



STORMWATER REVIEW CHECKLIST

Development Name: _____
 Location: _____

Date: _____
 Reviewed By: _____

PRELIMINARY PLAT OR SITE PLAN DRAWINGS

The following information shall be included on all preliminary plats or site plans submitted for approval. Sheets shall be no larger than 24" x 36" at a scale no smaller than 1" = 100' and prepared by a professional engineer or surveyor licensed in the State of Michigan.

The purpose of the preliminary review is to evaluate the development concept and assess stormwater impacts of the project on the surrounding area. Drawing submittal needs to include a "drainage map" with enough topographic information beyond the project limits to be able to evaluate grading and drainage impacts to offsite areas.

	<u>Provided/ Satisfactory</u>	<u>Comments</u>
General		
1. Development name/subdivision number.	_____	_____
2. North arrow, scale and legend.	_____	_____
3. Name, address, and telephone number of Proprietor.	_____	_____
4. Name, address, telephone number, signature, and seal of the Design Engineer (and/or surveyor).	_____	_____
5. Description of location (section and fractional portion thereof; town and range; township, city or village; county; state).	_____	_____
6. Location map.	_____	_____
7. Drainage map.	_____	_____
Site Layout		
8. The number of acres to be developed.	_____	_____
9. Development boundary with legal property description tied to government corners.	_____	_____
10. Identification of all adjoining parcels (for subdivisions show lot number, subdivision name, liber, and page numbers; for metes and bounds parcels show permanent parcel number).	_____	_____
11. Proposed street, alley, and lot layouts with dimensions (scaled or computed).	_____	_____
12. Lot numbers.	_____	_____



STORMWATER REVIEW CHECKLIST

	<u>Provided/ Satisfactory</u>	<u>Comments</u>
13. Building setback lines.	_____	_____
Easements		
14. Utility easements (with dimensions and type of utility).	_____	_____
15. Existing drainage easements with dimensions and recording liber and page.	_____	_____
16. Proposed drainage easements with dimensions.	_____	_____
Existing Site Features		
17. Existing buildings (label those under construction with address).	_____	_____
18. Existing roads (name, ROW width, and type of surface.	_____	_____
19. Existing drainage structures (with proper labeling as to type, size, and invert elevations).	_____	_____
20. The location and description of any other onsite and adjacent offsite features that may be relevant in determining the overall requirements for the development (e.g. railroads, high tension power lines, underground transmission lines, sanitary sewers, water mains, septic fields, wells, cemeteries and parks).	_____	_____
21. Riparian buffers, natural flow pathways, wetlands, floodplains and other sensitive areas.	_____	_____
22. Existing contours (no greater than 2' interval inside the plat; no greater than 10' interval outside the plat).	_____	_____
Soils		
23. Soil type(s) from County Soil Survey.	_____	_____
24. Soil borings indicating seasonally high groundwater elevations.	_____	_____
Proposed Site Features		
25. Proposed contours.	_____	_____
26. Proposed roads (label road as "Public Road" or "Private Road").	_____	_____
27. Proposed drainage systems (clearly identify all open and enclosed portions) and preliminary layout of stormwater BMPs.	_____	_____



STORMWATER REVIEW CHECKLIST

CONSTRUCTION DRAWINGS

The following additional information shall be included on all construction drawings submitted for approval. Sheets shall be no larger than 24" x 36" at a scale no smaller than 1" = 50' and sealed by a professional engineer licensed in the State of Michigan.

	<u>Provided/ Satisfactory</u>	<u>Comments</u>
1. Benchmark locations and elevations.	_____	_____
2. Plans, profiles, cross-sections, and details of all roads, storm sewers, footing drain laterals, open channel drains and other stormwater BMPs.	_____	_____
3. Details of storm sewer and culverts shall include: numbering of manholes/catchbasins, invert and casting elevations, pipe length (center-to-center of structure), pipe diameter, pipe material, pipe slope, pipe class, pipe joints, special backfill and bedding, inlet/outlet protection, profile of the hydraulic grade line.	_____	_____
4. Details of outlet control structures (scaled detail with hydraulic information matching calculations; schematic design sketches are unacceptable).	_____	_____
5. Lot grading plan (detail, statement, or drainage arrows).	_____	_____
6. Minimum opening and basement elevation for each lot.	_____	_____
7. Plans and details of SESC measures and staging.	_____	_____
8. Protected sensitive areas, minimal disturbance areas and other "non-structural" BMPs.	_____	_____
9. Location of all proposed drain fields. (Drain fields shall comply with isolation distance requirements.)	_____	_____



STORMWATER REVIEW CHECKLIST

DESIGN CALCULATION PACKAGE

Completed by a professional engineer licensed in the State of Michigan.

	<u>Provided/ Satisfactory</u>	<u>Comments</u>
1. Completed Stormwater Worksheet.	_____	_____
2. A topographic map with site delineated in relation to watershed.	_____	_____
3. Calculations of peak discharge for a range of storms up to and including the 100-year storm for any natural water courses and/or county drains passing through the proposed development, including area of upstream watershed.	_____	_____
4. Normal, design and 100-year water elevations, including overland flow routes shown on the topographic map.	_____	_____
5. A drainage area map that clearly shows subcatchment boundaries, acreages and flow paths of tributary areas to each point of discharge from the development, including tributary areas originating outside of the development. Also identify tributary areas to inlets, culverts, and other storm water BMPs.	_____	_____
6. Documentation and/or calculations required to demonstrate an adequate outlet, including the sizes and locations of upstream and downstream culverts serving drainage routes into and out of the development site.	_____	_____
7. Calculations of stormwater rates and volumes for each point of discharge or treatment train for pre-development and post-development conditions for the design storms.	_____	_____
8. BMP design calculations.	_____	_____
9. Groundwater mounding calculations (when required).	_____	_____
10. Design summary report, including at a minimum: description of stormwater management plan for the site, identified contributing areas with land cover types, soils and runoff coefficients, times-of-concentration, runoff volumes, peak discharges, design high water levels, sewer hydraulic grade line, required storage volumes, and volumes provided.	_____	_____



STORMWATER REVIEW CHECKLIST

MAINTENANCE ASSURANCE

The Design Engineer shall incorporate considerations for access, operation and maintenance into the design of all stormwater BMPs to ensure the stormwater system can be readily maintained. Specific minimum requirements are included on individual BMP design criteria sheets. The following information must be shown on the construction drawings at a minimum, and clearly identified on a separate set of drawings submitted for review:

	<u>Provided/ Satisfactory</u>	<u>Comments</u>
1. Identified access routes for trucks and maintenance equipment, including fences and gates.	_____	_____
2. Proper siting of BMPs for accessibility.	_____	_____
3. Design of BMP elements to minimize amount of maintenance required (e.g. filters on small orifices, design of trash racks to facilitate debris removal, etc.).	_____	_____
4. Design details to illustrate maintenance features (e.g. removable grates or rails, locks, access platforms, etc.).	_____	_____
5. Identified areas for staging and temporary spoil disposal.	_____	_____

CONSTRUCTION RECORD DRAWINGS

Completed by a professional engineer licensed in the State of Michigan.

A final set of drawings, updated and marked “issued for construction record” with date in revision block, must be received before release of any security on deposit.

	<u>Provided/ Satisfactory</u>	<u>Comments</u>
1. Horizontal location of all drainage structures and footing drain connection points relative to a coordinate point or lot corner. Alternately, locations may be shown by road stationing with offsets.	_____	_____
2. Final grading and volume of all detention/retention facilities and integrated BMPs with verification that they meet or exceed approved storage and infiltration capacities.	_____	_____
3. Pipe inverts, length and slope, manhole and catch basin rims, top of berm, and spillway elevations.	_____	_____
4. Details of inlet structures (including opening areas and elevations.)	_____	_____



STORMWATER REVIEW CHECKLIST

GIS DIGITAL SUBMISSION REQUIREMENTS

Required for final plats, construction record drawings and drainage district maps.

1. All files must be in a .dxf format.
2. All submitted files must be zipped to ensure they arrive intact.
3. Email or compact disc are acceptable ways to receive files.

Technical Requirements:

1. All lines must be snapped closed (no dangles, overstrikes, or understrikes).
2. Layers must have a reasonable label of what can be found on each layer.
3. The following separate layers must be included:
 - a. Lot Numbers.
 - b. Lot Lines.
 - c. Lot Dimensions.
 - d. Right-of-Way Dimensions.
 - e. Right-of-Way Names.
 - f. Subdivision Boundaries.
 - g. Water/Storm/Hydrants/Sewer Lines/Culverts.
 - h. Easements.
 - i. Easement Dimensions.
 - j. Contours.
 - k. Any other features of value in determining overall drainage requirements.
4. Lot and right-of-way dimension layers must have nothing more than leaderlines.
5. Hatching must be on one layer with no other items.
6. Layout design and any tables must be in one layer.

COMMENTS:
