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APPENDIX C – PAVEMENT DRAINAGE, STORM DRAINAGE, WATER QUALITY AND DETENTION BASIN DESIGN DOCUMENTATION FOR DEVELOPERS OR NON-ODOT PROJECTS

Drainage Report

Drainage calculations, a drainage map, a site plan, construction drawings drawn to scale, and operation and maintenance manual must be submitted to the ODOT Region Technical Center for review and approval. Enough information should be included so the design can be independently verified.

Drainage Calculations

The drainage calculations should be done using the same units as the drainage system plans, as much as practicable. This will help assure a timely review. The drainage calculations should contain the following information:

- a. A narrative and tables as needed describing the characteristics of the contributing drainage basin prior to and after the proposed development, including, but not limited to, areas, soil types, vegetation, storage, runoff coefficients, and other runoff characteristics. A description of the changes to these characteristics due to the proposed development should also be included.
- b. Calculations for the time-of-concentration, including slopes, lengths, hydraulic roughness, and other characteristics of the flow components.
- c. A copy of the rainfall intensity-duration-recurrence interval curve.
- d. The detention basin design calculations, printouts, and tables as per Chapter 12 if the simplified rational method is used, or the method described in Chapter 12 if the hydrograph and routing method is used. It should be clearly shown by calculation that the post-construction release rate from detention meets the requirements in Chapter 12.
- e. Prepare pavement and storm drainage calculations, printouts and tables as per Chapter 13. Enough information should be submitted so the design can be independently verified.
- f. Prepare water quality treatment calculations, printouts and tables as per Chapter 14 for improvements made with ODOT right-of-way. Enough information should be submitted so the design can be independently verified.

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Drainage Map, Site Plan, Construction Drawings and Operation and Maintenance Manual

The drainage map, site plan, construction drawings, and Operation and Maintenance Manual should include but not be limited to the following information:

- a. The drainage basin and sub-basin boundaries with runoff coefficients and soil types if NRCS based methods are used (include on drainage map).
- b. The flow path from the most remote point in the basin that is used to determine the time of concentration (include on drainage map).
- c. The flow paths throughout the site, including directions of flows, points of concentration, and junctions (include on drainage map).
- d. Buildings, landscaped areas, and impervious areas such as parking lots and sidewalks (include on drainage map, site plan, and construction drawings).
- e. Contours of the site prior to development (include on drainage map and construction drawings).
- f. Contours of the site after development (include on drainage map and construction drawings).
- g. Details of the existing and proposed drainage systems including flow line elevations, sizes, materials, lengths, headwater depths for all pipes and ditches, and locations and rim elevations of all inlets and manholes (include on drainage map and construction drawings).
- h. Details of the proposed system that includes the dimensions and bottom elevations of all facilities, and details of the primary and auxiliary outlets. The sizes, types, and elevations of all orifices should be shown (include on drainage map, site plan, and construction drawings).
- i. System Operation and Maintenance Summary should be provided. Reference Section 4.6.6.

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Review Submittal Check List

	Plan Sheet / Comments
OVERVIEW Project Description Location Highway name Highway number Highway Mile post County	
Purpose of Report Pavement drainage Storm drainage Detention Water Quality (ODOT Property Only)	
BACKGROUND Existing drainage system Proposed drainage system	
PAVEMENT DRAINAGE CALCULATIONS Design narrative Design storm Runoff coefficients Drainage basin map (proposed) Time of concentration Peak flow rate Spread width of stormwater flow in gutter calculations Inlet capacity and spacing analysis	
STORM DRAINAGE CALCULATIONS Design narrative Design storm Runoff coefficients Drainage basin map (proposed) Time of concentration Peak flow rate Access structure analysis Pipe sizing analysis Hydraulic grade line analysis	
DETENTION CALCULATIONS Design narrative Design storm Runoff coefficients Drainage basin maps (existing and proposed) Time of concentration Pond storage volume (required and proposed) Peak flow rates (existing and proposed) Storm drain conveyance calculations (orifices, weirs, etc.) Outlet control structure release rates Auxiliary overflow capacity (100-year) Prepare calculations in units in plans System maintenance summary	

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П	XX 7 A 7	FER QUALITY CALCULATIONS (ODOT PROPERTY ONLY)	Reference Page or Appendix and/or Plan Sheet / Comments
	VV AL	Design narrative	Tian Sheet / Comments
	H	Design storm	
	\vdash	Runoff coefficients	
	Η		
	H	Drainage basin map (delineate net new impervious area) Time of concentration	
	Η		
	님	Define water quality facility (pond, swale or water quality structure)	
	님	Storm drain conveyance calculations	
	닏	Outlet control structure release rates (orifice, weirs, etc.)	
	\sqcup	Pond storage volume (required and proposed)	
	Ш	Peak flow rate (swale or water quality structure)	
	Ш	Prepare calculations in units in plans	
	Ш	Estimate when facility will be constructed	
	Ш	System operation summary	
		System maintenance summary	
	<u>DRAWINGS</u>		
		Overall Site plan	
		☐ Existing conditions plan	
		☐ Existing contours	
		Existing drainage system	
		Existing structures	
		Existing waterways, wetlands, and ditches	
		Proposed plan	
	_	Proposed contours or spot elevations	
		Proposed storm drainage system plan and details	
		Proposed detention system plan and details	
		Auxilliary outlet or overflow	
		Screening provided to protect orifices	
		Back-check calculations, plans and details for consistency	
		Existing conditions (shaded)	
		Screening provided to protect orifices Back-check calculations, plans and details for consistency Existing conditions (shaded) Landscape areas	
		Impervious areas	
		☐ Impervious areas ☐ Maintenance access	
		Outfall protection	
		U Outan protection	