Project Number

(Completed by City of Plymouth)

Drainage Plan - Checklist
Part 2 of 3

Name of Project: _____

Address or Location Description: _____

_____

This form is the second part of a three-part application. Part 1 is the Application and Part 3 is the Invoice. .

1. Topographic and Soils Map		Yes	N/A	Page Number	Section, Paragraph
a.	Soils are to be identified. If SCS is utilized, identify hydrologic classification.				
b.	Contour intervals shall be 1Ft. when slopes are less than 4%. If slopes are greater than 4%, utilize 2-Ft. contours.				
c.	Location of streams and other flood water runoff channels. Identify 100-year flood / runoff elevations.				
d.	Normal water level (elevation) and delineation of lakes, ponds, swamps, detention basins, and flood plains. Include lines of inflow and outflow.				
e.	Location of any recorded or visible regulated drains, farm drains, inlets, and outfalls.				
f.	Location of any recorded or visible storm, sanitary, and combined sewers and outfalls.				
g.	Location of any recorded or visible septic tank systems and outlets.				
h.	Location of any recorded or visible seeps, springs, flowing and other wells.				

2. Preliminary Drainage Plan		Yes	N/A	Page Number	Section, Paragraph
a.	Extent and area of each watershed affecting the design of the retention / detention facilities.				
b.	Preliminary layout and design of proposed storm sewers and outlet locations. Show receiving stream(s) / channel(s).				
c.	Design of proposed street system, including depressed pavements used to convey or temporarily store overflow from heavier storms.				
d.	Locations, cross sections, and waterway openings and the basis for design (calculations) of culverts, bridges, and storm sewers.				
e.	Materials, elevations, waterway openings and basis for design (calculations) of culverts, bridges, and storm sewers.				
f.	Existing ponds and basins to be maintained, enlarged, or altered as well as new ponds or basins to be constructed and the basis for their design (calculations).				
g.	The estimated depth and the amount of storage required in the new ponds or basins (water elevations and supporting calculations).				
h.	The estimated location and amount (area) of imperious surface to be constructed.				
i.	Any interim plan which is to be incorporated into the development, pending completion of the final drainage plan.				

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3. Valley Cross-Section		Yes	N/A	Page Number	Section, Paragraph
a.	Typical cross-sections of existing and proposed channels. Identify 100 -year runoff / flood levels.				

4. Site Plan		Yes	N/A	Page Number	Section, Paragraph
a.	Site plan is drawn to scale and identifies site improvements and drainage facilities.				

5. Final Drainage Plans		Yes	N/A	Page Number	Section, Paragraph
a.	Extent and area of each watershed affecting the design of the retention / detention facilities.				
b.	Design of storm sewers and outlet locations. Show receiving stream(s) / channel(s).				
c.	Design of proposed street system including depressed pavements used to convey or temporarily store overflow from heavier storms.				
d.	Existing streams and floodplains to be maintained and new channels to be constructed. Locations, cross-sections, and profiles.				
e.	Proposed culverts and bridges to be built. Their materials, elevations, waterway openings, and basis for design.				
f.	Existing storage basins and ponds to be maintained, enlarged, or otherwise altered.				
g.	The estimated location and amount (area) of imperious surface to be constructed.				
h.	Slope, type, and size of all sewers and other waterways.				
i.	Plot or tabulation of storage volume(s) corresponding with water surface elevation(s). A tabulation of outflow rates.				

6. Report		Yes	N/A	Page Number	Section, Paragraph
a.	Description of the proposed development.				
b.	Current land use conditions.				
c.	Method of hydraulic and hydrologic analysis used and any special assumptions of special conditions.				
d.	Results of the analysis (basis for design calculations).				
e.	Recommended drainage control facilities.				

7. Permission to Connect to Legal Drain		Yes	N/A	Page Number	Section, Paragraph
a.	Written permission from the County Surveyor must be obtained to outlet into a legal drain (this includes any work in the legal drain easement).				

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8. Stormwater Retention Calculations		Yes	N/A	Page Number	Section, Paragraph
a.	Retention utilized, per Drainage Ordinance.				
b.	Retention requirements waived.				
c.	Retention storage requirements calculated. Required storage calculations and proposed pond volumes (to hold the 100-year, 24-hour storm event).				
d.	Proper retention storage provided (with a 6% "oversize" safety factor).				

9. Stormwater Detention Calculations		Yes	N/A	Page Number	Section, Paragraph
a.	Outlet at a 10-year, #-hour release rate or less (confirm with City Engineering).				
b.	Orifice calculations included.				
c.	Detention storage requirements calculated. Required storage calculations and proposed pond volumes.				
d.	Proper detention storage provided (with a 6% "oversize" safety factor).				

10. Stormwater Conveyance		Yes	N/A	Page Number	Section, Paragraph
a.	Flow and velocity of runoff calculated in pipe system and open channels.				
b.	Grade elevations set to drain into inlets; manhole rim elevations set.				
c.	Manhole invert elevations calculated and set.				
d.	Accounted for all site runoff.				
e.	Proper outlet and channel protection.				

11. Design Values		Unit	
a.	Site size (the size of the site may include multiple parcels).		Acre
b.	Number of watersheds on the site.		Count
Complete the following information for each watershed; additional sheet(s) located at the end.			
c.	Existing watershed area.		Ft^2 (SQFT)
d.	Existing watershed impervious area.		Ft^2 (SQFT)
e.	Existing watershed runoff coefficient.		(Unitless)
f.	Existing 10-year, #-hour storm runoff rate		Ft^3/s (CFS)
g.	City allowable runoff (may be less than the 10-year, #-hour runoff rate because of downstream restrictions)		Ft^3/s (CFS)
h.	Final watershed area.		Ft^2 (SQFT)
i.	Final watershed impervious area.		Ft^2 (SQFT)
j.	Final watershed runoff coefficient.		(Unitless)
k.	Final 100-year, #-hour storm runoff rate (note: apply a mark-up of 125%).		Ft^3/s (CFS)
l.	Final outlet / orifice size.		Inches
m.	Watershed volume of detention (note: apply a mark-up of 106%).		Ft^3 (CFT)

12. Itemized Drainage Financial Guarantee		Yes	N/A	Page Number	Section, Paragraph
a.	Provide an itemized list of financial guarantee.				
The Itemized Financial Guarantees shall be a list of drainage elements such as structures, conveyance system(s), detention / retention basins, etc. indicating the: amount to be installed, unit price, total cost for each item, and total cost for the project. Cost for closeout as-built drawings shall be included.					