CITY OF MENTOR
DRAINAGE DESIGN STANDARDS

Project Name:_____Location:_____

Design Engineer:_____Company:_____

Phone Number:_____Fax Number:_____

Owner's Name:_____Address:_____

Phone Number:_____Fax Number:_____

Reviewed by:_____Date:_____

Please check the section(s) that apply to the above project:

1. ____Detention
2. ____Roadway Culverts
3. ____Storm Sewers
4. ____Roadside Ditches
5. ____Drainage for Curb Pavement
6. ____Other Drainage Information
7. ____Erosion and Sediment Control and Water Quality

*****Information marked with an asterisk (*) to be noted on the plans.*****

In unique or unusual circumstances where the rigid conformance to this criteria may create adverse conditions to the intent of the City Codes, the City Engineer reserves the right to alter, modify or delete the problem criteria.

1. STORMWATER DETENTION (Refer to Mentor Code of Ordinances, Section 1115.07)

A. Development Size:_____Acres*_____Mi^2

B. Method to determine detention storage volume:

1. U.S. Soil Conservation Service's "Urban Hydrology for Small Watersheds," Technical Release Number 55, "Peak Discharge Method."

a. Submit copies of TR-55 worksheets 2, 3, 4, 5a, 5b, 6a, and 6b or printout of input and output data of TR-55 Computer Program as applicable.

2. Storm routing calculations are required to confirm that proposed detention facility meets the City's standard criteria. Calculations to include:

a. Overall Drainage Plan of the site showing existing and proposed grading, runoff flow paths, proposed drainage facilities and contributing areas including offsite areas draining to the drainage system. Indicate ground cover conditions and predominant soil types with Hydrologic Soil Group per the Lake County Soil Survey.

b. Plan View, typical cross-section and pertinent details of the proposed detention facility and its primary and emergency outlet control structure(s).

c. Detention Storage Capacity vs. Water Surface Elevation Rating Table.

d. Outlet Control Discharge vs. Water Surface Elevation Rating Table, including assumptions and calculations used to determine existing drainage system hydraulic gradient or water surface elevation at the outlet control structure discharge.

e. Inflow-Outflow Hydrographs, either in tabular or graphical form for one (1) year storm, CRITICAL STORM and all storms exceeding CRITICAL STORM up to the 100-year storm. The required inflow hydrographs shall include both pre-developed and post-developed conditions.

f. The assumptions and/or calculations utilized in determining the inflow hydrographs.

g. Hydraulic Gradient Calculations for the proposed storm sewer system based on the CRITICAL STORM design year and other storm design year frequencies as may be required by the City Engineer.

C. Critical Storm (yr): 1 2 5 10 25 50 100 (circle one)

D. Detention Volume: _____AC-Ft. Required _____Ac-Ft. Provided*

E. Maximum Outflow:

1. Outlet Control Device_____

2. 1-year pre-developed rate _____cfs.

3. High Water Level (HWL) at critical storm*_____Discharge*_____

(Also include max. discharge for storm frequencies exceeding critical storm up to 100-year storm.

* Include 2-, 5-, 10-, 25-, 50-, and 100-year storm frequencies as applicable.)_____

1. DETENTION – (continued)

F. Detention/Retention Facilities

1. Drainage basins, specify type_____

a. Soil name and type at basin_____

i) Will liner be required for basin? If so, specify_____

b. Minimum static water depth 4' Proposed Depth_____

c. Side slopes shall be equal or flatter than 3:1 Proposed Side Slope_____

d. Minimum bottom slopes:

Paved surface 1% Paved Channel 0.5% Grassed Surface 2%

Proposed bottom surface/slope_____

e. Outflow control device:_____

f. Emergency overflow provisions for flows above design storm:

i) Description_____

ii) Capacity/Design Year_____

iii) Design High water Elevation_____

g. Will basin be used as a temporary sediment basin during construction?

_____

If yes, provide calculations to determine additional volume needed to store sediment. (Minimum storage capacity: 67 cy/acre of disturbed area.)

2. Underground Storage Tanks

a. Access – opening shall be provided for inspection/maintenance. Opening to be properly secured to minimize unauthorized entry and safety hazards.

b. Outflow control device _____

c. Overflow provisions for flows above design storm

i) Description_____

ii) Capacity/Design Year_____

iii) Design High water Elevation_____

d. Draining – Include provisions for completely draining tank. Minimum slope of tank bottom is 0.5%.

1. DETENTION – (continued)

Draining provision _____

_____

3. Parking Lot Storage
   a. Maximum water depth 5" Proposed Depth _____
   b. Storage to be located in least used portion of parking lot.
   c. Overflow provisions for flows above design storm
      i) Description _____
      ii) Capacity/Design Year _____
      iii) Design High water Elevation _____
   d. The area of the parking lot designated for ponding shall be clearly marked with signs, pavement markings or other appropriate methods to discourage parking during potentially wet weather.

4. Infiltration/Recharge Systems
   a. Name and type of soil _____
   (soil borings required to verify type of soil)
      i) Permeability Rate from Laboratory Soils Analysis or from Field Percolation Tests
      (indicate rate and method of confirmation) _____
      _____
   b. Type of System _____
      i) Dimensions _____
   c. Overflow provisions for flows above design storm
      i) Description _____
      ii) Capacity/Design Year _____
      iii) Design High water Elevation _____

2. ROADWAY CULVERTS (ODOT TYPE 'A" CONDUITS)

A. Design Storm Frequency: (Refer to Mentor Code of Ordinances, Section 1115.07(b))

1. Mainline* _____ (25 year minimum ADT > 1000)
2. Crossroads *_____(10 year minimum ADT < 1000)

B. Maximum allowable headwater for design storm:

1. 2' below edge of pavement for drainage areas greater than 1,000 acres.
2. 1' below edge of pavement for drainage areas less than 1,000 acres.
3. 2' below lowest ground elevation adjacent to an occupied building for a 50-year storm.

C. Method used to estimate design discharge (Q):

1. "Estimation of Peak – frequency Relations, Flood Hydrographs, and Volume – Duration – Frequency Relations of Ungaged Small Urban Streams in Ohio" – U.S. Geological Survey, Open – File Report 93-135.

2. Rational Method (Q=ciA), for drainage areas less than 6 acres if there is no defined channel.

D. Topographic information used to delineate drainage areas:_____

_____

E. Manning's "n" used for smooth conduit: 0.013
corrugated conduit: 0.022

F. Entrance loss coefficient ke:

1. Concrete pipe: HW-4 headwall 0.20 Full headwall 0.20

G. Minimum cover from top of pipe to subgrade for:

1. Rigid Pipe 12" 2. Flexible Pipe 24"

H. Maximum cover:

1. Rigid Pipe _____ 2. Flexible Pipe _____

I. Name and type of soil at outlet:_____

J. Maximum allowable culvert outlet velocity:

1. Vegetated earth channel ** _____
2. Bare earth channel with lining (indicate type of lining)_____(max 5FPS)
3. Rock channel protection 5 fps < Velocity < 20 fps
4. Use Energy Dissipaters for velocity over 20 fps (see Table 1, Page 10)

2. ROADWAY CULVERT (ODOT TYPE 'A' CONDUITS) – (continued)

K. Headwall type HW-4B preferred Proposed _____

L. Minimum pipe size:

1. Right of way 18" 1. Private lands 6"

M. Other pertinent design information _____

_____

3. STORM SEWERS (ODOT TYPE 'B' AND TYPE 'C' CONDUITS):

A. Design frequency (just full)*_____
(2 year duration – minimum)

B. Hydraulic gradient shall not exceed:

1. 12" below edge of pavement for 10-year frequency storm. (Provide potential damage analysis for this condition.).
2. Catch basin grate or lip of inlet for 10-year frequency storm.
3. The above is based on:

a. Manning's "n" = 0.013
b. The intensity "i" for the last sewer run shall be used to locate the hydraulic gradient for the continuous sewer system.

C. Method used to estimate peak or design discharge, "Q"
Rational Method (Q = ciA). Intensity tables included in attached Table II.

D. Coefficient of runoff "c" for:

1. Pavement and paved shoulders 0.9

2. Residential 0.4 – 0.6 Woods 0.3
Cultivated 0.4 – 0.5

E. Method to determine time to first catch basin or pavement inlet _____

F. Minimum time to:

1. First ditch catch basin 15 minutes
2. First pavement inlet or catch basin 10 minutes

G. Minimum Pavement Grade
0.6% desirable minimum
0.4% absolute minimum
0.6% minimum machine controlled grade in cul-de-sacs, etc.

H. Minimum cover over sewers:

1. Reinforced or extra strength pipe

a. Types 'B' and 'C' conduit 12" from top of pipe to subgrade

2. Standard strength pipe

a. Type 'C' conduit 18" from top of pipe to subgrade

I. Velocity for design flow: 3.0 fps desirable minimum
2.5 fps absolute minimum

J. Maximum length between manholes or suitable cleanout points:

3. STORM SEWERS (ODOT TYPE 'B' AND TYPE 'C' CONDUITS) – (CONTINUED)

   1. Under 36" diameter 300' 2. 36" and over 500'

   K. Minimum pipe size under pavement: 12"

   L. Note on plan that when existing private drains (field tile) are cut by proposed sewers or ditches they are to be connected to proposed system.

   M. Other pertinent design information _____

4. ROADSIDE DITCHES

A. Method used to estimate peak or design discharges "Q": Rational method (Q = ciA)

B. Design frequency storm to determine:

1. Depth of flow 10 years
2. Velocity determination 5 years

C. Method to estimate time of flow to ditch: _____

_____

D. Name and type of soil at ditch _____

1. Allowable velocities for:

a. Seeded lining 1.5 – 4.5 fps
b. Sod, jute or other temporary lining 3.0 – 6.0 fps
(See Table 1 on Page 10)

E. Manning's "n" for:

1. Seeded lining 0.03
2. Sod, jute or other temporary lining 0.04
3. Paved lining 0.015
4. Rock channel protection 0.06

F. Ditch configuration

1. Roadway trapezoidal 2. Minimum Depth 18"

G. Type of ditch catch basin:

1. 2.

H. Longitudinal slope of ditches in cut sections to follow road grade whenever possible.

1. 2.0% desirable minimum 2. 0.5% absolute minimum

I. Minimum width of ditch lining:

1. Sod 7.5'
2. Temporary 7.5' for jute or excelsior matting

J. Design frequency depth of ditch shall not exceed:

A. 12" below edge of pavement

4. ROADSIDE DITCHES – (continued)

K. Other pertinent design information_____

TABLE I
MAXIMUM DITCH VELOCITIES (fps)

Soil Type	Soil Lining (ODOT 659)	Sod Lining (ODOT 660)	Excelsior Matting (ODOT 667 or 669)
Sand	1.5	3.5	3.0
Firm Loam	2.0	4.0	4.0
Clay	2.5	5.0	4.0
Gravel	3.5	6.0	5.0
Weathering Shale	4.5	6.0	5.0

Ditch velocities for the five-year frequency storm should not exceed the values shown in above Table I for the various soil types and flexible linings.

If the calculated velocity exceeds that shown in the table, a concrete lining may be considered. Also Type B or C Rock Channel Protection may be used to line the ditch if the nearest point of the lining is more than 30 feet beyond the edge of pavement. Type B rock should be considered for lining ditches on steep grades that carry flow from the end of a cut section down to the valley floor.

5. DRAINAGE FOR CURBED PAVEMENTS

A. Controls for the determination of inlet or catch basin spacing:

1. Design frequency using Rational Method _____
(5 year minimum)

2. Time to first inlet or catch basin/method:

a. Time _____ (10 minute minimum)

b. Method _____

3. Maximum spread of flow into traveled lane:

Two-lane	6 feet
Four-lane	8 feet

4. Maximum depth of flow at curb 3¼ inches

5. Roughness coefficient:

a. Reinforced concrete pavement 0.015

b. Asphalt concrete pavement 0.015

c. Paved shoulders 0.015

B. Type of inlet or catch basin ** proposed for:

1. Continuous grades _____

2. Sags _____

C. Inlet lip of curb opening inlet to be depressed 2 inches below normal gutter.

A local depression of ½ inch to be used to determine spacing of combination grade and curb opening catch basins.

D. Other pertinent design information

_____

_____

** Storm inlets and catch basin grates shall be of a type designed to permit safe crossing by bicycles.

6. OTHER DRAINAGE INFORMATION

A. Floodplain

1. Does site contain a Special Flood Hazard Area as designated by the Federal Emergency Management Agency's report entitled "The Flood Insurance Study for the City of Mentor"?

   If yes, indicate Flood Zone(s) _____
   (Permit Application Form FP-I must be completed)

   a. 100-year base flood elevation*_____ (Include note on plans that the lowest habitable floor elevation (including basements) must be 1.5 feet above 100-year base flood elevations).

2. Does site contain or adjoin a stream or natural swale?_____

   If yes, watercourse name _____ Drainage Area_____

   a. Method used to estimate 100-year peak discharge "Q", U.S. Conservation Service's, "TR-20 Project Formulation Hydrology.

   b. 100-year flood elevation* to be determined by backwater analysis _____ (Include note on plans that the lowest habitable floor elevation (including basements) must be 1.5 feet above 100-year base flood elevations).

B. Wetlands

1. Per Mentor Code of Ordinances, Sections 1133.05 and 1113.02, preliminary site plan and/or plat shall include the location of any jurisdictional wetlands on the site as delineated by an expert acceptable to the U.S. Army Corps of Engineers.

2. Per Mentor Code of Ordinances, Sections 1133.06 and 1113.03, submittal of final site plan and/or plat shall include a copy of the permit application or a wetlands delineation affirmation submitted to the U.S. Army Corps of Engineers and Ohio EPA for all proposed disturbances of jurisdictional wetlands as required for the proposed development / subdivision and associated building construction.

C. Residential Construction

1. Downspouts shall outlet onto splashblocks.*

2. If basements will be proposed, information concerning ground water elevations shall be provided. Proposed minimum basement grades shall be shown on overall site plan and shall be 16" above groundwater elevation.

D. Water Well Protection

1. If a subdivision is in close proximity to existing water wells, the location of wells shall be investigated per Section 1117.06. Information is required to determine potential impact of the installation of underground facilities within the subdivision on groundwater serving said wells. In areas of close proximity, groundwater flow barriers may be required in trenches.

7. EROSION AND SEDIMENT CONTROL AND WATER QUALITY PLAN (E&SC AND WQ PLAN)

A. Required for:

1. Soil disturbing activities consisting of 1 or more contiguous acres of land owned by one person or operated as one development unit.

a. Development areas less than one acre are not exempt from compliance with other erosion and sediment control provisions of Chapter 1353 of the Mentor Code of Ordinances. An E&SC plan shall be made part of the site development plan as required by Chapter 1133 of the Mentor Code of Ordinances. A water quality plan is not required for development areas under 1 acre.

b. When a residential dwelling unit is proposed on an individual lot that is less than 1 acre, an E&SC plan shall be made part of the site development plan for the requested permit. A water quality plan is not required.

B. Plan Requirements:

1. Contact information for the owner of the land, the developer, and the project engineer.*

2. Project engineer certification.*

3. The project name.*

4. Project vicinity map.*

5. Proof of compliance with federal requirements:

a. In areas where jurisdictional wetlands as defined by an on-site delineation verified by the United States Army Corps of Engineers (USACE) will be affected, a copy of the wetland delineation report shall be submitted with the E&SC and WQ plan.

b. If an individual USACE permit is required, a copy of the USACE permit and permit number showing project approval and any restrictions that apply to site activities shall be submitted.

c. If an individual permit is not required, the site owner shall submit confirmation with the Nationwide Permit Program.

6. Proof of compliance with State requirements:

a. A copy of the Ohio Environmental Protection Agency (OEPA) National Pollutant Discharge Elimination System (NPDES) permit with permit verification number or the Notice of Intent or a copy of the OEPA Director’s acceptance letter for the NPDES permit shall be submitted with the E&SC and WQ plan.

7. An additional description of the project and types of soil-disturbing activities noting specifically items not self-evident from the E&SC and WQ plan drawings.

8. The total project acreage, north arrow, and adjacent property boundaries.*

9. The existing site conditions shown with a maximum scale of 1"=200' with 2' contour intervals or as necessary to fully clarify the work, names of soil type boundaries, vegetation, ditches, springs, streams, lakes, wetlands, woods, agricultural fields, location of downstream lakes and wetlands within 1000' of the project, and existing drainage patterns including direction of flow and watershed acreage.*

10. A proposed grading plan showing types of soils and boundaries, limits of disturbance, areas of excavation and fill, final contours, and proposed drainage patterns including storm sewer inlets and permanent storm water basins. Basin details shall be drawn to scale showing volumes. The size of the contributing drainage area shall also be shown.*

    a. Limits to clearing and grading shall be clearly marked on site with signage, flagging, and/or fencing as required by the approved E&SC and WQ plan.*

11. The locations, types and construction details for perimeter controls, sediment settling devices, limits of disturbance, buffers for streams, wetlands, ponds and drainage facilities, seeding mixtures and rates, and type and quantity of mulching, application rates of water and/or fertilizer.*

12. Storm water control methods adequate to prevent pollution of public waters by soil sediment from accelerated storm runoff from development areas.*

13. A designated storage area marked for all fuel tanks and drums shall be shown on the site plan. A dike or reservoir shall be provided around the storage area with a minimum capacity equal to 110% of the volume of the largest container in the storage area.*

14. A designated area marked with signage for concrete washouts shall be shown on the site plan.*

15. A dumpster for the disposal of construction site waste materials shall be provided.*

16. The contractor's construction sequence and schedule that estimates the time frame required for the following shall be provided:*

    a. Initial clearing and grubbing to gain access and installation of perimeter controls

    b. Clearing and grubbing followed by excavation of sediment traps and basins and temporary soil stabilization for these sediment-settling devices.

    c. Project engineer's inspections and parties responsible for inspection and repair of erosion and sediment control devices

    d. Pre-winter stabilization needs if the project is to continue through the winter.

    e. Permanent soil stabilization.

    f. Removal of temporary erosion and sediment control devices.

    g. Provisions for long term maintenance and repair of storm water facilities after construction is complete, including a schedule and mechanisms for notification of future responsible parties and/or property owners.

C. Performance Standards:

1. Construction site erosion, sediment control and water quality practices shall conform, at a minimum, to the State of Ohio standards as set forth in the most current edition of the Rainwater and Land Development Manual published by the Ohio Department of Natural Resources. If requirements vary, the most environmentally protective requirement shall be followed.

2. Installation of perimeter erosion and sediment controls shall be installed as the first action of construction and shall be specified accordingly in the construction sequence.

3. Concentrated storm water runoff shall pass through sediment control devices before exiting site boundaries.

4. Concentrated runoff from bare soil areas shall be diverted into a settling pond or sediment control structure, or other approved sediment barrier before leaving the site.

5. Earthen structures such as dams, basins, stream modifications and water diversions shall be seeded and mulched within seven (7) days of the completion of installation.

6. Stabilization of critical areas within fifty (50) feet of any stream or wetland shall be temporarily stabilized within two (2) days of disturbance if the area will remain active for fourteen (14) days or longer. Construction vehicles shall avoid streams and their buffer areas. If an active drainage way must be crossed by construction vehicles repeatedly during construction, an approved temporary stream crossing shall be noted in the E&SC and WQ plan and constructed. Construction of bridges, culverts or sediment control structures shall not place soil, debris and other fine particulate material into or close to a stream or wetland in such a manner that it may slough, slip or erode.

7. Storm sewer inlets shall be protected so that sediment laden runoff will not enter the storm sewer system without first being filtered and/or treated.

8. The E&SC and WQ plan shall specify that temporary soil stabilization shall occur within seven (7) days after rough grading if the area will remain idle longer than twenty-one (21) days. Permanent soil stabilization shall be installed within seven (7) days after final grade is reached on any portion of the site. Permanent vegetation shall be a ground cover dense enough to cover 70% of the soil surface and mature enough to survive winter weather conditions.

9. Soil stockpiles shall be stabilized or protected to prevent soil erosion. Stabilization shall be required if stockpiles are located within critical areas near streams or wetlands, or if determined by the City that sediment from stockpiles will leave the site.

10. Steep slopes shall be protected. Unstable soils prone to slipping or sloughing shall not be cleared, graded, excavated, filled or have loads imposed upon them unless the work is planned by a qualified professional engineer and installed in accordance with the E&SC and WQ plan. Cut and fill slopes shall be designed to minimize erosion problems.

11. Soil shall be removed from paved surfaces and/or public roads at the end of each day or more frequently if deemed necessary by the City in such a manner that does not create off-site sedimentation and to ensure driver safety and to abate off-site soil deposition. Collected sediments shall be placed in a stable location.

12. Outfalls and drainage ways that have been constructed or modified shall be designed and constructed to withstand expected flow velocities and volumes from a post-development, 10-year return frequency storm event without eroding.

13. Erosive effects of storm water shall be reduced by utilizing and/or maintaining grassed swales, infiltration structures and water diversions.

14. The E&SC and WQ plan shall specify that sediment and erosion controls shall be inspected by the owner or his/her agent once every seven (7) days and within 24 hours of a 0.5 inch or greater rainfall event.

15. De-watering devices shall discharge in a manner that filters soil-laden water before discharging it to a receiving drainage facility.

D. Storm Water Quality Control

1. All new development resulting in the disturbance of one (1) or more acres of land shall provide storm water management practices that capture and treat a defined amount of water called the water quality volume (WQv) prior to it leaving the site. Regional treatment can be used to satisfy this requirement if the site is part of a "Larger Common Plan of Development." One or more of the following storm water management practices shall be used to capture and treat the WQv:

   a. Extended conveyance facilities that slow the rate of storm water runoff, filter and biodegrade pollutants in storm water, promote infiltration and evapotranspiration of storm water, and discharge the controlled runoff to a water resource.

   b. Extended detention facilities that detain storm water, settle or filter particulate pollutants, and release the controlled runoff to a water resource.

   c. Infiltration facilities that retain storm water, promote settling, filtering, and biodegradation of pollutants, and infiltrate all captured storm water into the ground.

   d. Other BMPs that may be approved by the City Engineer if the applicant demonstrates that they satisfactorily meet the objectives of Section 1353.05(s) of the Mentor Code of Ordinances.

2. All storm water management practices chosen must be sized to treat the water quality volume (WQv) and to ensure compliance with Ohio Water Quality Standards (Ohio Administrative Code Chapter 3745-1).

   a. The WQv shall be equal to the volume of runoff from a 0.75 inch rainfall event and shall be determined according to the following method:

      $WQ_v = C*P*A/12$

      Here terms have the following meanings:
      WQv = water quality volume in acre-feet
      C = runoff coefficient appropriate for storms less than 1 in. (Table 1)
      P = 0.75 inch precipitation depth
      A = Area draining into the storm water practice, in acres.

      Runoff coefficients required by the Ohio EPA for use in determining the water quality volume are listed in Table 1.

Table 1: Runoff Coefficients Based on the Type of Land Use

Land Use	Runoff Coefficient
Industrial & Commercial	C= 0.8
High Density Residential (> 8 dwelling units per acre)	C= 0.5
Medium Density Residential (4 to 8 dwelling units per acre)	C= 0.4
Low Density Residential (< 4 dwelling units per acre)	C= 0.3
Open space and recreational areas	C= 0.2
Where land use will be mixed, the runoff coefficient should be calculated using a weighted average. For example, if 60% of the contributing drainage area to the storm water treatment structure is Low Density Residential, 30% is High Density Residential, and 10% is open space, the runoff coefficient is calculated as follows: (0.6)(0.3) + (0.3)(0.5) + (0.1)(0.2) = 0.35	

Alternatively, the following equation may be used to calculate the runoff coefficient based on the proposed impervious area of the development: $C = 0.858i^3 – 0.78i^2 + 0.774i + 0.04$ where:

C = Runoff Coefficient, and
i = watershed imperviousness ratio; namely, the percent total impervious divided by 100.

b. An additional volume equal to 20% of the WQv shall be incorporated into the storm water practice for sediment storage.

c. Storm water management practices shall be designed such that the drain time is long enough to provide treatment and protect against downstream bank erosion, but short enough to provide storage available for successive rainfall events as defined in Table 2.

Table 2: Draw Down Times for Storm Water Management Practices

Best Management Practice	Drain Time of WQv
Infiltration	24-48 hours
Extended Conveyance (vegetated swales, filter strips)	24 hours
Extended Dry Detention Basins	48 hours
Extended Wet Detention Basins**	24 hours
Constructed Wetlands (above permanent pool)	24 hours
Media Filtration, Bioretention	40 hours
**** Provide both a permanent pool and an extended detention volume above the permanent pool, each sized with at least 0.75*WQv**	

d. Each practice shall be designed to facilitate sediment removal, vegetation management, debris control, and other maintenance activities.

3. The E&SC and WQ plan shall provide a narrative description and schedule of the post-construction best management practices (BMPs) required for the site.

4. The E&SC and WQ plan shall provide a long-term maintenance plan and schedule for the BMPs selected.

5. For all re-development projects disturbing one (1) or more acres of land, twenty percent (20%) of the WQ_v shall be treated or a reduction in impervious area by 20% shall be provided or a combination of both shall be provided. **NOTE: A project site is considered to be redevelopment only if the runoff curve number stays the same or is reduced. If the runoff curve number increases, then the site is considered to be a new development per Ohio EPA.**

6. Storm water management practices shall not be constructed in water resources unless the applicant obtains all appropriate permits from the Ohio EPA, the U.S. Army Corps of Engineers, and other applicable federal, state, and local agencies.