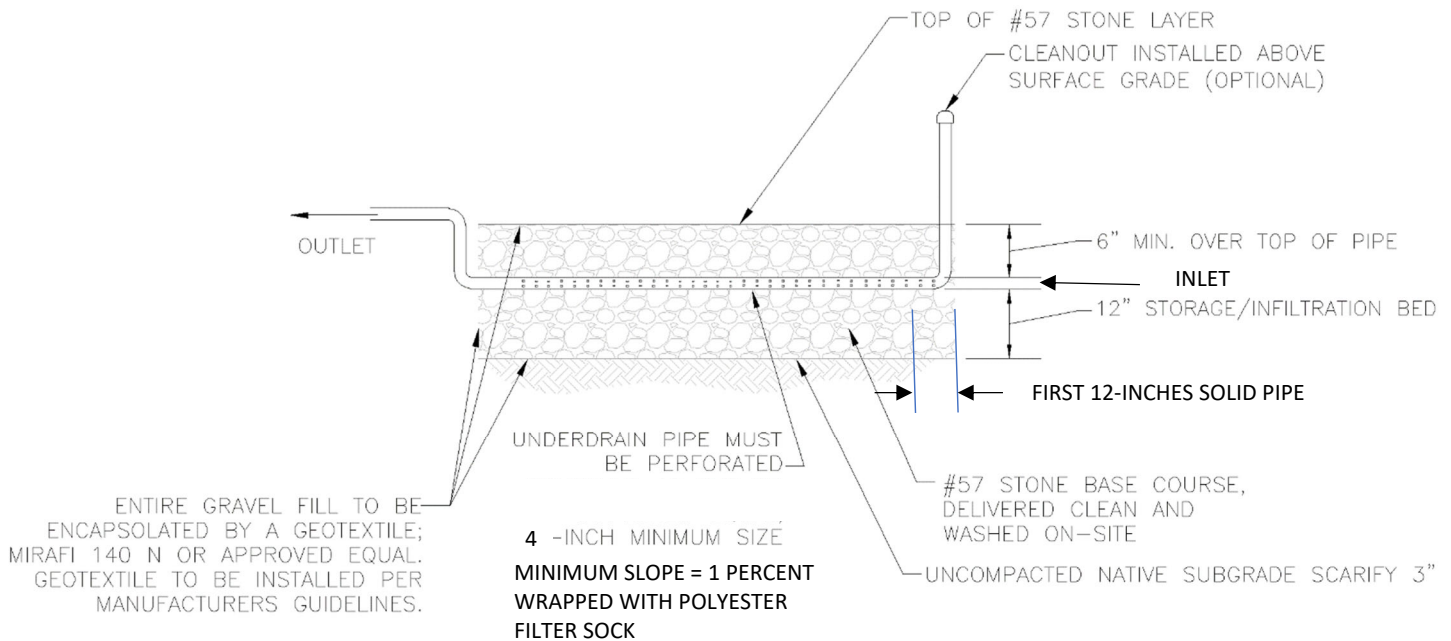




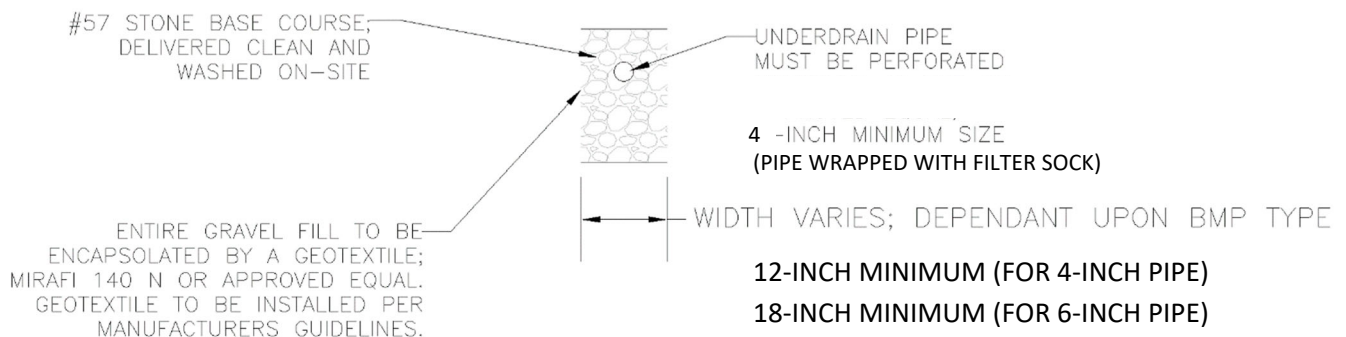
## APPENDIX D

### Underdrain Requirements

Some sites within the City have very low infiltration rates due to existing soil conditions and other factors. If your site has an infiltration rate that is less than required for your selected BMP, an underdrain will be required. An underdrain is a perforated pipe that is installed along the center of the BMP that will help the BMP to drain. The underdrain should be perched to allow some storage of water within the BMP before it drains out through the perforated pipe. See the detail below. All pipe BELOW FROST LINE shall be either HDPE or PVC or the equivalent. All horizontal drain pipe above the frost line shall be HDPE. Vertical pipe is to be Schedule 40 PVC.

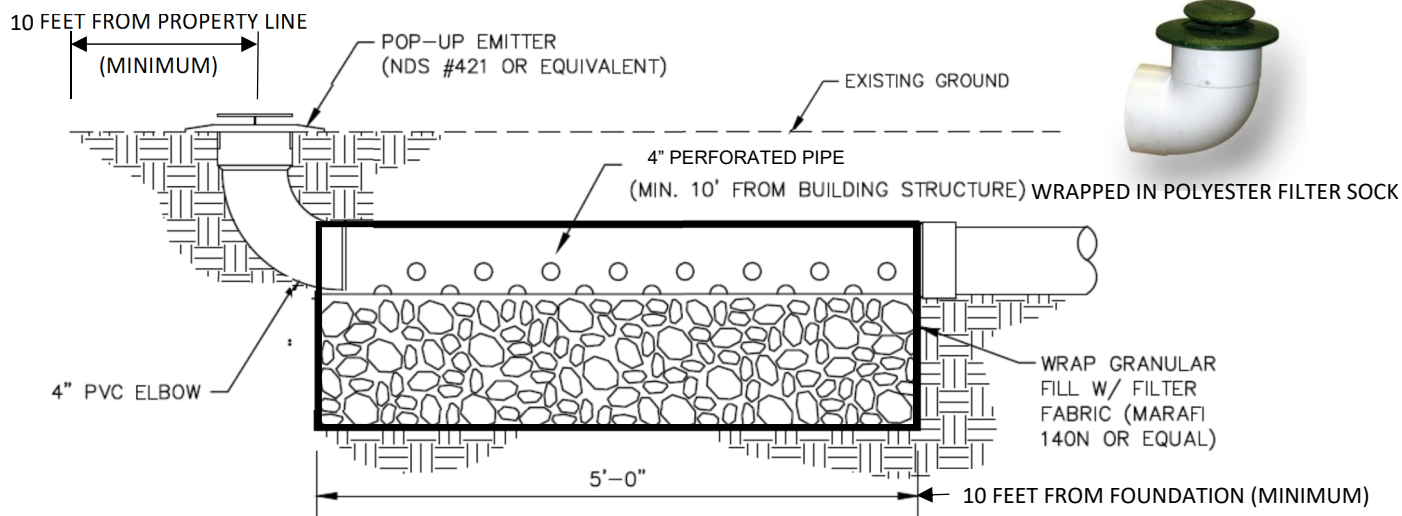


This detail consists of the general configuration of a perched underdrain system, the underdrain within your BMP may vary in size and position. Trench depth will increase due to pipe slope to maintain 12-inch infiltration bed.



The outlet pipes must conform to the following requirements:

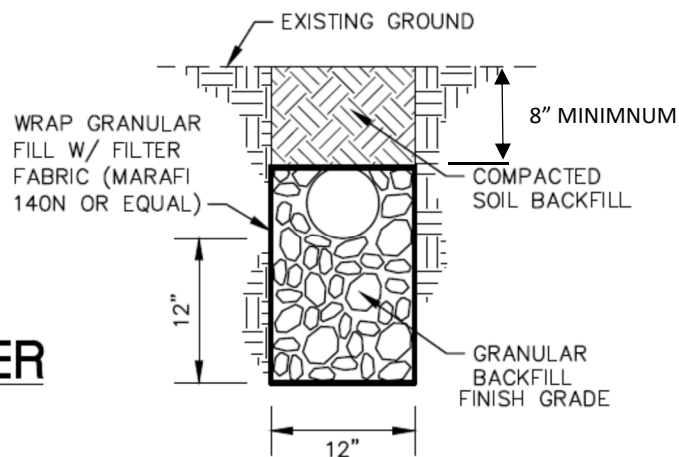
- 1. Emitter.** The BMP outlet pipe can drain to a pop-up emitter. The last 5 feet of pipe shall be perforated AND WRAPPED WITH FILTER SOCK, surrounded by gravel (for a 4-inch inside diameter pipe, 16-inch deep by 12-inch wide) and encapsulated with geosynthetic material (see detail BELOW) ; or



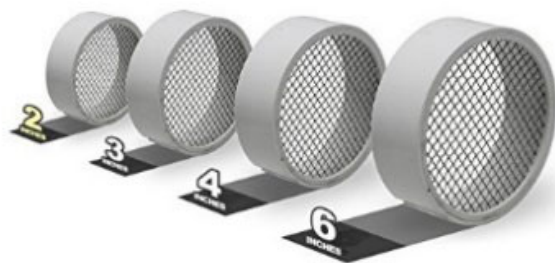
NOTES:

1. GRANULAR FILL SHALL BE 1" MIN. CLEAN DRAINAGE ROCK.
2. COMPACT SOIL MATERIAL UNDER LAWNS TO 85% MAXIMUM DENSITY AS DETERMINED BY THE MODIFIED PROCTOR COMPACTION TEST. (ASTM D 1557)
3. 4-INCH MINIMUM HDPE PERFORATED UNDERDRAIN OUTLET PIPE WRAPPED WITH FILTER SOCK
4. SLOPE PIPE TO DRAIN 1/8" PER FOOT OR 1%

## POP-UP EMITTER

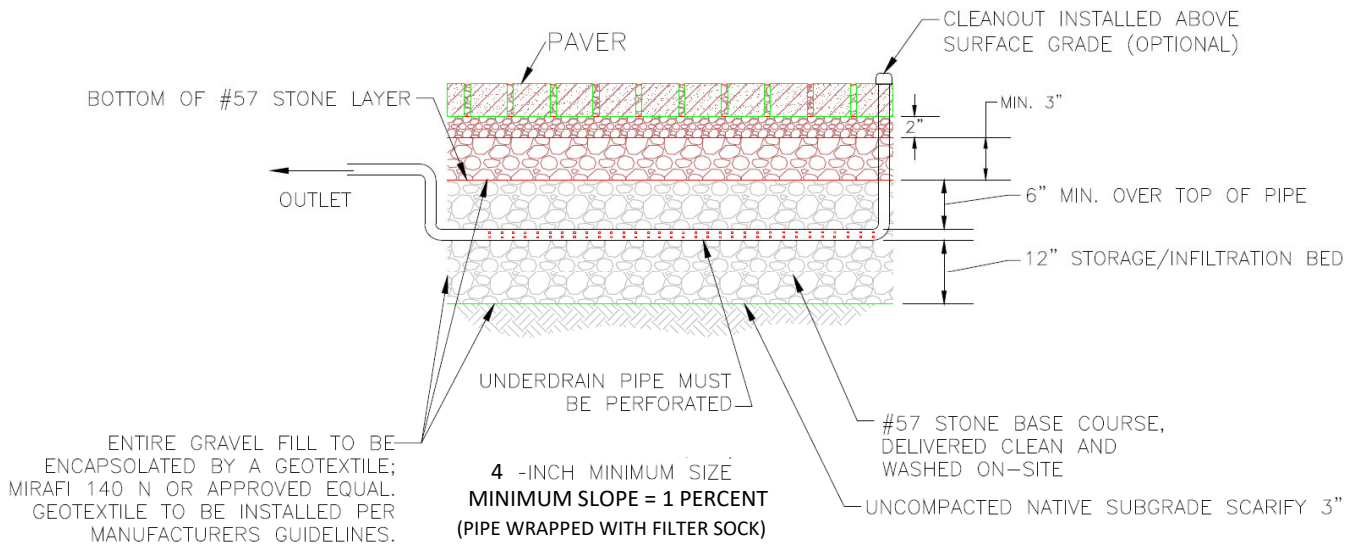


2. **Daylight (Rodent Screen).** Secure day lighted pipe ends with an end cap fitted with a rodent screen manufactured for the pipe used. The rodent screen shall be press formed of #3 or #4 mesh, 21 gauge or heavier, Type 304 stainless steel to provide a cup-shaped screen which will provide a friction tight fit when inserted into the drain outlet.

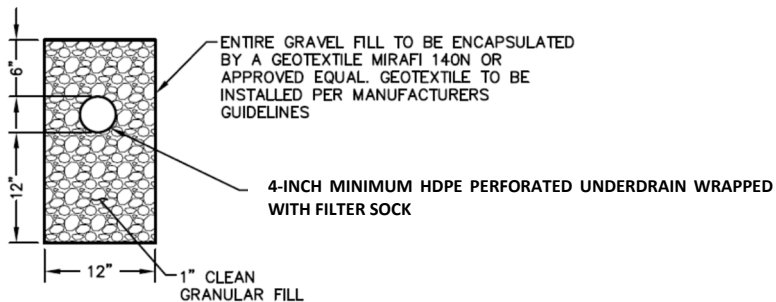
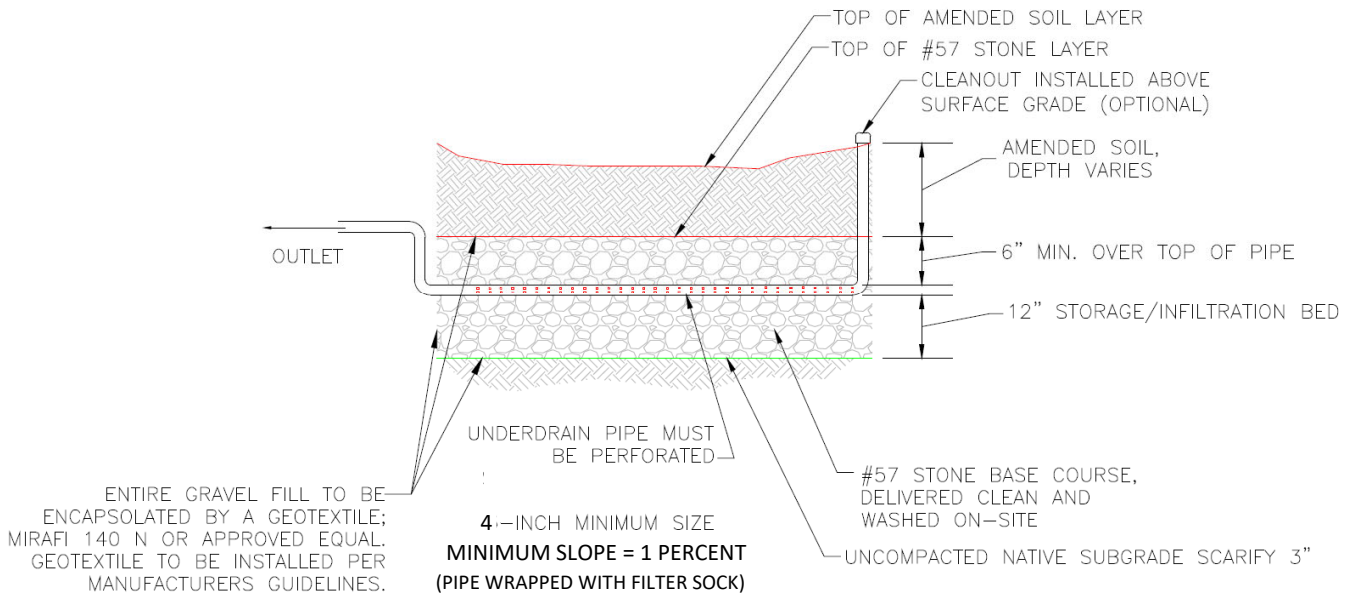




**Permeable Paver Detail**



**Rain Garden / Vegetated Filter Strip Detail**



OUTLET PIPE SECTION



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