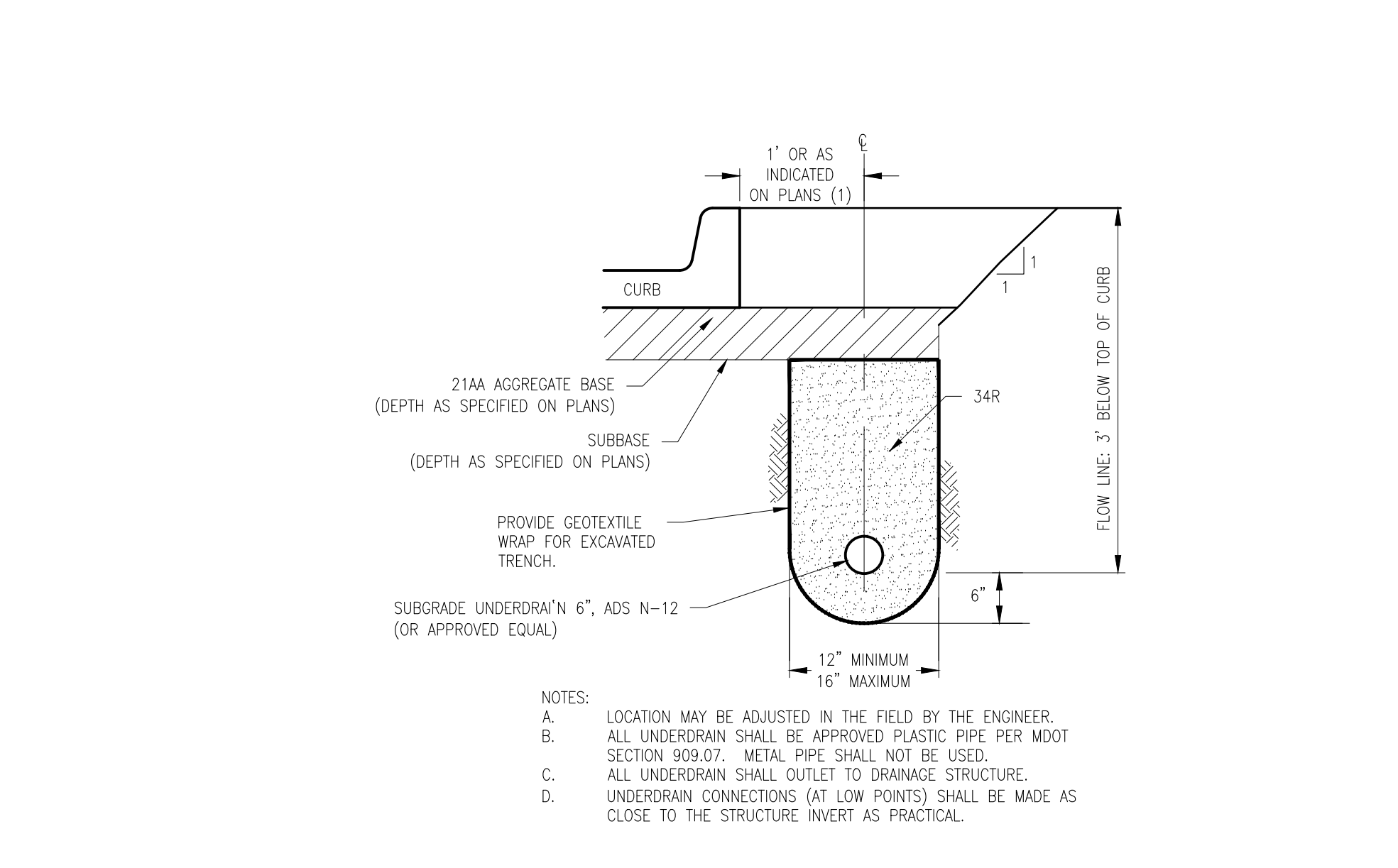
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OF 2



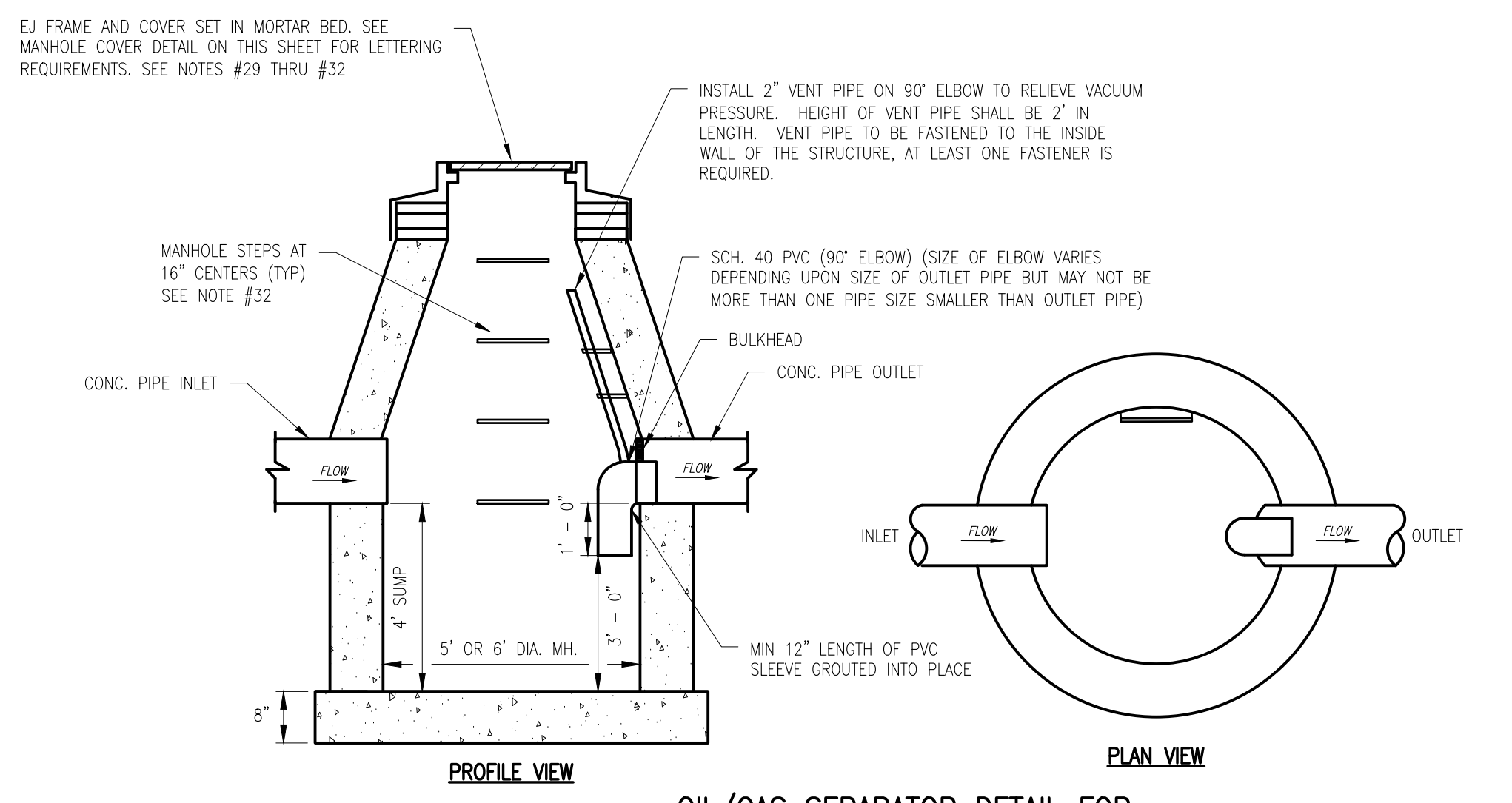
CAST IRON MANHOLE COVER
SEE NOTE #29



TYPICAL UNDERGROUND DETENTION AND OUTLET MANHOLE DETAILS
SEE NOTE #21



SUBGRADE UNDERDRAIN, 6\"/>



OIL/GAS SEPARATOR DETAIL FOR 18\"/>

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