MANHEIM TOWNSHIP
STORMWATER MANAGEMENT
REFERENCE MANUAL

June 9, 2014

This Stormwater Management Reference Manual is a compilation of design criteria, operation and maintenance guidelines, agreements, and forms. This reference manual should be used in conjunction with the Manheim Township Stormwater Management Ordinance.

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DESIGN CRITERIA

FIGURE 1
RECOMMENDED "n" VALUES TO BE USED WITH MANNING'S EQUATION

Type of Conveyance and Description	Minimum	Design	Maximum
A. Closed Conduits Flowing Partly Full			
A-1. Metal			
a. Steel			
1. Welded	0.010	0.012	0.014
b. Cast Iron/Ductile Iron			
Asphalt coated	0.010	0.013	0.014
Cement-lined and seal coated	0.011	0.013	0.015
c. Corrugated Metal			
Annular 2-2/3 x 1/2 inch (all diameters, unpaved)		0.024	
Annular 2-2/3 x 1/2 inch (all diameters, paved invert)		0.021	
Annular 2-2/3 x 1/2 inch (all diameters, fully paved)		0.012	
Helical 1-1/2 x 1/4 inch (unpaved)			
1. 8" diameter		0.012	
2. 10" diameter		0.014	
Helical 2-2/3 x 1/2 inch (unpaved)			
1. 12" diameter		0.011	
2. 18" diameter		0.014	
3. 24" diameter		0.016	
4. 36" diameter		0.019	
5. 48" diameter		0.020	
6. 60" diameter and larger		0.021	
Helical 2-2/3 x 1/2 inch (paved invert)			
1. 24" diameter		0.014	
2. 36" diameter		0.017	
3. 48" diameter		0.020	
4. 60" diameter and larger		0.019	
Helical 2-2/3 x 1/2 inch (fully paved)			
1. 24" diameter		0.012	
2. 36" diameter		0.012	
3. 48" diameter		0.012	
4. 60" diameter and larger		0.012	
Annular 3 x 1 inch (all diameters, unpaved)		0.027	
Annular 3 x 1 inch (all diameters, paved invert)		0.023	
Annular 3 x 1 inch (all diameters, fully paved)		0.012	

FIGURE 1
RECOMMENDED "n" VALUES TO BE USED WITH MANNING'S EQUATION

Type of Conveyance and Description	Minimum	Design	Maximum
Helical 3 x 1 inch (unpaved)			
1. 36" diameter		0.021	
2. 48" diameter		0.023	
3. 54" diameter		0.023	
4. 60" diameter		0.024	
5. 66" diameter		0.025	
6. 72" diameter		0.026	
7 78" diameter and larger		0.027	
Helical 3 x 1 inch (paved invert)			
1. 36" diameter		0.019	
2. 48" diameter		0.020	
3. 54" diameter		0.020	
4. 60" diameter		0.021	
5. 66" diameter		0.022	
6. 72" diameter		0.022	
7. 78" diameter and larger		0.023	
Helical 3 x 1 inch (fully paved)			
1. 36" diameter		0.012	
2. 48" diameter		0.012	
3. 54" diameter		0.012	
4. 60" diameter		0.012	
5. 66" diameter		0.012	
6. 72" diameter		0.012	
7. 78" diameter and larger		0.012	
Corrugations 6 x 2 inches (unpaved)			
1. 60" diameter		0.033	
2. 72" diameter		0.032	
3. 120" diameter		0.030	
4. 180" diameter		0.028	
Corrugations 6 x 2 inches (paved invert)			
1. 60" diameter		0.028	
2. 72" diameter		0.027	
3. 120" diameter		0.026	
4. 180" diameter		0.024	

FIGURE 1
RECOMMENDED "n" VALUES TO BE USED WITH MANNING'S EQUATION

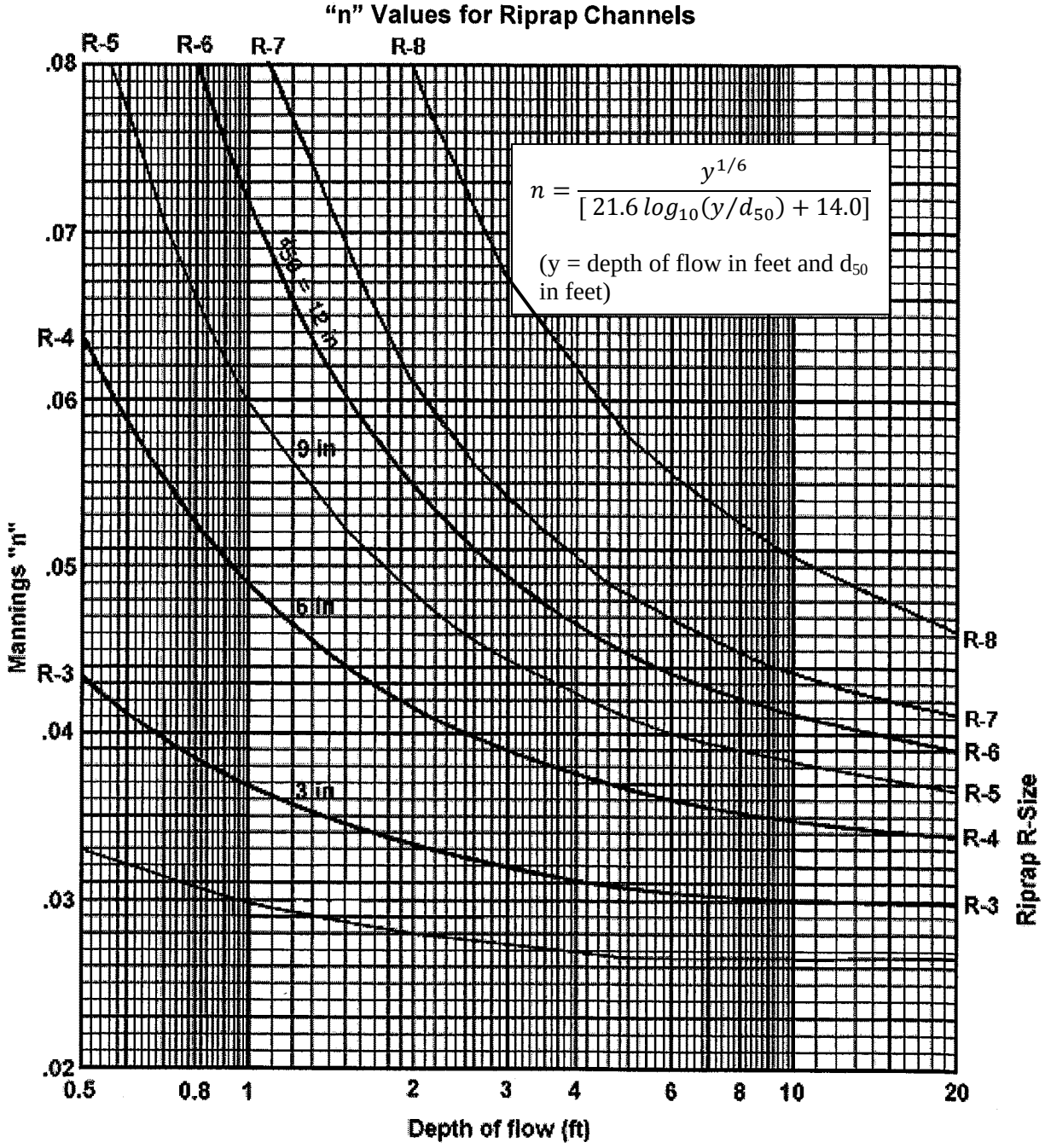
Type of Conveyance and Description	Minimum	Design	Maximum
A-2. Nonmetal			
a. Reinforced concrete		0.013	
b. Polyethylene (corrugated)			
1. 4" – 6" diameter		0.015	
2. 8" diameter		0.016	
3. 10" diameter		0.017	
4. 12" – 15" diameter		0.018	
5. 18" – 36" diameter		0.020	
c. Polyethylene (smooth inner wall)		0.012	
d. Polyvinyl Chloride		0.011	
e. Vitrified clay	0.010	0.013	0.017
f. Brick in cement mortar; brick sewers	0.012	0.015	0.017
g. Asbestos Cement		0.009	
B. Lined or Built-Up Channels			
B-1. Metal			
a. Smooth steel surface			
1. Unpainted	0.011	0.012	0.014
2. Painted	0.012	0.013	0.017
b. Corrugated	0.021	0.025	0.030
B-2 Nonmetal			
a. Cement			
1. Neat, surface	0.010	0.011	0.013
2. Mortar	0.011	0.013	0.015
b. Concrete			
1. Trowel finish	0.011	0.013	0.015
2. Float finish	0.013	0.015	0.016
3. Finished, with gravel on the bottom	0.015	0.017	0.020
4. Unfinished	0.014	0.017	0.020
5. Gunite, good section	0.016	0.019	0.023
6. Gunite, wavy section	0.018	0.022	0.025
c. Asphalt			
1. Smooth	0.013	0.013	
2. Rough	0.016	0.016	
C. Excavated or Dredged Channels and Ditches			
a. Earth, straight and uniform	0.017	0.023	0.025
b. Earth bottom, rubble sides	0.028	0.030	0.035
c. Dredged earth channels	0.025	0.028	0.033
d. Rock cuts:			
1. Smooth and uniform	0.025	0.035	0.040
2. Jagged and irregular	0.035	0.040	0.050

FIGURE 1
RECOMMENDED "n" VALUES TO BE USED WITH MANNING'S EQUATION

Type of Conveyance and Description	Minimum	Design	Maximum
D. Natural Streams			
D-1. Minor streams (top width at flood stage <100 feet)			
a. Streams on plain			
1. Clean, straight, full stage no rifts or deep pools	0.025	0.030	0.033
2. Same as 1, but more stones and weeds	0.030	0.035	0.040
3. Clean, winding, some pools and shoals	0.033	0.040	0.045
4. Same as 3, but some weeds and stones	0.035	0.045	0.050
5. Same as 4, lower stages, more ineffective slopes and sections	0.040	0.048	0.055
6. Same as 4, but more stones	0.045	0.050	0.060
7. Sluggish reaches, weedy and deep pools	0.050	0.070	0.080
8. Very weedy reaches, deep pools, or floodways with heavy stand of timber and underbrush	0.075	0.100	0.150

Adapted from Table 5-6 in Open-Channel Hydraulics by Ven Te Chow, Ph.D., 1959, Table 4-10 from Handbook of Steel Drainage & Highway Construction Products, 2nd Edition, American Iron and Steel Institute, 1971, Table 5 from Corrugated Metal Pipe Design Guide by Contech Engineered Solutions, 2013 and Table 1 from Technical Note 2.109 dated March 1, 1995 by Advanced Drainage Systems, Inc.

FIGURE 2
"n" VALUES FOR RIPRAP CHANNELS



Adapted from USDA-NRCS

FIGURE 3
RATIONAL RUNOFF COEFFICIENTS
BY HYDROLOGIC SOILS GROUP AND OVERLAND SLOPE (%)

Soils Group and Overland Slope	A				B				C				D		
	0-2%	2-6%	6%+		0-2%	2-6%	6%+		0-2%	2-6%	6%+		0-2%	2-6%	6%+
Land Use															
Cultivated Land[a]	0.33[b]	0.37	0.42		0.40	0.43	0.49		0.45	0.49	0.55		0.48	0.53	0.59
	0.37[c]	0.43	0.48		0.44	0.49	0.55		0.51	0.55	0.63		0.54	0.59	0.69
Pasture	0.12	0.20	0.30		0.18	0.28	0.37		0.24	0.34	0.44		0.30	0.40	0.50
	0.15	0.25	0.37		0.23	0.34	0.45		0.30	0.42	0.52		0.37	0.50	0.62
Meadow	0.10	0.16	0.25		0.14	0.22	0.30		0.20	0.28	0.36		0.24	0.30	0.40
	0.14	0.22	0.30		0.20	0.28	0.37		0.26	0.35	0.44		0.30	0.40	0.50
Forest	0.05	0.08	0.11		0.08	0.11	0.14		0.10	0.13	0.16		0.12	0.16	0.20
	0.08	0.11	0.14		0.10	0.14	0.18		0.12	0.16	0.20		0.15	0.20	0.25
Residential															
Lot Size 1/8 Acre	0.25	0.28	0.31		0.27	0.30	0.25		0.30	0.33	0.38		0.33	0.36	0.42
	0.33	0.37	0.40		0.35	0.39	0.44		0.38	0.42	0.49		0.41	.045	0.54
Lot Size 1/4 Acre	0.22	0.26	0.29		0.24	0.29	0.33		0.27	0.31	0.36		0.30	0.34	0.40
	0.30	0.34	0.37		0.33	0.37	0.42		0.36	0.40	0.47		0.38	0.42	0.52
Lot Size 1/3 Acre	0.19	0.23	0.26		0.22	0.26	0.30		0.25	0.29	0.34		0.28	0.32	0.39
	0.28	0.32	0.35		0.30	0.35	0.39		0.33	0.38	0.45		0.36	0.40	0.50
Lot Size 1/2 Acre	0.16	0.20	0.24		0.19	0.23	0.28		0.22	0.27	0.32		0.26	0.30	0.37
	0.25	0.29	0.32		0.28	0.32	0.36		0.31	0.35	0.42		0.34	0.38	0.48
Lot Size 1 Acre	0.14	0.19	0.22		0.17	0.21	0.26		0.20	0.25	0.31		0.24	0.29	0.35
	0.22	0.26	0.29		0.24	0.28	0.34		0.28	0.32	0.40		0.31	0.35	0.46
Industrial	0.67	0.68	0.68		0.68	0.68	0.69		0.68	0.69	0.69		0.69	0.69	0.70
	0.85	0.85	0.86		0.85	0.86	0.86		0.86	0.86	0.87		0.86	0.86	0.88
Commercial	0.71	0.71	0.72		0.71	0.72	0.72		0.72	0.72	0.72		0.72	0.72	0.72
	0.88	0.88	0.89		0.89	0.89	0.89		0.89	0.89	0.90		0.89	0.89	0.90
Streets	0.70	0.71	0.71		0.71	0.72	0.74		0.72	0.73	0.76		0.73	0.75	0.78
	0.76	0.77	0.79		0.80	0.82	0.84		0.84	0.85	0.89		0.89	0.91	0.95
Open Space	0.05	0.10	0.14		0.08	0.13	0.19		0.12	0.17	0.24		0.16	0.21	0.28
	0.11	0.16	0.20		0.14	0.19	0.26		0.18	0.23	0.32		0.22	0.27	0.39
Parking	0.85	0.86	0.87		0.85	0.86	0.87		0.85	0.86	0.87		0.85	0.86	0.87
	0.95	0.96	0.97		0.95	0.96	0.97		0.95	0.96	0.97		0.95	0.96	0.97

a Cultivated land "C" coefficients were compiled using other sources to reflect varying conditions of the ground cover due to tilling, plant growth, harvesting, maintenance, land management and similar factors.

b Runoff coefficients for storm recurrence intervals less than 25 years.

c Runoff coefficients for storm recurrence intervals 25 years or more.

Source: Rawls, W. J., S. L. Wong and R. H. McCuen, 1981. Comparison of urban flood frequency procedures. Preliminary draft report prepared for the U. S. Soil Conservation Service, Beltsville, Maryland.

FIGURE 4
RUNOFF CURVE NUMBERS

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description: Cover type and hydrologic condition	Average percent impervious area [2/]	Curve numbers for hydrologic soil group: A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only)		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

[1] Average runoff condition, and $I_a = 0.2S$.

[2] The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition.

[3] CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

FIGURE 4
RUNOFF CURVE NUMBERS

Table 2-2c Runoff curve numbers for other agricultural lands [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type	Hydrologic Condition	A	B	C	D
Pasture, grassland, or range — continuous forage for grazing. [2/]	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow — continuous grass, protected from grazing and generally mowed for hay.	—	30	58	71	78
Brush — brush-weed-grass mixture with brush the major element. [3/]	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30 [4/]	48	65	73
Woods — grass combination (orchard or tree farm). [5/]	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods. [6/]	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30 [4/]	55	70	77
Farmsteads—buildings, lanes, driveways, and surrounding lots.	—	59	74	82	86

[1] Average runoff condition, and $I_a = 0.2S$.

[2] *Poor:* <50%) ground cover or heavily grazed with no mulch.
Fair: 50 to 75% ground cover and not heavily grazed.
Good: > 75% ground cover and lightly or only occasionally grazed.

[3] *Poor:* <50% ground cover.
Fair: 50 to 75% ground cover.
Good: >75% ground cover.

[4] Actual curve number is less than 30; use CN = 30 for runoff computations.

[5] CN's shown were computed for areas with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture.

[6] *Poor:* Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning.
Fair: Woods are grazed but not burned, and some forest litter covers the soil.
Good: Woods are protected from grazing, and litter and brush adequately cover the soil.

FIGURE 5
TIME OF CONCENTRATION WORKSHEET

Project:	By:	Date:
Location:	Checked:	Date:

Check one: ☐ Present ☐ Developed

Check one: ☐ T_c ☐ T_t through subarea

Notes: Space for as many as two segments per flow type can be used for each worksheet. Include a map, schematic or description of flow segments.

Sheet flow (applicable to Tc only)

	Segment ID				
1. Surface description (table 3-1)					
2. Manning's roughness coefficient, n (table 3-1)					
3. Flow length, L (total L ≤ 150) ft					
4. Two-year 24-hour rainfall, P_2 in					
5. Land slop, s ft/ft					
6. $Tt = 0.007*(nL)^{0.8}/P_2^{0.5}s^{0.4}$ Compute Tt hr					=

Shallow concentratred flow

	Segment ID				
7. Surface description (paved or unpaved)					
8. Flow Length, L ft					
9. Watercourse slop, s ft/ft					
10. Average velocity, V (figure 3-1) ft/s					
11. Tt = L/3600*V Compute Tt hr					=

Channel flow

	Segment ID				
12. Cross sectional flow area, a ft^2					
13. Wetted perimeter, p_w ft					
14. Hydraulic radius, $r = a/p_w$ Compute r ft					
15. Channel slope, s ft/ft					
16. Manning's roughness coefficient, n					
17. $V = (1.49*r^{2/3}*s^{1/2})/n$ Compute V ft/s					
18. Flow length, L ft					
19. Tt = L/3600*V Compute Tt hr					=
20. Watershed or subarea T_c or T_t (add Tt in steps 6, 11, and 19)					

Table 3-1 (Manning's Roughness Coefficient, n)

Surface Description	n
Smooth Surfaces (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover ≤ 20%	0.06
Residue cover ≥ 20%	0.17
Grass:	
Short grass prairie	0.15
Dense grasses	0.24
Bermuda grass	0.41
Range (natural)	0.13
Woods	
Light underbrush	0.4
Dense underbrush	0.8

Minutes	
Sheet Flow	0 min.
Shallow Conc. Flow	0 min.
Channel Flow	0 min.
Total	0 min.

No Input required in shaded cells.

STRUCTURAL AND NON-STRUCTURAL BMPS

FIGURE 6

STRUCTURAL CONTROL BMPS

INFILTRATION TRENCH

INSPECTION ACTIVITIES	SUGGESTED FREQUENCY
■ Inspect after every major storm for the first twelve (12) months to ensure proper functioning. Drain times should be observed to confirm that designed drain times has been achieved.	Post Construction (0-12 Months)
■ Inspect facility for signs of wetness or damage to structures, signs of petroleum hydrocarbon contamination, standing water, trash and debris, sediment accumulation, slope stability, and material buildup. ■ Check for standing water or, if available, check observation wells following 3 days of dry weather to ensure proper drain time. ■ Inspect pretreatment devices, diversion structures, and upstream tributary area for damage, sediment buildup, and structural damage.	Semi-annual and after Extreme Rainfall Events
■ Trenches with filter fabric should be inspected for sediment deposits by removing a small section of the top layer. If inspection indicates that the trench is partially or completely clogged, it should be restored to its design condition.	Annual
MAINTENANCE ACTIVITIES	**SUGGESTED FREQUENCY**
■ Repair undercut and eroded areas at inflow and outflow structures. ■ Remove sediment, debris, and oil/grease from pretreatment devices and overflow structures.	Standard Maintenance, as needed
■ Remove trash, debris, grass clippings, trees, and other large vegetation from the trench perimeter and dispose of properly. ■ Mow and trim vegetation to prevent establishment of woody vegetation and for aesthetic and vector reasons.	Semi-Annual, more often as needed
■ Clean out sediment traps, forebays, inlet/outlet structures, overflow spillway, and trenches, if necessary. ■ Remove grass clippings, leaves, and accumulated sediment from the surface of the trench. Replace first layer of aggregate and filter fabric if clogging appears only to be at the surface. ■ Clean trench when loss of infiltrative capacity is observed. If drawdown time is observed to have increased significantly over the design drawdown time, removal of sediment may be necessary. This is an expensive maintenance activity and the need for it can be minimized through prevention of upstream erosion.	Annual
■ If bypass capability is available, it may be possible to regain the infiltration rate in the short term by providing an extended dry period. ■ Seed or sod to restore ground cover.	5 Year Maintenance
■ Total rehabilitation of the trench should be conducted to maintain storage capacity within 2/3 of the design treatment volume and 72-hour exfiltration rate limit. ■ Trench walls should be excavated to expose clean soil. ■ All of the stone aggregate and filter fabric or media must be removed. Accumulated sediment should be stripped from the trench bottom. At this point the bottom may be scarified or tilled to help induce infiltration. New fabric and clean stone aggregate should be	Upon Failure

FIGURE 6

TREATMENT CONTROL BMPS

INFILTRATION BASIN

INSPECTION ACTIVITIES	SUGGESTED FREQUENCY
■ Observe drain time for a storm after completion or modification of the facility to confirm that the desired drain time has been obtained. ■ Newly established vegetation should be inspected several times to determine if any landscape maintenance (reseeding, irrigation, etc.) is necessary.	Post Construction (0-12 Months)
■ Inspect for the following issues: differential accumulation of sediment, signs of wetness or damage to structures, erosion of the basin floor, dead or dying grass on the bottom, condition of rip-rap, drain time, signs of petroleum hydrocarbon contamination, standing water, trash and debris, sediment accumulation, slope stability, pretreatment device condition.	Semi-annual and after Extreme Events
MAINTENANCE ACTIVITIES	**SUGGESTED FREQUENCY**
■ Factors responsible for clogging should be repaired immediately. ■ Weed once monthly during the first two growing seasons.	Post Construction
■ Stabilize eroded banks. ■ Repair undercut and eroded areas at inflow and outflow structures. ■ Maintain access to the basin for regular maintenance activities. ■ Mow as appropriate for vegetative cover species. ■ Monitor health of vegetation and replace, as necessary. ■ Control mosquitos, as necessary. ■ Remove litter and debris from infiltration basin area, as required.	Standard Maintenance, as needed
■ Mow and remove grass clippings, litter, and debris. ■ Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons. ■ Replant eroded or barren spots to prevent erosion and accumulation of sediment.	Semi-annual
■ Scrape bottom and remove sediment when accumulated sediment reduces original infiltration rate by 25-50%. Restore original cross-section and infiltration rate. Properly dispose of sediment. ■ Seed or sod to restore ground cover. ■ Disc or otherwise aerate bottom. ■ Dethatch basin bottom.	3 to 5 Year Maintenance

FIGURE 6

TREATMENT CONTROL BMPS

WET POND

INSPECTION ACTIVITIES	SUGGESTED FREQUENCY
■ Inspect after several storm events to confirm that the drainage system functions, and bank stability and vegetation growth are sufficient.	Post Construction (0-12 Months)
■ Inspect for invasive vegetation, trash and debris, clogging of inlet/outlet structures, excessive erosion, sediment buildup in basin or outlet, cracking or settling of the dam, bank stability, tree growth on dam or embankment, vigor and density of the grass turf on the basin side slopes and floor, differential settlement, leakage, subsidence, damage to the emergency spillway, mechanical component condition, and graffiti.	Semi-annual, after Significant Storms, or More Frequent as Needed
■ Inspect condition of inlet and outlet structures, pipes, sediment forebays, basin, and upstream and downstream channel conditions. Monitor drain times, and check for algae growth, signs of pollution such as oil sheens, discolored water or unpleasant odors, and signs of flooding.	Annual
■ During inspections, note changes to the wet pond or the contributing watershed, as these may affect basin performance.	
MAINTENANCE ACTIVITIES	**SUGGESTED FREQUENCY**
■ Introduce mosquito fish, *Gamusi* spp., (where permitted by the Department of Fish and Game or other agency regulations) to enhance natural mosquito and midge control and regularly maintain emergent and shoreline vegetation to provide access for vector inspectors and facilitate vector control, if needed.	Post Construction
■ Perform vector control, if necessary. ■ Remove sediment from outlet structure. Dispose of properly. ■ Remove accumulated trash and debris in the basin, inlet/outlet structures, side slopes, and collections system, as required. ■ Repair undercut areas and erosion to banks and basin.	Semi-annual, after Significant Storm Events
■ Maintain protected vegetation buffer around pond. Mow side slopes and maintain vegetation in and around basin to prevent any erosion or aesthetic problems. Minimize use of fertilizers and pesticides. Reseed if necessary. ■ Manage and harvest wetland plants. ■ Structural repair or replacement, as needed.	Annual Maintenance, if needed
■ Remove sediment from the forebay and regrade when the accumulated sediment volume exceeds 10-20% of the forebay volume. Clean in early spring so vegetation damaged during cleaning has time to re-establish.	5 to 7 Year Maintenance
■ Remove sediment when the permanent pool volume has become reduced significantly (sediment accumulation exceeds 25% of design depth), resuspension is observed or the pond becomes eutrophic.	>5 Year Maintenance

FIGURE 6

TREATMENT CONTROL BMPS

CONSTRUCTED WETLAND

INSPECTION ACTIVITIES	SUGGESTED FREQUENCY
■ Inspect after several storm events for bank stability, vegetation growth, drainage system functioning, and structural damage.	Post Construction (0-12 Months)
■ Inspect for invasive vegetation, differential settlement, cracking; erosion, leakage or tree growth on the embankment; the condition of the rip-rap in the inlet, outlet, and pilot channels; sediment accumulation in the basin; clogging of the outlet; and the vigor and density of the vegetation on the basin side slopes and floor. Correct observed problems, as necessary.	Semi-annual
■ Inspect for damage to the embankment and inlet/outlet structures. Repair as necessary. ■ Note signs of hydrocarbon buildup, such as floating oil on the water surface. ■ Monitor for sediment accumulation in the facility and forebay. ■ Examine inlet and outlet devices to ensure they are free of debris and are operational.	Annual
MAINTENANCE ACTIVITIES	**SUGGESTED FREQUENCY**
■ Replace wetland vegetation to maintain at least 50% surface area coverage in wetland plants after the second growing season.	One-time
■ Repair undercut areas, erosion to banks and bottom, as required. ■ Where permitted by the Department of Fish and Game or other agency regulations, stock constructed wetlands regularly with mosquito fish (*Gambusia* spp.) to enhance natural mosquito and midge control.	As Needed Maintenance
■ Clean and remove debris from inlet and outlet structures. ■ Mow side slopes and remove grass clippings. ■ Remove little and debris from banks, basin bottom, trash racks, outlet structures, and valves, as required.	Frequent (3-4 Times/Year) Maintenance
■ Supplement wetland plants if a significant portion have not established (at least 50% of the surface area). ■ Remove nuisance plant species.	Annual Maintenance, if needed
■ Clean forebay to avoid accumulation in main wetland area to minimize when the main wetland area needs to be cleaned.	5 to 7 Year Maintenance
■ Harvest plant species if vegetation becomes too thick causing flow backup and flooding. More frequent plant harvesting may be required by local vector control agencies.	5 to 7 Year Maintenance (or more frequently as required)
■ Monitor sediment accumulations and remove sediment when the accumulated sediment volume exceeds 10-20% of the basin volume, plants are "choked" with sediment, or the wetland becomes eutrophic. It is suggested that the main area be cleaned one half at a time with at least one growing season in between cleanings. This will help to preserve the vegetation and enable the wetland to recover more quickly from the cleaning.	As Needed Maintenance (20 to 50 Years)

FIGURE 6

TREATMENT CONTROL BMPS

EXTENDED DETENTION BASIN

INSPECTION ACTIVITIES	SUGGESTED FREQUENCY
■ Inspect after several storm events for bank stability, vegetation growth, and to determine if the desired residence time has been achieved. ■ Inspect outlet structure for evidence of clogging or outflow release velocities that are greater than design flow.	Post Construction (0-12 Months)
■ Inspect for the following issues: differential settlement, cracking; erosion of pond banks or bottom, leakage or tree growth on the embankment; the condition of the rip-rap in the inlet, clogging of the outlet and pilot channels; standing water, slope stability, presence of burrows; sediment accumulation in the basin, forebay, and outlet structures; trash and debris, and the vigor and density of the grass turf on the basin side slopes and floor.	Semi-annual, after Significant Storms or more Frequent
■ Inspect for the following issues: subsidence, damage to the emergency spillway; inadequacy of the inlet/outlet channel erosion control measures; changes in the condition of the pilot channel, accumulated sediment volume, and semi-annual inspection items.	Annual
■ During inspections, changes to the extended storage pond or the contributing watershed should be noted, as these may affect basin performance.	Annual
MAINTENANCE ACTIVITIES	**SUGGESTED FREQUENCY**
■ If necessary, modify the outlet orifice to achieve design values if inspection indicates modifications. ■ Repair undercut or eroded areas. ■ Mow side slopes. ■ Manage pesticide and nutrients. ■ Remove litter and debris. ■ Control vectors, as necessary.	As Needed
■ Remove accumulated trash and debris from the basin, around the riser pipe, side slopes, embankment, emergency spillway, and outflow trash racks. The frequency of this activity may be altered to meet specific site conditions. ■ Trim vegetation at the beginning and end of the wet season to prevent establishment of woody vegetation and for aesthetic and vector reasons.	Semi-annual or More Frequent, as needed.
■ Seed or sod to restore dead or damaged ground cover. ■ Repair erosion to banks and bottom, as required.	Annual Maintenance (as Needed)
■ Supplement wetland plants if a significant portion have not been established (at least 50% of the surface area). ■ Remove nuisance plant species.	Annual Maintenance (if Needed)
■ Remove sediment from the forebay to reduce frequency of main basin cleaning.	3 to 5 Year Maintenance
■ Monitor sediment accumulation and remove accumulated sediment and regrade about every 10 years or when the accumulated sediment volume exceeds 10-20% of the basin volume or when accumulation reaches 6 inches or if resuspension is observed. Clean in early spring so vegetation damaged during cleaning has time to re-establish.	Every 10 to 25 Years

FIGURE 6

TREATMENT CONTROL BMPS

VEGETATED SWALE

INSPECTION ACTIVITIES	SUGGESTED FREQUENCY
■ Inspect after seeding and after first major storms for any damages.	Post Construction (0-12 Months)
■ Inspect for signs of erosion, damage to vegetation, channelization of flow, debris and litter, and areas of sediment accumulation. Perform inspections at the beginning and end of the wet season. Additional inspections after periods of heavy runoff are desirable.	Semi-annual
■ Inspect level spreader for clogging, grass along side slopes for erosion and formation of fills or gullies, and sand/soil bed for erosion problems.	Annual
MAINTENANCE ACTIVITIES	**SUGGESTED FREQUENCY**
■ Mow grass to maintain a height of 3 to 4 inches, for safety, aesthetic or other purposes. Litter should always be removed prior to mowing. Clippings should be composted. ■ Irrigate swale during dry season (April through October) or when necessary to maintain the vegetation. ■ Provide weed control, if necessary, to control invasive species.	As Needed (Frequent, Seasonally)
■ Remove litter, branches, rock blockages, and other debris, and dispose of properly. ■ Maintain inlet flow spreader, if applicable. ■ Repair any damaged areas within a channel identified during inspections. Erosion rills or gullies should be corrected, as needed. Bare areas should be replanted, as necessary.	Semi-annual
■ Declog the pea gravel diaphragm, if necessary. ■ Correct erosion problems in the sand/soil bed of dry swales. ■ Plant an alternative grass species, if the original grass cover has not been successfully established. Reseed and apply mulch to damaged areas.	Annual (as Needed)
■ Remove all accumulated sediment that may obstruct flow through the swale. Sediment accumulating near culverts and in channels should be removed when it builds up to 3 inches at any spot or covers vegetation or once it has accumulated to 10% of the original design volume. Replace the grass areas damaged in the process. ■ Rototill or cultivate the surface of the sand/soil bed of dry swales if the swale does not draw down within 48 hours.	As Needed (Infrequent)

FIGURE 6

TREATMENT CONTROL BMPS

VEGETATED BUFFER STRIP

INSPECTION ACTIVITIES	SUGGESTED FREQUENCY
■ Once the vegetated buffer strip is established, inspect at least three times per year. ■ Inspect buffer strips after seeding and repair as needed.	Post Construction (0-12 Months)
■ Inspect buffer strip and repair all damage immediately. ■ Inspect soil and repair eroded areas.	After Major Storms
■ Inspect for erosion or damage to vegetation, preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to be sure the strips are ready for winter. However, additional inspection after periods of heavy runoff is desirable. ■ Inspect pea-gravel diaphragm/level spreader for clogging and effectiveness and remove built-up sediment. ■ Inspect for rolls and gullies. Immediately fill with topsoil, install erosion control blanket and seed or sod. ■ Inspect to ensure grass is well established. If not, either prepare soil and reseed or replace with alternative species. Install erosion control blanket. ■ Check for debris and litter, and areas of sediment accumulation.	Semi-annual
MAINTENANCE ACTIVITIES	**SUGGESTED FREQUENCY**
■ Water plants daily for 2 weeks after construction.	Post Construction
■ Mow regularly to maintain vegetation height between 2 - 4 inches, and to promote thick, dense vegetative growth. Cut only when soil is dry to prevent tracking damage to vegetation, soil compaction and flow concentrations. Clippings are to be removed immediately after mowing. ■ Remove all litter, branches, rock, or other debris. Damaged areas of the filter strip should be repaired immediately by reseeding and applying mulch. ■ Regularly maintain inlet flow spreader. ■ Irrigate during dry season (April through October) when necessary to maintain the vegetation.	Frequently, as needed
■ Remulch void areas. ■ Treat diseased trees and shrubs, remove dead vegetation	Semi-annual
■ Remove sediment and replant in areas of buildup. Sediment accumulating near culverts and in channels should be removed when it builds up to 3 inches at any spot or covers vegetation or once it has accumulated to 10% of the original design volume. Replace the grass areas damaged in the process. ■ Limit fertilizer applications based on plant vigor and soil test results. ■ Rework or replant buffer strip if concentrated flow erodes a channel through the strip.	Annual

FIGURE 6

TREATMENT CONTROL BMPS

BIORETENTION

INSPECTION ACTIVITIES	SUGGESTED FREQUENCY
■ Inspect soil and repair eroded areas.	Monthly
■ Inspect for erosion or damage to vegetation, preferably at the end of the wet season to schedule summer maintenance and before major fall runoff to sure the strips are ready for winter. However, additional inspection after periods of heavy runoff is desirable. ■ Inspect to ensure grass is well established. If not, either prepare soil and reseed or replace with alternative species. Install erosion control blanket. ■ Check for debris and litter, and areas of sediment accumulation. ■ Inspect health of trees and shrubs.	Semi-annual
MAINTENANCE ACTIVITIES	**SUGGESTED FREQUENCY**
■ Water plants daily for 2 weeks	Post Construction
■ Remove litter and debris	Monthly
■ Remove sediment. ■ Remulch void areas. ■ Treat diseased trees and shrubs. ■ Mow turf areas. ■ Repair outflow structures. ■ Unclog underdrain. ■ Regulate soil pH regulation.	As needed
■ Remove and replace dead and diseased vegetation.	Semi-annual
■ Add mulch. ■ Replace tree stakes and wires.	Annual
■ Mulch should be replaced every 2 to 3 years or when bare spots appear. Remulch prior to the wet season.	Every 2 to 3 years, or as needed

FIGURE 6

TREATMENT CONTROL BMPS

PERVIOUS PAVEMENT WITH INFILTRATION TRENCH

INSPECTION ACTIVITIES	SUGGESTED FREQUENCY
■ Inspect after every major storm for the first twelve (12) months to ensure proper functioning. Drain times should be observed to confirm that designed drain times has been achieved.	Post Construction (0-12 Months)
■ Inspect facility for signs of wetness or damage to structures, signs of petroleum hydrocarbon contamination, standing water, trash and debris, sediment accumulation, slope stability, and material buildup. ■ Check for standing water or, if available, check observation wells following 3 days of dry weather to ensure proper drain time. ■ Inspect pretreatment devices, diversion structures, and upstream tributary area for damage, sediment buildup, and structural damage.	Semi-annual and after Extreme Rainfall Events
■ Trenches with filter fabric should be inspected for sediment deposits by removing a small section of the top layer. If inspection indicates that the trench is partially or completely clogged, it should be restored to its design condition.	Annual
MAINTENANCE ACTIVITIES	**SUGGESTED FREQUENCY**
■ Repair undercut and eroded areas at inflow and outflow structures. ■ Remove sediment, debris, and oil/grease from pretreatment devices and overflow structures.	Standard Maintenance, as needed
■ Remove trash, debris, grass clippings, trees, and other large vegetation from the trench perimeter and dispose of properly. ■ Mow and trim vegetation to prevent establishment of woody vegetation and for aesthetic and vector reasons. ■ Vacuum pavement with a commercial cleaning unit	Semi-Annual, more often as needed
■ Clean out sediment traps, forebays, inlet/outlet structures, overflow spillway, and trenches, if necessary. ■ Remove grass clippings, leaves, and accumulated sediment from the surface of the trench. Replace first layer of aggregate and filter fabric if clogging appears only to be at the surface. ■ Clean trench when loss of infiltrative capacity is observed. If drawdown time is observed to have increased significantly over the design drawdown time, removal of sediment may be necessary. This is an expensive maintenance activity and the need for it can be minimized through prevention of upstream erosion.	Annual
■ If bypass capability is available, it may be possible to regain the infiltration rate in the short term by providing an extended dry period. ■ Seed or sod to restore ground cover.	5 Year Maintenance
■ Total rehabilitation of the trench should be conducted to maintain storage capacity within 2/3 of the design treatment volume and 72-hour exfiltration rate limit. ■ Trench walls should be excavated to expose clean soil. ■ All of the stone aggregate and filter fabric or media must be removed. Accumulated sediment should be stripped from the trench bottom. At this point the bottom may be scarified or tilled to help induce infiltration. New fabric and clean stone aggregate should be refilled.	Upon Failure

FIGURE 6

TREATMENT CONTROL BMPS

WATER QUALITY INLET

INSPECTION ACTIVITIES	SUGGESTED FREQUENCY
■ Inspect after every storm event to determine if maintenance is required.	Monthly during the wet season, or after significant rain events
MAINTENANCE ACTIVITIES	**SUGGESTED FREQUENCY**
■ Clean out and dispose of accumulated oil, grease, and sediments. Remove accumulated trash and debris. The clean out and disposal techniques should be environmentally acceptable and in accordance with local regulations.	Annual, before the wet season, or more frequent as needed

FIGURE 7

NON STRUCTURAL BMPs

PROTECT/CONSERVE/ENHANCE RIPARIAN AREAS

DESCRIPTION	
■	The objective of this BMP is to protect, maintain, and enhance the existing riparian forest buffers on the project area site.
GUIDELINES	
■	The Riparian Buffer Protection areas shall include a minimum width of 25 feet from each stream bank for Zone 1.
■	The Riparian Buffer Protection areas shall include a minimum width of 75 feet from each stream bank for Zone 2.
■	The Riparian Buffer Protection areas shall not be disturbed during project construction (i.e. cleared or graded) except temporary impacts associated with mitigation and afforestation efforts.
■	Areas disturbed for stream crossings are not considered to receive credit.
■	The Riparian Buffer Protection Areas shall be located within an acceptable land preservation/protection agreement that ensures protection of the Riparian Buffer Area.
■	Managed turf is not considered an acceptable form of vegetation management within Zone 1 or Zone 2.
■	Zone 1 shall not be subject to point discharges for the entire length of Zone 1. Zone 2 shall not be subject to point discharges unless the use of a level spreader or similar device is implemented.
■	The Riparian Buffer Protection area shall be located on the development project.
■	A landscaped plan and planting schedule shall be provided with the design plans in the event that the Riparian Buffer is damaged or encroached upon.
MAINTENANCE	
■	The Riparian Buffer Protection area shall not be disturbed or encroached upon.
CREDITS	
■	Water Quality Volume Reduction (cf) = Riparian Buffer Area (sf) x 1/2" / 12
ENFORCEMENT	
■	A land preservation/protection agreement and easement that ensures protection of the Riparian Buffer Area shall be established where the Riparian Buffer Area is maintained in accordance with the design plans. The Riparian Buffer Area shall not be disturbed or damaged. The owner shall keep photo and written documentation of the riparian buffer once a year and submit it to the Township to ensure that the Riparian Buffer Area is being maintained.

FIGURE 7

NON STRUCTURAL BMPs

PROTECT/UTILIZE NATURAL FLOW PATHWAYS IN OVERALL STORMWATER PLANNING AND DESIGN

DESCRIPTION	
■	The objective of this BMP is to identify, protect, and utilize the site's natural drainage features as part of the stormwater management system.
GUIDELINES	
■	The natural drainage area features shall include natural swales and drainage pathways that existed prior to development and that will receive runoff from developed areas.
■	The natural drainage area features may use check dams, low berms, native vegetation, and limited grading to improve natural drainage features.
■	The natural drainage area features shall be designed to receive runoff such that flows after development are non erosive.
■	The natural drainage area features shall be protected from compaction or disturbance during construction by having the limits of disturbance clearly shown on all construction drawings and delineated in the field.
■	The natural drainage features shall be noted on the stormwater management plans as part of the stormwater management system and be included in any Township easement requirements. These areas shall be noted on parcel deeds and protected from future encroachment or disturbance by deed restrictions.
■	The natural drainage areas shall not include perennial streams.
■	The natural drainage areas shall not include constructed vegetated swales and vegetated filter strips.
MAINTENANCE	
■	The natural drainage areas should be inspected periodically during the year to assess the drainage way erosion, bank stability, sediment/debris accumulation, and vegetative conditions. In the event that there is erosion, bank instability, sediment/debris accumulation, and/or reduced vegetation, the corrective actions shall be taken to fix the natural drainage area.
CREDITS	
■	Water Quality Volume Reduction (cf) = vegetated area of natural drainage feature x 1/4"/12
ENFORCEMENT	
■	The natural drainage features shall be included in an easement. These areas shall be noted on parcel deeds and protected from future encroachment or disturbance by deed restrictions.The project owner shall inspect the natural drainage areas two times per year and after any major storm events. The owner shall inspect the natural drainage area by writing the condition of the drainage area down and taking photographs during each inspection. These inspections shall be submitted to the Township.

NON STRUCTURAL BMPs

MINIMIZE SOIL COMPACTION IN DISTURBED AREAS

DESCRIPTION	
■	The objective of this BMP is to minimize soil compaction of the proposed project site and ensure topsoil quality can reduce the volume of runoff by maintaining soil functions by increasing infiltration and evapotranspiration.
GUIDELINES	
■	The minimal soil compaction area shall not be stripped of existing topsoil.
■	The area shall not be subject to excessive equipment movement. Vehicular movement and material storage shall be strictly prohibited in these areas.
■	The area shall be protected by having the limits of disturbance and access clearly shown on the stormwater management plans and construction drawings. The limit of disturbance shall be delineated in the field.
■	The use of soil amendment and additional topsoil is permitted. Grading over these areas may be done with a tracked vehicle that prevents compaction.
■	Lawn and turf grass are acceptable uses. Planted Meadow is an encouraged use.
MAINTENANCE	
■	The vegetation planted on the minimal soil compaction areas shall be maintained. Lawn mowers and heavy equipment shall not be placed on these areas to prevent soil compaction. Planting low maintenance native vegetation is the easiest and best way to prevent damage due to maintenance.
CREDITS	
■	Lawns - Water Quality Volume Reduction (cf) = area of min. soil compaction x 1/4"/12
■	Meadow - Water Quality Volume Reduction (cf) = area of min. soil compaction x 1/3"/12
ENFORCEMENT	
■	Minimal soil compaction area shall be restricted from future development through easements and deed restrictions. Additional BMPs shall be provided if development shall occur. The owner shall inspect the minimal soil compaction areas and maintain the existing vegetation.

FIGURE 7

NON STRUCTURAL BMPs

RE-VEGETATE AND RE-FOREST DISTURBED AREA USING NATIVE SPECIES

DESCRIPTION	
■	The objective of this BMP is to select and use vegetation that does not require significant chemical maintenance by fertilizers, herbicides, and pesticides in disturbed areas.
GUIDELINES	
■	Trees must be native species, minimum 2" caliper. Minimum tree height of 6 feet.
■	Trees shall be adequately protected during construction.
■	Trees credited for stormwater management shall be clearly labeled on the construction drawings and recorded on Record Plan for Project.
■	Trees shall be maintained and protected for the life of the project (50 years) or until redevelopment occurs.
■	No more than 25% of the runoff volume can be mitigated through the use of trees.
■	Escrow shall be provided for the replacement of any protected trees used for stormwater credit that die within 5 years of construction. Dead trees shall be replaced within 6 months.
■	Non native trees are not to be used in these areas.
MAINTENANCE	
■	The woodland area maintenance shall be mowed properly to control invasive species from growing into the area. Herbicides and protective tree tubes may be necessary to control invasive species from damaging the woodland area. The initial maintenance can be expected for the first 5 years of growth.
CREDITS	
■	Water Quality Volume Reduction (cf) = existing tree canopy x 1/2"/12
ENFORCEMENT	
■	Tree areas to be credited shall be contained within easements and recorded with the deed. An escrow shall be provided for the replacement of any protected trees that die within 5 years of construction. The owner shall inspect the tree canopy area (proposed and existing) and take photo documentation. These inspections shall be provided to the Township.

FIGURE 7

NON STRUCTURAL BMPs

ROOFTOP DISCONNECTION

DESCRIPTION	
■	The objective of this BMP is to minimize stormwater runoff volume entering into streams and swales by disconnecting roof leaders and directing rooftop runoff to vegetated areas to infiltrate.
GUIDELINES	
■	Roof leaders are to be directed to a pervious area where runoff can either infiltrate into the soil or filter over it
■	Additional topsoil and soil amendment are permitted.
■	The Rooftop Disconnection Area shall be noted on stormwater management plans as part of stormwater management system and included in any municipal easement requirements for stormwater systems.
■	Rooftop cannot be within a designated hotspot.
■	Disconnection shall not cause basement seepage.
■	The contributing rooftop area to each disconnection point shall be 500 sf or less.
■	Disconnections will only be credited for lot sizes greater than 6,000 square feet.
■	The vegetated disconnection area shall have a maximum slope of 5%.
■	The disconnection must drain continuously through a vegetated swale or filter strip to the property line or property BMP.
■	Roof downspouts shall be at least 10 feet away from the nearest impervious surface.
MAINTENANCE	
■	The proposed designated areas where stormwater is being discharged shall be maintained. Rooftop leaders shall be inspected periodically. When debris and materials are discovered within the rooftop leaders, the rooftop leaders shall be cleaned out.
CREDITS	
■	Water Quality Volume Reduction (cf) = contributing rooftop area x 1/4"/12
ENFORCEMENT	
■	The owner of the property shall provide pictures and written documentation to the Township that the rooftop leaders were disconnected and directed to a vegetated area after construction is completed.

FIGURE 7

NON STRUCTURAL BMPs

STORM SEWER DISCONNECTION

DESCRIPTION	
■	The objective of this BMP is to minimize stormwater runoff by disconnecting impervious roads and driveways and directing the stormwater runoff to grassed swales or bioretention areas to infiltrate.
GUIDELINES	
■	Runoff from non rooftop impervious cover shall be directed to pervious areas where it is infiltrated into the soil.
■	Runoff can be discharged into vegetated swales, bioretention areas, and other approved structural bmps that are accepted by the Township.
■	Vegetated swales may include check dams, low berms, native vegetation, and limited grading to improve natural drainage features.
■	Vegetated swales shall be designed so that flows do not create erosion after development.
■	Vegetated swales and bmps shall be noted on the stormwater management plans as part of the stormwater management system and include any municipal easement requirements.
■	The maximum contributing impervious flow path length shall be 75 feet.
■	The disconnection shall drain continuously through a vegetated swale or filter strip, or planted area to the property line or BMP.
■	The length of the disconnection area must be at least the length of the contributing area.
■	The entire vegetated disconnection area shall have a maximum slope of 5%.
■	The contributing impervious area to any one discharge point shall not exceed 1,000 sf.
■	If the site cannot meet the required disconnect length, a level-spreading device, recharge garden, infiltration trench, etc. may be needed for compensation.
MAINTENANCE	
■	The proposed designated areas where stormwater is being discharged shall be maintained. Swales an bioretention areas shall be periodically inspected for erosion and healthy vegetated growth.
CREDITS	
■	Water Quality Volume Reduction (cubic feet) = contributing impervious area x 1/4"/12
ENFORCEMENT	
■	The owner of the property or developer shall provide pictures and written documentation to the Township that the proposed storm sewer systems were disconnected from the storm sewer after construction is completed.

AGREEMENTS

FIGURE 8

Prepared By
Name: _____
Company: _____
Address: _____
Address: _____
Phone: _____

Return To
Company: _____
Address: _____
Address: _____
Phone: _____

Parcel ID _____

STORMWATER MANAGEMENT AGREEMENT
AND DECLARATION OF EASEMENT

THIS AGREEMENT AND DECLARATION OF EASEMENT made as of the _____ day of _____, 20____, by and between _____ _____ with a mailing address of _____ _____ (hereinafter whether singular or plural referred to as the "Grantor"), and the Township of Manheim, Lancaster County, Pennsylvania, a first class township duly organized under the laws of the Commonwealth of Pennsylvania, with its municipal offices located at 1840 Municipal Drive, Lancaster, Pennsylvania (hereinafter referred to as the "Township").

BACKGROUND.

Grantor is the legal and/or beneficial owner of premises located at _____ _____, in Manheim Township, Lancaster County, Pennsylvania, as more specifically described in a deed recorded in Deed or Record Book _____, Volume _____, Page _____, or at Document No. _____ in the Office of the Recorder of Deeds in and for Lancaster County, Pennsylvania, and as shown on the plan for _____, prepared by _____, Drawing or Project No _____ dated _____, 20____, last revised _____, 20____, (hereinafter referred to as the "Premises").

Prior to the commencement of any development, Grantor is required under the Stormwater Management Ordinance of Manheim Township (the "Ordinance") to submit a stormwater management plan to the Township for approval. The Ordinance requires that the Grantor's plan reflect and/or be accompanied with supporting documentation which identifies the ownership of, and the method of administering and maintaining, all permanent stormwater management facilities. Drainage courses, swales, grassed waterways, open inlets, stormwater inlets, pipes, manholes, conduits, detention basins, retention basins, infiltration structures, and other stormwater management facilities, including Best Management Practices facilities ("BMPs") shall be included under the term "stormwater management facilities" in this Agreement and Declaration of Easement.

The purpose of this Agreement and Declaration of Easement is to describe the ownership and maintenance responsibilities for the stormwater management facilities which will be installed on the Premises and to impose the ownership and maintenance responsibilities upon Grantor, its successors and assigns, and upon successor owners of the Premises, and to set forth the rights of the Township.

NOW, THEREFORE, intending to be legally bound hereby and in consideration of receiving approval of its Stormwater Management Plan (hereinafter referred to as the "Plan") from the Board of Commissioners of Manheim Township, and in consideration of receiving permits from Manheim Township to develop the Premises, Grantor, for Grantor and the assigns and successors of Grantor, covenants and declares as follows:

1. Stormwater management facilities not dedicated to and accepted by the Township will be owned by Grantor, its successors and assigns.

2. All stormwater management facilities, shall be installed, constructed and maintained by Grantor, its successors and assigns, in a first-class condition in conformance with the Plan and the Operation and Maintenance Plan (O & M Plan), and in a manner sufficient to meet or exceed the design standards and specifications set forth on the Plan including any accompanying stormwater information and reports and the minimum design and maintenance standards and requirements for BMPs set forth in the Ordinance.

3. Grantor, for itself, its successors and assigns, agrees that failure to maintain all stormwater management facilities in a first-class condition in conformance with this

Agreement and the Plan or the failure to repair any sinkholes, cavities, cracks or holes in any storm drainage pipes, and similar conditions which may develop within or adjacent to any stormwater management facilities or drainage easements or the failure to repair any sinkholes or cavities which may be caused by the improper maintenance of stormwater management facilities or BMPs shall constitute a nuisance and shall be abatable by the Township as such.

4. Grantor, for itself, its successors and assigns, authorizes the Township, at any time and from time to time, by its authorized representatives, to enter upon the Premises to inspect the stormwater management facilities.

5. Manheim Township may require that Grantor, its successors or assigns, or any future owner or occupier of the Premises, or any part thereof, take such corrective measures as the Township may deem reasonably necessary to bring the Premises into compliance with this Agreement and with the Plan.

6. Upon the failure of the owner or occupier of the Premises to comply with the terms of this Stormwater Management Agreement or to take corrective measures following thirty (30) days' written notice from the Township, the Township, through its authorized representatives, may take such corrective measures as it deems reasonably necessary to bring the Premises into compliance with this Agreement and with the Plan, including, but not limited to, the removal of any blockage or obstruction from drainage pipes, swales, detention basins, and BMPs, and/or the repair of any sinkholes, cavities, cracks or holes in any storm drainage pipes, and similar conditions which may develop within or adjacent to any stormwater management facilities or drainage easements and/or the repair of any sinkholes or cavities which may be caused by the improper maintenance of stormwater management facilities or BMPs and may charge the cost thereof to Grantor, its successors or assigns, or any owner of the Premises or part thereof and, in default of such payment, may cause a municipal lien to be imposed upon the Premises or any part thereof. Any municipal lien filed pursuant to this Agreement shall be in the amount of all costs incurred by the Township, plus a penalty of ten (10%) of such costs, plus the Township's reasonable attorney's fees.

7. If ownership or maintenance responsibility of the stormwater management facilities is assigned to a homeowners' association, condominium unit owners'

association, or similar entity, the Township shall be notified. In the event such an association or entity has already been formed, the association or entity shall consent to and join in this Agreement. If such association or entity fails to properly maintain the stormwater management facilities, the Township shall have the same rights granted to municipalities with reference to maintenance of common open space under Section 705 of the Pennsylvania Municipalities Planning Code, Act of July 31,1968, P.L.805, No. 247, or any future amendment thereof, to maintain the stormwater management facilities. Any association or entity hereinafter formed shall enter into an agreement with the Township recognizing its duties and the Township's rights under this Agreement.

8. Grantor hereby imposes upon the Premises for the benefit of all present and future owners of the Premises or any part of the Premises, the Township and all other property owners affected by the stormwater management facilities, the perpetual nonexclusive right, privilege and easement for the draining of stormwater in and through the drainage courses, swales, stormwater inlets, pipes, conduits, detention basins, BMPs, and other stormwater management facilities depicted on the plan or plans submitted to the Township or hereafter made of record and now or hereafter installed on or constructed upon the Premises and, in addition, easements of access to the stormwater management facilities.

9. Grantor shall include a specific reference to this Stormwater Management Agreement and Declaration of Easement and the requirement to implement BMPs and maintain BMP facilities in accordance with the minimum design standards and requirements for BMPs set forth in the Ordinance in any deed of conveyance for the Premises or any part thereof. Failure to do so does not relieve the owner whether past, present or future of fulfilling the requirements of this Stormwater Management Agreement and Declaration of Easement.

10. Grantor shall prepare and attach to this agreement a summary table (Attachment 1 – A sample summary table has been provided at the end of this document) of all BMPs. The table shall include the BMP ID, drainage area to the BMP, name of the receiving water body, the BMP's inspection/maintenance frequency, name of responsible person or organization at the time of stormwater plan approval, and the addresses or lot numbers where the BMP is located.

11. The Stormwater Management Facilities have been designed to allow a maximum impervious surface coverage as set forth in Attachment 2 attached hereto and incorporated herein. If the owner of the Premises or any lot to be created from the Premises desires to install additional impervious surface coverage beyond that allocated to Premises or any lot created from the Premises in Attachment 2, such owner must submit an application under the Stormwater Management Ordinance in effect at such time as the application is filed and meet all applicable stormwater management regulations.

12. Grantor agrees to indemnify the Township and all of its elected and appointed officials, agents and employees (hereinafter collectively referred to as the "Indemnities") against and hold Indemnities harmless from any and all liability, loss or damage, including attorneys' fees and costs of investigation and defense, as a result of claims, demands, costs or judgments against Indemnities which arise as a result of the design, installation, construction or maintenance of the stormwater management facilities.

13. The Township may, in addition to the remedies prescribed herein, proceed with any action at law or in equity to bring about compliance with the Stormwater Management Ordinance of Manheim Township and this Agreement.

14. Grantor's personal liability under this Agreement shall cease at such time as (a) all stormwater management facilities have been constructed in accordance with the specifications of the Manheim Township Subdivision and Land Development Ordinance, the Stormwater Management Ordinance of Manheim Township and the approved plans; (b) the stormwater management facilities have been inspected and approved by the Township Engineer; (c) all financial security, including any maintenance security, posted by Grantor has been released by the Township; and (d) Grantor has transferred all lots to be created from the Premises to third parties. Notwithstanding the foregoing, Grantor's personal liability shall continue for any violations of this Agreement and Declaration of Easement which occurred during the time that Grantor owned the Premises or any lot created from the Premises or in the event the stormwater management facilities were not completed, inspected or approved as set forth in (a) through (c) herein.

15. Grantor shall, upon completion of installation of the stormwater management facilities, deposit financial security with the Township to secure the

structural integrity of the stormwater management facilities as well as the functioning of the stormwater management facilities in accordance with the design and specifications of the approved plans and any modifications required by the Township. The financial security shall be in the amount of fifteen (15%) percent of the actual cost of installation of the storm water management facilities and shall have a term of not less than eighteen (18) months.

16. Grantor has prepared an O & M Plan covering all of the BMPs summarized in Attachment 1. This O & M Plan as reviewed and approved by Manheim Township and is attached hereto as Attachment 3. The O&M Plan shall be available to the Grantor and all subsequent owners for their use in learning how to operate and maintain their BMPs.

17. Grantor, his personal representatives, heirs, successors and assigns, shall be responsible for maintaining records of all inspections of and maintenance to BMPs and other stormwater management facilities. Grantor, his personal representatives, heirs, successors and assigns, shall be responsible to prepare all annual BMP and post construction stormwater management facility reports detailing the actual inspection and maintenance activities which are required by the terms of any NPDES permit or other state or federal regulation or requirement performed in the prior calendar year and submit such reports to the Township on or before March 31 of each calendar year, together with any fee which the Township may impose for the review and processing of such report. It is the responsibility of Grantor to inform successor owners of the Premises or any lot created from the Premises of this reporting requirement. The failure to submit an annual report is a violation of this Agreement. The Township may prepare any required report and recover all costs required to prepare such report from the then-owner of the Premises or any lot created from the Premises, plus a penalty of ten (10%) percent of such costs and may file a municipal claim to secure payment of such costs.

18. It is the intent of the parties to this Agreement that personal liability and maintenance obligations shall pass to subsequent title owners upon change in ownership of the Premises or any lot created from the Premises, and such subsequent owners shall assume all personal liability and maintenance obligations for the time period during which they hold title. Personal liability shall remain for any violations of this Agreement

and Declaration of Easement which occurred during the period in which an owner held title.

19. This Agreement and Declaration of Easement shall be binding upon Grantor, the successors and assigns of Grantor, and all present and future owners of the Premises, or any part thereof, and is intended to be recorded in order to give notice to future owners of the Premises, or any part thereof, of their duties and responsibilities with respect to the stormwater management facilities.

20. This Agreement and Declaration of Easement may be amended only by written instrument signed on behalf of all owners of the Premises and the Township.

21. When the sense so requires, words of any gender used in this Stormwater Management Agreement and Declaration of Easement shall be held to include any other gender, and words in the singular number shall be held to include the plural, and vice versa.

IN WITNESS WHEREOF, the undersigned have caused this Agreement and Declaration to be executed on the day and year first above written.

MANHEIM TOWNSHIP
Lancaster County, Pennsylvania

Attest: _____ By: _____

(Assistant) Secretary (Vice) President
Board of Commissioners

[TOWNSHIP SEAL]

(Individual or Husband and Wife Landowner*)

Witnesses:

_____ _____

(Signature of Individual)

Print Name: _____

_____ _____

(Signature of Spouse)

Print Name: _____

*If individual is married, both spouses must sign regardless of whether property is titled in the name of one spouse or both spouses.

(Partnership Landowner)**

_____
(Name of Partnership)

Witnesses:

_____ _____
(Signature of Partner)
Print Name: _____

_____ _____
(Signature of Partner)
Print Name: _____

_____ _____
(Signature of Partner)
Print Name: _____

**All partners must execute this Agreement. Additional signature lines should be attached if necessary.

(Corporation Landowner)

_____
(Name of Corporation)

ATTEST:

By: _____ By: _____
(Assistant) Secretary (Vice) President

[CORPORATE SEAL]

(Limited Liability Company Landowner*)**

_____
(Name of Limited Liability Company)

Witnesses:

_____ _____
(Signature of Member)
Print Name: _____

_____ _____
(Signature of Member)
Print Name: _____

_____ _____
(Signature of Member)
Print Name: _____

***All members must sign.

(TOWNSHIP ACKNOWLEDGMENT)

COMMONWEALTH OF PENNSYLVANIA :
: SS:
COUNTY OF LANCASTER :

On this _____ day of _____, 20___, before me, the undersigned Officer, a Notary Public in and for the aforesaid Commonwealth and County, personally appeared _____, who acknowledged himself / herself to be (Vice) President of the Board of Commissioners of the Township of Manheim, Lancaster County, Pennsylvania, and that he / she, as such officer, being authorized to do so, executed the foregoing Stormwater Management Agreement and Declaration of Easement for the purposes therein contained by signing the name of such Township by himself / herself as such officer.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

_____
Notary Public

(SEAL)

My Commission Expires:

(INDIVIDUAL OR HUSBAND AND WIFE ACKNOWLEDGMENT)

COMMONWEALTH OF PENNSYLVANIA :
: SS:
COUNTY OF LANCASTER :

On this _____ day of _____, 20___, before me, the subscriber, a Notary Public in and for the aforesaid Commonwealth and County, came the above named _____, known to me (or satisfactorily proven) to be the person (s) whose name (s) is / are subscribed on the within instrument, and acknowledged the foregoing Stormwater Management Agreement and Declaration of Easement to be his / her / their act and deed and desired the same to be recorded as such.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

_____
Notary Public

(SEAL)

My Commission Expires:

(PARTNERSHIP LANDOWNER ACKNOWLEDGMENT)

COMMONWEALTH OF PENNSYLVANIA :
: SS:
COUNTY OF LANCASTER :

On this _____ day of _____, 20___, before me, a Notary Public, the undersigned officer, personally appeared

_____

_____

, who acknowledged themselves to be all of the partners of _____, a general partnership, and that they, as such partners, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of the partnership by themselves as such partners.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

_____
Notary Public

(SEAL)

My Commission Expires:

(CORPORATE LANDOWNER ACKNOWLEDGMENT)

COMMONWEALTH OF PENNSYLVANIA :
: SS:
COUNTY OF LANCASTER :

On this _____ day of _____, 20___, before me, a Notary Public, the undersigned officer, personally appeared _____, who acknowledged himself / herself to be the _____ of _____, a corporation, and that as such officer, being authorized to do so, acknowledged the foregoing instrument for the purpose therein contained by signing the name of the corporation by himself / herself as _____.

(title of officer)

(name of corporation)

(title of officer)

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

_____
Notary Public

(SEAL)

My Commission Expires:

(LIMITED LIABILITY COMPANY LANDOWNER ACKNOWLEDGMENT)

COMMONWEALTH OF PENNSYLVANIA :
: SS:
COUNTY OF LANCASTER :

On this _____ day of _____, 20___, before me, a Notary Public, the undersigned officer, personally appeared

_____

_____, who acknowledged themselves to be all of the members of _____, a _____ limited liability company, and that they as such members, being authorized to do so, executed the foregoing instrument for the purposes therein contained by signing the name of said limited liability company by themselves as such members.

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

_____
Notary Public

(SEAL)

My Commission Expires:

JOINDER BY MORTGAGEE

_____ ("Mortgagee") as holder of a certain mortgage on the within-described Premises, which mortgage, in the amount $ _____, is dated _____, _____, and is recorded or is about to be recorded in the Recorder of Deeds Office in and for Lancaster County, Pennsylvania, as well as any other mortgages which Mortgagee may now or hereafter hold on the Premises (all such mortgages hereinafter collectively referred to as the "Mortgages"), joins in, consents to, and expressly approves the grant of easements and other rights and privileges described in the attached Stormwater Management Agreement and Declaration of Easement (the "Agreement").

The Mortgagee, for itself, its successors and assigns (which shall include any assignee of the Mortgages and any purchaser of the Premises at a sale in foreclosure of the Mortgages or otherwise), hereby covenants and agrees that the rights and privileges herein granted with respect to the Premises shall not be terminated or disturbed by reason of any foreclosure or other action which may be instituted by the Mortgagee, its successors and assigns, as a result of any default under the Mortgages or the debt of instruments that such Mortgages secure. Mortgagee by consenting to the Agreement shall not by virtue of its interest as Mortgagee be deemed to have undertaken any of the obligations of the Grantor under the Agreement, including but not limited to construction, maintenance, inspection or indemnification.

IN WITNESS WHEREOF, Mortgagee hereby joins in the execution of the Agreement as of this _____ day of _____, 20____.

_____
(Name of Mortgagee)

ATTEST:

By: _____ By: _____
(Assistant) Secretary (Vice) President

[SEAL]

(MORTGAGEE ACKNOWLEDGMENT)

COMMONWEALTH OF PENNSYLVANIA :
: SS:
COUNTY OF LANCASTER :

On this _____ day of _____, 20___, before me, a Notary Public, the undersigned officer, personally appeared

_____, who

acknowledged himself / herself to be the

_____ of
(title of officer)

_____, a corporation, and that as such officer, being
(name of corporation)

authorized to do so, acknowledged the foregoing instrument for the purpose therein contained by

signing the name of the corporation by himself / herself as

_____.
(title of officer)

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

_____
Notary Public

(SEAL)

My Commission Expires:

CONSENT AND JOINDER OF HOMEOWNERS' ASSOCIATION

The UNDERSIGNED HEREBY CONSENTS TO AND JOINS IN THE ATTACHED Stormwater Management Agreement and Declaration of Easement (the "Agreement"). The undersigned shall maintain all stormwater management facilities in accordance with the terms and provisions of the Agreement and in accordance with any separate Declarations of Restrictions. The undersigned specifically agrees that the Township shall have the rights referred to in Paragraph 7 of the Agreement.

IN WITNESS WHEREOF, the undersigned, intending to be legally bound, hereby consents to and joins in the Agreement as of this _____ day of _____, 20____.

_____
(Name of Homeowner's Association or similar entity)

ATTEST:

By: _____ By: _____
(Assistant) Secretary (Vice) President

[SEAL]

(HOMEOWNERS' ASSOCIATION ACKNOWLEDGMENT)

COMMONWEALTH OF PENNSYLVANIA :
: SS:
COUNTY OF LANCASTER :

On this _____ day of _____, 20___, before me, a Notary Public, the undersigned officer, personally appeared _____, who acknowledged himself / herself to be the _____ of _____, a corporation, and that as such officer, being authorized to do so, acknowledged the foregoing instrument for the purpose therein contained by signing the name of the corporation by himself / herself as _____.

(title of officer)

(name of corporation)

(title of officer)

IN WITNESS WHEREOF, I have hereunto set my hand and official seal.

_____
Notary Public

(SEAL)

My Commission Expires:

Representation and Warranty Concerning Mortgages
Affecting Proposed Development

I (We), _____ the undersigned, intending to be legally bound, represent and warrant to the Township of Manheim that there are not presently nor will there be prior to the recording of the Stormwater Management Agreement and Declaration of Easement Agreement any mortgages affecting the property which is being developed in accordance with the subdivision and/or land development plan titled _____, prepared by_____, drawing or project number _____, dated _____, last revised _____.

The undersigned understand (s) and agree (s) that the Township of Manheim will rely upon this statement when releasing the aforementioned subdivision and/or land development plan for recording.

_____ _____
Date Signature

_____
Signature

_____
Signature

_____
Signature

ATTACHMENT 1

BMP SUMMARY TABLE
(ATTACHMENT TO BE INCLUDED BY THE APPLICANT)

ATTACHMENT 2

MAXIMUM IMPERVIOUS SURFACE COVERAGE
(ATTACHMENT TO BE INLCUDED BY THE APPLICANT)

ATTACHMENT 3

OPERATION AND MAINTENANCE PLAN
(ATTACHMENT TO BE INLCUDED BY THE APPLICANT)

FIGURE 9
PENNDOT HOP DRAINAGE INDEMNIFICATION INFORMATION REQUIRED

1. Legal name(s) of record landowners:

   (a) If a corporation, the name of the president.
   (b) If a partnership, the name of all general partners.
   (c) If a limited liability company, the names of all members.

2. Mailing address of record landowners.

3. Name of developer/equitable owner (if different than landowner):

   (a) If a corporation, the name of the president.
   (b) If a partnership, the name of all general partners.
   (c) If a limited liability company, the names of all members.

4. Mailing address of developer/equitable owner.

5. Copy of current deed(s) for property and recording information (i.e. Record Book, Page No. or Document ID).

6. Location and size of property (i.e. 25 acres west side of Fruitville Pike).

7. Copy of Subdivision/Land Development Plan, including plan last revision date.

8. List of stormwater improvements to be located within PennDOT right-of-way.

9. Copy of construction plan for improvements within PennDOT right-of-way, including plan date and plan last revision date.

10. Location of the improvements (i.e. the improvements will be constructed within the limits of work designated as SR 4011 SEG 0090 OFF 1580 to SR 4011 SEG 0090 OFF 3215).

11. Current mortgage search for the property (list of mortgages and recording references).

12. The Developer will be required to provide certificates of insurance (naming the Township as additional insured) in a form acceptable to the Township Solicitor. The representative for the Developer should contact the Township Solicitor with regard to the required form.

CERTIFICATES

FIGURE 10
CERTIFICATES

STORMWATER MANAGEMENT PLAN CERTIFICATION

I hereby certify that, to the best of my knowledge, the stormwater management facilities shown and described hereon are designed in conformance with the Stormwater Management Ordinance of Manheim Township.

_____, 20_____ _____*

**

* Signature of the registered professional responsible for the preparation of the plan.

** Seal of the individual

FIGURE 10
CERTIFICATES

CERTIFICATION OF OWNERSHIP, ACKNOWLEDGEMENT OF PLAN,
AND OFFER OF DEDICATION

(LANDOWNER is an Individual)

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF LANCASTER

On this, the ____ day of _____, 20___, before me, the undersigned individual owner, personally appeared _____who being duly sworn according to law, deposes and says that he is the *_____ of the property shown on this plan, that the plan thereof was made at his direction, that he acknowledges the same to be his ACT and plan, that he desires the same to be recorded, and that all STREETS and other property identified as proposed public property (excepting those AREAS labeled "NOT FOR DEDICATION") are hereby dedicated to the public use.

**_____

***_____

My Commission Expires _____, 20___

* Identify Ownership or Equitable Ownership

** Signature of the Individual

*** Signature and Seal of Notary Public or other officer authorized to acknowledge deeds.

FIGURE 10
CERTIFICATES

CERTIFICATE OF OWNERSHIP, ACKNOWLEDGEMENT OF PLAN,
AND OFFER OF DEDICATION

(LANDOWNER is a Co-partnership)

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF LANCASTER

On this, the ____ day of _____, 20___, before me, the undersigned officer, personally appeared _____, being one of the firm of _____, who being duly sworn according to law, deposes and says that the co-partnership is the *_____ of the property shown on this plan, that the plan thereof was made at its direction, that it acknowledges the same to be its ACT and plan and desires the same to be recorded, and that all STREET and other property identified as proposed public property (excepting those AREAS labeled "NOT FOR DEDICATION") are hereby dedicated to the public use.

**_____

***_____

My Commission Expires _____, 20___

* Identify Ownership or Equitable Ownership

** Signature of the Individual

*** Signature and Seal of Notary Public or other officer authorized to acknowledge deeds.

FIGURE 10
CERTIFICATES

CERTIFICATE OF OWNERSHIP, ACKNOWLEDGEMENT OF PLAN,
AND OFFER OF DEDICATION

(LANDOWNER is a Corporation)

COMMONWEALTH OF PENNSYLVANIA
COUNTY OF LANCASTER

On this, the ____ day of _____, 20___, before me, the undersigned officer, personally appeared _____,
being *_____ of **_____
who being duly sworn according to law, deposes and says that the corporation is the ***_____ of the property shown on this plan, that he is authorized to execute said plan on behalf of the corporation, that the plan is the ACT and deed of the corporation, that the corporation desires the same to be recorded and on behalf of the corporation further acknowledges, that all STREETS and other property identified as proposed public property are hereby dedicated to the public use - (excepting those AREAS labeled "NOT FOR DEDICATION").

****_____

*****

******_____

My Commission Expires _____, 20___

* Individual's Title

** Name of Corporation

*** Identify Ownership or Equitable Ownership

**** Signature of Individual

***** Corporate Seal

****** Signature and Seal of Notary Public or other officer authorized to acknowledge deeds.

FIGURE 10
CERTIFICATES

CERTIFICATE FOR REVIEW BY THE TOWNSHIP ENGINEER

Reviewed by the Manheim TOWNSHIP ENGINEER this ____ day of _____, 20____.

_____

RECORDER OF DEEDS CERTIFICATE

Recorded in the office for Recording of Deeds, in and for Lancaster County, Pennsylvania, in SUBDIVISION Plan Book _____, Volume _____, Page _____.
Witness my hand and seal of office this ____ day of _____, A.D., 20____.

_____
Recorder

CERTIFICATE OF PROFESSIONAL GEOLOGIST

I _____ hereby certify that to the best of my knowledge, the proposed Stormwater Management Facilities (circle one) is/is not underlain by Carbonate Geology.

_____, 20_____ _____*

* Signature of the registered professional responsible for the certification.

** Seal of the individual.

CHECKLIST/APPLICATION

Department of Planning & Zoning
1840 Municipal Drive
Lancaster, PA 17601
717-569-6406
www.manheimtownship.org

MT Project No.: _____
Date Received: _____
Application Fee: $_____
Escrow Deposit: $_____
(from Page 2)

APPLICATION FOR APPROVAL OF STORMWATER MANAGEMENT PLAN

The undersigned hereby applies for approval under the Manheim Township Stormwater Management Ordinance of 2018, as amended, for the Stormwater Management Plan submitted herewith and described below.

1. **Plan Name**: _____

2. **Project Location**: _____

   Tax Parcel (Account) No.: _____ **Total Acreage**: _____

   Existing Impervious Cover: _____ **Proposed Impervious Cover**: _____

   Proposed Area of Disturbance (include this information on Plan): _____

   Is this Property covered by an open NPDES Permit? _____ If yes, Permit No.: _____

   Zoning District(s): _____ **Existing Use**: _____

3. **Project Description**: _____

   _____

4. **Legal Name of Applicant:** _____

   Address: _____

   Contact Person: _____Phone: _____ Email: _____

5. **Name of Property Owner (if different than Applicant)**: _____

   Address: _____

   Phone: _____Email: _____

6. **Name of Consultant**: _____

   Address: _____

   Contact: _____ Phone: _____ Email: _____

7. **Water Supply**: □ Public □ Private **Sewage Disposal**: □ Public □ On-Lot

8. **Did the plan require Zoning Hearing Board approval?** ____ If yes, date of approval: _____

   Describe approval(s) obtained: _____

   _____

   _____

9. Fees

A. Fees are calculated based on the currently adopted Manheim Township Fee Schedule, which can be obtained from the Township website or from the Planning and Zoning Department.

Application Fee: $_____ Escrow Deposit: $_____

Calculations: _____ _____

_____ _____

B. All Stormwater Management Plan applications shall be accompanied by a non-refundable application fee and an escrow deposit in accordance with the Township Fee Schedule. The application fee is a one-time payment applied toward the Township's costs of administering the plan and is non-refundable. Escrow funds are deposited to cover the costs to the Township of plan review, construction observation, and project closeout activities performed by Township consultants. Separate checks are required for the non-refundable application fee and the escrow deposit.

C. If the escrow funds deposited with the Township are depleted to a level of twenty-five percent (25%) of the original balance and the Township determines that the remaining escrow balance is insufficient to pay the Township's anticipated project costs, the Applicant shall, within fifteen (15) days' notice from the Township, deposit additional funds in an amount sufficient to restore the escrow account to its original level. If the escrow account has become fully depleted, the Applicant must pay the balance due and fully replenish the escrow account. Failure to pay the balance due and/or replenish the escrow account may delay processing of the plan, financial security reductions, and/or project closeout.

D. All escrow funds deposited with the Township by an Applicant that are not expended by the Township to pay project costs shall be returned to the Applicant at project closeout.

11. Representations:

A. By making a submission under this Ordinance, the applicant acknowledges and agrees that all documents and other information submitted to the Township pursuant to this Ordinance constitute public records within the meaning of the Pennsylvania Right to Know Law, Act 3 of 2008, as amended, and are therefore subject to review and reproduction upon request in accordance with that Law and applicable Township ordinances and resolutions.

B. By signing this application, Applicant confirms that he/she/they are the responsible party for this plan and project and as such, assume responsibility for paying to the Township the costs incurred in connection with the project, as permitted by the Township Fee Schedule.

12. Signatures:

Signature of Applicant or Authorized Agent: _____

Print Name: _____ Date: _____

Signature of Record Property Owner: _____

Print Name: _____ Date: _____

MANHEIM TOWNSHIP STORMWATER MANAGEMENT PLAN SUBMITTAL REQUIREMENTS

All plan submissions to the Township must include the following, as applicable. Both hard copy and digital copy submittals are required to be submitted to the Township, as described below.

HARD COPY SUBMITTAL:

- A completed stormwater management plan application with original signature
- Application fee and expense escrow deposit (refer to fee schedule at office or website www.manheimtownship.org)
- One (1) full-size paper copy of the full plan set, containing the following certificates:

- Project description/narrative, modification requests, applications to outside agencies, and outside agency review letters, if applicable

DIGITAL SUBMITTAL:

- Full plan set and all support documentation
- Digital only: Stormwater management and E&S reports, any other reports/studies, including draft Stormwater Management Agreement and Declaration of Easement

Send digital submittals to Plan Review Administrator Jim Langenstein at jlangenstein@manheimtownship.org with a copy to Planning and Zoning Director Sharyn Young at syoung@manheimtownship.org.

Submittals for the Township Engineer shall be made directly to the engineer, in digital format only:

- *Jeff Shue, PE, C.S. Davidson – jss@csdavidson.com*
- *Nate Hardman, EIT, C.S. Davidson – njh@csdavidson.com*

NOTE:

1. Stormwater management plans do not get reviewed by the Township Planning Commission. The Township Board of Commissioners review stormwater management plans only if modifications are requested from the Stormwater Management Ordinance.
2. Once all review comments and administrative requirements have been satisfied (including but not limited to financial security, any outside agency approvals, and a digital copy of the approved plan in AutoCAD data file format), submit adequate copies of the signed and sealed record plan sets and one copy of the signed and notarized Stormwater Management Agreement and Declaration of Easement to the Township for signatures.

Please contact Jim Langenstein at 717-669-6406 ext. 1136 or jlangenstein@manheimtownship.org or Sharyn Young at ext. 1105 or syoung@manheimtownship.org if you have any questions about these requirements.