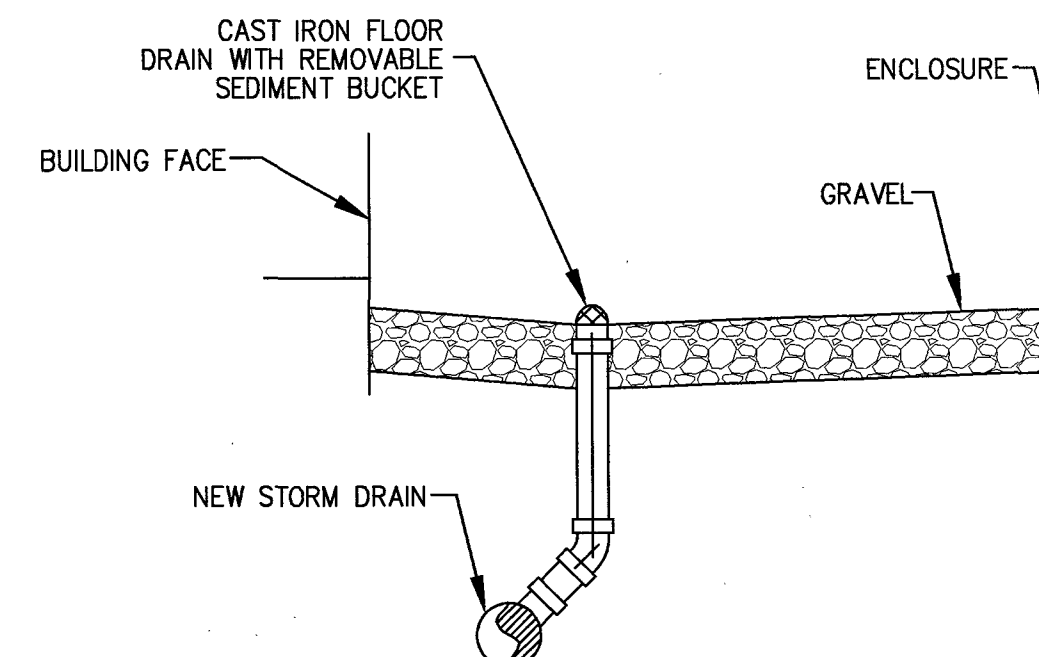
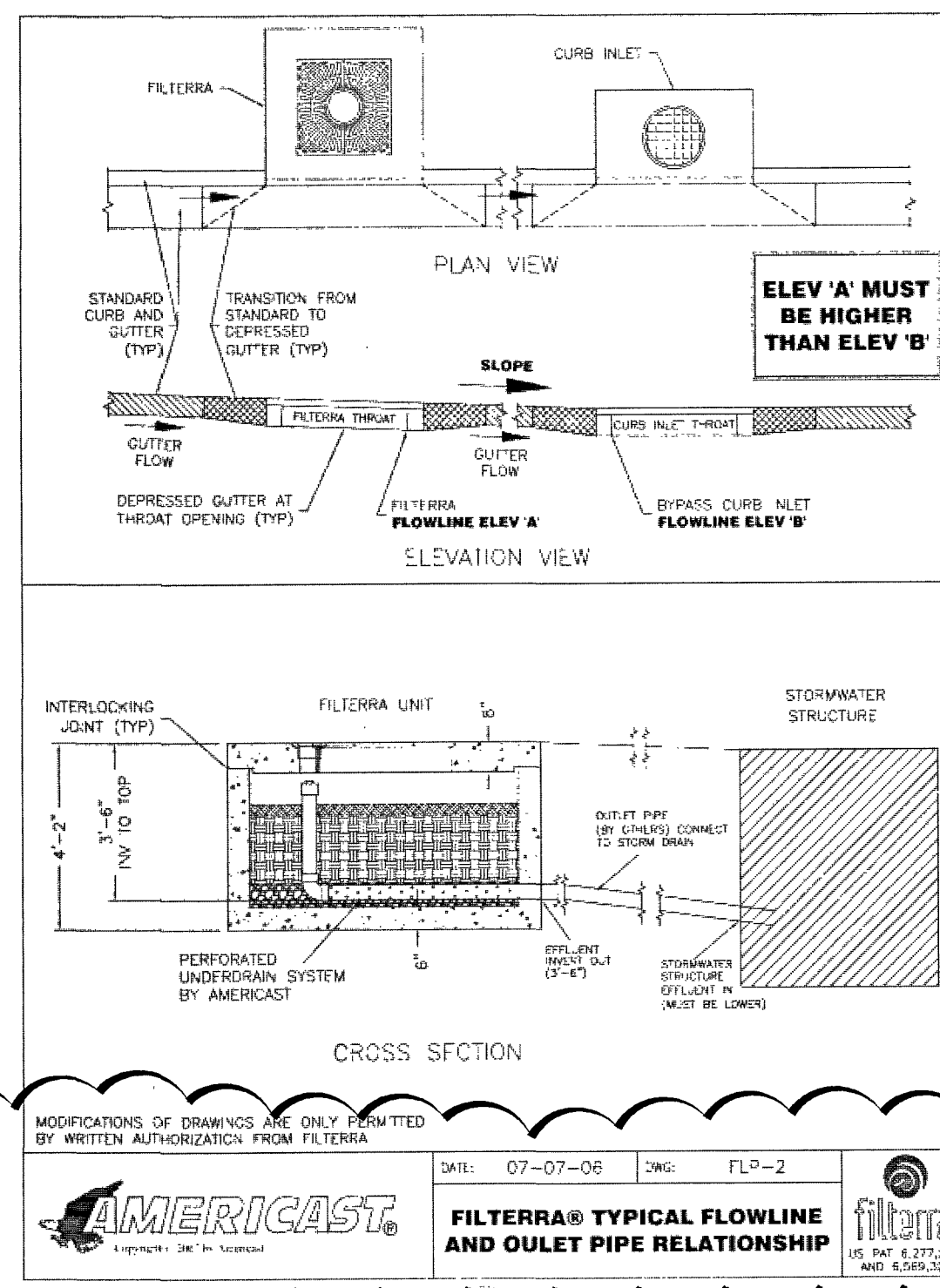
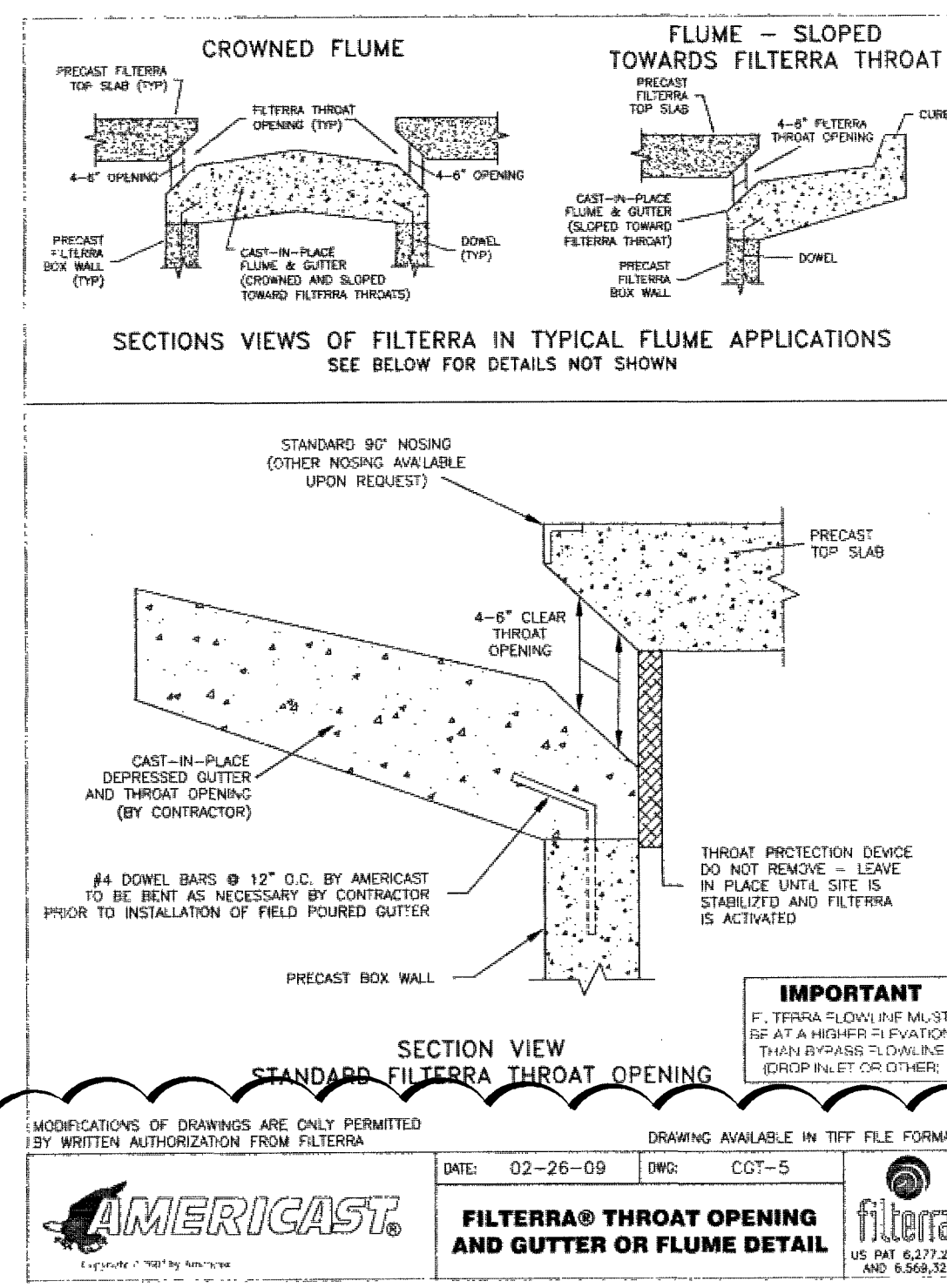


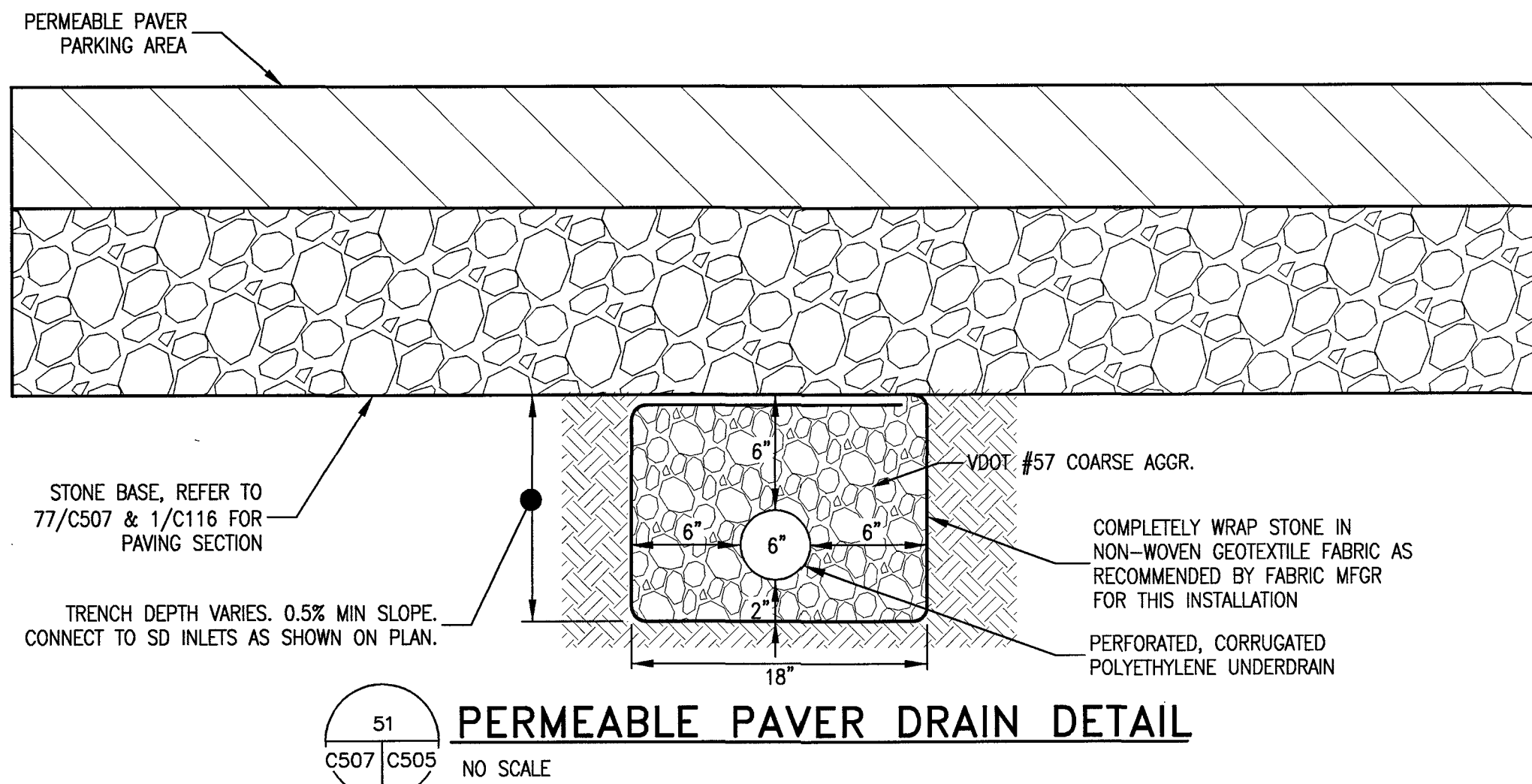
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53 AREA DRAIN DETAIL (TYP)

C108 C505 NO SCALE

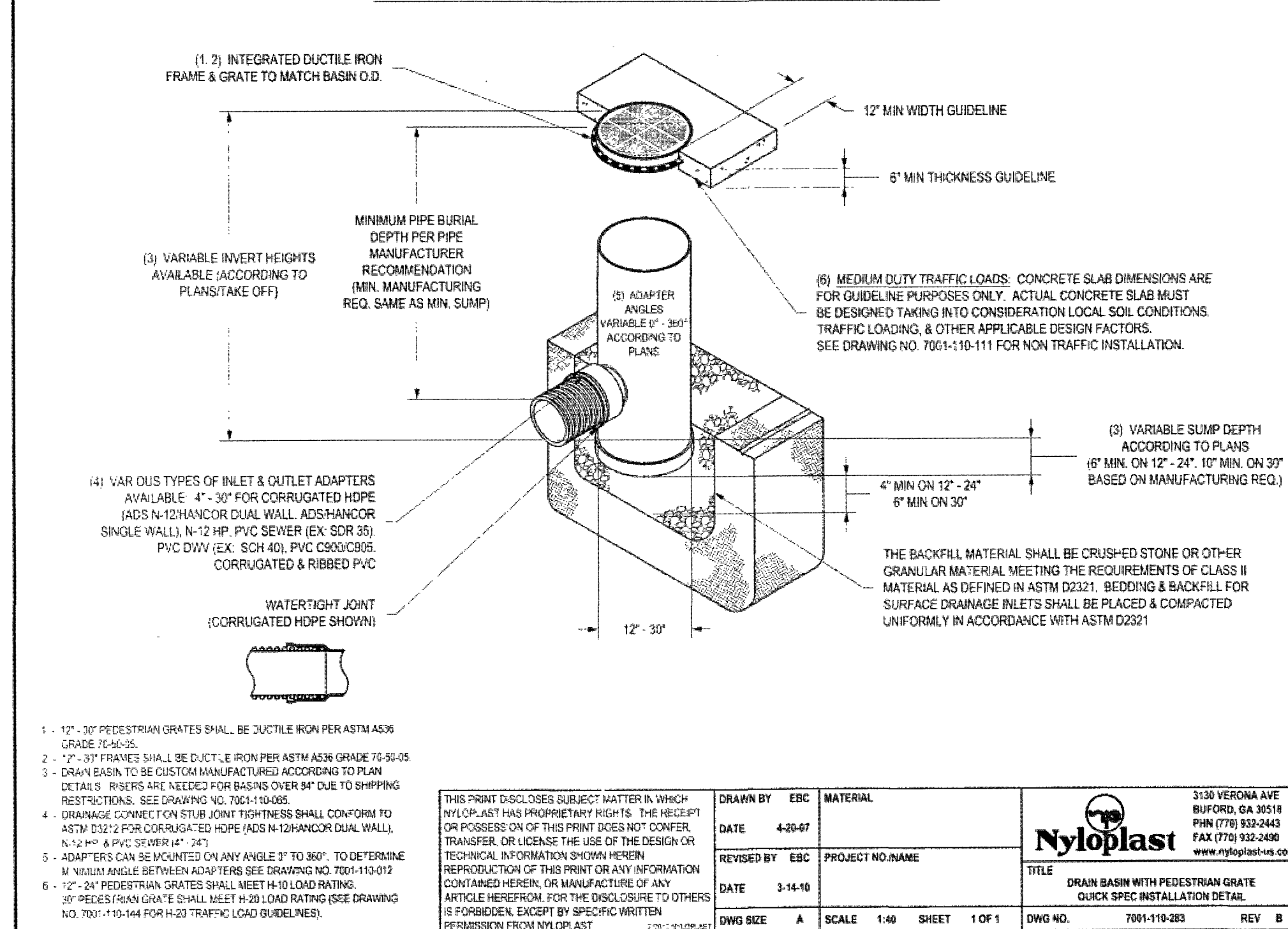


54
C108 C505
NOT TO SCALE



51
C507 C505
NO SCALE

NYLOPLAST DRAIN BASIN WITH PEDESTRIAN GRATE



TREE BOX STORMWATER FILTER SPECIFICATIONS

I. General Description

The following general specifications describe the components and installation requirements for a tree box stormwater filter for bioretention filtration of stormwater that utilizes physical, chemical and biological mechanisms of a soil, plant and microbe complex to remove pollutants typically found in urban stormwater runoff. The treatment system shall be a fully equipped, pre-constructed, drop-in-place unit designed for applications in the urban landscape to treat contaminated runoff from impervious surfaces.

II. Work Includes

- The Dealer or manufacturer, selected by the contractor shall furnish all required engineering assistance required to properly size and install all components of the treatment device in accordance with the approved drawings and these specifications.
- The contractor will be responsible for unloading and installation of the delivered product.
- Manufacturer shall provide, at no additional cost, maintenance of the treatment system for a period of one year.
- Manufacturer shall have a minimum of 5 years of experience in producing said systems for commercial use and a minimum of 2,000 installed operational units.

III. Quality Control

- The quality of precast concrete components, underdrain materials, filter media, landscape materials, filter media, landscape materials and all other appurtenances and their assembling process shall be subject to inspection upon delivery of the unit at the work site.
- All plant materials shall comply with the type and size required by the approved drawings and shall be alive and free of obvious signs of disease.
- Filter media shall be visually inspected to ensure appropriate volume, texture, and consistency with the approved drawings, filter media must be certified following tarp or tape protocol testing to meet or exceed the filter media minimum flow rates and pollutant removal efficiency of the Tree Box Stormwater Filter.

IV. Submittals

- Installation, Operation and Maintenance Manuals**
The contractor shall submit the manufacturers approved Tree Box Stormwater Filter installation, operation, and maintenance manuals for the system, it will be the responsibility of the unit owner/operator or their contractor to ensure the unit is operated and maintained in accordance with the manual.
- Drawings**
The contractor shall be provided dimensional drawings and, when specified, utilize these drawings to show details for construction, materials, specifications, reinforcing, pipe joints and any maintenances.
- Manufacturer's Warranty**
The Manufacturer shall warranty all components of the units for a minimum period of one year provided the unit is operated and maintained in accordance with the manual. Improper operation, maintenance or accidental or illegal activities (i.e. dumping of pollutants, vandalism, etc.) will void the warranty.
- Substitutions**
Any proposed equal alternative product substitution to this specification must be submitted for review by the Engineer and submitted with recommendations to Roanoke County for final review and approval. Review package should include third party reviewed performance data for both flow rate and pollutant removal. Pollutant removal data should follow tape or tarp protocols.

V. Materials and Design

Each manufactured system shall consist of a precast concrete container together with an underdrain system, filter media, plant material, and appropriate grate landscape cover where applicable.

A. Concrete for precast unit shall conform to the following:

- The wall thickness shall not be less than 150MM (5") or as shown on the dimensional drawings. In all cases, the wall thickness shall be no less than the minimum thickness required to meet loading requirements of the application.
- The precast concrete unit shall be cured by an approved method, the unit shall not be shipped until the concrete has attained 85% of its design compressive strength.
- The connections shall be provided to accept pipes of the specified size(s) and material(s).

VI. Performance Criteria

- The media shall achieve a flow rate equivalent to a minimum of 100 inches per hour and verified via third-party report.
- The Unit shall remove 80% total suspended solids (TSS) using a sil-co-sil 106 typical particle size distribution in the laboratory, field results should show at least 80% TSS removal following either tape or tarp protocols.
- The unit shall be located to ensure that high flow events shall bypass the filter media preventing erosion and resuspension of pollutants.

VII. Construction

- Each unit shall be constructed at the locations and elevations according to the sizes shown on the approved drawings. Any modifications to the elevation or location shall be at the direction of and with approval by the engineer.

B. Inlet and outlet connections shall be aligned to meet the approved drawings with modifications necessary to meet site conditions.

C. Once the unit is set, backfilling should be performed in a careful manner. Bringing the appropriate fill material up in 150mm (5") lifts on all sides. In all instances installation of filter unit shall conform to ASTM specification C891 "Standard Practice for Installation of Underground Precast Utility Structures".

VIII. Maintenance
A. Each correctly installed system is to be maintained by the manufacturer for a minimum period of one year. The cost of this service is to be included in the price of the system.

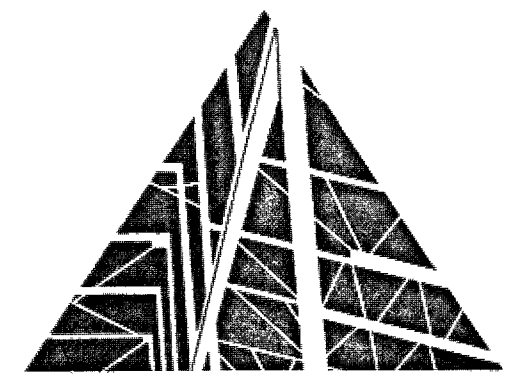
B. Annual maintenance consists of a maximum of two (2) scheduled visits.

C. Each maintenance visit consists of the following:

- System inspection
- Foreign debris, silt, plant material and trash removal
- Filter media evaluation
- Plant health evaluation and pruning
- Replacement of plant material
- Disposal of all maintenance refuse items
- Maintenance records updated and stored

KEY PLAN

GENERAL NOTES



SPECTRUM DESIGN
architects | engineers

10 CHURCH AVE SE, PLAZA SUITE 1 ROANOKE, VIRGINIA 24011 540.342.6001

GLENVAR HIGH SCHOOL RENOVATIONS & ADDITIONS

ROANOKE COUNTY

VA DOE PROJECT#: 80-61-00-101

SPECTRUM DESIGN PROJECT NO. 13054



DATE: 06 APRIL 2014
DESIGN ARCHITECT: C2V
PROJECT ARCHITECT: MF
CHECKED BY: NUMBER 1
DRAWN BY: DATE 05/14/14
REVISIONS: COUNTY REVIEW #1

SHEET TITLE

GRADING & DRAINAGE DETAILS

C505

APPROVED