Fact Sheet #3

2009 DRAINAGE DESIGN AND EROSION CONTROL MANUAL FOR THURSTON COUNTY

What is Different Between the 1994 Drainage Manual and the 2009 Drainage Manual?

Overview

One big difference between the two manuals is the sheer volume of the documents. The 2009 Drainage Manual consists of over 1,100 pages including text and appendices. The 1994 Drainage Manual consisted of approximately 250 pages. The major additional information included in the 2009 Drainage Manual as compared to the 1994 Drainage Manual includes:

- Greatly expanded detail and explanation for Construction Stormwater Pollution Prevention.
- A full volume (Volume IV, almost 200 pages) related to source control and preparing a source control plan (see Fact Sheet #2, page 3)
- A greatly expanded section on Best Management Practices including greater design detail for each Best Management Practice and detailed information on BMP selection.
- Best Management Practices and site planning practices related to Low Impact Development.

Other Differences between 1994 Drainage Manual and 2009 Drainage Manual

Other general differences between the 1994 Drainage Manual and the 2009 Drainage Manual include:

- Changes in project thresholds for when drainage reports and plans are required (see pages 3 and 4 of this fact sheet).
- Changes in what types of submittals are required and the information required to be contained within each submittal (see pages 3 and 4 of this fact sheet).
- Greater level of detail on maintenance and operations requirements for BMPs (see page 8 of this fact sheet).

These differences are summarized in the table on the following pages:

Item	1994 Manual	2009 Manual
Manual Applicability	1. Throughout Thurston County including Cities that adopt it. 2. All governmental entities including port, utility, irrigation, drainage and flood control districts and other local, state and federal government entities.	**Same as 1994 except that:** 1. Other governmental entities unless they adopt alternative manual equivalent to Ecology 2005 Manual. (i.e. WSDOT Highway Runoff Manual, for example).
What are pre-submittal requirements for projects?	1. Pre-submittal meetings are held for projects as required by Thurston County Development Services and existing Thurston County Code. Typically includes commercial and industrial projects and subdivisions but excludes single family residential projects on a single lot, short plats & large lot plats.	1. Pre-submittal meetings still required per land use codes for the same projects. 2. For any project that exceeds the minimum thresholds for which Flow Control (MR #7) or Runoff Treatment (MR #6) is required the applicant shall submit a Drainage Scoping Report prior to project submittal (see also fact sheet #2). 3. Upon review of the scoping report, the County (or applicant) may request/require a Scoping Meeting to discuss the stormwater management aspects of the project in more detail prior to detailed site plans or applications being submitted.
Categorically Exempt Projects or Projects where No Submittal is Required	1. Public roads if SEPA exempt 2. Public Road Projects within right-of-way that don't add impervious surface. 3. Routine agriculture practices 4. Utilities if no new impervious surfaces created & surfaces are replaced with like kind. 5. Emergency projects. 6. Projects where new impervious surface is less than 5% of the parcel and no discharges to adjoining property or waters of United States is probable. 7. Grading Projects where no permit is required (<50 cubic yards).	**Same as 1994 except also:** 1. Roadway Maintenance & Parking Lot Maintenance not adding impervious area. 2. Utility projects are subject to minimum requirement #2 – Construction Stormwater Pollution Prevention. 3. Oil & Gas Field Activities or Operations. 4. Forest Practices (non-conversion, regulated by DNR) 5. Except that roadway or parking lot projects that remove existing impervious to base course are subject to the re-development thresholds. 6. Public Drainage Facilities, except that government shall meet the intent and requirements of the Manual and maintain records of such compliance.

Item	1994 Manual	2009 Manual
When is an Abbreviated Drainage Plan Allowed?	1. All single family residence/duplex projects on a single lot. (irregardless of size) 2. Where a permit is required for Clearing/Forest Practices <20 acres, if slopes >5%. 3. Clearing greater than 20 acres, if slopes are <5%. 4. Large Lot Plats without engineered roads 5. Cluster subdivisions with no "substantial" discharge to surface water. 6. Marine Bluff (unless special conditions require an engineered abbreviated plan). 7. All other projects including commercial, utility, plats, etc. not meeting threshold for full Drainage and Erosion Control Plan (ie. <5,000 square feet of new impervious surface). 8. County can increase submittal requirements for projects expected to have a significant impact on sensitive natural resources or projects that could exacerbate existing flooding or water quality problems.	**Only on Land Zoned for Residential and:** 1. On a single lot where less than 2,000 square feet of new impervious is created and less than 7, 000 square feet of land is disturbed. 2. Single family residence/duplex with predominately Type A/B (outwash) soils and <5,000 square feet new impervious and less than ¾ acre is disturbed. 3. Projects on a single lot within a development that has an accepted and functioning stormwater system that accounts for future lot development. 4. Project converting less than 2.5 acres from native vegetation to pasture or less than ¾ acre of native vegetation to lawn or landscape. 5. Projects of any size on parcels of greater than 2 ½ acres outside the urban area where soils are predominately Type C/D (till) and where no increase to surface water discharge occurs and where all impervious surface is less than 10% and less than 35% of site is cleared. 6. Projects of any size on parcels of greater than 1 acre outside the urban area where soils are predominately Type A/B (outwash) and where no increase to surface water discharge occurs and where all impervious surface is less than 10% and less than 35% of site is cleared. 7. Grading projects requiring a permit up to 5, 000 cubic yards.

Item	1994 Manual	2009 Manual
When is an Engineered Abbreviated Drainage Plan Required (Civil Engineer must prepare)?	1.Projects on Marine Bluffs if: -within 2:1 area of bluff -applicant proposes infiltration -offsite drainage crosses property -determined necessary by County	**Projects meeting requirements for an Abbreviated Plan but have special circumstances:** 1. Any critical area within 200' of the projects disturbed area. 2. Any project located within the Marine Bluff Hazard Area 3. Lots less than 1 acre in size with soils not classified as predominately Type A/B (outwash) or where the average slope is greater than 10% 4. Land use is commercial or industrial. 5. Project is a subdivision (more than one lot being developed).
When is a Full Drainage & Erosion Control Plan Required	1. Grading >5,000 CY 2. Clearing>20 Acres & >5% slopes 3. Plats, subdivisions, commercial, etc. if >5,000 sf of impervious. 4. If determined necessary for any project if determined by the County that the project would have a significant impact on sensitive natural resources or for projects that could exacerbate existing flooding or water quality problems.	**Any project not exempt or not eligible for an abbreviated or engineered abbreviated drainage plan including:** 1. Grading >5,000 cubic yards 2. Project with >5,000 sf new impervious surface & not eligible for abbreviated plan. 3. Projects that convert greater than 3/4 acre of native vegetation to lawn or landscape. 4. Project that converts greater than 2.5 acres from native vegetation to pasture. 5. Commercial or industrial project with >2,000 sf of new impervious area or >7,000 sf of land disturbing activity. 6. If determined necessary for any project if determined by the County that the project would have a significant impact on sensitive natural resources or for projects that could exacerbate existing flooding or water quality problems.

Item	1994 Manual	2009 Manual
For a Redevelopment or Remodel Project When would a Retrofit of the entire Site to Current Drainage Manual Standards be Required.	1. Project creates >5,000 sf of new impervious surface & results in a 25% increase in impervious surface. 2. Remodel costs 25% or more of assessed value, excluding land, and at least $300,000 3. County determines existing water quality, flooding or other problems can be attributed to the site.	1. Same as 1994 Manual, except that cost threshold is $690,000 for remodel cost and will be adjusted annually based on WSDOT Construction Cost Index. Note: $690,000 represents $300,000 adjusted for construction cost index from 1994 to 2008.
Low Impact Development Techniques and BMP's	Not allowed: except by variance.	1. On-site measures required for all significant projects – roof downspout controls and amended soils. 2. Allows full dispersion (LID) for sites meeting maximum impervious surface area and disturbed area limits. This is the preferred method for residential development in rural areas. 3. Requires soil amendments for all site disturbed soils. 4. Allowed BMP's include: rain gardens, green roofs, downspout infiltration, porous pavements, stormwater dispersion. 5. Allows engineered and natural dispersion for rural roadway projects.
Precipitation Data Used for Modeling Stormwater Facility Performance	1. Single Event 24- hour Storm precipitation data for typical design storms (6-month, 2, 10, 25, 50 & 100 year) . One set of values used for entire county.	1. Continuous record of precipitation from Olympia Airport and Thurston County data stations representing rainfall data at 15-minute increments over a 50+ year period. 2. For conveyance design, continue to use single event storm design precipitation data but based on Isopluvial maps of Thurston County taking into account geographic changes in precipitation values across the county. 3. Accounts for geographical variation in rainfall intensity. 4. Addition of recent large storm events (2006 & 2007) to precipitation data base will improve modeling and possibly result in slightly less of an increase in design pond sizes (see next item below).

Item	1994 Manual	2009 Manual
Hydrologic Computer Modeling to Size Detention Facilities	1. Prescriptive Tables based on impervious and landscape areas (generated based on HSPF computer model). 2. More conservative than most other jurisdictions at the time. 3. Since running HSPF Model is complicated, used a prescriptive approach and tables to size facilities. 4. Detention/retention volume is calculated based on overall site infiltration rate estimate and amount of impervious and disturbed pervious area using tables based on HSPF model. 5. Discharge rates are also based on overall site infiltration rate estimate using a prescriptive method.	1. Continuous Simulation Model (Western Washington Hydrologic Model, WWHM). 2. WWHM is modified by Thurston County to include infiltration & groundwater recharge results, incorporate new rainfall data stations and use a 15 minute time step interval. 3. Detention facility design based on matching developed discharge durations to pre-development durations for discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow (Ecology requirement). 4. Result will generally be larger facilities (ponds) for similar sites. Less impact in southeast portions of county where rainfall is less than Olympia airport data. Higher impact in northwest portions of county where rainfall is higher than Olympia airport data. 5. Pre-development condition based on 2nd Growth Forest, except where historically prairie.
Infiltration Requirements	1. Overall site characterization required to establish minimum infiltration requirements. 2. 0% to 100% infiltration required based on overall site infiltration rate. <0.5 inches/hr = 0% infiltration. >6.0 inches/hr = 100% infiltration. 3. Infiltration requirement based on single event 24-hour, 100-year storm. Minimum infiltration volume is difference between pre-development runoff and post-development runoff.	1. Overall site characterization required to establish if infiltration requirement needs to be met. 2. For project with an overall site infiltration rate >0.5 inches per hour, match average annual pre-development infiltration to average annual post-development infiltration based on continuous simulation hydrologic model (WWHM). 3. If overall site infiltration rates <0.5 inch per hour no minimum infiltration requirement. 4. In assessing minimum infiltration all site facilities including dispersion, rain gardens, etc. can be used to demonstrate compliance with standard.

Item	1994 Manual	2009 Manual
Conveyance System Design	1. Based on single-event model. Uses one set of precipitation data for entire county. 2. On-site pipes & swales: design for 10-year, 24 hour storm. 3. Public road culverts: design for 25-year, 24 hour storm. 4.Bridges and culverts carrying natural channels: design for 100-year, 24 hour storm.	1. Based on single-event model (more conservative for flows) – same as 1994. Use precipitation data from isopluvial maps available for Thurston County. 2. On-site pipes: design for 25-year, 24 hour storm. 3. On-site swales & ditches: design for 100-year, 24 hour storm. 4. Public road culverts: same as 1994. 5. Bridges & culverts carrying natural channels: same as 1994.
Water Quality Facility Design & Selection Criteria	1. Design facilities for 6-month, 24 hour single-event storm. 2. Based on "Hierarchy of Treatment" with constructed wetlands for sites >12 acres impervious; wet pond, biofilter or sand filter for up to 12-acres of impervious; wet vault allowed for sites with <2-acres impervious. 3. One level of treatment, no consideration for metals (enhanced treatment), oils, phosphorous etc.	1. Design facilities based on continuous simulation model flow for which 91% of all flows are less. 2. Implement on-site measures and Low Impact Development (LID) techniques first and to the maximum extent practicable. 3. Phosphorous control measures required if basin flows to phosphorous sensitive waters. (Black, Capitol, Clear, Lawrence, Long and Patterson Lakes). 4 Enhanced treatment (to removal metals) required if commercial, industrial, or multi-family and discharges to fish-bearing stream or tributary of fish-bearing stream. 5. Oil control required if high intensity site use. 6. Wet Vault and Stormfilter™ type vault use is limited to sites where area or other constraints limit use of other BMPs and subject to County approval.

Item	1994 Manual	2009 Manual
Water Quality Best Management Practices Allowed	1. Bio-swale (50' Min Length) 2. Biofiltration strip 3. Constructed Wetland 4. Wet Pond 5. Sand Filter (use restricted) 6. Wet Vault 7. Others – Allowed with variance and/or specific administrator approval.	1. Bio-swale (100' min length), three alternatives, "standard" "wet" and "continuous inflow" 2. Biofiltration strip (Narrow area & standard) 3. Constructed wetland 4. Wet Pond & Large Wet Pond (for enhanced treatment) 5. Sand Filter (several configurations, use not restricted). 6. Media Filter Drain 7. Bioretention (rain gardens). 8. Infiltration treatment (where soils are suitable or amended to be suitable) 9. Dispersion to native vegetation areas or amended soil areas. 10. Bio-infiltration swale 11. Full dispersion (LID) – only for sites meeting maximum impervious surface and cleared area percentages. 12. Wet Vault (use restricted) 13. Proprietary Media Filter (Stormfilter ™) systems (use restricted).
Operation and Maintenance & Financial Assurance	1. O&M Manual Required. 2. Financial assurance required for 2 years after approval. 3. Maintenance Agreement required, allows County to provide maintenance if not performed by property owner. 4. Requires a source control plan	**Same as 1994 except:** 1. Detail of what is required is expanded to ensure consistent submittals for all projects. 2. Financial assurance for minimum of 2 years and until at least 80% buildout for residential subdivisions. 3. Requires developer to maintain ability to perform maintenance or legally transfer financial assurance mechanism to new owner.

For More Information:

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