**City of Aberdeen**
Engineering Department
200 East Market Street • Aberdeen, WA 98520-5207

# Full Drainage Submittal - Requirements Guide

## *Overview of Full Drainage Submittal*:

The Full Drainage Submittal is a comprehensive submittal addressing Minimum Technical Requirements #1 through #9, found in Volume I-3.4 of the 2019 Stormwater Management Manual for Western Washington (SWMMWW). A link to the online, interactive SWMMWW is provided here:
https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMWW/2019SWMMWW.htm

This guide explains the elements of the Full Drainage Submittal and provides a checklist of all required components.

A Full Drainage Submittal is required when the proposed project results in 5,000 square feet, or more, of new plus replaced hard surface area, ***and***, if the value of the proposed improvements exceed 50% of the assessed value of the existing site improvements; ***or***, if the project converts ¾ acres or more of vegetation to lawn or landscaped area, ***or***, converts 2.5 acres or more of native vegetation to pasture. Please refer to the Glossary in the SWMMWW for definitions and terminology explanation.

The Full Drainage Submittal includes technical engineering requirements and must be prepared and stamped by a Professional Civil Engineer in the State of Washington. The City has adopted the most current version of the SWMMWW as its stormwater design standards and guidance document. All proposed projects shall adhere to the SWMMWW in the design and construction of stormwater improvements.

## *Full Drainage Submittal – Submittal Items*:

The following submittal items are required as part of the Full Drainage Plan:

1) **Civil Construction Plans**
   Civil Construction Plans shall contain all of the proposed improvements and applicable information essential for construction of a project. The plans showing stormwater facilities (e.g., pipes, inlets, detention or infiltration facilities, and water quality treatment measures) must be prepared by a licensed civil engineer. The plans should also be consistent with the Stormwater Site Plan to provide engineering justification and constructability for stormwater facilities. This may include applicable drainage, grading, erosion and sediment control, and topographic survey information, as well as any applicable notes or details. The minimum drawing requirements checklist is provided

with this guide to verify that all submitted drawings contain the necessary information for Engineering Department review.

2) **Stormwater Site Plan**
A Stormwater Site Plan is a crucial element of the Full Drainage Submittal and is necessary for summarizing the design of stormwater facilities. The Stormwater Site Plan shall address all 9 Minimum Requirements and must be consistent with the Civil Construction Plans. **Volume III-3.2 of the SWMMWW** provides a step-by-step process to develop the Stormwater Site Plan and shall be used in completing the document. The Stormwater Site Plan must be prepared by a licensed civil engineer and include all of the steps listed in Volume III-3.2.

A Construction Stormwater Pollution Prevention Plan (CSWPPP) shall be completed as part of the Stormwater Site Plan. All land disturbing activities and projects creating hard surfaces are required to address stormwater runoff from construction areas. Sediment from soil erosion, waste concrete, spills, and other construction materials that may enter stormwater are considered pollutants and must be contained on-site. A Construction Stormwater Pollution Prevention Plan (CSWPPP) outlines the essential procedures for correctly managing stormwater during construction.

3) **Stormwater Facilities Operations and Maintenance Plan**
Once the project is complete and stormwater facilities are constructed, they must be regularly inspected and maintained to assure proper function based on the original design. A Stormwater Facilities Operations and Maintenance Plan identifies the area and facilities requiring routine maintenance and specifies methods for preventing pollution from entering the storm drain system. The plan contains instructions for facility inspection and maintenance, and a legal agreement between the property owner(s) and the City of Aberdeen ensures the facility will continue to remain functional in the future. A checklist for the Stormwater Facilities Operations and Maintenance Plan has been included with this guide to assist in development of a complete plan.

## *Low Impact Development (LID)*

All projects that exceed 2,000 square feet of new plus replaced hard surface are required to manage runoff from those hard surfaces using low impact development techniques and principles. Stormwater runoff from hard surfaces must be managed with rain gardens/bioretention cells, permeable pavements, downspout infiltration, or stormwater dispersion to native vegetation. In addition to mitigating runoff from hard surfaces, all disturbed pervious, landscaped areas on a project must meet the Ecology's requirement for post-construction soil quality and depth.

## *When a Professional Engineer is Required*

State law requires that engineering work be performed by or under the direction of a professional engineer licensed to practice in Washington State. Designs and plans involving construction of water quality treatment facilities, flow control facilities (detention ponds or infiltration basins, vaults, or galleries), structural pollution source control facilities, LID facilities (using

performance standard design), or drainage conveyance systems (such as inlets, pipes, swales, and ditches) shall be prepared by or under the direction of a licensed engineer. The "practice of engineering" is further defined in RCW 18.43.020(5)(a).

All onsite soils evaluations and reports must be prepared by a professional soil scientist certified by the Soil Science Society of America (or equivalent national program), locally licensed on-site sewage designer, or a professional engineer, geologist, hydrogeologist, or engineering geologist registered in the State of Washington.

Full Drainage Submittals that require engineering calculations to size pipes, swales, inlets, infiltration facilities, rain gardens or bioretention cells, downspout infiltration or dispersion, permeable pavements, green roofs, or construction stormwater best management practices shall also be prepared by a licensed engineer. Construction Stormwater Pollution Prevention Plans (SWPPPs) that involve engineering calculations must also be prepared by or under the direction of a licensed engineer.

Full Drainage Submittals for single-family residences and small projects similar in size may use prescriptive methods for sizing onsite stormwater management facilities to comply with Minimum Requirement #5. If these prescriptive methods for facility sizing are used, an engineered plan is not required but all calculations, plans, and supporting documents still must be provided with the submittal.

## *Submittal Checklists*

Please use the attached checklists to confirm all necessary components of the Full Drainage Submittal are included. Missing or incomplete items may result in the denial of your application.

| **CIVIL CONSTRUCTION PLANS<br>MINIMUM DRAWING REQUIREMENTS CHECKLIST**<br>*(applies to all stormwater plan sheets)* | | |
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| ***Applicant check box*** | ***Drawing Item Description*** | ***Staff check box*** |
| **General Plan Requirements** | | |
| ☐ | All final design, construction drawings shall be stamped, signed, and dated by a licensed professional engineer | ☐ |
| ☐ | Vertical datum based on NAVD88 | ☐ |
| ☐ | All sheets shall have a north arrow, scale, a benchmark and datum reference, the section, township, and range. Each set of drawings shall have a legend to define map symbols. North arrow should point to the top or to the left of the sheet | ☐ |
| ☐ | Right-of-way, easements, tract lines, and dimensions for all existing and proposed facilities including proposed roads and intersecting roads, properly dimensioned lot lines, lot numbers, location, and dimension of all tract and easement areas | ☐ |
| ☐ | Parcel boundaries, street alignments, and horizontal control shall include bearings, distances and stationing as appropriate | ☐ |
| ☐ | All topographic features within project limits and sufficient area beyond to resolve questions of setback, slope, drainage features and paths, access onto abutting property, and road continuations | ☐ |
| ☐ | All ditch flow lines, all drainage structures with invert elevations, utility locations, fences, structures, existing curbing and approaches, pertinent trees and shrubbery, and other appurtenances, which would affect the construction of the project | ☐ |
| ☐ | Identification of all existing public roads and adjoining subdivisions when it is pertinent to the scope of the project | ☐ |
| ☐ | Existing features shall be screened back or shaded so as to distinguish from proposed improvements | ☐ |
| **Cover Requirements** | | |
| ☐ | A simple vicinity map, with north arrow oriented to the top of the sheet, showing project site, existing public road system and any other pertinent information | ☐ |
| ☐ | The applicant and project engineering firm's names, address, telephone number, email address, current owner, and parcel numbers | ☐ |

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| ☐ | An index table of drawings within the plan set | ☐ |
| ☐ | Title block | ☐ |
| **Grading & Drainage Requirements** | | |
| ☐ | The project's existing and proposed storm drainage along with easements, tracts, drainage facilities, all buffer and screening areas, Soil and Vegetation Protection Areas, offsite and onsite existing drainage courses, flow dispersal areas and path dimensions, delineated wetlands, and associated buffers | ☐ |
| ☐ | Areas of possible significant environmental concern (gullies, ravines, swales, wetlands, steep slopes, estuaries, springs, creeks, lakes, etc.). For natural drainage features, show direction of flow | ☐ |
| ☐ | 100-year floodplain boundary (if applicable) | ☐ |
| ☐ | Soil logs, soil log locations, and soils within the project site as verified by field testing (and documented in the Geotechnical Report) | ☐ |
| ☐ | Wells and wellhead protection areas – existing and proposed, onsite and on adjacent properties (both of record and not of record) within specified setbacks | ☐ |
| ☐ | Existing and proposed utilities (other than stormwater) | ☐ |
| ☐ | Existing paved and hard surfaces, including roads, roofs, and driveways | ☐ |
| ☐ | Lot dimensions and areas, property lines, parcel numbers, and ownership | ☐ |
| ☐ | Topographic information including contour lines of the property in its existing condition (confirmed with field survey data) | ☐ |
| ☐ | Topographic features that may act as natural stormwater storage, infiltration, or conveyance | ☐ |
| ☐ | Proposed grades and contours | ☐ |
| **Plan and Profile Requirements** | | |
| ☐ | Original surface grade profile at 100-foot stations and at significant ground breaks and topographic features | ☐ |
| ☐ | Typical roadway/storm drainage cross-sections when applicable | ☐ |
| ☐ | Final surface and storm drain profile with stationing the same as the site/grading plan sheets | ☐ |
| ☐ | Type of structure and structure number (matching Stormwater Report) | ☐ |
| ☐ | Stationing/offsets on profile (coordinates on plan view) | ☐ |

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| ☐ | Rim and invert (in and out) for all structures | ☐ |
| ☐ | Pipe length, size, material, and slope | ☐ |
| ☐ | Utility crossings shown on profile view and plan view | ☐ |
| ☐ | Structure information only shown on profile view | ☐ |
| **Detail Drawing Requirements** | | |
| ☐ | A minimum of two cross-sections of each retention/detention pond and bioretention area showing original property lines, slope catch points, and all other pertinent information to adequately construct the pond or bioretention area | ☐ |
| ☐ | Details of flow control structures proposed to meet Minimum Requirement #7 and #8 depicting size, elevation, and orientation of all orifices, weirs, risers, etc. | ☐ |
| ☐ | Details of all facilities intended for treatment of stormwater to meet Minimum Requirement #6. All pertinent flow direction, elevations, and pipe invert information should be included on the detail | ☐ |
| ☐ | Details of all onsite stormwater management BMPs that are used to help achieve compliance with Minimum Requirement #5. If distributed bioretention areas and/or storage below permeable pavement are used, provide details to confirm accurate facility representation in the runoff models. Downspout infiltration and/or dispersion details should be included with appropriate sizing notes/schedule for residential lots | ☐ |
| ☐ | Identify locations and approximate size of all permeable pavement surfaces and/or bioretention areas to be installed, including those that will be installed on individual lots | ☐ |
| ☐ | Identify locations and species types for newly planted or retained trees for which impervious surface reduction credits are claimed. Supporting areas such as the flow paths for dispersion BMPs shall also be shown on the drawings | ☐ |
| ☐ | Standard open conveyance system (e.g., swales, ditches, etc.) cross-sections (if applicable) | ☐ |
| ☐ | Right-of-way cross-sections as required by the City | ☐ |
| ☐ | Construction recommendations from a soils report (if applicable) | ☐ |
| ☐ | Construction sequencing notes for protection of LID facilities and tree protection | ☐ |

| STORMWATER SITE PLAN REQUIREMENTS CHECKLIST | | |
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| ***Applicant check box*** | ***Item Description*** | ***Staff check box*** |
| **General Format** | | |
| ☐ | Cover sheet and/or title page with project information, applicant name, engineer contact information | ☐ |
| ☐ | Project Engineer's Certification statement, with stamp and signature of engineer | ☐ |
| ☐ | Table of Contents | ☐ |
| ☐ | Existing and proposed drainage basin maps with threshold discharge areas (TDA) identified | ☐ |
| ☐ | Work maps (e.g., soil maps, offsite basin maps, conveyance maps, etc.) | ☐ |
| **Proposed Project Description** | | |
| ☐ | Description of permit application submittal | ☐ |
| ☐ | Address, parcel numbers, zoning, and abbreviated legal description for the associated parcel(s) | ☐ |
| ☐ | Summary of development thresholds and how the proposed project meets applicable Minimum Requirements | ☐ |
| ☐ | Discussion and justification for LID BMP selection or infeasibility to meet Minimum Requirement #5 | ☐ |
| ☐ | Brief project description of the entire development project | ☐ |
| ☐ | Tabulation of existing and proposed hard surfaces, pollution generating surfaces, converted vegetation areas, and undisturbed areas by threshold discharge area (TDA) | ☐ |
| ☐ | Summary of proposed conveyance system and sizing | ☐ |
| **Existing Conditions** | | |
| ☐ | Brief description of the existing site conditions | ☐ |
| ☐ | LID feasibility evaluation for the project site | ☐ |
| ☐ | Discussion of existing drainage patterns and discharge from the site | ☐ |
| ☐ | Proximity to aquifer recharge or wellhead protection areas (if applicable) | ☐ |
| ☐ | Proximity and setbacks to critical areas (streams, wetlands, steep slopes, shorelines, etc.), including both onsite and nearby offsite areas | ☐ |
| ☐ | Offsite drainage to or through the project | ☐ |

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| **Soils Investigation** | | |
| ☐ | Description of soil testing procedure and evaluation used | ☐ |
| ☐ | Geotechnical or soils evaluation of the site (include in the appendix) | ☐ |
| ☐ | Discussion of SCS/NRCS soil series mapping and Hydrologic Soil Group | ☐ |
| ☐ | Soil reports completed by a qualified professional | ☐ |
| ☐ | Design infiltration rates determined by the applicable Ecology analysis method and correct equations and factors (i.e. $K_{sat}$, $K_{equiv}$, $f_{design}$) | ☐ |
| ☐ | Depth to groundwater (i.e. any saturated soil stratum) identified on soil logs | ☐ |
| ☐ | Depth to confining soil layers identified on logs or in report | ☐ |
| ☐ | Identification of proposed native soil and vegetation protection areas (SVPAs) on site | ☐ |
| ☐ | Identification of any steep slopes, contaminated soils, or other sensitive soil areas | ☐ |
| ☐ | Discussion of soil suitability for proposed LID, treatment, or flow control BMPs | ☐ |
| **Wells, Septic Systems and Fuel Tanks (**if applicable) | | |
| ☐ | Report presence of existing wells and septic systems in proximity to the site | ☐ |
| ☐ | Address methods for decommissioning wells or septic systems | ☐ |
| ☐ | Address setbacks for wells and septic systems from stormwater facilities | ☐ |
| ☐ | Address existing fuel tanks show on Civil Construction Plans | ☐ |
| ☐ | Address methods for tank removal or abandonment and coordination with Grays Harbor County Environmental Health | ☐ |
| **Sub-basin Description** | | |
| ☐ | Description of offsite drainage tributary to the project | ☐ |
| ☐ | Description of the drainage system between the site and receiving waters | ☐ |
| ☐ | Description of how pre-developed and post developed drainage basins are analyzed for the project (reference work map and basin delineations) | ☐ |
| ☐ | Existing and proposed drainage basin maps are provided and summarized in the body of the report | ☐ |

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| **Floodplain Summary** | | |
| ☐ | FEMA FIRM panel and zone designation included | ☐ |
| ☐ | Base flood elevation reported (if known) | ☐ |
| ☐ | Discussion of any known flooding issues in the area and the extent of the known flooding | ☐ |
| **Landscaping Considerations** | | |
| ☐ | Discussion of trees, fencing, or other screening requirements for facilities | ☐ |
| ☐ | Discussion of long-term maintenance needs of vegetation proposed for the entire stormwater management site | ☐ |
| ☐ | Discussion of Soil and Vegetation Protection Areas | ☐ |
| ☐ | Landscape plans for vegetated facilities included in report | ☐ |
| ☐ | Planting list for ponds, bioretention, etc. | ☐ |
| **Stormwater Facility Design and Sizing** | | |
| ☐ | Applicable structural Source Control BMPs are identified in the report and shown on the Civil Construction Plans. | ☐ |
| ☐ | Pre-developed and Post-developed drainage basins summarized with total land coverage areas in body of report | ☐ |
| ☐ | Each detention and/or infiltration facility has a stage/storage volume table in the body of the report | ☐ |
| ☐ | Discussion of how flow control facilities comply with Minimum Requirement #7 | ☐ |
| ☐ | Discussion of LID facility sizing to meet Minimum Requirement #5 *(from list or performance standard selection)* | ☐ |
| ☐ | Calculations for stormwater facilities are included in the report and correspond to work map or Civil Construction Plans. | ☐ |
| ☐ | WWHM2012 modeling included in appendix for all basins/facilities *(must include at minimum report print out generated from the program; screen shots alone are not acceptable*) | ☐ |
| ☐ | WWHM2012 model includes most current Grays Harbor County precipitation data and uses 15 minute time steps | ☐ |
| ☐ | Pre- and Post-developed drainage basins modeled in WWHM use the same naming convention as the work map or basin maps | ☐ |
| ☐ | Assumptions for sizing facilities have been stated for each design | ☐ |

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| ☐ | Calculation and summary of disturbed pervious and converted native vegetation areas | ☐ |
| ☐ | Listing and discussion of all BMPs proposed for flow control and treatment for the project | ☐ |
| ☐ | Description of lot coverage and stormwater facilities proposed for each lot in a subdivision (residential or commercial) | ☐ |
| ☐ | Discussion of facility setbacks from basements, crawl spaces, steep slopes, etc. | ☐ |
| **Conveyance System Analysis** | | |
| ☐ | Conveyance calculations summarized in body of report (table) | ☐ |
| ☐ | Calculations correspond to pipes and structures listed on plans by same name/callout | ☐ |
| ☐ | Flow rates, velocity, and depth included for each reach analyzed | ☐ |
| ☐ | Hydraulic grade, invert, and rim elevations identified for catch basins and manholes (with backwater analysis) | ☐ |
| ☐ | Inlet capacity flow calculations included in report | ☐ |
| **Offsite Analysis** | | |
| ☐ | Discussion of offsite conditions and proposed mitigation methods | ☐ |
| ☐ | Nearest receiving surface water identified on map and in narrative | ☐ |
| ☐ | Stream basin or watershed where the project is located | ☐ |
| ☐ | Offsite analysis extends ¼ mile downstream | ☐ |
| ☐ | Offsite conveyance map showing downstream flow path is included | ☐ |
| ☐ | Evaluation of existing downstream drainage courses, channels, and/or pipes have been checked for capacity issues | ☐ |
| ☐ | Areas of localized flooding/ponding are identified | ☐ |
| ☐ | Potential erosion impacts at outfalls and discharge points are identified | ☐ |
| ☐ | Address water quality standards and restrictions for receiving waters (e.g. 303d listings, TMDLs, etc.) | ☐ |
| ☐ | Date and time of field inspection of downstream drainage course | ☐ |
| **Covenants, Dedications, Easements, Agreements** | | |
| ☐ | Proposed and existing utilities are described for the project | ☐ |
| ☐ | Potential conflicts between existing utilities and stormwater improvements identified | ☐ |
| ☐ | Presence of onsite sewage systems (OSS) identified and decommissioning discussed | ☐ |

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| ☐ | Describe maintenance agreements and Stormwater Site Management Plans prepared for the project | ☐ |
| ☐ | The Program Operator for maintenance activities is identified | ☐ |
| ☐ | Dedication of tracts or easements for stormwater management are described in the report and shown on plans and work maps | ☐ |
| **Appendix** | | |
| ☐ | Hydrologic and hydraulic modeling program output reports included | ☐ |
| ☐ | Geotechnical reports and soil investigation results included | ☐ |
| ☐ | Any wetland or critical areas reports and studies with stormwater design impacts are included | ☐ |
| ☐ | Supporting calculations for summary design data provided in the body of the report is included | ☐ |
| ☐ | Environmental assessments or investigations are included | ☐ |
| ☐ | Additional specifications or data supporting the design of BMPs identified in the report and on plans | ☐ |

| **STORMWATER FACILITIES OPERATION AND MAINTENANCE REQUIREMENTS CHECKLIST** | | |
|---|---|---|
| ***Applicant check box*** | ***Item Description*** | ***Staff check box*** |
| **Required Plan Elements** | | |
| ☐ | Cover Sheet | ☐ |
| ☐ | Agreement to Maintain Stormwater Facilities | ☐ |
| ☐ | Stormwater Facility Maintenance Program | ☐ |
| **Cover Sheet And Agreement To Maintain Stormwater Facilities** | | |
| ☐ | Cover sheet includes date prepared, project name, and contact information for person or firm responsible for preparation of the Stormwater Facilities Operations and Maintenance Plan | ☐ |
| ☐ | Agreement shall use current template and language from the City | ☐ |
| ☐ | Program Operator or property owner clearly identified | ☐ |

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| ☐ | Full legal description for the property or properties that include stormwater facilities or areas | ☐ |
| ☐ | Agreement signed by program operator or property owner and notarized | ☐ |
| ☐ | Formatting meets Grays Harbor County Auditor requirements for recorded documents | ☐ |
| **Stormwater Facility Maintenance Program** | | |
| ☐ | Maintenance program includes cover sheet with project or plat name, tax parcel numbers containing stormwater facilities to be maintained, and Program Operator identified | ☐ |
| ☐ | Program shall use current maintenance program template and language from the City | ☐ |
| ☐ | Program includes facility inspection description and maintenance checklists for the site | ☐ |
| ☐ | Project key map is included with location of facilities and stormwater management areas clearly identified | ☐ |
| ☐ | Itemized list of stormwater facilities and components found on site (e.g. quantity of catch basins, pipe, treatment vaults, ponds, etc.) | ☐ |
| ☐ | Program includes an itemized annual cost of maintenance for the management site, and replacement costs (stormwater facilities only) | ☐ |
| ☐ | Program includes narrative for management site including description of stormwater system, and description of receiving waters for stormwater leaving the site | ☐ |
| ☐ | Soil and Vegetation Protection Areas are shown on the key maps | ☐ |
| ☐ | All areas designated for stormwater flow dispersion are delineated on the key map and located within an easement or separate tract | ☐ |