Engineering Department

Stormwater Design Standards

New Subdivisions and All Non-Single Family Residential Sites

Information in this document is for informational and reference purposes only. Such information is subject to change. Last Revised: 3/15/2015

Proposes drainage plans and calculations shall be prepared in accordance with the current applicable City Standards for Volume Control, Rate Control, and Water Quality Control as outlined in the City Stormwater Management Ordinance No 52.25 and the Stormwater Design Standards Post-Construction Stormwater Requirements Document. (disturbance of an acre or more)

1. General

1.1 Owner, Engineer, Architect- names, phone and email listed.
1.2 Proposed drainage plan/report and hydraulic calculations are dated and signed by licensed professional.
1.3 Final grading plan is signed by a licensed professional.
1.4 Plan is 1'' = 50' or larger scale. North Arrow is shown.
1.5 Property limits are shown and streets are clearly labeled. Lot and Block information provided.
1.6 Existing public and private utilities are labeled and legible.
1.7 Proposed sidewalks for commercial and industrial sites.
1.8 Size of the project is shown.
  1.8.1 Existing impervious and pervious surface areas of the site.
  1.8.2 Areas not to be disturbed clearly defined.
  1.8.3 Ultimate (when site is fully developed) impervious and pervious surface of the site.
  1.8.4 Development schedule: show phasing and calendar year each phase is planned for construction.
1.9 Describe existing vegetation including wooded areas and tree survey.

2. Site Grading

2.1 Plan is drawn in 2- foot contours. All finished contours and adequate existing contours are labeled.
  2.1.1 Existing contours are dashed and proposed contours are solid.
  2.1.2 Details of terrain and drainage are provided for areas adjacent to the proposed grading.
  2.1.3 Where applicable, extend existing 2- foot contour lines a minimum of 100- feet beyond the site boundary or more to accurately depict the drainage patterns.
2.2 Proposed grading and direction of slope of each lot shall be shown.
  2.2.1 The entire lot must be sloped to drain to an adjoining public street, wetland (subject to wetland regulations), water body, water course, drainage easement, or other public drainage way.
  2.2.2 Slope percent is shown for streets and drainage swales.
2.3 All existing and proposed lot corner elevations are shown to the nearest tenth of a foot
2.4 Proposed elevations of structure corners and lowest openings.
2.5 Proposed elevations of ground at front and rear of building, along with structure type are shown.
2.6 Top of foundation is a minimum of 6'' above the ground.

2.7 Grade is 1’ below the top of foundation at a distance of 10ft from the building.

3. Drainage and Site Hydrology

3.1 Location and dimensions of existing stormwater drainage systems and natural patterns on and immediately adjacent to the site delineating in which direction and at what rate stormwater is conveyed from the site.
3.2 Existing drainage: Show pre-developed drainage areas
  3.2.1 Show land use and the direction of flow for each area and
  3.2.2 Travel path used to determine the Time of Concentration.
3.3 Final drainage: Show post-developed drainage areas
  3.3.1 Show land use and the direction of flow for each area and
  3.3.2 Travel path used to determine the Time of Concentration.
3.4 Identify any off-site catchment areas draining to the site.
  3.4.1 Provide 2-foot contours.
  3.4.2 Show land use and the direction of flow for each area and travel path used to determine the Time of Concentration.
3.5 100 year floodplains, flood fringes, and floodways clearly labeled.
3.6 All receiving waters, including wetlands, show or identified, including impaired or special waters.
3.7 On-site soil characteristics including infiltration rates: boundaries of different soil types are described.
3.8 Groundwater elevations are shown.
3.9 Minimum slope for vegetation areas is 2%.
3.10 Wetland areas clearly defined: submit approval letter from the Steele County Soil and Water Conservation District Office.

4. Drainage Swales, Easements, and Building Lots

4.1 Existing and proposed drainage and utility easements are shown and labeled on the plan.
4.2 Control and spot elevations for drainage ways are shown.
4.3 Minimum slope of side lot drainage swales is 2% with directional arrow shown.
4.4 Minimum slope of back lot drainage swales is 1% direction arrow shown.
4.5 Building pads are shown, type of structure to be built is shown
4.6 Structure corner elevations, lowest floor elevation, and lowest opening elevation are shown.
4.7 Floor elevation or grade adjacent to building must be minimum of 2’ above 100-year HWL, minimum 1’ above emergency overflow elevation and minimum 1’ above FEMA
4.8 Easement documents signed and submitted to Engineering Department with recording fee.
4.9 Minimum drainage easements shown on plan.
  4.9.1 Flows from 1 acre or less, or 4 lots or less are a minimum of 15’ wide. Ditch is 1.9’ deep, V-shaped with 4:1 slopes.
  4.9.2 Flows from 1 acre or more, or 4 lots or more are minimum of 20’ wide. Ditch is a minimum of 2’ deep with a 4’ bottom and 4:1 slopes up to the easement line.
  4.9.3 Drainage easements provided where concentrated flow is received from more than 1 adjacent lot and also where concentrated flow is received from more than 1 acre of adjacent property.
  4.9.4 100-year flow must be contained in the easements.
4.10 Velocity computations are provided for drainage easements where concentrated flow from more than 2 acres or 8 lots is directed. Where 10-year velocities exceed 5ft per second, permanent turf reinforcement mats depicted on plan.

5. Storm Drain System, Inlets, Outlets and Overflows

5.1 Pipe size, length, grade, and material are shown.
5.2 Top of castings and all inverts of catch basins and manholes are shown. Label all storm drain structures.
  5.2.1 All apron elevations (inlets and outlets) are shown.
5.3 400’ maximum manhole spacing for lines 15” diameter or less and 500’ maximum manhole spacing for lines 18’’ to 30’’ diameter.
5.4 Flow direction change is not more than 90 degrees at junctions.
5.5 Apron inlets to the storm system include trash racks.
  5.5.1 Trash racks in inlet structures in wooded areas designed assuming 50% plugging condition.
5.6 Overflow swales are provided which limit the depth of ponding in the street to 2’ or less.
  5.6.1 Must meet minimum drainage easement standard.
  5.6.2 Emergency overflow with the high point elevation and direction of overflow are clearly marked on the plans.
5.7 For other than residential areas, drainage from impervious surfaces is collected on site and not sheet drained onto sidewalks, right of ways, or adjacent property.
  5.7.1 Concentrated drainage is collected in catch basin before crossing walks.
  5.7.2 Drainage does not cross intersections. (no valley gutters)
5.8 Catch basin spacing as necessary for inlet capacity, curb spread, and not exceeding 1000’ on residential streets or 600’ on collector and arterial streets. Maintain 11’ driving lane.
  5.8.1 Not more than 3 catch basins in a series (at an intersection) before connecting to the storm sewer main.

6. Outlets and Energy Dissipation

6.1 Discharge direction of flow generally 45 degrees or less to the flow direction of the receiving ditch or stream.
6.2 Where discharge pipe velocities are 10 fps or less, rip rap and filter fabric quantities are indicated in accordance with Mn/DOT.
6.3 Where discharge pipe velocities are greater than 10 fps, energy dissipation is provided in addition to riprap and filter fabric.
6.4 Discharges on slopes steeper than 10% shall not be allowed unless discharge is into existing drainage ditch and volume of water in ditch is not greater than 110% of the pre-developed condition.
6.5 Pipe outlet energy dissipation complete within 24 hours of connection to surface water indicated.

7. Stormwater Pollution Prevention Plan (if disturbance is equal or greater to 1 acre, refer to MPCA Permit)

7.1 Schedule of anticipated start date and installation of erosion and sediment control best management practices.

7.2 Provisions for maintenance and inspection of erosion and sediment control BMP's clearly indicated on plan.

7.3 Maintenance and inspections conducted in compliance with most recent MPCA Construction Activity Permit timeline requirements.

7.4 Plan for temporary stabilization methods clearly indicated.

7.5 A description of proposed permanent stabilization measures to be taken, including specifications, times frames/scheduling, and responsible party.

7.5.1 Plan for temporary and permanent winter erosion and sediment control for projects that extend or start after November 15th.

7.6 Locations of all proposed land disturbances and any phasing of the activities.

7.7 Locations and specification of perimeter control method shown on plan.

7.8 Locations and protection of all temporary stockpiles.

7.9 Location and dimension of temporary rock construction entrance(s).

7.10 Location and specification of inlet protection in downstream catch basin(s).

7.11 Plan for all dewatering activities.

7.12 Plan for all concrete washout containment, no concrete waste shall contact ground.

7.13 Measures to manage all solid and liquid wastes from construction and building activity clearly indicated.

7.13.1 In compliance with most recent MPCA Construction Activity Permit (Part IV. F. Pollution Prevention Management Measures.)

7.14 Plan for keeping street clear of tracking clearly indicated on plan, including timeframe.

7.15 All other requirements other requirements of the MPCA Construction Activity Permit where applicable (plan will be reviewed against permit criteria)