

DRAINAGE/ STORMWATER REPORT
CHECKLIST

7/30/09

Owner's Name: _____ Engineer's Name: _____
Site Address: _____ Date: _____

These requirements apply to all projects affecting drainage or stormwater in Springfield for Site Plan, Planning Board, Conservation Commission, etc submissions.

All reports shall be bound and include the following information:

Report Cover

Project title/development name
Site address
Site map and parcel
Owner's name, address and telephone number
Developer's name, address, fax and telephone number
Engineer's and Surveyor's names, address, fax and telephone number
Date of report (with latest revision date (s))
Registered Professional Engineer's stamp

Pre-and Post-development Plans

Pre-and post-development plans on 24"x36" sheets
Clearly show all pre and post subcatchment areas including cover type, hydrologic conditions (good, fair, poor), hydrologic soil group designation (A, B, C, D)
Show all ultimate point source discharge locations for each subcatchment area
Show all Tc paths with lengths and slopes for each subcatchment area
Plans should show enough topographic information outside of the site to show & pre and post peak discharge impacts
Plans should show enough topographic information on and off the site to illustrate regional flow (i.e. drainage boundaries should not start/ stop at property lines)

Executive Summary (1-2 pages maximum)

Description of project
Locus map
Background information/ references: NRCS/ SCS mapping, etc
Description of existing and proposed conditions/use
Drainage/ Stormwater summary

- Pre & post-peak development flows calculation and BMP summary
- Infiltration system calculation and BMP summary
- TSS removal calculation and BMP summary

Report author contact information

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Stormwater Management

Completed Stormwater Management Form from the latest edition of the MA DEP Stormwater Management Regulations

Hydraulic Calculations

Peak Flow Attenuation (MA DEP Stormwater Checklist Standard 2)

- Follow the general procedures in the MA DEP Stormwater Handbook and the MA DEP Hydrology Handbook for Conservation Commissioners (*Post peak flow must be < that pre peak flow*)
- All peak flow discharges to the City drain or CSO system in excess of the pre development rate will require complete review of drain/ CSO system from the development connection to the drain to a surface water outfall. The developer shall mitigate all hydraulic capacity or structural issues within the City system, unless determined otherwise by the City Engineer.
- Describe pre & post-development drainage conditions (narrative and illustration on pre-development plans)
- Describe all existing & proposed subcatchment areas
- Describe existing and proposed impervious and pervious areas within each subcatchment (narrative and on plans)
- Provide pre & post development CN number calculations
- Provide pre & post development Tc calculations
- Provide pre & post development hydraulic calculations for the 2, 10, 25, and 100-year storm events
- Use TP-40 peak rainfall as modified by the Cornell Atlas (RR-93-5):

2 yr	3.0 inches/ 24 hours
10 yr	4.5 inches/ 24 hours
25 yr	5.5 inches/ 24 hours
50 yr	6.2 inches/ 24 hours
100 yr	7.3 inches/ 24 hours
- Provide pre & post development hydrographs showing time-stage relationship (peak flow, peak hour)
- Provide a summary of pre and post-development flows
- Infiltration flows from recharge structures can not be subtracted from post-development flow calculations
- Provide proposed peak attenuation BMP calculations, design & plans
 - Detention basins- see below plus MA DEP Stormwater Handbook design criteria
 - Other BMPs – Use MA DEP Stormwater Handbook design criteria
- Provide the BMP hydraulic profile for all design storms (upstream manhole to outlet control structure (OCS)).

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Recharge (MA DEP Stormwater Checklist Standard 3)

- Follow the general procedures in the MA DEP Stormwater Handbook and the MA DEP Hydrology Handbook for Conservation Commissioners (*infiltrate change in impermeable area*)
- Provide test pit (TP) data (locations shall be shown on pre-and post-construction plans) - minimum of three TP per recharge site
- Determine & document the seasonal high groundwater elevation – both depth below surface & elevation
- Determine & document the soil type/ saturated soil hydraulic conductivity
One TP per each 5000 SF of infiltration area and at least three TP per recharge area and Laboratory soil textural analyses for each TP sample are required
- Determine & document 72 hour BMP dewatering calculations
- Provide proposed recharge BMP calculations, design & plans
Detention basins- see below plus MA DEP Stormwater Handbook design criteria
Other BMPs – Use MA DEP Stormwater Handbook design criteria
- Provide the BMP hydraulic profile for all design storms (upstream manhole to outlet control structure (OCS)).
- Recommend 100% roof runoff recharge, and/ or on site reuse if site conditions permit

Water Quality (MA DEP Stormwater Checklist Standards 4 & 5)

- Follow the general procedures in the MA DEP Stormwater Handbook and the MA DEP Hydrology Handbook for Conservation Commissioners (*80% TSS removal*)
- Address Land Uses With Higher Potential Pollution Control (LUHPPL)
- Describe Best Management Practice method proposed to improve water quality
- Provide proposed TSS removal BMP sizing calculations, design & plans
Detention basins- see below plus MA DEP Stormwater Handbook design criteria
Other BMPs – Use MA DEP Stormwater Handbook design criteria
- Provide the BMP hydraulic profile for all design storms (upstream manhole to outlet control structure (OCS)).
- Provide for oil separation in all catch basins (sumps and hoods)
- Provide multiple access points for the maintenance of subsurface structures

Operation and Maintenance Plans

Construction Period Pollution Prevention & Erosion and Sediment Control (MA DEP Stormwater Checklist Standard 8)

- Use the general guidance provided by the US EPA NPDES General Construction Permit SWPPP; the MA DEP Erosion and Sediment Control in Urban and Suburban Areas, the MA DEP Stormwater Handbook and the MA DEP Stormwater Checklist
- Submit proposed Construction Period Pollution Prevention & Erosion and Sediment Control Plan
- Plan required for all projects in Springfield disturbing one (1) or more acres

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Post Construction Stormwater System Operations & Maintenance (O&M) Plan (MA DEP Stormwater Checklist Standard 9)

- Use the general guidance provided by the US EPA Stormwater web site, the MA DEP Erosion and Sediment Control in Urban and Suburban Areas Manual, the MA DEP Stormwater Handbook and the MA DEP Stormwater Checklist
- Provide the Long Term Pollution Prevention Plan for this development
- Provide the development's proposed stormwater system O & M plan

Detention Basin BMPs

Provide a general description of proposed basin & basin sizing calculations

Provide peak in and outflow calculations for the 2, 10, 25, and 100-year storm events

Provide hydrographs showing time-stage relationship inside basin (peak flow, elevation, and hour)

Provide for a 3:1 basin side slopes or flatter & install a low permeability core material keyed into existing sub grade within berm footprint

Describe the proposed method of construction for berms and quality assurance/ quality controls methods to assure low permeability and stability

Provide construction details and details

Provide for 1 foot of freeboard for the 100 year event

Provide detention basin sections showing elevations of storm events

Verify seasonal groundwater elevations does not impact basin operation (at least three TPs)

Provide outlet control structure (OCS) details with elevations

Recommend OCS with a low flow discharge and grated top

Construct rip rap emergency overflow spillway with a uniform, level crest in natural soil

Construct basin discharge piping with a flared end & rip rap apron

Install seepage collars around discharge pipe

Provide sufficient access for vehicles to inspect & maintain structure (top of berm top; basin perimeter; and sediment fore bay inspection/ sediment removal)

Enclose basin with gated six (6) foot fence

Provide a fixed sediment depth indicator/ marker post to facilitate inspection

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General Drainage Design & Plan Requirements

- See DPW Standard Engineering Details for design standards
- See DPW Site Plan Review Checklist for general Plan submission requirements
- Existing & proposed surface features and underground utilities must be shown on plans
- Proposed storm water drain structures must be shown with rim elevations, invert elevations and details.
- Standard precast concrete catch basins with a minimum 4 (four) foot sump and a trap hood will be used. Onsite water quality treatment via sump or equivalent stormwater treatment BMP must be installed prior to its connection with the city system
- On-site drain pipes (pipes & catch basin laterals) will have a ten (10) inches minimum diameter and shall have a manhole for connection to the city sewer system.
- Proposed storm water drain lines must indicate the length, size, type, class, slope of pipe and method of connection to the city sewer system.
- Use minimum / maximum drainage pipe slopes of 1.0% / 9% (Unless site conditions dictate otherwise)
- Flow velocity within the pipe to be > 2 ft/s (self cleaning) or < 14 ft/s (scour) (unless site conditions dictate otherwise)
- All drainage pipes in the public way / city easement shall have a minimum diameter of 12 inches & Class III RCP shall be used unless determined otherwise by the City Engineer
- Private drain pipe material can be RCP, PVC or HDPE CPP, however must provide structural support calculations & details if top of pipe has less than 4 feet of cover
- Provide a minimum cover over pipe of 4.0 feet; if shallower, provide structural support calculations & construction details
- Locations having a city combination sewer system will require separate sanitary and stormwater sewer service connections from the site to the system to allow for future separation projects. SWSC standard shall be used.
- Any off site surface discharge to the public way or onto abutting properties will not be allowed.
- Design the drainage piping for 10 yr rainfall with a minimum 12 inch diameter pipe in public way / city easement