

City of Tacoma SWMM Table 10.1 Enforceable Document Updates to Match Ecology's Significant Changes

Significant Change Being Addressed	Enforceable Document Being Updated	Section Within the Enforceable Document Being Updated	Text as Written in the 2014 Functionally Equivalent Enforceable Document	Proposed Text to Gain 2019 Functional Equivalency	Page Number & Color
2. Replaced Hard Surfaces Redevelopment Threshold	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.3.5 Redevelopment All text from bullet point 5 through end of section	<ul style="list-style-type: none"> <li>The total of new plus replaced hard surfaces is 5,000 square feet or more and the valuation of the proposed improvements (materials plus labor to construct)...</li> <li>The Building Valuation Data provided by the International Code Council may not include all improvements that can occur on a site...</li> </ul>	<p>For commercial and industrial projects</p> <ul style="list-style-type: none"> <li>The total of new plus replaced surfaces is 5,000...</li> <li>The valuation of the proposed improvements...</li> </ul> <p>For all other project types (not commercial or industrial):</p> <ul style="list-style-type: none"> <li>The total of new plus replaced surfaces...</li> <li>The valuation of the proposed improvements,...</li> </ul> <p>The valuation of the proposed improvements shall... Assessed values can be found on the Pierce County Assessor's website.</p>	1-22 & 1-23 Red
3. Equivalent Areas	City of Tacoma Stormwater Management Manual	Volume Chapter 3 3.3.5 Equivalent Areas Second paragraph	Minimum Requirements may be applied to an equivalent area within the same project site that drains to the same receiving water. For the portion...	The equivalent area facility must discharge to the same discharge point in the receiving water as the project that transferred...	1-23 & 1-24 Red
2. Replaced Hard Surfaces Redevelopment Threshold	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.3.11 Flowcharts Figure 1-6 Redevelopment Flowchart. Text boxes in flow chart.	Is the total of new plus replaced hard surfaces 5,000 square feet or more and does the value of the proposed improvements, including interior improvements, exceed 50% of the assessed value of the existing site improvements?	<p>Is the total of new plus replaced hard surfaces 5,000 square feet or more and does the values of the proposed improvements, including interior improvements, exceed 50% of the assessed value of the:</p> <ul style="list-style-type: none"> <li>Existing Project Site Improvements (for commercial or industrial projects)</li> <li>Existing Site Improvements (for all other projects)</li> </ul>	1-32 Red
4. Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.4.2 Minimum Requirement #2: Construction Stormwater Pollution Prevention Paragraphs 2 - 10	<p>Projects which meet or exceed the thresholds of Volume... The SWPPP shall be implemented with initial... The City has developed a Construction SWPPP...</p> <ul style="list-style-type: none"> <li>Add or replace between 2,000 and 5,000...</li> <li>Clear or disturb between 7,000 square...</li> <li>Grade/fill 50 - 499 cubic yards of material.</li> </ul> <p>If project quantities exceed any of the above... Unless located in a Critical Area, projects below...</p>	<p>Projects that meet or exceed the thresholds in Section... Projects below the thresholds in Section 3.3... The Construction SWPPP shall:</p> <ul style="list-style-type: none"> <li>Include a narrative and drawings.</li> <li>Clearly reference all BMPs used in the narrative.</li> <li>Clearly mark all BMPs on the drawings.</li> <li>Include documentation to explain and...</li> <li>Consider and include all 13 Construction SWPPP...</li> </ul> <p>The Construction SWPPP shall be implemented...</p>	1-36 & 1-37 Red
5. Minimum Requirement 5	City of Tacoma Stormwater Management Manual	Volume Chapter 3 3.4.5 Minimum Requirement #5: Onsite Stormwater Management First paragraph	Projects shall employ, where feasible and appropriate, Onsite Stormwater Management BMPs to infiltrate, disperse, and retain stormwater runoff onsite to the maximum extent feasible without causing flooding, or erosion impacts.	Projects shall employ, Onsite Stormwater Management BMPs to infiltrate, disperse, and retain stormwater runoff onsite to the extent feasible without causing flooding or erosion impacts.	1-40 Red
5. Minimum Requirement 5	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.4.5.1 Compliance Options by Project Type subheading and text under subheading	NA	<p>3.4.5.1 Compliance Options by Project Type Compliance options are based on the proposed improvements, project location, and discharge location.</p>	1-40 Red
5. Minimum Requirement 5	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.4.5.1 Compliance Options by Project Type, First subheading and text under subheading	<p>Project Thresholds - Minimum Requirements #1-5 Except as noted in Volume 1, Section 3.4.5.3, projects triggering only Minimum Requirements #1 through #5 and #10 shall either:</p> <p>a. Use onsite stormwater management BMPs from List #1, per Volume 1, Section 3.4.5.5, for all surfaces within each type of surface in List #1; OR b. Demonstrate compliance with the LID Performance Standard per Volume 1, Section 3.4.5.4. Projects selecting...</p>	<p>Projects that Trigger Only - Minimum Requirements #1-5 Projects triggering only Minimum Requirements #1 through #5, except Flow Control Exempt Projects shall either:</p> <p>a. Use onsite stormwater management BMPs from List #1, Table XX per Volume 1, for all surfaces within each Surface Type in List #1; OR b. Use Flow Control BMPs to achieve the LID Performance Standard AND apply BMP L613: Post Construction Soil Quality and Depth.</p>	1-40 Red

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5. Minimum Requirement 5	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.4.5.1 Compliance Options by Project Type, Second subheading and text under subheading	3.4.5.2 Project Thresholds - Minimum Requirements #1-#10 Except as noted in Volume 1, Section 3.4.5.3, projects triggering Minimum Requirements #1 through #10 shall either: a. Use onsite stormwater management BMPs from List #2 per Volume 1, Section 3.4.5.6, for all surfaces within each type of surface in List #2; OR b. Demonstrate compliance with the LID Performance Standard per Volume 1, Section 3.4.5.4. Projects selecting...	Projects that Trigger – Minimum Requirements #1 - #9 Projects triggering Minimum Requirements #1 through #109, except Flow Control Exempt Projects, shall either: a. Use onsite stormwater management BMPs from List #2, Table xx, for all surfaces within each Surface Type in List #2; OR b. Use Flow Control BMPs to achieve the LID Performance Standard AND apply BMP L613: Post Construction Soil Quality and Depth, if feasible.	1-40 Red
5. Minimum Requirement 5	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.4.5.1 Compliance Options by Project Type, Third subheading and text under subheading	NA	Flow Control Exempt Projects Flow Control Exempt Projects shall either: a. Use onsite stormwater management BMPs from... b. Use Flow Control BMPs to achieve the... If a project has multiple threshold discharge areas...	1-40 & 1-41 Red
5. Minimum Requirement 5	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.4.5.2 Project Thresholds - Marine Waterbodies and Flow Control Exempt Waterbodies 3.4.5.3 Low Impact Development Performance Standard 3.4.5.4 List #1 Onsite Management BMPs for Projects Triggering only Minimum Requirement #1- #5 3.4.5.5 List #2 Onsite Management BMPs for Projects Triggering Minimum Requirements #1- #10. 3.4.5.6 Competing Needs 3.4.5.7 Compliance Methods	3.4.5.2 Project Thresholds - Marine Waterbodies and Flow Control Exempt Waterbodies Projects that discharge to marine waters and... 3.4.5.3 Low Impact Development Performance Standard Stormwater discharges shall match developed... 3.4.5.4 List #1 Onsite Management BMPs for Projects Triggering only Minimum Requirement #1- #5 For each surface category (Lawn and Landscaped... 3.4.5.5 List #2 Onsite Management BMPs for Projects Triggering Minimum Requirements #1- #10. For each surface category (Lawn and Landscaped... 3.4.5.6 Competing Needs The Onsite Stormwater Management BMP...	3.4.5.7 Compliance Methods Low Impact Development Performance Standard Utilize one or a combination of Flow Control BMPs... The List Approach The List Approach requires evaluating the... Table 1-1: The List Approach for MR#5 Compliance	1-41 - 1-47 Red
1. Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.4.7.3.1 Thresholds - Freshwater Protection Requirement Fourth bullet point under subheading	• Projects that, through a combination of hard surfaces and converted vegetation areas, cause a 0.15 cfs or greater increase in the 100-year return period flowrate from a threshold discharge area as estimated using the Western Washington Hydrology Model (assuming a 15-minute time step)	• TDAs that, through a combination of effective hard surfaces and converted vegetation areas, cause a 0.15 cfs or greater increase in the 100-year return period flowrate as estimated using the an approved continuous simulation model (assuming a 15-minute time step).	1-52 Red
1. Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.4.7.3.2.1 Mitigation -Forested Condition Second paragraph under subheading	Using WWHM for design, stormwater discharges shall match developed discharge durations to predeveloped discharge durations...	Using an Ecology approved continuous simulation model for design, stormwater discharges shall match developed discharge...	1-53 Red

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1. Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.4.7.3.2.2 Mitigation - Existing Condition Second paragraph under subheading	Using WWHM for design, stormwater discharges shall match developed discharge durations to existing discharge durations...	Using an Ecology approved continuous simulation model for design, stormwater discharges shall match developed discharge...	1-53 Red
9. Wetlands Guidance	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.4.8.2 Thresholds and Requirements All text under subheading	When either of the thresholds identified in Minimum Requirement #6 – Runoff Treatment, or Minimum Requirement #7 – Flow Control are met or exceeded, this requirement shall also be applied. Minimum Requirement #8 applies regardless of final discharge location.	TDA within projects that meet the thresholds for Minimum Requirement #8 (Volume 1, Section xx) and discharge stormwater directly... The Level of Wetlands Protection is based upon: <ul style="list-style-type: none"> <li>• The Wetland Category into which the TDA discharges</li> <li>• Whether or not the TDA triggered Minimum...</li> <li>• Whether or not the wetland is a depressional...</li> <li>• Whether or not the project proponent has...</li> <li>• The wetland habitat score,</li> <li>• Whether or not the wetland provides...</li> <li>• Whether or not there is a presence of...</li> </ul> The Levels of Protection are: <ul style="list-style-type: none"> <li>• General Protection...</li> <li>• Protection from Pollutants...</li> <li>• Wetland Hydroperiod Protection...</li> </ul> See Volume 8, Chapter xx for additional information...	1-55 & 1-56 Red
9. Wetlands Guidance	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.4.8.3 Standard Requirement All text under subheading	3.4.8.3 Standard Requirement Projects shall comply with Guide Sheets #1 through #3 in Appendix D. The hydrologic analysis shall use the existing land cover unless otherwise directed. Model calibration and pre- and post-development monitoring of wetlands, groundwater levels and water quality may be required.	NA	1-58 Red
9. Wetlands Guidance	City of Tacoma Stormwater Management Manual	Volume 1 Chapter 3 3.4.8.4 Additional Requirements (deleted subheading) First paragraph and bullet points under subheading	Additional Requirements Stormwater treatment and flow control facilities shall not be constructed within a natural vegetated buffer, except for: <ul style="list-style-type: none"> <li>• Necessary conveyance systems as approved by the City; or</li> <li>• As allowed in wetlands approved for hydrologic modification and/or treatment in accordance with Guidesheet 2 in Appendix D of this Volume.</li> </ul>	Stormwater treatment and flow control facilities shall not be constructed within a wetland or its buffer unless approved as part of a Cit of Tacoma Critical Area Verification, Minor Development Permit, and/or Development Permit.	1-58 Red

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9. Wetlands Guidance	City of Tacoma Stormwater Management Manual	Volume 1 Appendix D	Appendix D Guidelines for Wetlands when Managing Stormwater	NA	1-214 - 1-222 Red

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Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #2: Establish Construction Access Bullet 2 under subheading	<ul style="list-style-type: none"> <li>Access points shall be stabilized per BMP C105 – Stabilized Construction Entrance or other City of Tacoma approved equivalent BMPs.</li> </ul>	<ul style="list-style-type: none"> <li>Stabilize access points with a pad of quarry spalls, crushed rock, or other equivalent BMPs. to minimize tracking of sediment.</li> </ul>	2-4 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #3: Control Flow Rates Bullet 1 under subheading	<ul style="list-style-type: none"> <li>Protect properties and waterways downstream of development sites from erosion due to increases in the volume, velocity, and peak flow rate of stormwater runoff from the project site. Requirements of the City of Tacoma Critical Areas Protection Ordinance (TMC 13.11) must be followed during construction as applicable.</li> </ul>	<ul style="list-style-type: none"> <li>Protect downstream properties, receiving waters, and conveyance systems from erosion and other damage due to increases in the volume, velocity, and peak flow rate of stormwater runoff from the project site. A quantitative downstream analysis may be required to ensure no damage to the downstream system during construction. See Volume 1, Additional Protection Measure - Infrastructure Protection.</li> </ul>	2-4 Red (parts of bullet are also Orange & Grey)
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #3: Control Flow Rates Bullet 3 under subheading	<ul style="list-style-type: none"> <li>Where necessary, construct stormwater detention facilities as one of the first steps in grading. Detention facilities shall be functional prior to construction of site improvements (e.g. impervious surfaces). It may be necessary to install temporary detention facilities to meet detention requirements during construction.</li> </ul>	<ul style="list-style-type: none"> <li>Where necessary, construct flow control detention facilities as one of the first steps in grading. Flow control facilities shall be functional prior to construction of site improvements (e.g. impervious surfaces). It may be necessary to install temporary flow control facilities to meet flow control requirements during construction.</li> </ul>	2-4 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #3: Control Flow Rates Bullet 4 under subheading	NA	<ul style="list-style-type: none"> <li>Control structures designed for permanent flow control BMPs are not appropriate for use during construction without modification. If used during construction, modify the control structure to allow for long-term storage of runoff and enable sediments to settle. Verify that the BMP is sized appropriately for this purpose. Restore BMPs to their original design dimensions, remove sediment, and install a final control structure at completion of the project.</li> </ul>	2-4 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #3: Control Flow Rates Bullet 5 under subheading	NA	<ul style="list-style-type: none"> <li>Velocity of water leaving the site shall not exceed 3 feet/second if the discharge is to a stream or ditch.</li> </ul>	2-4 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #3: Control Flow Rates Bullet 6 under subheading	<ul style="list-style-type: none"> <li>Baker tanks or similar may be used to help control flow rates. Calculations for the proposed size of the tank shall be provided to Environmental Services.</li> </ul>	NA	2-5 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #3: Control Flow Rates Bullet 7 under subheading	<ul style="list-style-type: none"> <li>Sites that must implement flow control for the developed condition must also control stormwater release rates during construction. Construction site stormwater discharges shall not exceed the discharge durations of the predeveloped condition for the range of predeveloped discharge rates from ½ of the 2-year flow through the 10-year flow as predicted by WWHM. The predeveloped condition to be matched shall be the land cover condition immediately prior to the project.</li> </ul>	NA	2-5 Red

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Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #3: Control Flow Rates Bullet 8 under subheading	<ul style="list-style-type: none"> <li>During construction, the City may require non-standard temporary sediment control pond designs in order to provide additional flow control necessary to address local conditions or to protect properties and waterways downstream from erosion due to construction activities.</li> </ul>	NA	2-5 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #3: Control Flow Rates Bullet 9 under subheading	<ul style="list-style-type: none"> <li>Permanent infiltration ponds shall not be used for flow control during construction unless specifically allowed in writing by Environmental Services. If allowed, these facilities shall be protected from siltation during the construction phase as required by Environmental Services. A liner may be required. The ponds shall be excavated to final grade after the site is stabilized.</li> </ul>	<ul style="list-style-type: none"> <li>Permanent infiltration facilities shall not be used for flow control during construction unless lined. The bottom of the facility shall be scarified to ensure any compaction that occurred during construction is mitigated</li> </ul>	2-5 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #4: Install Sediment Controls Bullet 3 under subheading	<ul style="list-style-type: none"> <li>Prior to leaving a construction site or prior to discharge to an infiltration facility, stormwater runoff from disturbed areas shall pass through a sediment pond or other appropriate sediment removal BMP.</li> </ul>	<ul style="list-style-type: none"> <li>Prior to leaving a construction site or prior to discharge to an infiltration facility, stormwater runoff from disturbed areas shall pass through a sediment removal BMP.</li> </ul>	2-5 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #4: Install Sediment Controls Bullet 6 under subheading	NA	<ul style="list-style-type: none"> <li>Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, where feasible.</li> </ul>	2-6 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #5: Stabilize Soils Bullet 1 under subheading	<ul style="list-style-type: none"> <li>Stabilize exposed and unworked soils by application of effective BMPs that protect the soil from the erosive forces of raindrop impact, flowing water, and wind.</li> </ul>	<ul style="list-style-type: none"> <li>Stabilize exposed and unworked soils by application of effective BMPs prevent erosion.</li> </ul>	2-6 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #6: Protect Slopes Bullet 2 under subheading	<ul style="list-style-type: none"> <li>Reduce slope runoff velocities by reducing continuous length of slope with terracing and diversions, reducing slope steepness, and/or roughing slope surface.</li> </ul>	NA	2-7 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #6: Protect Slopes Bullet 3 under subheading	<ul style="list-style-type: none"> <li>Divert offsite stormwater (sometimes called run-on) away from slopes and disturbed areas with interceptor dikes and/or swales. Manage clean offsite stormwater separately from stormwater generated on the site.</li> </ul>	<ul style="list-style-type: none"> <li>Divert offsite stormwater (sometimes called run-on) or groundwater away from slopes and disturbed areas with interceptor dikes and/or swales. Manage clean offsite stormwater separately from stormwater generated on the site.</li> </ul>	2-7 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #6: Protect Slopes Bullet 6 under subheading	<ul style="list-style-type: none"> <li>Provide drainage to remove groundwater seepage from the slope surface of exposed soil areas.</li> </ul>	<ul style="list-style-type: none"> <li>Provide temporary or permanent conveyance to remove groundwater seepage from the slope surface of exposed soil areas.</li> </ul>	2-8 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #6: Protect Slopes Bullet 10 under subheading	<ul style="list-style-type: none"> <li>Construction on or near slopes 20% or greater may require evaluation by a geotechnical engineer.</li> </ul>	NA	2-8 Red

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Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #6: Protect Slopes Bullet 11 (sub bullets 4 & 5) under subheading	NA	◦BMP C123: Plastic Covering ◦BMP C124: Sodding	2-8 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #7: Protect Stormwater System Inlets Bullet 2 under subheading	NA	• Clean or remove and replace inlet protection devices when sediment has filled 1/3 of the available storage (unless a different standard is specified by the product manufacturer).	2-9 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #7: Protect Stormwater System Inlets Bullet 4 under subheading	• Inspect inlets weekly at a minimum and after each storm event. Clean or remove and replace inlet protection devices when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).	• Inspect inlets weekly at a minimum and daily during storm events.	2-9 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #9: Control Pollutants Bullet 3 under subheading	• Handle and dispose of all pollutants, including waste materials and demolition debris that occur on site during construction in a manner that does not cause contamination of stormwater.	• Handle and dispose of all pollutants, including waste materials and demolition debris that occur on site in a manner that does not cause contamination of stormwater.	2-10 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #9: Control Pollutants Bullet 4 under subheading	• Provide cover, containment, and protection from vandalism for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health and the environment. Provide secondary containment for tanks holding pollutants. Secondary containment means placing tanks or containers within an impervious structure capable of containing 110% of the volume contained in the largest tank within the containment structure. Double-walled tanks do not require additional secondary containment. If stormwater becomes polluted within the containment structure it must be managed appropriately based upon the pollutant of concern.	• Provide cover, containment, and protection from vandalism for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health and the environment. Provide secondary containment for tanks holding pollutants including onsite fueling tanks. Secondary containment means placing tanks or containers within an impervious structure capable of containing 110% of the volume contained in the largest tank within the containment structure. Double-walled tanks do not require additional secondary containment.	2-10 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #9: Control Pollutants Bullet 5 under subheading	• Use spill prevention and control measures, such as drip pans, when conducting maintenance and repair of heavy equipment and vehicles involving oil changes, hydraulic system drain down, solvent and de-greasing cleaning operations, fuel tank drain down and removal, and other activities which may result in discharge or spillage of pollutants to the ground or into stormwater runoff. Clean contaminated surfaces immediately following any discharge or spill incident. Emergency repairs may be performed onsite using temporary plastic placed beneath and, if raining, over the vehicle.	• Conduct maintenance, fueling and repair of heavy equipment and vehicles, using spill prevention and control measures. Clean contaminated surfaces immediately following any spill incident.	2-10 Red

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Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #9: Control Pollutants Bullet 6 under subheading	NA	<ul style="list-style-type: none"> <li>Conduct oil changes, hydraulic system drain down, solvent and degreasing cleaning operations, fuel tank drain down and removal, and other activities, which may result in discharge or spillage of pollutants to the ground or into stormwater runoff using spill prevention measures, such as drip pans.</li> </ul>	2-10 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #9: Control Pollutants Bullet 7 under subheading	<ul style="list-style-type: none"> <li>Discharge wheel wash or tire bath wastewater to a separate onsite treatment system that prevents discharge to surface water such as closed-loop recirculation or upland applications, or to the sanitary sewer. Wheel wash, or tire bath wastewater shall not include wastewater from concrete washout areas.</li> </ul>	<ul style="list-style-type: none"> <li>Discharge wheel wash or tire bath wastewater to a separate onsite treatment system that prevents discharge to surface water. Alternatively, discharge wheel wash or tire bath wastewater to the wastewater system (only allowed with approval from Environmental Services through SAD Permit).</li> </ul>	2-10 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #9: Control Pollutants Bullet 8 under subheading	<ul style="list-style-type: none"> <li>Only apply agricultural chemicals, including fertilizers and pesticides, when absolutely necessary and only in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Follow manufacturers' recommendations for application rates and procedures.</li> </ul>	<ul style="list-style-type: none"> <li>Apply fertilizers and pesticides in a manner at application rates that will not result in loss of chemicals to stormwater runoff. Follow manufacturers' recommendations for application rates and procedures.</li> </ul>	2-10 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #9: Control Pollutants Bullet 9 under subheading	<ul style="list-style-type: none"> <li>Use BMPs to prevent or treat contamination of stormwater runoff by pH modifying sources. These sources include, but are not limited to, bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, and concrete pumping and mixer washout waters. Construction site operators must adjust the pH of stormwater to prevent violations of water quality standards.</li> </ul>	<ul style="list-style-type: none"> <li>Use BMPs to prevent or treat contamination of stormwater runoff by pH modifying sources. These sources include, but are not limited to, recycled concrete stockpiles, bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, and concrete pumping and mixer washout waters.</li> </ul>	2-10 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #9: Control Pollutants Bullet 10 under subheading	NA	<ul style="list-style-type: none"> <li>Adjust the pH of stormwater if necessary to prevent violations of water quality standards.</li> </ul>	2-10 Red

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Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #9: Control Pollutants Bullet 11 & 12 under subheading	<ul style="list-style-type: none"> <li>Assure that washout of concrete trucks is performed offsite or in designated concrete washout areas only. Do not wash out concrete trucks onto the ground, or into storm drains, open ditches, streets, or streams. Do not dump excess concrete onsite except in designated concrete washout areas. Concrete spillage or concrete discharge to surface waters of the State is prohibited. Do not use upland land applications for discharging wastewater from concrete washout areas.</li> </ul>	<ul style="list-style-type: none"> <li>Manage concrete washout appropriately.                             <ul style="list-style-type: none"> <li>Washout concrete truck drums or concrete handling equipment in onsite or offsite designated concrete washout areas only.</li> <li>Do not washout concrete truck drums or concrete handling equipment onto the ground, into stormwater pipes, into ditches, onto streets, or into streams.</li> <li>Washout of small concrete handling equipment may be disposed of in a formed areas awaiting concrete where it will not contaminate surface or groundwater.</li> <li>Do not use upland land applications for discharging wastewater from concrete washout areas.</li> <li>Do not dump excess concrete onsite, except in designated concrete washout areas.</li> <li>Do not washout concrete truck drums or concrete handling equipment into formed areas awaiting infiltration BMPs.</li> <li>Concrete spillage or concrete discharge directly to groundwater or surface waters of the State is prohibited.</li> </ul> </li> </ul>	2-11 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #9: Control Pollutants Bullet 13 under subheading	<ul style="list-style-type: none"> <li>Written approval from the Department of Ecology is required prior to using chemical treatment other than CO2 or dry ice to adjust pH.</li> </ul>	<ul style="list-style-type: none"> <li>Written approval from the Department of Ecology is required prior to using chemical treatment other than CO2, dry ice, or food grade vinegar to adjust pH.</li> </ul>	2-11 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #9: Control Pollutants Bullet 15 under subheading	NA	<ul style="list-style-type: none"> <li>Uncontaminated water from water-only based shaft drilling for construction of building, road, and bridge foundations may be infiltrated provided the wastewater is managed in a way that prohibits discharge to surface waters. Prior to infiltration, water from water-only based shaft drilling that comes into contact with curing concrete must be neutralized until pH is in the range of 6.5 to 8.5.</li> </ul>	2-11 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #9: Control Pollutants Bullet 16 (sub bullet 7 & 8) under subheading	<ul style="list-style-type: none"> <li>BMP C252: High pH Neutralization Using CO2</li> <li>BMP C253: pH Control for High pH Water</li> </ul>	<ul style="list-style-type: none"> <li>BMP C252: Treating and Disposing of High pH Water</li> </ul>	2-11 Red

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Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #10: Control Dewatering Bullet 1 under subheading	<ul style="list-style-type: none"> <li>All dewatering discharges to the City sewer system (storm or sanitary sewers) require City approval. The approval may include a separate Special Approved Discharge (SAD) permit. Contact a City Source Control Representative at 253-591-5588.</li> </ul>	<ul style="list-style-type: none"> <li>Dewatering discharges to the City of Tacoma stormwater conveyance system or the City of Tacoma wastewater system require City approval through a Special Approved Discharge (SAD) Permit. See <a href="https://www.cityoftacoma.org/government/city_departments/environmentalservices/wastewater/wastewater_permits_and_manuals">https://www.cityoftacoma.org/government/city_departments/environmentalservices/wastewater/wastewater_permits_and_manuals</a> for more information on the SAD Permit Process.</li> </ul>	2-12 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #10: Control Dewatering Bullet 3 under subheading	<ul style="list-style-type: none"> <li>Clean, non-turbid dewatering water, such as well-point groundwater, can be discharged to systems tributary to state surface waters, as specified in Element #8, provided the dewatering flow does not cause erosion or flooding of receiving waters. These clean waters should not be routed through stormwater sediment ponds/tanks.</li> </ul>	<ul style="list-style-type: none"> <li>Clean, non-turbid dewatering water, such as well-point groundwater, can be discharged to systems tributary to state surface waters, as specified in Element #8, provided the dewatering flow does not cause erosion or flooding of receiving waters. Do not route dewatering water through TESC BMPs.</li> </ul>	2-12 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #12: Manage the Project Bullet 3 under subheading	<ul style="list-style-type: none"> <li><b>Coordination with Utilities and Other Contractors</b>– Include surface water management requirements for the entire project, including the utilities and other contractors, in the Construction SWPPP.</li> </ul>	NA	2-13 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #12: Manage the Project Bullet 4a under subheading	<ul style="list-style-type: none"> <li>a. Inspect, maintain, and repair all BMPs as needed to assure continued performance of their intended function.</li> </ul>	<ul style="list-style-type: none"> <li>a. Inspect, maintain, and repair all BMPs as needed to assure continued performance of their intended function. Projects regulated under the Construction Stormwater General Permit (CSWGP) must conduct site inspections and monitoring in accordance with Special Condition S4 of the CSWGP</li> </ul>	2-13 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #12: Manage the Project Bullet 6 under subheading	<ul style="list-style-type: none"> <li><b>Reporting</b> – Report spillage or discharge of pollutants within 24-hours to the City of Tacoma Source Control 24-hour phone number at (253) 502-2222.</li> </ul>	NA	2-14 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #13: Protect Permanent Stormwater BMPs Bullet 1 under subheading	<ul style="list-style-type: none"> <li>Protect all permanent stormwater BMPs from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the BMPs. Restore all BMPs to their fully functioning condition if they accumulate sediment during construction. Sediment impacting Best Management Practices shall be removed before system start-up. Restoring the BMP shall include removal of all sediment</li> </ul>	<ul style="list-style-type: none"> <li>Protect all permanent stormwater BMPs from sedimentation through installation and maintenance of erosion and sediment control BMPs on portions of the site that drain into the BMPs. Restore all BMPs to their fully functioning condition if they accumulate sediment during construction. Sediment impacting Best Management Practices shall be removed before system start-up. Restoring the BMP shall include removal of all sediment and full replacement of treatment media.</li> </ul>	2-15 Red
Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #13: Protect Permanent Stormwater BMPs Bullet 2 under subheading	<ul style="list-style-type: none"> <li>If sediment impacts bioretention or rain garden soil; any sediment-laden soil shall be removed and replaced in order to meet design specifications.</li> </ul>	NA	2-15 Red

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Minimum Requirement 2	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 1 Italic heading: Element #13: Protect Permanent Stormwater BMPs Bullet 3 under subheading	<ul style="list-style-type: none"> <li>Prevent compacting bioretention and rain garden BMPs by excluding construction equipment and foot traffic.</li> </ul>	<ul style="list-style-type: none"> <li>Prevent compacting infiltration facilities by excluding construction equipment and foot traffic.</li> </ul>	2-15 Red

**City of Tacoma SWMM Table 10.1 Enforceable Document Updates to Match Ecology's Significant Changes**

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Concrete Washout BMP	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 2 (was Chapter 3) 2.1.22.2 Conditions of Use Bullet 2 under subheading	<ul style="list-style-type: none"> <li>Concrete trucks, pumpers, or other concrete coated equipment are washed onsite.</li> </ul>	<ul style="list-style-type: none"> <li>Concrete truck drums are washed onsite.</li> </ul>	2-84 Red
Concrete Washout BMP	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 2 (was Chapter 3) 2.1.22.2 Conditions of Use Bullet 3 under subheading	NA	<ul style="list-style-type: none"> <li>Concrete is used as a construction material.</li> </ul>	2-84 Red
Concrete Washout BMP	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 2 (was Chapter 3) 2.1.22.2 Conditions of Use Text under bullet 3 under subheading	NA	At no time shall concrete be washed off into the footprint of an area where an infiltration feature will be installed.	2-84 Red
Concrete Washout BMP	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 2 (was Chapter 3) 2.1.22.2 Conditions of Use Note: and bullet point under note	NOTE: If less than 3 concrete trucks or pumpers need to be washed onsite, the washwater may be disposed of in a formed area awaiting concrete. Do not allow dirty water to enter storm drains, open ditches, or any waterbody.	<ul style="list-style-type: none"> <li>Auxiliary concrete truck components (e.g. chutes and hoses) and small concrete handling equipment (e.g. hand tools, screeds, shovels, rakes, floats, trowels, and wheelbarrows) may be washed into formed areas awaiting concrete pour.</li> </ul>	2-84 Red
Concrete Washout BMP	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 2 (was Chapter 3) 2.1.22.3 Design and Installation Specifications Italic heading: Implementation Bullets 1, 4 & 10 under subheading	<ul style="list-style-type: none"> <li>Perform washout of concrete trucks offsite or in designated concrete washout areas only.</li> </ul>	<ul style="list-style-type: none"> <li>Perform washout of concrete truck drums at an approved offsite location or in designated concrete washout areas only.</li> <li>Wash equipment difficult to move, such as concrete paving machines, in areas that do not directly drain to natural or constructed stormwater conveyance or potential infiltration areas.</li> <li>Concrete washout areas shall be constructed and maintained in sufficient quantity and size to contain all liquid and concrete waste generated by washout operations.</li> </ul>	2-84 & 2-85 Red
Concrete Washout BMP	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 2 (was Chapter 3) 2.1.22.3 Design and Installation Specifications Italic heading: Education Bullet 3 under subheading	NA	<ul style="list-style-type: none"> <li>Arrange for the contractor's superintendent or Certified Erosion and Sediment Control Lead (CESCL) to oversee and enforce concrete waste management procedures.</li> </ul>	2-85 Red
Concrete Washout BMP	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 2 (was Chapter 3) 2.1.22.3 Design and Installation Specifications Italic heading: Contracts Subheading paragraph under subheading	NA	Contracts Incorporate requirements for concrete waste management into concrete supplier and subcontractor agreements.	2-85 Red
Concrete Washout BMP	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 2 (was Chapter 3) 2.1.22.3 Design and Installation Specifications Italic heading: Concrete Truck Washout Procedures Subheading and all bullets under subheading	NA	Concrete Truck Washout Procedures <ul style="list-style-type: none"> <li>Washout concrete truck drums in designated concrete washout areas only.</li> <li>Concrete washout from concrete pumper bins can be washed into concrete pumper trucks and discharged into designated concrete washout areas or properly disposed of offsite.</li> </ul>	2-85 Red

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Concrete Washout BMP	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 2 (was Chapter 3) 2.1.22.3 Design and Installation Specifications Italic heading: Concrete Washout Area Installation Subheading and all text under subheading	NA	Concrete Washout Area Installation <ul style="list-style-type: none"> <li>• Install concrete washout areas prior to starting concrete work.</li> <li>• Construct concrete washout areas of sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations. It is recommended that the minimum length and width be 10 feet.</li> <li>• Plastic lining should be a minimum of 10-mil polyethylene sheeting and free of holes, tears, or other defects that compromise impermeability.</li> <li>• Lath and flagging should be commercial grade.</li> <li>• Install liner seams per manufacturer's recommendations.</li> <li>• Prepare soil base free of rocks or other debris that may cause tears of holes in plastic lining.</li> </ul>	2-85 & 2-86 Red
Concrete Washout BMP	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 2 (was Chapter 3) 2.1.22.4 Onsite Temporary Concrete Washout Facility, Transit Truck Washout Procedures: Subheading and all text under subheading	2.1.22.4 Onsite Temporary Concrete Washout Facility, Transit Truck Washout Procedures: <ul style="list-style-type: none"> <li>• Locate temporary washout facilities at least 50 feet from sensitive areas including storm drain inlets, open drainage facilities, and surface waterbodies...</li> </ul> Temporary Above-Grade Concrete Washout Facility <ul style="list-style-type: none"> <li>• Temporary concrete washout facility (type above grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and minimum width of 10 ft, but with sufficient quantity and volume to contain all liquid and concrete waste generated by washout operations...</li> </ul> Temporary Below-Grade Concrete Washout Facility <ul style="list-style-type: none"> <li>• Temporary concrete washout facilities (type below grade) should be constructed as shown on the details at the end of this BMP, with a recommended minimum length and minimum width of 10 ft...</li> </ul>	NA	2-86 Red
Concrete Washout BMP	City of Tacoma Stormwater Management Manual	Volume 2 Chapter 2 (was Chapter 3) 2.1.22.5 Inspection and Maintenance Bullet 2 under subheading	NA	<ul style="list-style-type: none"> <li>• Once concrete wastes are washed into designated washout areas and allowed to harden, the concrete should be broken up, removed, and disposed of per applicable solid waste regulations. Dispose of hardened concrete on a regular basis.</li> </ul>	2-87 Red

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Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 1 (new) Chapter 1 Source Control BMPs Applicable to All Sites	NA	BMP S101: Labeling Stormwater Inlets	3-6 Red
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 1 (new) 1.2 BMP S101: Labeling Stormwater Inlets BMP heading, subheadings and all text under headings	NA	1.2 BMP S101: Labeling Stormwater Inlets	3-9 Red

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Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.2.7 BMP S113: Dock Washing BMP heading, subheadings and all text under headings	NA	2.2.7 BMP W106: Dock Washing	3-37 & 3-38 Red
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.3.3 BMP S116: Storage of Dry Pesticides and Fertilizers BMP heading, subheadings and all text under headings	NA	2.3.3 BMP S116: Storage of Dry Pesticides and Fertilizers	3-45 Red
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.3.7 BMP S120: Temporary Storage or Processing of Fruits or Vegetables	S120: Temporary Storage of Processing of Fruits or Vegetables is equivalent to Ecology BMP S445		3-58
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.4.3 BMP S124: For In-Water and Over-Water Fueling BMP heading, subheadings and all text under headings	NA	2.4.3 BMP S124: For In-Water and Over-Water Fueling	3-64 - 3-66 Red
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.5.2 BMP S126: Demolition	S126: Demolition is equivalent to Ecology's S438		3-69 & 3-70
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.5.3 BMP S127: Building, Repair, Remodeling and Construction	S127: Building Repair, Remodeling, and Construction is equivalent to Ecology's S451		3-71 & 3-72
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.5.5 BMP S129: Roof Vents BMP heading, subheadings and all text under headings	NA	2.5.5 BMP S129: Roof Vents	3-74 Red
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.8.5 BMP S138: Water Reservoir, Transmission Mainline, Wellhead, and Hydrant Flushing Activities	S138: Water Reservoir, Transmission Mainline, Wellhead, and Hydrant Flushing BMP is equivalent to Ecology BMP S441.		3-93
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.19.2 BMP S144: Implement Integrated Pest Management Measures Pesticides and Integrated Pest Management	S144: Pesticides and Integrated Pest Management is equivalent to Ecology BMP S435		3-107 - 3-110

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Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.10.3 BMP S145: Fertilizer Application BMP heading, subheadings and all text under headings	NA	2.10.3 BMP S145: Fertilizer Application	3-111 & 3-112 Red
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.10.4 BMP S146: Irrigation BMP heading, subheadings and all text under headings	NA	2.10.4 BMP S146: Irrigation	3-113 & 3-114 Red
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.12.2 S148 BMP: Goose Waste BMP heading, subheadings and all text under headings	NA	2.12.2 S148 BMP: Goose Waste	3-116 & 3-117 Red
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.12.3 S149 BMPs for Pet Waste BMP heading, subheadings and all text under headings	NA	2.12.3 S149 BMPs for Pet Waste	3-118 Red
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.13.3 BMP S152: Color Events BMP heading, subheadings and all text under headings	NA	2.13.3 BMP S152: Color Events	3-123 & 3-124 Red
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.12.2 BMP S154: Nurseries and Greenhouses BMP heading, subheadings and all text under headings	NA	2.12.2 BMP S154: Nurseries and Greenhouses	3-126 & 3-127 Red
Source Control BMP	City of Tacoma Stormwater Management Manual	Volume 3 (was Volume 4) Chapter 2 (was Chapter 4) 2.13.12 BMP S161: Well, Utility, Directional and Geotechnical Drilling BMP heading, subheadings and all text under headings	NA	2.13.12 BMP S161: Well, Utility, Directional and Geotechnical Drilling	3-141 & 3-142 Red

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Minimum Requirement #5	City of Tacoma Stormwater Management Manual	Volume 5 Chapter 1	NA	Chapter 1 Minimum Requirement #5	5-2 - 5-6 Red

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Minimum requirement #7	City of Tacoma Stormwater Management Manual	Volume 7 Chapter 1 Chapter 1 Minimum Requirement #7 - Flow Control 1.1 Flow Control Thresholds: 1.2 Flow Control Types: Headings and all text under headings	NA	<p>Chapter 1 Minimum Requirement #7 - Flow Control</p> <p>1.1 Flow Control Thresholds</p> <p>Threshold Discharge Areas within projects that trigger the thresholds for Minimum Requirement #7 (See Volume 1 - Minimum Requirements) must utilize BMPs to provide flow control...</p> <p>1.2 Flow control Types</p> <p>The type of flow control is dependent upon the receiving waterbody.</p> <ul style="list-style-type: none"> <li>• Freshwater Protection - Forested Condition Mitigation:...</li> <li>• Freshwater Protection - Existing Condition Mitigation:...</li> <li>• Flow Control Exempt Waterbodies:...</li> </ul>	7-2 Red

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Minimum Requirement #8	City of Tacoma Stormwater Management Manual	Volume 8 Chapter 1 1.1 Wetlands Protection Thresholds: 1.2 Determining Required Levels of Protection: 1.2.1 Wetland Delineation Report 1.3 Levels of Protection 1.3.1 General Protection 1.3.2 Protection for Pollutants 1.3.3 Wetland Hydroperiod Protection 1.3.3.1 Wetland Hydroperiod Data Collection and Evaluation Procedures All subheadings and all text under subheadings	NA	Chapter 1 Minimum Requirement #8 - Wetlands Protection 1.1 Wetlands Protection Thresholds: TDAs within projects that meet the thresholds for Minimum Requirement #8 (Volume 1, Section xx) and discharge stormwater directly or indirectly to a wetland must provide Wetlands Protection.1.2 Determining Required Levels of Protection... 1.2 Determining Required Levels of Protection: 1.2.1 Wetland Delineation Repair In order to assess the impacts and risks to wetlands and to determine the required level of protection, a wetland delineation report is required... 1.3 Levels of Protection 1.3.1 General Protection All wetlands (Categories I, II, III and IV) must receive the following general protection:... 1.3.2 Protection from Pollutants All wetlands (Categories I, II, III and IV) must receive the following protection from pollutants:... 1.3.3 Wetland Hydroperiod Protection Protection of many wetland functions and values depends on maintaining the existing wetland's hydroperiod... 1.3.3.1 Wetland Hydroperiod Data Collection and... Method 1 Field Monitoring and Data Collection Field monitoring data of the wetland must be collected to determine the existing pre-project hydroperiod, which will then	8-2 - 8-12 Red

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Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 2 2.3.1.7 Post Construction Soil Quality and Depth Modeling, all text under subheading	In WWHM 2012, for sizing flow control devices, areas meeting the design guidelines may be modeled as pasture rather than lawn... Flow reduction credits can be taken in runoff modeling when Post-Construction Soil Quality and Depth is used as part of a dispersion design under the conditions described in:...	All areas meeting the soil quality and depth design criteria may be entered into approved runoff models as "Pasture" rather than "Lawn/Landscaping".	11-13 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 2 2.4.2.6 Flow Credit for Roof Downspout Full Infiltration, first sentence under subheading	If roof runoff is infiltrated according to the requirements of this section, the area draining to the infiltration facility is not entered into WWHM.	If roof runoff is infiltrated according to the requirements of this section, the area draining to the infiltration facility is not entered into an Ecology approved continuous simulation model.	11-32 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 2 2.4.4.5.13 Bioretention Modeling, second, third and fourth bold subheadings	<b>For facilities sized to meet Minimum Requirement #6, Water Quality:</b> Use WWHM and model the facility using the bioretention element. Size the facility to treat or infiltrate the water quality design volume which is 91% of the total runoff volume as predicted by WWHM. Alternatively, size the facility to treat 100% of the water quality design volume. The surface pool drawdown time shall be 24 hours or less. <b>For facilities sized to meet Minimum Requirement #7, Flow Control:</b> Use WWHM and model the facility using the bioretention element. Size the facility to meet the flow control requirements. The surface pool drawdown time shall be 24 hours or less.	<b>For facilities sized to meet the Low Impact Development Performance Standard.</b> Model the facility using the bioretention element within a Washington State Department of Ecology approved continuous simulation model. Size the facility to meet the Low Impact Development Performance Standard. The surface pool drawdown time shall be 24 hours or less. <b>For facilities sized to meet Minimum Requirement #6, Water Quality:</b> Model the facility using the bioretention element within a Washington State Department of Ecology approved continuous simulation model. Size the facility to treat or infiltrate the water quality design volume which is 91% of the total runoff volume as predicted by WWHM. Alternatively, size the facility to treat 100% of the water quality design volume. The surface pool drawdown time shall be 24 hours or less. <b>For facilities sized to meet Minimum Requirement #7, Flow Control:</b> Use WWHM and model the facility using the bioretention element. Model the facility using the bioretention element within a Washington State Department of Ecology approved continuous simulation model. Size the facility to meet the flow control requirements. The surface pool drawdown time shall be 24 hours or less.	11-60 Red

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Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 2 2.5.4.5.3.1 Permeable Ballast Base Course, second sentence of first paragraph, second and third sentence of second paragraph	<p>The applicant shall submit WWHM calculations showing the proposed ballast thickness is sufficient as a reservoir layer to manage stormwater runoff based on the design criteria applicable to the project.</p> <p>The applicant shall submit WWHM calculations showing the required ballast thickness is sufficient as a reservoir layer based on the design criteria applicable to the project. Projects required to comply with Minimum Requirements #6, 7, or 8 shall submit WWHM calculations.</p>	<p>The applicant shall submit modeling with an Ecology approved continuous simulation model showing the proposed ballast thickness is sufficient as a reservoir layer to manage stormwater based on the design criteria applicable to the project.</p> <p>The applicant shall submit modeling results from an Ecology approved continuous simulation model showing the required ballast thickness is sufficient as a reservoir layer based on the design criteria applicable to the project. Projects required to comply with Minimum Requirements #6, 7, or 8 shall submit modeling results from an Ecology approved continuous simulation model.</p>	11-89 Red

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Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 3 3.2.3.2 Water Quality Design Flow Volume, last paragraph of subsection	NA	Stormwater treatment facilities are sized using either a water quality design volume or a water quality design flowrate. Refer to the design criteria within each BMP to determine whether the water quality design volume or water quality design flowrate is used for sizing the facility. The water quality design volume can be calculated using either method: A. An Ecology approved continuous simulation model to obtain the water quality design volume. B. A single event model to obtain the total volume of runoff from the 6-month, 24-hour storm event, assuming a Type 1A distribution, using the SBUH method. The 6-month, 24-hour storm event in the City of Tacoma is 1.44"	11-100 & 11-101 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 3 3.2.3.3 Water Quality Design Flowrate, first paragraph under subheading	A. Preceding Detention Facilities or when Detention Facilities are not required: The flowrate at or below which 91% of the runoff volume, as estimated by WWHM, will be treated.....	Stormwater treatment facilities are sized using either a water quality design volume or a water quality design flowrate. Refer to the design criteria within each BMP to determine whether the water quality design volume or water quality design flowrate is used for sizing the facility. The water quality design flowrate is dependent on the location of the stormwater treatment facility relative to detention BMPs: A. Upstream of Detention or Where No Detention Exists:...	11-101 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 3 3.2.3.3 Water Quality Design Flowrate First bullet point under section B.	• WWHM shall identify the 2-year return frequency flow rate discharged by a detention facility that is designed to meet the flow duration standard.	• An Ecology approved continuous simulation model shall identify the 2-year return frequency flow rate discharged by a detention facility that is designed to meet the flow duration standard.	11-101 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 3 3.7.1.5.1 Sizing, first paragraph under subheading	The size of the infiltration facility can be determined by routing the influent runoff file generated by WWHM through it.	The size of the infiltration facility can be determined by routing the influent runoff file generated by an Ecology approved continuous simulation model through it.	11-127 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 3 3.7.1.5.1 Sizing Last sentence under subheading	Using the output files from WWHM, ensure the total of any bypass and overflow from the facility meets the applicable LID performance standard.	Using the output files from an Ecology approved continuous simulation model, ensure the total of any bypass and overflow from the facility meets the applicable LID performance standard.	11-129 Red

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Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 3 3.7.2.4 Design Criteria for All Sand Filtration BMPs	<p>1. Sand filters shall be sized to capture and treat the water quality design volume, which is 91% of the total runoff volume as predicted by WWHM.</p> <p>4. Online sand filters placed downstream of a detention facility must be sized using WWHM to filter the water quality design volume.</p> <p>5. Offline sand filters placed upstream of a detention facility must have a flow splitter designed to send all flows at or below the 15-minute water quality flow rate, as predicted by WWHM to the sand filter. The sand filter must be sized to filter all the runoff sent to it (no overflows from the treatment facility should occur).</p> <p>6. Offline sand filters placed downstream of a detention facility must have a flow splitter designed to send all flows at or below the 2-year return period flowrate as estimated by WWHM, from the detention facility to the treatment facility. The treatment facility must be sized to filter all the runoff sent to it (no overflows from the treatment facility should occur).</p>	<p>2. Sand filters shall be sized to capture and treat the water quality design volume, which is 91% of the total runoff volume as predicted by an Ecology approved continuous simulation model.</p> <p>5. Online sand filters placed downstream of a detention facility must be sized using an Ecology approved continuous simulation model to filter the on-line water quality design flowrate. This ensures the sand filter is treating 91% of the total runoff volume.</p> <p>6. Offline sand filters placed upstream of a detention facility must have a flow splitter designed to send all flows at or below the 15-minute water quality flow rate, as predicted by an Ecology approved continuous simulation model to the sand filter. The sand filter must be sized to filter all the runoff sent to it (no overflows from the treatment facility should occur).</p> <p>7. Offline sand filters placed downstream of a detention facility must have a flow splitter designed to send all flows at or below the 2-year return period flowrate as estimated by an Ecology approved continuous simulation model, from the detention facility to the treatment facility. The treatment facility must be sized to filter all the runoff sent to it (no overflows from the treatment facility should occur).</p>	11-142 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 3 3.7.6.1 Sizing Procedure for Biofiltration Swales, Freeboard Check subheading, Text under F.1	S.1 Perform the stability check for the 100-year, return frequency flow using 15-minute time steps using WWHM.	F.1 Determine Qconvey which is the 100-year, return frequency flow using an Ecology approved continuous simulation model..	11-173 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 3 3.7.10.3 Design Criteria, fifth paragraph under subheading	The CAVFS shall treat 91% of the influent runoff file through the soil profile using WWHM. WWHM 2012 contains a CAVFS element that shall be used for design.	CAVFS shall be designed to treat 91% of the influent runoff file through the soil profile. Use the CAVFS element of an Ecology approved continuous simulation model to ensure this requirement is met.	11-192 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 3 3.7.11.3.1 Sizing Procedure, text under 1. under subheading	1. Identify required wetpool volume using the SCS (now known as NRCS) curve number equations. A basic wetpond requires a volume equal to or greater than the total volume of runoff from the 6-month, 24-hour storm event, or, alternatively, the water quality design volume using WWHM. A large wetpond requires a volume at least 1.5 times the total volume of runoff from the 6-month, 24-hour storm event or 1.5 times the water quality design volume using WWHM.	1. Calculate the required wetpool volume V using either: a. An Ecology approved continuous simulation model to obtain the water quality design volume. b. A single event model to obtain the total volume of runoff from the 6-month, 24-hour storm event, assuming a Type 1A distribution, using the SBUH method. The 6-month, 24-hour storm event in the City of Tacoma is 1.44"	11-198 Red

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Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 4 4.2.1.3.1 Flows Requiring Treatment, second sentence of second paragraph.	In WWHM model these areas using the permeable pavement element.	In WWHM an Ecology approved continuous simulation model, these areas using the permeable pavement element.	11-240 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 4 4.2.5.5.1 Sizing First sentence of first paragraph.	The size of the infiltration facility can be determined by routing the influent runoff file generated by WWHM through it.	The size of the infiltration facility can be determined by routing the influent runoff file generated by an Ecology approved continuous simulation model through it.	11-248 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 4 4.2.6.3.3 Detention Facility Overflow Frst sentence under subheading	In all ponds, tanks, and vaults, a primary overflow (usually a riser pipe within the control structure; see Section 7.5) shall be provided to bypass the 100-year, 24-hour developed peak flowrate or the 100-year return period flowrate as estimated by WWHM, over or around the restrictor system.	In all ponds, tanks, and vaults, a primary overflow (usually a riser pipe within the control structure; see BMP xx: Control Structures) shall be provided to bypass the 100-year return period flowrate as estimated by an Ecology approved continuous simulation model, over or around the restrictor system.	11-257 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 4 4.2.7.1.7 Emergency Overflow Spillway Second bullet point under subheading	<ul style="list-style-type: none"> <li>As an option for ponds with berms less than 2 feet in height and located at grades less than 5 percent, emergency overflow may be provided by an emergency overflow structure, such as a Type II manhole fitted with a birdcage as shown in Figure 3 - 3. The emergency overflow structure must be designed to pass the 100-year, 24-hour developed peak flowrate or 100-year return period flowrate as estimated using WWHM, with a minimum of 6 inches of freeboard, directly to the downstream conveyance system or another acceptable discharge point.</li> </ul>	<ul style="list-style-type: none"> <li>As an option for ponds with berms less than 2 feet in height and located at grades less than 5 percent, emergency overflow may be provided by an emergency overflow structure, such as a Type II manhole fitted with a birdcage as shown in Figure 11 - 17. The emergency overflow structure must be designed to pass the 100-year return period flowrate as estimated using an Ecology approved continous simulation model, with a minimum of 6 inches of freeboard, directly to the downstream conveyance system or another acceptable discharge point.</li> </ul>	11-263 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 4 4.4.4.2.4 Vegetated Rooftop Modeling All text under subheading	Modeling in WWHM is required to obtain flow credits. The applicant can elect to model the facility using the Green Roof element	Use the Green Roof element in an Ecology approved continuous simulation model to model vegetated roofs.	11-293 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 4 4.4.4.3.4 Rainwater Harvesting Modeling Second bullet under subheading	<ul style="list-style-type: none"> <li>100% of the annual average runoff volume (using WWHM) is re-used, or</li> </ul>	<ul style="list-style-type: none"> <li>100% of the annual average runoff volume ( predicated by an Ecology approved continuous simulation model) is re-used, or</li> </ul>	11-293 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 4 4.4.4.4.4 Minimal Excavation Foundation Modeling First bullet under subheading	<ul style="list-style-type: none"> <li>Modeling in WWHM is required to obtain flow credits.</li> </ul>	<ul style="list-style-type: none"> <li>Modeling using an Ecology approved continuous simulation model is required.</li> </ul>	11-294 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 11 Chapter 4 4.4.4.5.4 Reverse Slope Sidewalk Modeling Second bullet point under subheading	<ul style="list-style-type: none"> <li>Modeling in WWHM is required to obtain flow credits. Model the facility using the Lateral Flow Element to send impervious areas onto lawn areas for dispersion.</li> </ul>	<ul style="list-style-type: none"> <li>Modeling in an Ecology approved continuous simulation model is required to obtain flow credits. The applicant can elect to model the facility using the Lateral Flow Element to send impervious areas onto lawn areas for dispersion or model the sidewalk area as lawn/landscaped over existing soil type.</li> </ul>	11-295 Red

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Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 12 Chapter 1 1.1.1 Minimum Computational Standards First bullet point under subheading	<ul style="list-style-type: none"> <li>WWHM shall be used for designing flow control and water quality treatment BMPs.</li> </ul>	<ul style="list-style-type: none"> <li>A Ecology approved continuous simulation model shall be used for designing flow control and water quality treatment BMPs.</li> </ul>	12-2 Red
Continuous Simulation Modeling	City of Tacoma Stormwater Management Manual	Volume 12 Chapter 1 1.1.2 Continuous Simulation Model Subheading and all text under subheading	<p>Western Washington Hydrology</p> <p>For most flow control design purposes, a continuous runoff model, such as the Western Washington Hydrology Model (WWHM), must be used. Information on the WWHM is provided in the Stormwater Management Manual for Western Washington (Washington State Department of Ecology, 2012). The software can be downloaded at the following website:  <a href="http://www.ecy.wa.gov/programs/wq/stormwater/wwhmraining/index.html">http://www.ecy.wa.gov/programs/wq/stormwater/wwhmraining/index.html</a>                      More WWHM information is available at  <a href="http://www/clearcreeksolutions.com">http://www/clearcreeksolutions.com</a></p>	<p>1.1.2 Continuous Simulation Model</p> <p>Use only Ecology approved continuous simulation models. See <a href="https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMWW/2019SWMMWW.htm#Topics/AppStatusOfContSimModel.htm">https://fortress.wa.gov/ecy/ezshare/wq/Permits/Flare/2019SWMMWW/2019SWMMWW.htm#Topics/AppStatusOfContSimModel.htm</a> for a list of current Ecology approved models.</p> <p>C Type soils shall be used for modeling purposes unless a Soils Report stamped by a Washington State Licensed Professional Engineer or Washington State Licensed Professional Geologist substantiates through soil characterization that a different soil type is appropriate for modeling.</p>	12-2 & 12-3 Red