

TYPICAL HOME-LOT POST CONSTRUCTION  
STORMWATER MANAGEMENT PLANS  
FOR THE

**JEFFERSON COUNTY CONSERVATION DISTRICT**  
JEFFERSON COUNTY - PENNSYLVANIA

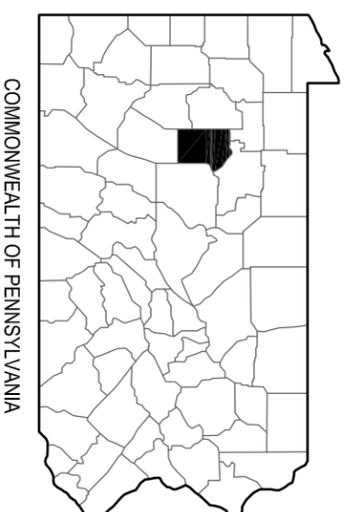
**MARCH 2011**



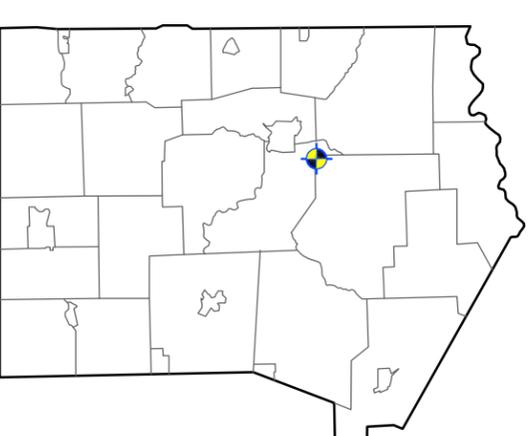
**JEFFERSON COUNTY  
CONSERVATION DISTRICT**

1514 ROUTE 28  
BROOKVILLE, PA 15825  
PHONE: (814) 849-7463  
FAX: (814) 849-0825  
EMAIL: JCCD@WINDSTREAM.NET

TABLE OF CONTENTS	
SHEET	DESCRIPTION
C0.00	COVER SHEET
C1.00	EROSION AND SEDIMENTATION CONTROL - TYPICAL SITE
C1.01	EROSION AND SEDIMENTATION CONTROL - DETAILS



COMMONWEALTH OF PENNSYLVANIA



JEFFERSON COUNTY  
CONSERVATION DISTRICT

## RESIDENTIAL ON-LOT RAIN GARDEN CONSTRUCTION SEQUENCE

THE FOLLOWING IS A TYPICAL CONSTRUCTION SEQUENCE; HOWEVER, ALTERATIONS MIGHT BE NECESSARY DEPENDING ON DESIGN VARIATIONS.

1. INSTALL TEMPORARY SEDIMENT CONTROL BMPs AS SHOWN ON THE PLANS.
2. COMPLETE SITE GRADING. IF APPLICABLE, CONSTRUCT CURB CUTS OR OTHER INFLOW ENTRANCE BUT PROVIDE PROTECTION SO THAT DRAINAGE IS PROHIBITED FROM ENTERING CONSTRUCTION AREA.
3. STABILIZE GRADING WITHIN THE LIMIT OF DISTURBANCE EXCEPT WITHIN THE RAIN GARDEN AREA. RAIN GARDEN BED AREAS MAY BE USED AS TEMPORARY SEDIMENT TRAPS PROVIDED THAT THE PROPOSED FINISH ELEVATION OF THE BED IS 12 INCHES LOWER THAN THE BOTTOM ELEVATION OF THE SEDIMENT TRAP.
4. EXCAVATE RAIN GARDEN TO PROPOSED INVERT DEPTH AND SCARIFY THE EXISTING SOIL SURFACES. DO NOT COMPACT IN-SITU SOILS.
5. BACKFILL RAIN GARDEN WITH AMENDED SOIL AS SHOWN ON PLANS AND SPECIFICATIONS. OVERFILLING IS RECOMMENDED TO ACCOUNT FOR SETTLEMENT. LIGHT HAND TAMPING IS ACCEPTABLE IF NECESSARY.
6. PRESOAK THE PLANTING SOIL PRIOR TO PLANTING VEGETATION TO AID IN SETTLEMENT.
7. COMPLETE FINAL GRADING TO ACHIEVE PROPOSED DESIGN ELEVATIONS, LEAVING SPACE FOR UPPER LAYER OF COMPOST, MULCH OR TOPSOIL AS SPECIFIED ON PLANS.
8. PLANT VEGETATION ACCORDING TO PLANTING PLAN. 9. MULCH AND INSTALL EROSION PROTECTION AT SURFACE FLOW ENTRANCES WHERE NECESSARY.

## MAINTENANCE ISSUES

PROPERLY DESIGNED AND INSTALLED RAIN GARDENS REQUIRE SOME ANNUAL MAINTENANCE:

1. WHILE VEGETATION IS BEING ESTABLISHED, PRUNING AND WEEDING MAY BE REQUIRED.
2. DETRITUS MAY ALSO NEED TO BE REMOVED EVERY YEAR. PERENNIAL PLANTINGS MAY BE CUT DOWN AT THE END OF THE GROWING SEASON.
3. MULCH SHOULD BE RE-SPREAD WHEN EROSION IS EVIDENT AND BE REPLISHED AS NEEDED. ONCE EVERY 2 TO 3 YEARS THE ENTIRE AREA MAY REQUIRE MULCH REPLACEMENT.
4. BIORETENTION AREAS SHOULD BE INSPECTED AT LEAST TWO TIMES PER YEAR FOR SEDIMENT BUILDUP, EROSION, VEGETATIVE CONDITIONS, ETC.
5. DURING PERIODS OF EXTENDED DROUGHT, BIORETENTION AREAS MAY REQUIRE WATERING.
6. RAIN GARDENS SHOULD NOT BE MOWED ON A REGULAR BASIS.
7. TREES AND SHRUBS SHOULD BE INSPECTED TWICE PER YEAR TO EVALUATE HEALTH.

## SPECIFICATIONS

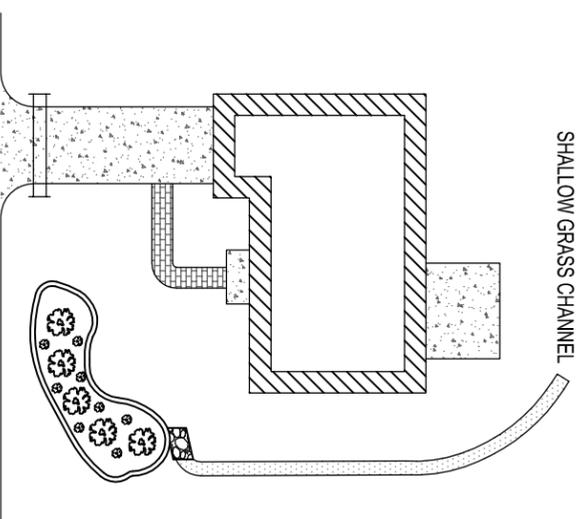
THE FOLLOWING SPECIFICATIONS ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THESE SPECIFICATIONS INCLUDE INFORMATION ON ACCEPTABLE MATERIALS FOR TYPICAL APPLICATIONS, BUT ARE BY NO MEANS EXCLUSIVE OR LIMITING.

### EXECUTION

- A. OWNER AND ENGINEER SHALL BE NOTIFIED AT LEAST 24 HOURS PRIOR TO ALL WORK.
- B. SUBGRADE PREPARATION
  1. EXISTING SUB-GRADE IN BIORETENTION AREAS SHALL NOT BE COMPACTED OR SUBJECT TO EXCESSIVE CONSTRUCTION EQUIPMENT TRAFFIC.
  2. INITIAL EXCAVATION CAN BE PERFORMED DURING ROUGH SITE GRADING BUT SHALL NOT BE CARRIED TO WITHIN ONE FOOT OF THE FINAL BOTTOM ELEVATION. FINAL EXCAVATION SHOULD NOT TAKE PLACE UNTIL ALL DISTURBED AREAS IN THE DRAINAGE AREA HAVE BEEN STABILIZED.
  3. WHERE EROSION OF SUB-GRADE HAS CAUSED ACCUMULATION OF FINE MATERIALS AND/OR SURFACE PONDING IN THE GRADED BOTTOM, THIS MATERIAL SHALL BE REMOVED WITH LIGHT YORK RAKE OR EQUIVALENT BY LIGHT TRACTOR.
  4. BRING SUB-GRADE OF BIORETENTION AREA TO LINE, GRADE, AND ELEVATIONS INDICATED. FILL AND LIGHTLY REGRADE ANY AREAS DAMAGED BY EROSION, PONDING, OR TRAFFIC.
  5. COMPACTION. ALL RAIN GARDEN AREAS SHALL BE LEVEL, GRADE ON THE BOTTOM. HALT EXCAVATION AND NOTIFY ENGINEER IMMEDIATELY IF EVIDENCE OF SINKHOLE ACTIVITY OR PINNACLES OF CARBONATE BEDROCK ARE ENCOUNTERED IN THE BIORETENTION AREA.
- C. RAIN GARDEN INSTALLATION
  1. UPON COMPLETION OF SUB-GRADE WORK, THE ENGINEER SHALL BE NOTIFIED AND SHALL INSPECT AT HIS/HER DISCRETION BEFORE PROCEEDING WITH RAIN GARDEN INSTALLATION.
  2. FOR THE SUBSURFACE STORAGE/FILTRATION BED INSTALLATION, AMENDED SOILS SHOULD BE PLACED ON THE BOTTOM TO THE SPECIFIED DEPTH.
  3. PLANTING SOIL SHALL BE PLACED IMMEDIATELY AFTER APPROVAL OF SUB-GRADE PREPARATION/BED INSTALLATION. ANY ACCUMULATION OF DEBRIS OR SEDIMENT THAT TAKES PLACE AFTER APPROVAL OF SUB-GRADE SHALL BE REMOVED PRIOR TO INSTALLATION OF PLANTING SOIL AT NO EXTRA COST TO THE OWNER.
  4. INSTALL PLANTING SOIL (EXCEEDING ALL CRITERIA) IN 18-INCH MAXIMUM LIFTS AND LIGHTLY COMPACT (TAMP WITH BACKHOE BUCKET OR BY HAND). KEEP EQUIPMENT MOVEMENT OVER PLANTING SOIL TO A MINIMUM. DO NOT OVER COMPACT. INSTALL PLANTING SOIL TO GRADES INDICATED ON THE DRAWINGS.
  5. PLANT TREES AND SHRUBS ACCORDING TO SUPPLIER'S RECOMMENDATIONS AND ONLY FROM MID-MARCH THROUGH THE END OF JUNE OR FROM MID-SEPTEMBER THROUGH MID-NOVEMBER.
  6. INSTALL 2-3" SHREDED HARDWOOD MULCH (MINIMUM AGE 6 MONTHS) OR COMPOST MULCH EVENLY AS SHOWN ON PLANS. DO NOT APPLY MULCH IN AREAS WHERE GROUND COVER IS TO BE GRASS OR WHERE COVER WILL BE ESTABLISHED BY SEEDING.
  7. PROTECT RAIN GARDENS FROM SEDIMENT AT ALL TIMES DURING CONSTRUCTION. HAY BALES, DIVERSION BERMS AND/OR OTHER APPROPRIATE MEASURES SHALL BE USED AT THE TOE OF SLOPES THAT ARE ADJACENT TO RAIN GARDENS TO PREVENT SEDIMENT FROM WASHING INTO THESE AREAS DURING SITE DEVELOPMENT.
  8. WHEN THE SITE IS FULLY VEGETATED AND THE SOIL MANITL STABILIZED, THE PLAN DESIGNER SHALL BE NOTIFIED AND SHALL INSPECT THE RAIN GARDEN DRAINAGE AREA AT HIS/HER DISCRETION BEFORE THE AREA IS BROUGHT ONLINE AND SEDIMENT CONTROL DEVICES REMOVED.
  9. WATER VEGETATION AT THE END OF EACH DAY FOR TWO WEEKS AFTER PLANTING IS COMPLETED.



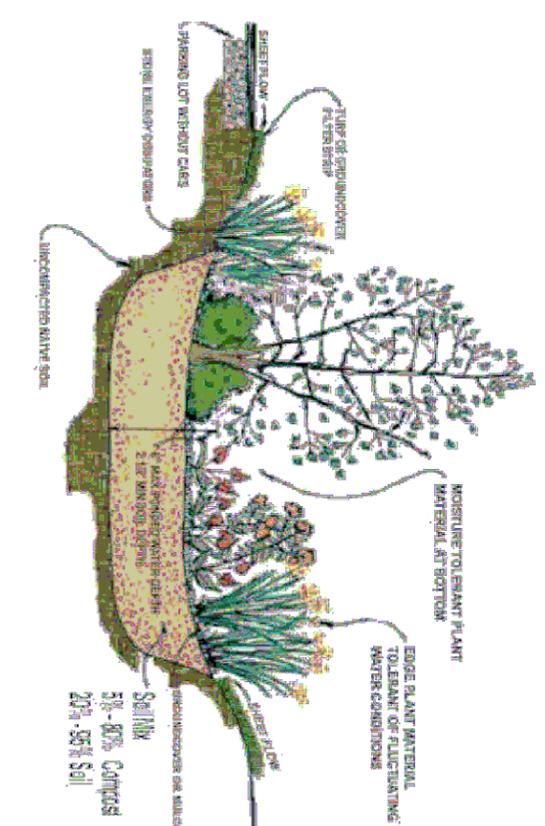
EXAMPLE OF RESIDENTIAL ON-LOT RAIN GARDEN  
SCALE: NTS



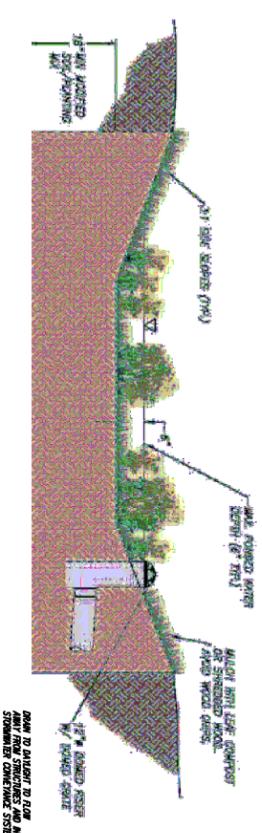
TYPICAL RESIDENTIAL ON-LOT RAIN GARDEN  
SCALE: NTS

IMPERVIOUS AREA (SQ. FT.)	REQUIRED RAIN GARDEN AREA (SQ. FT.)
250	50
500	100
750	150
1,000	200
1,250	250
1,500	300
1,750	350
2,000	400
2,250	450
2,500	500
2,750	550
3,000	600
3,250	650
3,500	700
3,750	750
4,000	800
4,250	850
4,500	900

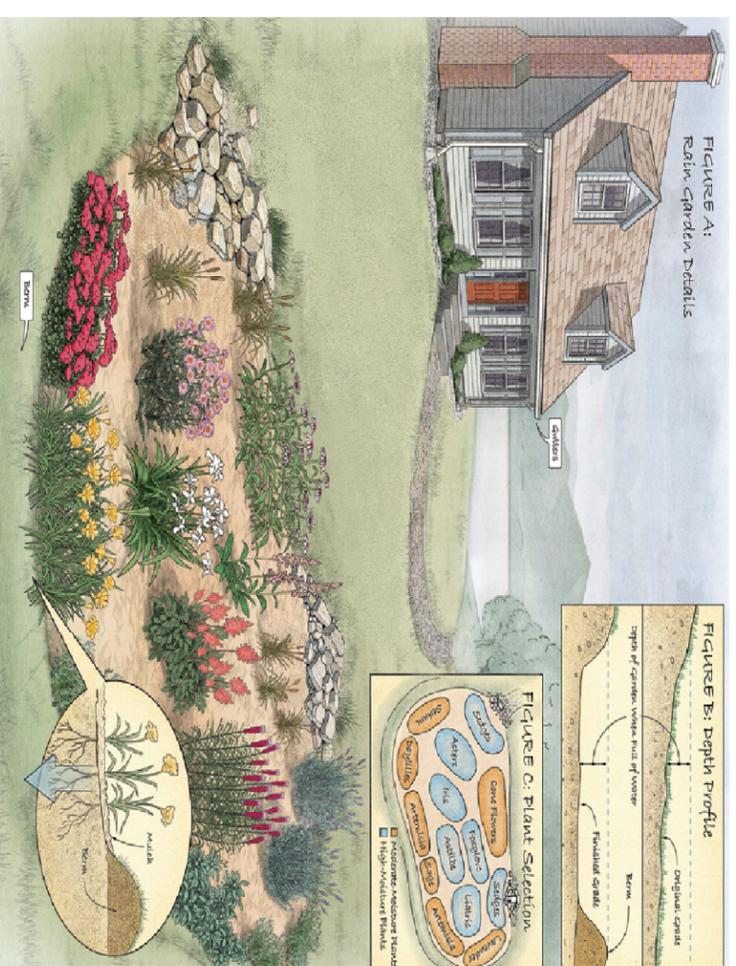
NOTES: RAIN GARDENS ARE SIZED USING A RATIO OF 1 PART RAIN GARDEN REQUIRED TO EVERY 6 PARTS IMPERVIOUS AREA. RAIN GARDENS WILL CAPTURE THE DRIVEWAY AREAS AND A PORTION OF THE LAWN AREA.



TYPICAL COMPONENTS OF A RAIN GARDEN  
SCALE: NTS



TYPICAL RAIN GARDEN CROSS SECTION  
SCALE: NTS



TYPICAL RESIDENTIAL ON-LOT RAIN GARDEN  
SCALE: NTS

  
JEFFERSON COUNTY  
CONSERVATION DISTRICT  
1514 ROUTE 28  
BROOKVILLE, PA 15825  
PHONE: (814) 849-7463  
FAX: (814) 849-0825  
EMAIL: JCCDD@WINDSTREAM.NET

Project Name:  
TYPICAL HOME-LOT  
POST CONSTRUCTION  
STORMWATER  
MANAGEMENT PLAN

Rev. Date Description  
MARCH 2011  
Issue: As Specified  
Scale: TDP  
Drawn By: JLS  
Checked By: JLS  
Sheet Title:

RESIDENTIAL  
RAIN GARDEN  
DETAILS AND  
NOTES

Sheet Number:

C1.00

**DRY WELL CONSTRUCTION SEQUENCE**

1. PROTECT INFILTRATION AREA FROM COMPACTION PRIOR TO INSTALLATION.
2. IF POSSIBLE, INSTALL DRY WELLS DURING LATER PHASES OF SITE CONSTRUCTION TO PREVENT SEDIMENTATION AND/OR DAMAGE FROM CONSTRUCTION ACTIVITY.
3. INSTALL AND MAINTAIN PROPER EROSION AND SEDIMENT CONTROL MEASURES DURING CONSTRUCTION AS PER THE PENNSYLVANIA EROSION AND SEDIMENT POLLUTION CONTROL PROGRAM MANUAL (MARCH 2000, OR LATEST EDITION).
4. EXCAVATE DRY WELL BOTTOM TO A UNIFORM, LEVEL UNCOMPACTED SUBGRADE FREE FROM ROCKS AND DEBRIS. DO NOT COMPACT SUBGRADE. TO THE GREATEST EXTENT POSSIBLE, EXCAVATION SHOULD BE PERFORMED WITH THE LIGHTEST PRACTICAL EQUIPMENT. EXCAVATION EQUIPMENT SHOULD BE PLACED OUTSIDE THE LIMITS OF THE DRY WELL.
5. COMPLETELY WRAP DRY WELL WITH NONWOVEN GEOTEXTILE. (IF SEDIMENT AND/OR DEBRIS HAVE ACCUMULATED IN DRY WELL BOTTOM, REMOVE PRIOR TO GEOTEXTILE PLACEMENT.) GEOTEXTILE ROLLS SHOULD OVERLAP BY A MINIMUM OF 24 INCHES WITHIN THE TRENCH. FOLD BACK AND SECURE EXCESS GEOTEXTILE DURING STONE PLACEMENT.
6. INSTALL CONTINUOUSLY PERFORATED PIPE. OBSERVATION WELLS, AND ALL OTHER DRY WELL STRUCTURES, CONNECT ROOF LEADERS TO STRUCTURES AS INDICATED ON PLANS.
7. PLACE UNIFORMLY GRADED, CLEAN-WASHED AGGREGATE IN 6-INCH LIFTS, LIGHTLY COMPACTING BETWEEN LIFTS.
8. FOLD AND SECURE NONWOVEN GEOTEXTILE OVER TRENCH, WITH MINIMUM OVERLAP OF 12-INCHES.
9. PLACE 12-INCH LIFT OF APPROVED TOPSOIL OVER TRENCH, AS INDICATED ON PLANS.
10. SEED AND STABILIZE TOPSOIL.
11. CONNECT SURCHARGE PIPE TO ROOF LEADER AND POSITION OVER SPLASHBOARD.
12. DO NOT REMOVE EROSION AND SEDIMENT CONTROL MEASURES UNTIL SITE IS FULLY STABILIZED.

**MAINTENANCE ISSUES**

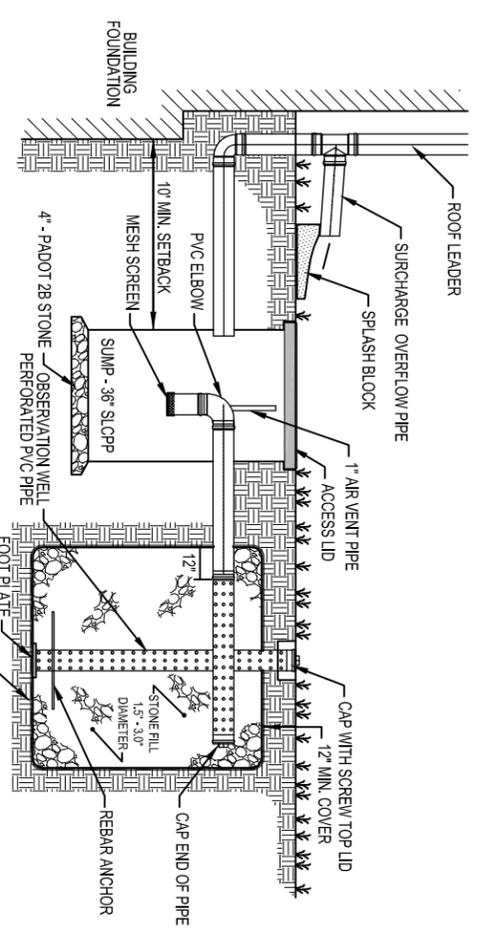
AS WITH ALL INFILTRATION PRACTICES, DRY WELLS REQUIRE REGULAR AND EFFECTIVE MAINTENANCE TO ENSURE PROLONGED FUNCTIONING. THE FOLLOWING REPRESENT MINIMUM MAINTENANCE REQUIREMENTS FOR DRY WELLS.

1. INSPECT DRY WELLS AT LEAST FOUR TIMES A YEAR, AS WELL AS AFTER EVERY STORM EXCEEDING 1 INCH OF RAINFALL.
2. DISPOSE OF SEDIMENT, DEBRIS/TRASH, AND ANY OTHER WASTE MATERIAL REMOVED FROM A DRY WELL AT SUITABLE DISPOSAL/RECYCLING SITES AND IN COMPLIANCE WITH LOCAL, STATE, AND FEDERAL WASTE REGULATIONS.
3. EVALUATE THE DRAIN-DOWN TIME OF THE DRY WELL TO ENSURE THE MAXIMUM TIME OF 72 HOURS IS NOT BEING EXCEEDED. IF DRAIN-DOWN TIMES ARE EXCEEDING THE MAXIMUM, DRAIN THE DRY WELL VIA PUMPING AND CLEAN OUT PERFORATED PIPING, IF INCLUDED. IF SLOW DRAINAGE PERSISTS, THE SYSTEM MAY NEED REPLACING.
4. REGULARLY CLEAN OUT GUTTERS AND ENSURE PROPER CONNECTIONS TO FACILITATE THE EFFECTIVENESS OF THE DRY WELL.
5. REPLACE FILTER SCREEN THAT INTERCEPTS ROOF RUNOFF AS NECESSARY.
6. IF AN INTERMEDIATE SUMP BOX EXISTS, CLEAN IT OUT AT LEAST ONCE PER YEAR.

**SPECIFICATIONS**

THE FOLLOWING SPECIFICATIONS ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THESE SPECIFICATIONS INCLUDE INFORMATION ON ACCEPTABLE MATERIALS FOR TYPICAL APPLICATIONS, BUT ARE BY NO MEANS EXCLUSIVE OR LIMITING.

1. STONE FOR INFILTRATION TRENCHES SHALL BE 2-INCH TO 1-INCH UNIFORMLY GRADED COARSE AGGREGATE WITH A WASH LOSS OF NO MORE THAN 0.5% ASHTO SIZE NO. 3 PER ASHTO SPECIFICATIONS, PART I, 19TH ED., 1998, OR LATER AND SHALL HAVE Voids 40% AS MEASURED BY ASTM-C29.
2. NONWOVEN GEOTEXTILE SHALL CONSIST OF NEEDED NONWOVEN POLYPROPYLENE FIBERS AND MEET THE FOLLOWING PROPERTIES: 120 LBS
  - A. GRAB TENSILE STRENGTH (ASTM-D4632) 120 LBS
  - B. MULLEN BURST STRENGTH (ASTM-D3786) 225 PSI
  - C. FLOW RATE (ASTM-D4491) 95 GAL/MIN/FT2
  - D. UV RESISTANCE AFTER 500 HRS (ASTM-D3786) 70%
  - E. HEAT-SET OR HEAT-CALENDARED FABRICS ARE NOT PERMITTED ACCEPTABLE TYPES INCLUDE MIRAFI 140N, AMOCO 4547, AND GEOTEX 451.
3. PIPE SHALL BE CONTINUOUSLY PERFORATED, SMOOTH INTERIOR, WITH A MINIMUM INSIDE DIAMETER OF 4-INCHES. HIGH-DENSITY POLYETHYLENE (HDPE) PIPE SHALL MEET AASHTO M252, TYPE S OR AASHTO M294, TYPE S. 12 GAUGE ALUMINUM OR CORRUGATED STEEL PIPE MAY BE USED IN SEEPAGE PITS.
4. GUTTERS AND SPLASHBOARDS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS.



**TYPICAL ON-LOT DRY WELL WITH OBSERVATION SUMP DETAIL**  
SCALE: NTS

NOTE: DRY WELLS WILL BE USED TO CAPTURE THE ROOF AREAS ONLY.

**DRY WELL SIZING CHART**

IMPERVIOUS ROOF AREA (SQ. FT.)	REQUIRED DRY WELL VOLUME (CU. FT.)
800	36
900	40.5
1,000	45
1,100	49.5
1,200	54
1,300	58.5
1,400	63
1,500	67.5
1,600	72
1,700	76.5
1,800	81
1,900	85.5
2,000	90
2,100	94.5
2,200	99
2,300	103.5
2,400	108
2,500	112.5
2,600	117
2,700	121.5
2,800	126
2,900	130.5
3,000	135
3,100	139.5
3,200	144

NOTES:  
4.5 CUFT. OF VOLUME FOR EVERY 100 SQ.FT. OF ROOF AREA.

JEFFERSON COUNTY  
CONSERVATION DISTRICT  
1514 ROUTE 28  
BROOKVILLE, PA 15825  
PHONE: (814) 849-7463  
FAX: (814) 849-0825  
EMAIL: JCCDD@WINDSTREAM.NET

Project Name:  
**TYPICAL HOME-LOT POST CONSTRUCTION STORMWATER MANAGEMENT PLAN**

Rev.	Date	Description
Issue:	MARCH 2011	
Scale:	As Specified	
Drawn By:	TDP	
Checked By:	JLS	
Sheet Title:	RESIDENTIAL DRY WELL DETAILS AND NOTES (ROOF SUMPS)	

Sheet Number:  
**C1.01**