Project Worksheets, Design Tables & Construction Notes – Stone Infiltration Trench

The following guidance has been provided for those regulated activities that qualify as a Minor Land Disturbance. This volume represents the amount of runoff to be permanently removed (managed on-site through reuse, infiltration, evaporation, or transpiration) per the Ephrata Township Storm Water Management Ordinance. The volume does not account for the rate of percolation into the ground.

Variables:

A = Impervious Area in square feet (sq. ft.)
V = Required Stone Infiltration Volume in cubic feet (cu. ft.)

Compute Total Required Volume:

V = 0.5 x A
or;
V = 0.5 x _____ (impervious area in sq. ft.) = _____ (required trench volume in cu. ft.).

Sizing Chart for Stone Infiltration Trench

Impervious Area (sq. ft.)	Stone Infiltration Trench (Cu. ft. - incl. 40% void ratio)
1000	500
1250	625
1500	750
1750	875
2000	1000
2250	1125
2500	1250
2750	1375
3000	1500
3250	1625
3500	1750
3750	1875
4000	2000
4250	2125
4500	2250
4750	2375
5000	2500

Stone Infiltration Trench

Total Depth = _____ inches of stone + 12 inches of cover = _____ inches*
*must be between 24 inches and 40 inches

Depth of Stone (D) = _____ feet (inches of stone divided by 12)

Width (W) = _____ feet

Length (L) = _____ feet

Note: Depth of Stone x Width x Length must be equal to or greater than (V) total required trench volume.

Trench Volume = D x W x L = _____

Stone Infiltration Trench Construction - General Notes

1. Use the worksheets and table to compute the required volume in the stone infiltration trench (in cubic feet) for all proposed impervious areas. The calculated total volume is the minimum requirement for on-site construction. The actual horizontal dimensions of the stone infiltration trench may vary to fit specific site configurations and constraints, but the vertical depth of the stone infiltration trench must be a minimum of twenty-four (24) inches and a maximum of forty (40) inches. The total volume of the stone infiltration trench must be equal to or greater than the required minimum.

2. Multiple stone infiltration trenches may also be utilized. If multiple stone infiltration trenches are desired, the volume for each stone infiltration trench should be a proportional amount of the calculated total storage volume (if utilizing two [2] trenches; if sixty [60] percent of the total roof area is piped to one stone infiltration trench, then that stone infiltration trench should be sized for sixty [60] percent of the total required minimum volume. The second stone infiltration trench would be sized for the remaining forty [40] percent of the total required minimum volume).

3. Based on the calculations of the required stone infiltration trench dimensions computed using the worksheet and table, stake out the locations of the stone infiltration trench corners. Staking is critical and should outline the location of the stone infiltration trench. The stone infiltration trench shall be located as far as possible downslope from the proposed home. A minimum of ten (10) feet of undisturbed soil shall be provided between the stone infiltration trench and any adjoining building or structure. Maintain a minimum of ten (10) feet between the stone infiltration trench and any property lines and road rights-of-way. Stone infiltration trenches shall be located beside or downslope (not upslope of) and a minimum of ten (10) feet from any component of any on-lot sewage disposal system or on-lot sewage disposal system replacement absorption area.

4. Excavation of the stone infiltration trench shall be conducted from outside of the stone infiltration trench perimeter, using equipment which has a bucket on a reaching arm (backhoe or trackhoe). No equipment shall be permitted in or on the stone infiltration trench area. The bottom and sides of the stone infiltration trench shall be chiseled or ripped to break up any smearing or compaction that may have occurred during excavation.

5. After excavation of the stone infiltration trench is complete, ensure that the bottom is graded with a slope that is no greater than two (2) inches per one hundred (100) feet. Line the stone infiltration trench bottom and sides with a Class 1 Geotextile filter fabric, leaving enough excess filter fabric to cover the top of the stone infiltration trench before it is backfilled with earthen fill. If multiple runs of filter fabric are required to completely enclose the stone infiltration trench, a minimum of twelve (12) inches overlapping must be provided.

6. Backfill the stone infiltration with clean aggregate (clean washed stone with no fines in the range of coarse aggregate sizes from AASHTO #1 to AASHTO #57). Backfilling of the stone infiltration trench shall be conducted from outside of the stone infiltration trench perimeter, using equipment which has a bucket on a reaching arm (backhoe or trackhoe). No equipment shall be permitted in or on the stone infiltration trench area. The stone infiltration trench shall be to a uniform depth a minimum of six (6) inches below the finished top of stone (a minimum of eighteen [18] inches below finished grade).

7. The perforated pipe (minimum four [4] inch PVC) with cleanout pipe extension should then be placed on the stone. Connect roof drain pipes from downspouts to the stone infiltration facility. Be sure to leave the pipes exposed for observation by the Township.

8. At this time, before more stone is placed in the infiltration trench to cover the pipe, or roof leaders trenches are backfilled, the Township should be notified for inspection of the facility to verify proper pipe installation.

9. Following the Township inspection, add more stone around and over the pipe to a uniform depth a minimum of two (2) inches over the top of the pipe. Carefully cover the top of the stone bed with the remaining geotextile fabric, being careful to overlap a minimum of twelve (12) inches.

10. The infiltration trench should then be backfilled to the top of the infiltration trench with at least twelve (12) inches of clean earth fill.

11. To ease maintenance of the underground pipes, and prevent clogging of the infiltration trench, consideration should be given to providing screens for all roof gutters. The screens prevent foreign materials from clogging the pipes and stone infiltration trench.

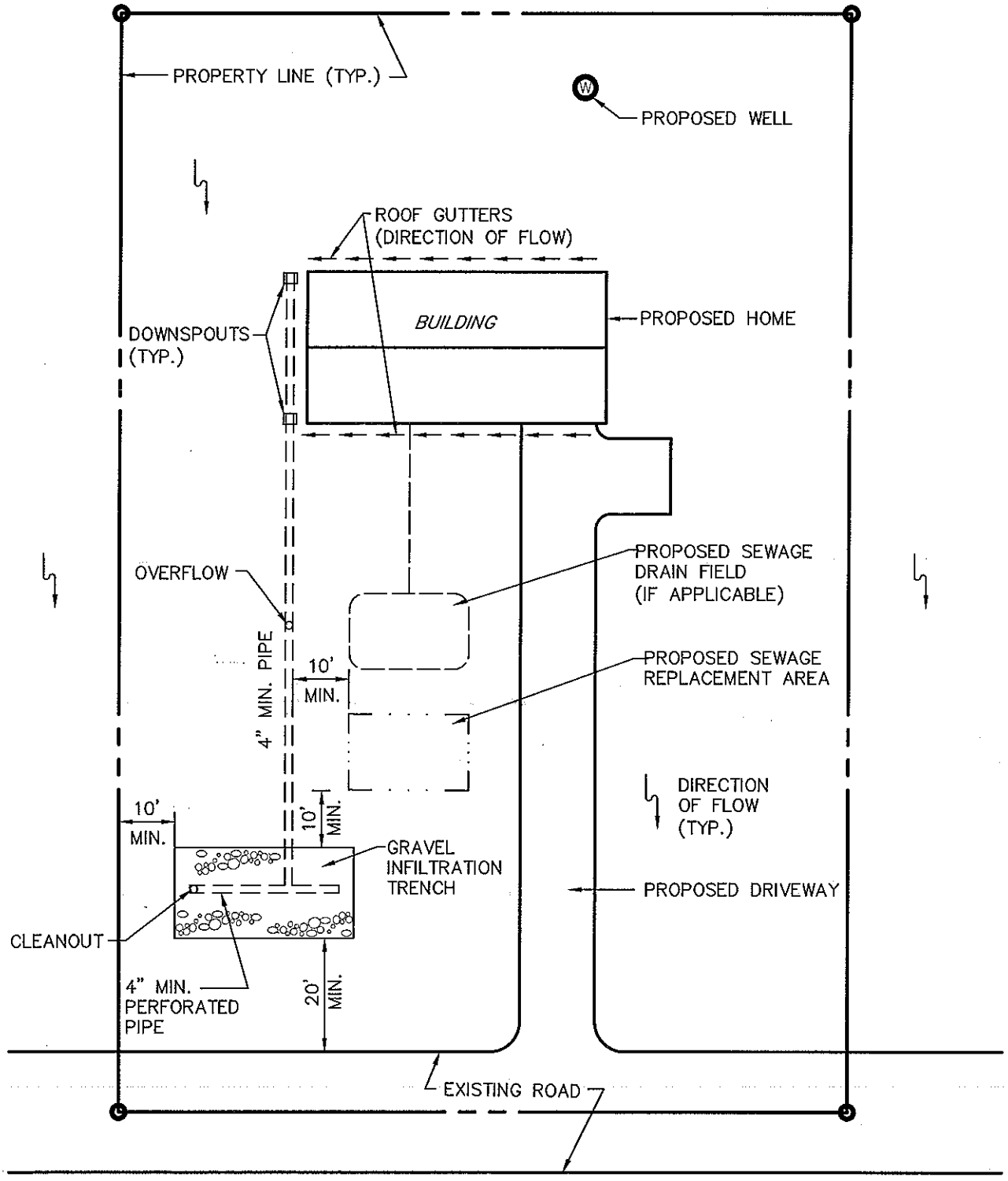


EXHIBIT A
TYPICAL INFILTRATION TRENCH PLAN

EPHRATA TOWNSHIP LANCASTER COUNTY

RETTEW
RETTEW Associates, Inc.
3020 Columbia Ave., Lancaster, PA 17603
Phone (717) 394-3721 · Fax (717) 394-1063

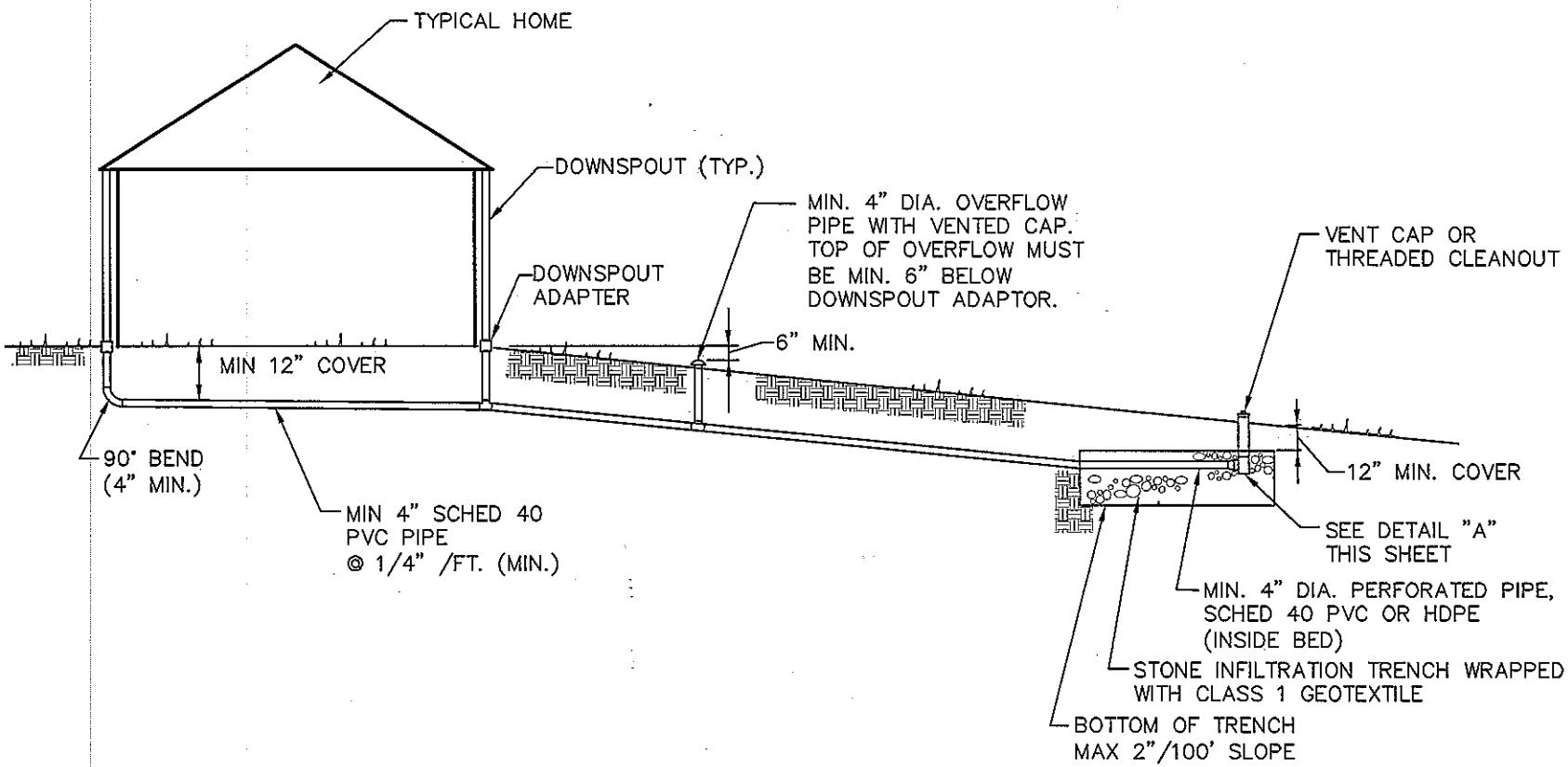
DRAWN BY:
DATE: 5/6/14
SCALE: NOT TO SCALE
DWG. NO. 011142014

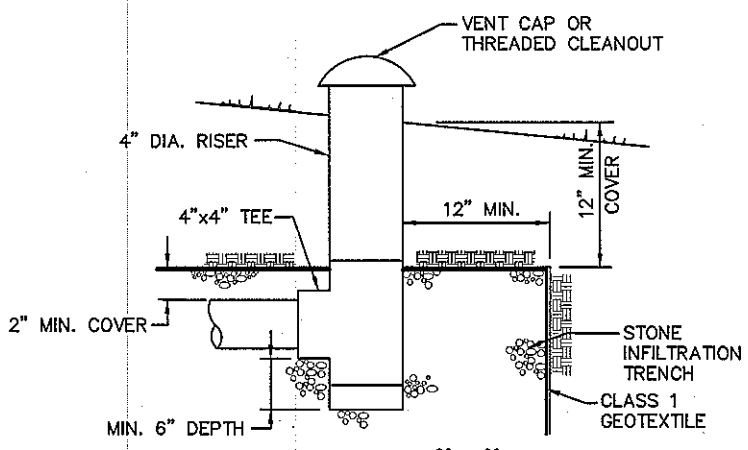
EPHRATA TOWNSHIP

LANCASTER COUNTY

EXHIBIT B

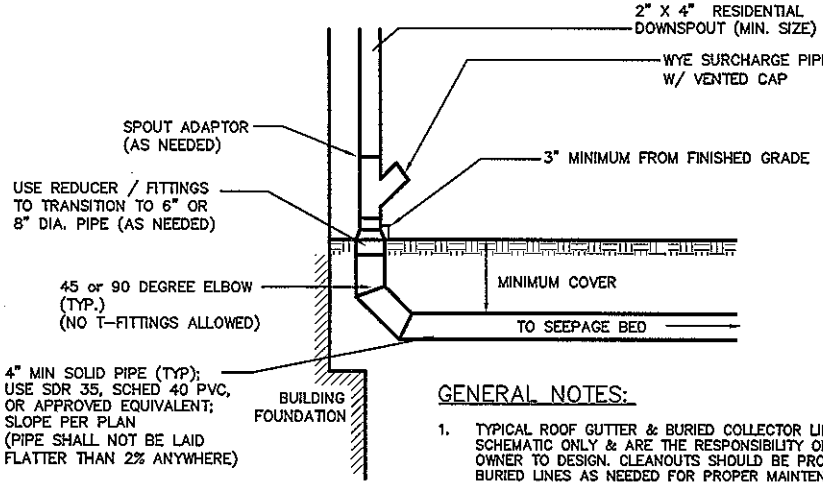
TYPICAL INFILTRATION TRENCH PROFILE





DETAIL "A"

NOT TO SCALE



GENERAL NOTES:

1. TYPICAL ROOF GUTTER & BURIED COLLECTOR LINES SHOWN ARE SCHEMATIC ONLY & ARE THE RESPONSIBILITY OF THE BUILDER & OWNER TO DESIGN. CLEANOUTS SHOULD BE PROVIDED ON ALL BURIED LINES AS NEEDED FOR PROPER MAINTENANCE.
2. WYE "Y" FITTINGS MUST BE USED AT ALL PIPE INTERSECTIONS. TEE "T" FITTINGS SHALL NOT BE USED.

DOWNSPOUT CONNECTION DETAIL

NOT TO SCALE

RETTEW

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Phone (717) 394-3721 · Fax (717) 394-1063

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