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# STORM WATER MANAGEMENT

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Site Plan Review

City of Saint Paul

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A storm water management plan must be submitted as part of the site plan package for review by the Department of Public Works. The purpose of the plan is to show how storm water will be handled on the site: where it will drain to and at what rate.

## **SITES SMALLER THAN ONE QUARTER ACRE**

For sites less than one quarter of an acre, it may be possible to meet the requirements for storm water management by grading the site so that storm water flows to a street or public alley. Storm water drainage must be shown on the plan by grades and/or drainage arrows. Storm water may not drain across a public sidewalk at any point except at a driveway.

## **SITES EQUAL TO OR LARGER THAN ONE QUARTER ACRE**

For sites equal to or greater than one quarter of an acre, the rate of storm water runoff for the site may not exceed 1.64 cubic feet per second per acre. Storm water must normally be directed to on-site storm water detention ponds and catch basins connected to the City storm sewer system in order to control the rate of storm water runoff from the site. The following information must be submitted:

### **Grading**

- Grades or contours to define the routing of storm water and storm water detention areas.

### **Drainage Areas**

- Outline of each separate drainage area within the site property lines or improvement limits. Include roofs and all other surface areas.
- Area in acres of each drainage area.
- Separate pervious and impervious curve numbers along with drainage area descriptions.
- Time of concentration in minutes of drainage areas.

### **On-site Detention**

- Outline of each separate on-site detention area. Ponding may be provided in parking lots, green areas, roof tops or underground storage.
- Depth in ft. of on-site detention.
- Area in acres of on-site detention.
- Volume in acre-ft. of on-site detention.
- Overflow route of on-site detention.

## **SPECIAL SITES**

The rate control requirement may be waived for a site that meets at least one of the following conditions:

- The site's disturbed area is more than one quarter of an acre but less than an acre and the proposed construction will not result in a net increase of the site's impervious area and runoff.
- The site is a zero-lot-line site that is in close proximity to the river.

## **Structures**

- Location and details of all structures used to control the rate of discharge of storm water from the site. These include catch basins, manholes, pipes, weirs, curb openings and control flow roof drains. Rim and invert elevations must be provided.

## **Connections to City Sewer**

- Connections are not permitted to City catch basins or sanitary sewers.
- Connections must be no deeper than 5 feet to invert at the property line.
- Minimum pipe size is a 4 inch diameter pipe.
- The plan must include a note stating that “Connections to public sewers must be done by a Licensed House Drain Contractor under a permit from Saint Paul Department of Public Works.”
- Set the tailwater elevation equals to the invert elevation of the connecting point of the City sewer. If the peak discharge time of the private connecting pipe coincides with that of the City sewer, the City may require that the tailwater effects on the proposed on-site storage be investigated.

## **Calculations**

- The standard used to check for conformance with storm water management requirements is HydroCAD version 7.10 or newer.
- Use the SCS TR-20 Runoff Method.
- Use 5.9 inches for the Type II 24-hr 100 year storm in the City of Saint Paul.
- Use a rate control rate of 1.64 cubic feet per second per acre.
- Based on your HydroCAD model, complete the following tables provided with this handout:
  - Table 1 (Drainage area information)
  - Table 2 (Drainage area peak runoff for 100 year storm)
  - Table 3 (On-site detention information)
  - Table 4 (On-site peak detention for 100 year storm)
  - Table 5 (On-site detention outlet control for 100 year storm)
  - Table 6 (Connection pipe to City sewer)
- Submit an electronic copy of all HydroCAD files used in obtaining values for the six tables above.

Please call Anca Sima of Saint Paul Public Works at 651- 266- 6237 if you have any questions.

This information and other information about site plan review are also available on-line at <http://www.stpaul.gov/sewer>.

**Table1. Drainage Area information**

Drainage Area Name	Area (acres)	Curve Number	Description of Area	Time of Concentration (minutes)
<b>Total</b>				

**Table2. Drainage Area Peak Runoff for 100 year storm**

Drainage Area Name	Runoff (cfs)	Volume (acre-ft.)
<b>Total</b>		

**Table3. On-site Detention information**

Name of On-site Detention Structure:			
Elevation (ft)	Surface Area (acres)	Incremental Storage (acre-ft.)	Cumulative Storage (acre-ft.)

**Table4. Peak On-site Detention for 100 year storm**

Name of On-site Detention Structure:			
Peak Elevation (ft)	Time (Hours)	Required Storage for 1.64 cfs Rate Control to City Sewer (acre-ft.)	Available Storage for 1.64 cfs Rate Control to City Sewer (acre-ft.)

**Table5. On-site Detention Outlet Control for 100 year storm**

Name of On-site Detention Outlet Structure:		
Outlet Type	Maximum Discharge (cfs)	Tailwater Elevation (ft.)

**Table6. Connection pipe to City Sewer**

Name of Connection Pipe:						
Pipe Length (ft)	Pipe Diameter (inches)	Pipe Type	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Maximum Discharge (cfs)	Downstream Water Elevation (ft)

# SAMPLE STORMWATER MANAGEMENT PLAN

