

TOWN OF EAST GREENBUSH

RENSSELAER COUNTY, NEW YORK



STANDARD SPECIFICATIONS FOR STORM DRAINAGE SYSTEMS

Town of East Greenbush
225 Columbia Turnpike
Rensselaer, New York 12144

ADOPTED:
Resolution # of

Town of East Greenbush
Standard Specifications for Storm Drainage Systems
Date Prepared: August 14, 2009

PART 1 - GENERAL

1.1 Description:

- A. The following subsections establish the construction requirements for and the sequence in which new drainage systems are to be constructed.
- B. The Drainage Design Standards set forth in the following paragraphs shall be employed in the development of a Storm Water Management Plan and/or Storm Water Pollution Prevention Plan for a proposed project. This plan will be considered an integral part of all project plans submitted for Town approval.

1.2 Requirements:

- A. It shall be the responsibility of the Contractor to supply and install all materials in accordance with these Standards. The Commissioner of Public Works and/or his representative reserves the right to conduct any testing to verify that the material and/or installation is within the requirements of the sections of these Standards. Should any material and/or installation be determined not to be in accordance with all the requirements the sections of Standards, the Contractor shall, at his own expense, correct the unacceptable material and/or installation. The Contractor shall also reimburse the Town for all costs associated with the testing of materials and/or installations that is determined not to be in accordance with the requirements of the sections of these Standards. Prior to installation of any stormwater structure, shop drawings shall be reviewed and approved by the Commissioner of Public Works or his designee.
- B. The Contractor shall connect all new storm sewer systems to existing storm sewer systems to the maximum extent practical. The Town of East Greenbush has a designated MS4 (Municipal Separate Storm Sewer System) area(s) and as such, the Developer/Owner and his Contractor shall adhere to all applicable MS4 guidelines.

PART 2 - DESIGN STANDARDS:

2.1 Storm Sewer Drainage Structures

A. Junction Boxes:

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1. Placement shall be at the property line corners to provide a point of connection for the sump pump discharge line of each house or building into the sewer system, as required.
2. The junction box shall be square precast concrete, 2'-6" x 2'-6" x 3'-0" I.D. Catch Basin as manufactured by The Fort Miller CO., or an approved equivalent.
3. Junction boxes shall be designed for HS20-44 Vehicular Loading Plus 25% impact.

B. Catch Basins:

1. Placement shall be such that the maximum distance which storm water run-off is allowed in an open gutter flow shall not exceed three (300) hundred lineal feet. A shorter distance than this maximum limit may be necessary due to site specific conditions.
2. Catch basins shall be installed at all intersections such that no storm water run-off shall accumulate in or pass through the intersection.
3. The catch basin shall be square precast concrete, 2'-6" x 2'-6" I.D. Catch Basin as manufactured by The Fort Miller CO., or an approved equivalent.
4. Catch Basins shall be designed for HS20-44 Vehicular Loading Plus 25% impact.
5. All catch basins are required to have a minimum twelve (12) inch sump.
6. When pipe sizes and angles preclude the use of a catch basin, the type of storm sewer drainage structure must be changed from a catch basin to a storm sewer manhole as depicted on the Town standard drainage manhole detail.

C. Storm Sewer Manholes:

1. The storm sewer manhole inside diameter shall be a function of the storm sewer pipes that enter and exit the specific manhole.
2. The storm sewer manholes shall be round precast concrete, in accordance with the 4'-0", 5'-0", 6'-0", 6'6", 7'-0" and 8'-0" I.D. Manhole Sections as manufactured by The Fort Miller Co., Inc. or an approved equivalent.
3. Reinforcement for manhole top slab shall be designed by a Licensed New York State Professional Engineer prior to construction. Shop drawings shall be submitted to the Town for review. Manholes shall be designed for HS20-44 vehicular loading plus 25% impact.
4. All storm sewer manholes shall have a standard monolithic base, unless otherwise approved by the Town Engineer or Commissioner of Public Works or designated representative.
5. All storm sewer manholes are required to have a minimum twelve (12) inch sump.

2.2 Storm Pipes:

A. Material:

1. AASHTO M 294, Type S, with smooth waterway for coupling joints.
 - a. Soil tight Couplings: AASHTO M 294, corrugated, matching pipe and fittings to form soil tight joints.
 - b. Silt tight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with pipe and fittings to form silt tight joints.
2. Solid corrugated polyethylene pipe and end sections shall be 12", 15", 18", 24", 30", 36", 48", etc. N-12 pipe.

B. Pipe Size:

1. The minimum pipe diameter for any storm sewer shall be twelve (12) inches.

C. Pipe Placement:

1. Vertical alignment shall provide for a minimum depth of cover from the finished ground elevation to the top of pipe equal to two (2) feet.
2. Pipes generally shall be laid on grades to produce a velocity of not less than three (3) feet per second and not more than eight (8) feet per second when flowing full. Under special conditions involving circumstances such as level terrain and shallow surface water outlet, permission to install storm sewer at grades producing velocities of not less than (2) feet per second when flowing full may be granted by the Town Engineer or Commissioner of Public Works. If velocities will exceed eight (8) feet per second, an energy dissipating structure shall be installed in conformance with the Town standard energy dissipating structure detail.
3. When pipe sizes of different diameters enter a drainage structure at a straight through grade condition, the crown elevations of the pipe shall be matched. Underdrain pipe (excluding perforated storm sewer pipe) shall be excluded from this requirement.
4. When more than one pipe enters a drainage structure, at no time will an elevation difference between inverts exceed three (3) feet. Underdrain pipe (excluding perforated storm sewer pipe) shall be excluded from this requirement.

2.3 Sump Pump Collector System:

- A. This system shall provide a point of connection for the sump pump discharge line (known as sump pump lateral) of each house or building as required.

- B. Sump pump laterals may be installed directly into a junction box, catch basin or storm sewer manhole in instances where these drainage structures are located on the same side of the street and in front of the property to be served.
- C. The minimum pipe diameter and material for any sump pump lateral shall be four (4) inch polyvinyl chloride (PVC) SDR 35 Sewer Pipe.
- D. Whenever possible, all sump pump laterals shall be gravity flow.
- E. Junction boxes shall be inter-connected with a collector pipe.
- F. The minimum pipe diameter and material for any collector pipe shall be six (6) inch PVC SDR 35 Sewer Pipe.
- G. The collector pipe shall have a minimum slope of one half percent (0.50%), a minimum depth of cover of two (2) feet, and shall be connected into the storm sewer system at a junction box, catch basin or storm sewer manhole only.

2.4 Underdrain Pipe:

- A. When the ground water and/or soil conditions are such that sub-surface highway drainage becomes necessary, a perforated underdrain pipe shall be installed at low points along the highway profile.
- B. This underdrain pipe will connect directly into any drainage structure at the edge of pavement.
- C. The minimum pipe diameter for underdrain pipe shall be six (6) inches.
- D. The Town Engineer or the Commissioner of Public Works under special circumstances may allow portions of the storm sewer to be utilized as underdrain pipe through the use of perforated pipe rather than solid-wall storm sewer pipe.

2.5 Stormwater Management Areas

- A. All proposed stormwater management areas intended for ownership by the Town shall be contained on their own parcel. It shall be noted that these lots do not necessary have to conform to zoning relative to bulk lot requirements; however the lot shall have direct access to a public right of way.

- B. All design elements of the stormwater basin shall be in conformance with the NYSDEC guidelines in effect at the time of construction. Notwithstanding, the following additional elements shall be included which are specific to the Town's ability to access and maintain the facilities.
1. Access to basin:
 - a. All basins shall have a paved access way from an approved town/county/state paved right of way and into the fenced area of the basin. The access shall be a minimum of 16-feet in width and the pavement and subbase section shall conform to the Town standard detail for rural roads.
 - b. The access shall have a vertical slope not exceeding 10%.
 2. Access external and internal to basin:
 - a. Suitable access shall be provided both interior and exterior of the perimeter fence for mowing. These areas shall not have a land slope in excess of 25%.
 3. Perimeter Fencing & Gate:
 - a. All basins shall be provided with a 6-foot high chain link fence which shall surround the entire stormwater management area.
 - b. The gate shall be constructed of the same material as the fence and shall have a fence locking mechanism.

2.6 Easements

- A. A thirty (30) foot permanent utility easement shall be dedicated to the Town to be maintained by the Town whenever utility lines, which are required for the mutual benefit of adjoining property owners, pass through private property.

2.7 Performance Standards

- A. All of the requirements enumerated in this specification shall be performed and all of the utilities and work shall be installed in accordance with standards, specifications and procedures acceptable to the Town Engineer and Commissioner of Public Works.

2.8 Inspection and Certification

- A. Adequate inspection shall be provided at all times and during all phases of construction and shall be done under the direction of the Town Engineer.
- B. The inspection service may be provided either by the Town or by an engineer approved by the Town. However, the engineer hired by the owner/developer to perform the design may not inspect his or her own

work on behalf of the Town due to a conflict of interest. In either case, the cost of inspection shall be the responsibility of the developer. If the inspection service is provided by the Town, the cost will be based on the actual costs of payroll plus overhead incurred by the Town.

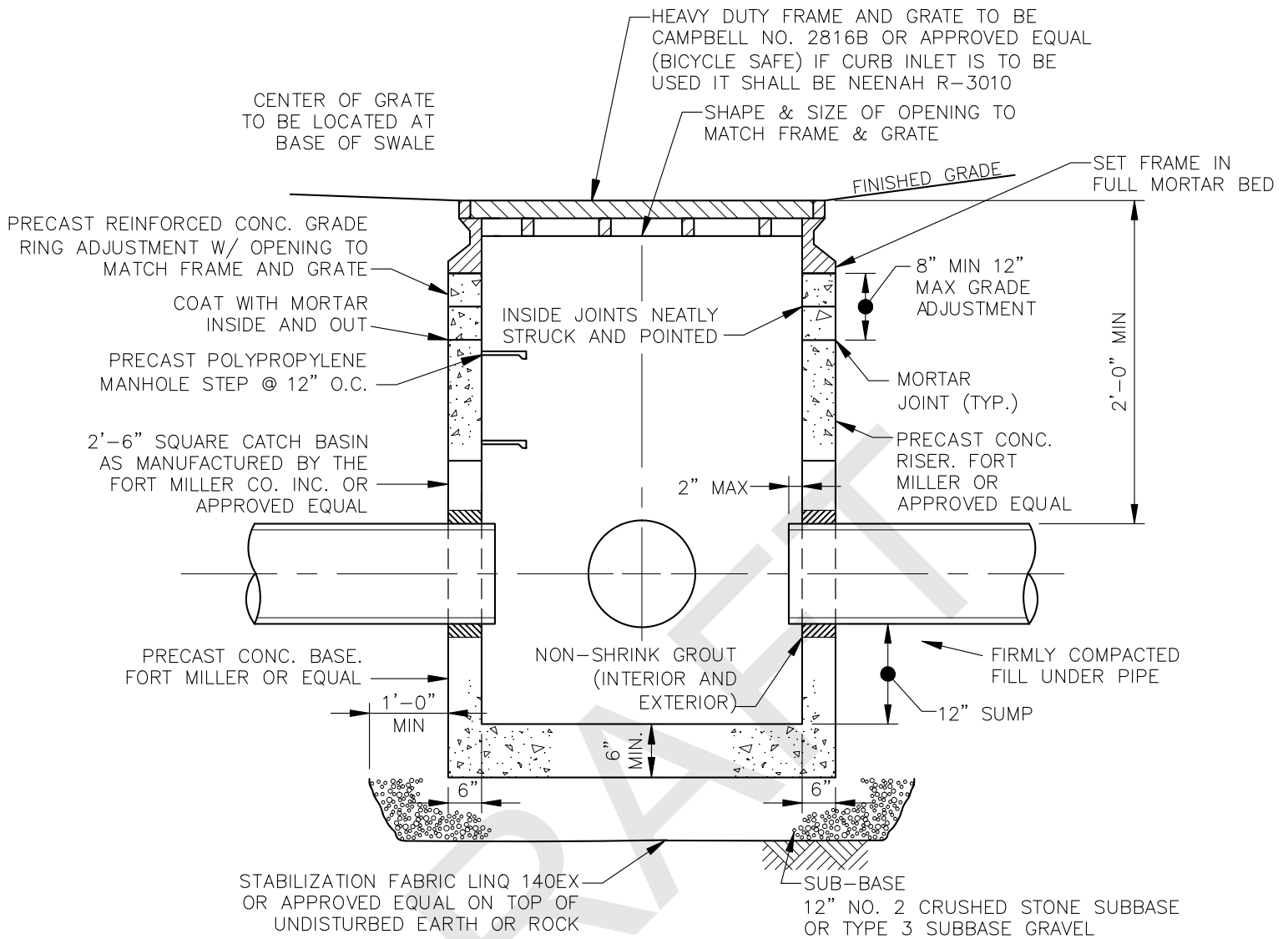
- C. Written certification by a New York State licensed engineer will be required from the owner/developer certifying to the Town (and other agencies having jurisdiction) that the storm water management systems were constructed in accordance with plans. The Engineer's Certification of proper storm sewer installation shall be submitted to the Commissioner of Public Works prior to asphalt placement within the roadway.

2.9 Modification or Waiver Requirements

- A. When the Town determines that extraordinary hardship would result from strict compliance with the provisions of this specification because of an unusual circumstance of topography or other physical condition in the proposed location of a street, it may modify the requirements for said street. In addition, for good cause, the Town may waive compliance with the provisions of any part of this specification in connection with the construction of a proposed street.

**STANDARD DETAILS
FOR
STORM DRAINAGE SYSTEMS**

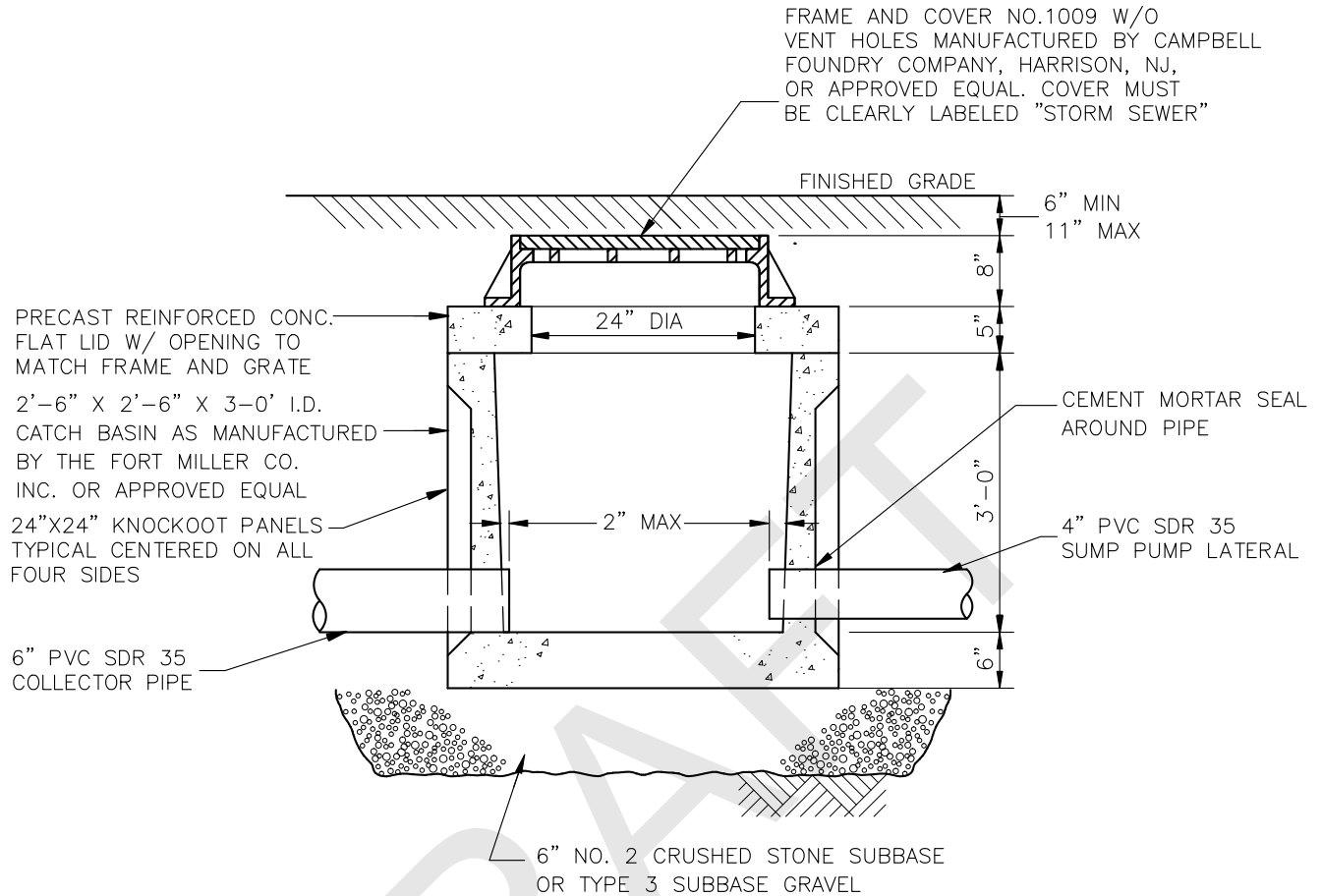
Town of East Greenbush
Standard Specifications for Storm Drainage Systems



NOTES:

1. CATCH BASINS SHALL BE PRECAST, CONCRETE, REINFORCED CATCH BASINS IN ACCORDANCE WITH ASTM C-478-78 UNLESS OTHERWISE NOTED. CATCH BASINS SHALL BE DESIGNED FOR HS20-44 VEHICULAR LOADING PLUS 25% IMPACT.
2. CONCRETE TO TEST TO 4,000 PSI AT 28 DAYS.
3. INSTALLED ON 12" CRUSHED STONE BEDDING.
4. CATCH BASINS SHALL BE AS MANUFACTURED BY FORT MILLER OR EQUAL. FRAMES AND GRATES SHALL BE APPROVED BY THE TOWN.
5. ALL STORM SEWER MANHOLES SHALL HAVE A MINIMUM 1'-0" SUMP.
6. ALL GRADE ADJUSTMENT MUST BE COMPLETED USING GRADE RINGS, BRICK GRADE ADJUSTMENTS ARE NOT PERMITTED.

SQUARE CATCH BASIN DETAIL



NOTES:

1. JUNCTION BOXES SHALL BE PRECAST, CONCRETE, REINFORCED CATCH BASINS IN ACCORDANCE WITH ASTM C-478-78 UNLESS OTHERWISE NOTED. JUNCTION BOXES SHALL BE DESIGNED FOR HS20-44 VEHICULAR LOADING PLUS 25% IMPACT.
2. CONCRETE TO TEST TO 4,000 PSI AT 28 DAYS.
3. INSTALLED ON 6" CRUSHED STONE BEDDING.
4. JUNCTION BOXES SHALL BE AS MANUFACTURED BY FORT MILLER OR EQUAL. FRAMES AND COVERS SHALL BE APPROVED BY THE TOWN.
5. ALL GRADE ADJUSTMENT MUST BE COMPLETED USING RISERS AND GRADE RINGS, BRICK GRADE ADJUSTMENTS ARE NOT PERMITTED.

JUNCTION BOX

PREPARED BY:

THE
Chazen
COMPANIES

ENGINEERS • SURVEYORS
PLANNERS • GIS SPECIALISTS
ENVIRONMENTAL PROFESSIONALS
LANDSCAPE ARCHITECTS

REVISION DATE

STANDARD DETAIL

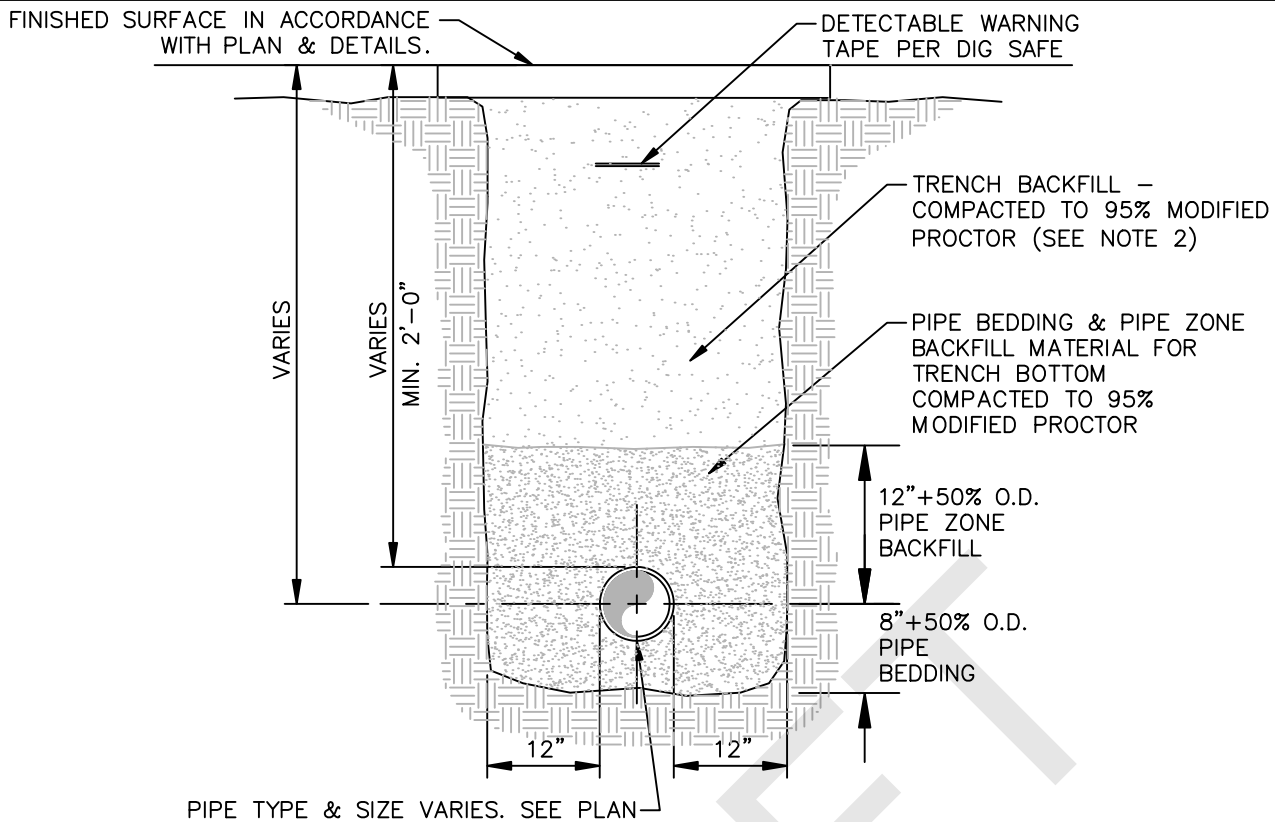
STORMWATER DETAILS

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AUGUST 2009

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NOTES:

- PIPE BEDDING & PIPE ZONE BACKFILL SHALL BE A NATURAL RUN-OF-BANK (R.O.B.) SAND OR A MIXTURE OF CRUSHED STONE AND GRAVEL, FREE OF SOFT, NONDURABLE PARTICLES, ORGANIC MATERIALS AND ELONGATED PARTICLES, AND SHALL BE WELL GRADED FROM FINE TO COARSE PARTICLES. BEDDING GRADATIONS SHALL BE APPROVED BY THE ENGINEER AND SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
3/4"	100%
NO. 40	0-70%
NO. 200	0-10%

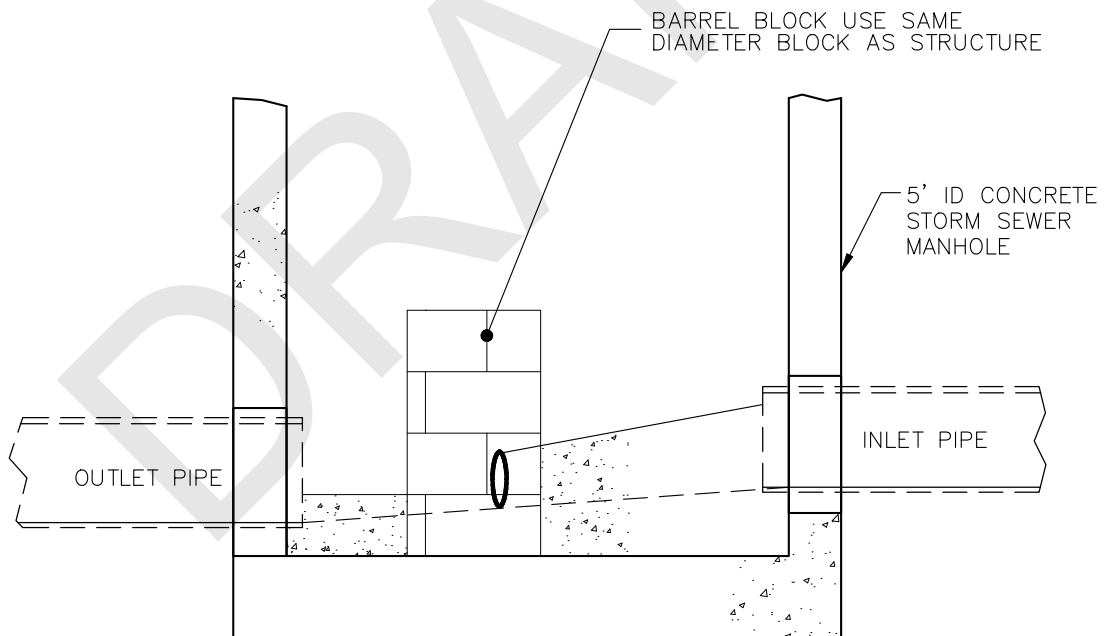
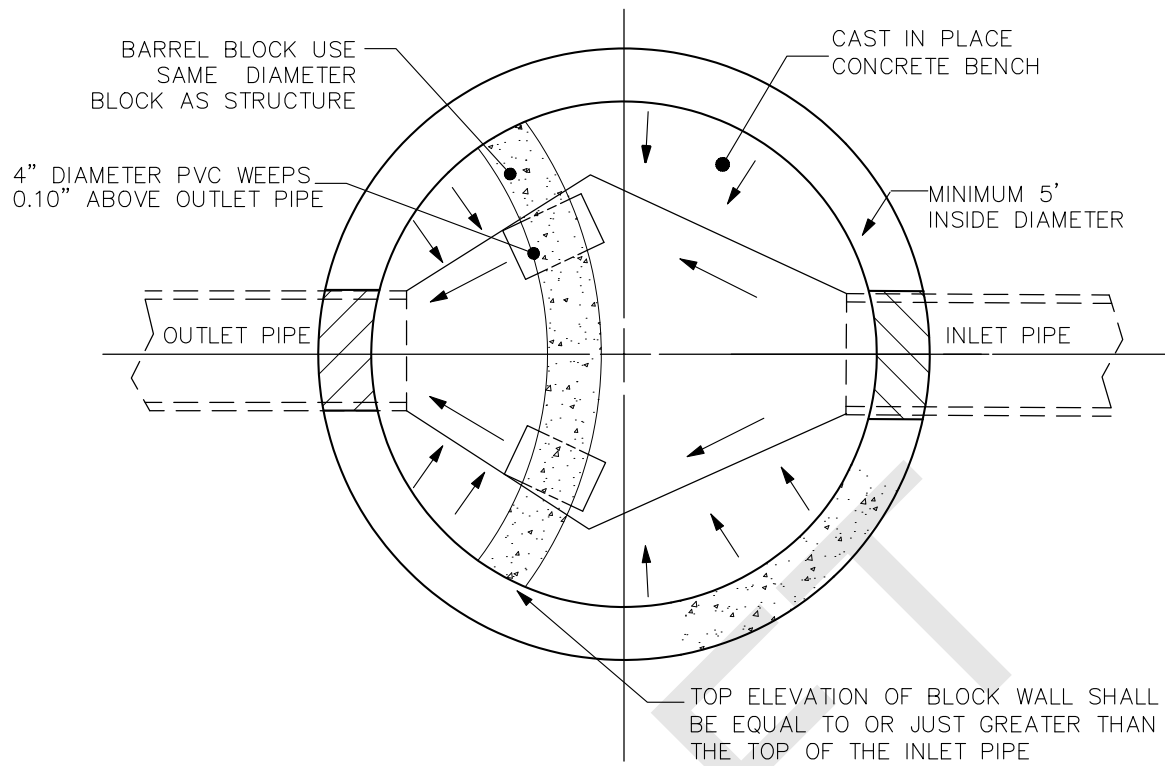
- TRENCH BACKFILL SHALL BE A NATURAL RUN-OF-BANK (R.O.B.) OR PROCESSED GRAVEL, OR EXCAVATED MATERIAL FREE OF SOFT, NONDURABLE PARTICLES, ORGANIC MATERIALS AND ELONGATED PARTICLES, AND SHALL BE WELL GRADED FROM FINE TO COARSE PARTICLES. TRENCH BACKFILL GRADATIONS SHALL BE APPROVED BY THE ENGINEER AND SHALL MEET THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
4"	100%
NO. 40	0-70%
NO. 200	0-10%

IN NON-TRAFFIC UNPAVED AREAS TRENCH BACKFILL CAN BE MATERIALS EXCAVATED FROM THE TRENCH AS APPROVED BY THE ENGINEER AND COMPACTED TO 90% MODIFIED PROCTOR.

- INSTALL CONTINUOUS DETECTABLE MARKING TAPE DURING BACKFILLING OF TRENCH FOR UNDERGROUND PIPING. LOCATE TAPE 12" BELOW FINISHED GRADE, DIRECTLY OVER PIPING, EXCEPT 6" BELOW SUBGRADE UNDER PAVEMENTS & SLAB.
- TRENCHING SHALL BE IMPLEMENTED IN ACCORDANCE WITH O.S.H.A. STANDARDS.
- ALL HDPE PIPE JOINTS SHALL BE WRAPPED WITH APPROVED DRAINAGE FABRIC.
- ALL HDPE PIPE SHALL BE SMOOTH BORE.

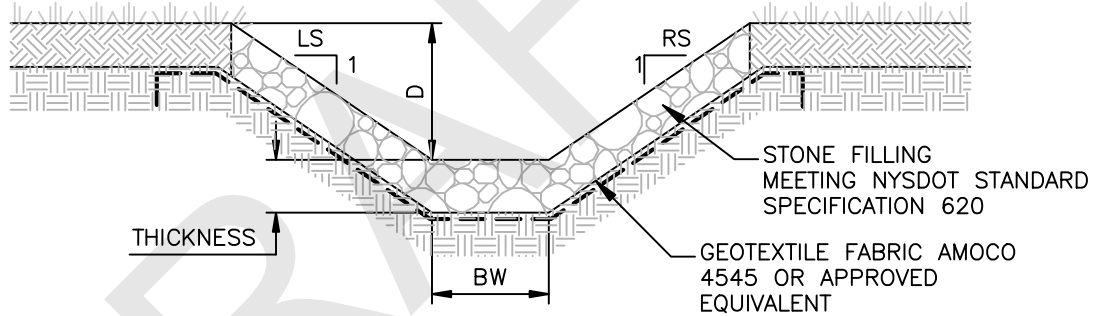
STORM SEWER TRENCH DETAIL



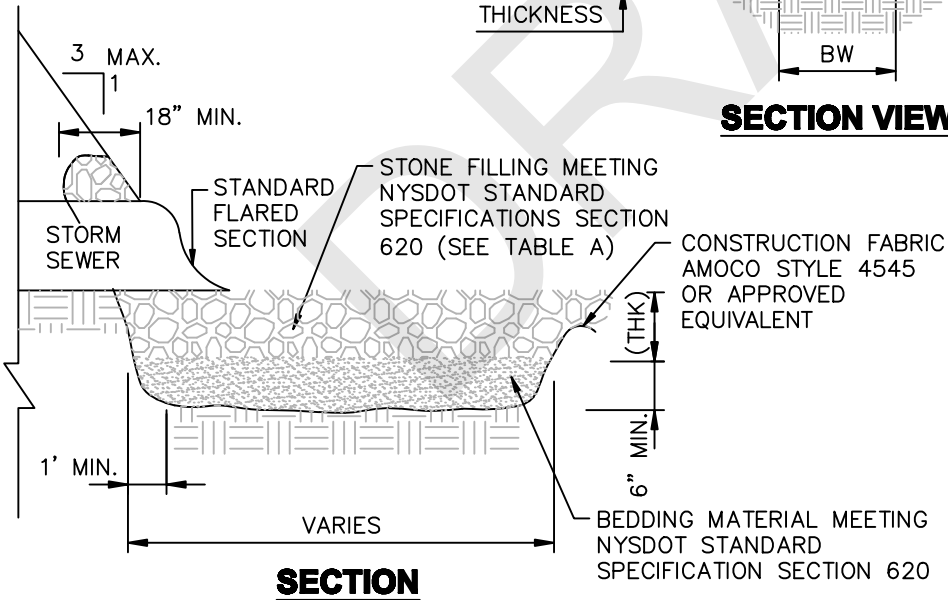
ENERGY DISSIPATING STRUCTURE

STONE APRON SIZING REQUIREMENT - TABLE "A"

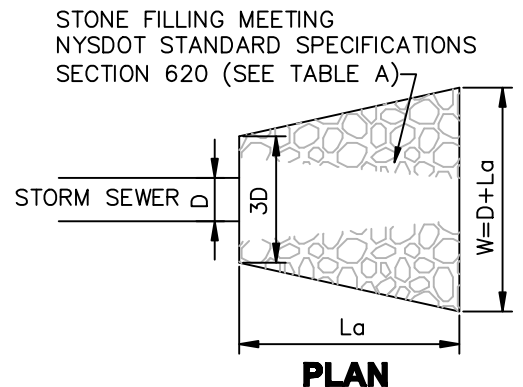
CULVERT DIA. (D)	CULVERT SLOPE, %	NYSDOT STANDARD STONE FILLING APRON MATERIAL	d50	dMAX	MINIMUM APRON THICKNESS (IN)	MINIMUM OUTLET APRON LENGTH(FT) (La)
12"	< 8	LIGHT	6"	9"	18	10
	8-10	MEDIUM	9"-12"	14"-18"	24	10
18"	< 4	LIGHT	6"	9"	18	10
	4-6	MEDIUM	9"-12"	14"-18"	24	12
	6-8	HEAVY	15"-18"	22"-27"	36	12
	8-10	HEAVY	15"-18"	22"-27"	36	18
24"	< 3	LIGHT	6"	9"	18	12
	3-4	MEDIUM	9"-12"	14"-18"	24	16
	4-8	HEAVY	15"-18"	22"-27"	36	24
30"	< 1	LIGHT	6"	9"	18	15
	1-2	MEDIUM	9"-12"	14"-18"	24	20
	2-4	HEAVY	15"-18"	22"-27"	36	25
	4-6	HEAVY	15"-18"	22"-27"	36	30
36"	< 2	MEDIUM	9"-12"	14"-18"	24	24
	2-3	HEAVY	15"-18"	22"-27"	36	30
	3-5	HEAVY	15"-18"	22"-27"	36	36
42"	< 1	MEDIUM	9"-12"	14"-18"	24	28
	1-2	HEAVY	15"-18"	22"-27"	36	35
	2-3	HEAVY	15"-18"	22"-27"	36	42
48"	< 1	MEDIUM	9"-12"	14"-18"	24	32
	1-2	HEAVY	15"-18"	22"-27"	36	40
	2-3	HEAVY	15"-18"	22"-27"	36	48



SECTION VIEW



SECTION



PLAN

END SECTION WITH RIP-RAP APRON

THE Chazen COMPANIES
 ENGINEERS • SURVEYORS
 PLANNERS • GIS SPECIALISTS
 ENVIRONMENTAL PROFESSIONALS
 LANDSCAPE ARCHITECTS

REVISION	DATE

STANDARD DETAIL
 STORMWATER DETAILS
 TOWN OF EAST GREENBUSH
 RENSSELAER COUNTY, NEW YORK

AUGUST 2009

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