Glossary, Acronyms, and Notations

Glossary

The following terms are provided for reference and use with this manual.

Absorption	The penetration of a substance into or through another, such as the dissolving of a soluble gas in a liquid.
Administrator	See Director.
Adsorption	The adhesion of a substance to the surface of a solid or liquid often used to extract pollutants by causing them to be attached to such adsorbents as activated carbon or silica gel. Hydrophobic, or water-repulsing adsorbents, are used to extract oil from waterways when oil spills occur. Heavy metals such as zinc and lead often adsorb onto sediment particles.
Aeration	The process of being supplied or impregnated with air. In waste treatment, the process used to foster biological and chemical purification. In soils, the process by which air in the soil is replenished by air from the atmosphere. In a well-aerated soil, the soil air is similar in composition to the atmosphere above the soil. Poorly aerated soils usually contain a much higher percentage of carbon dioxide and a correspondingly lower percentage of oxygen.
Aerobic	Living or active only in the presence of free (dissolved or molecular) oxygen.
Agricultural Activities	The normal actions associated with the production of crops such as: plowing, cultivating, minor drainage, and harvesting, and/or raising or keeping of livestock, including operation and maintenance of farm and stock ponds, drainage ditches, irrigation systems, and normal operation, maintenance, and repair of existing serviceable agricultural structures, facilities, or improved areas. The term “agricultural activities” as used within this Title does not include the practice of aquaculture. Forest practices regulated under Chapter 76.09 RCW and Title 222 WAC are not included in this definition.
Algal Bloom	Proliferation of living algae on the surface of lakes, streams, or ponds often stimulated by phosphate over-enrichment. Algal blooms reduce the oxygen available to other aquatic organisms.
American Association of State Highway and Transportation Officials (AASHTO) Classification	The official classification of soil materials and soil aggregate mixtures for highway construction, used by the American Association of State Highway and Transportation Officials.
American Public Works Association (APWA)	The Washington State Chapter of the American Public Works Association.
Anti-Seep Collar	A device constructed around a pipe or other conduit and placed through a dam, levee, or dike for the purpose of reducing seepage losses and piping failures.
Applicant	Means the person, party, firm, corporation, or other legal entity that proposes to develop property in the City of Gig Harbor by submitting an application for any of the activities covered by these Regulations.

Appurtenances	Machinery, appliances, or auxiliary structures attached to a main structure, but not considered an integral part thereof, for the purpose of enabling it to function.
Aquifer	A geologic stratum containing groundwater that can be withdrawn and used for human purposes, and must be protected from pollutants.
Areas of Special Flood Hazard	Critical Area regulated per Ch. 18.08 GHMC. Land in a floodplain within the City subject to a 1 percent or greater chance of flooding in any given year. Designations on FEMA maps will include the letter “A” or “V.” Areas of Special Flood Hazard will also include “shaded X” zones (formerly called “B” zones by FEMA).
As-Built Drawings	As-constructed engineering plans that include all changes made to a project during construction and submitted to the City. All drawing changes shall be made by a professional engineer or land surveyor. Also referred to as record drawings.
Assessed Value	The value of the existing improvements excluding land as listed in current records at the Pierce County Assessor's Office. Alternately, the applicant may provide current appraisal information and request that it be substituted for the Assessor's records.
Assignment of Funds	Retention of funds by a bank to guarantee that work is completed in compliance with City of Gig Harbor requirements.
Average Daily Traffic	Means the general unit of measurement for traffic defined as the total volume during a given time period (in whole days) greater than 1 day and less than 1 year divided by the number of days in that time period.
Background	A description of pollutant levels arising from natural sources, and not because of man's immediate activities.
Backwater	Water upstream from an obstruction or conveyance roughness that is deeper than it would normally be without the obstruction or roughness.
Baffle	A device to check, deflect, or regulate flow.
Base Flood	The flood having a 1 percent chance of being equaled or exceeded in any given year, also referred to as the “100-year flood.”
Base Flood Elevation (BFE)	The water surface elevation, in feet, above mean sea level for the base flood and referenced to the North American Vertical Datum of 1988.
Baseline sampling	Sampling performed to define the existing environmental and biological conditions present before any modification occurs.
Basin	An area from which surface runoff is concentrated, usually to a single point such as the mouth of a stream.
Bedrock	The more or less solid rock in place either on or beneath the surface of the earth. It may be soft, medium, or hard and have a smooth or irregular surface.
Bench	Means a relatively level step excavated into natural earth or fill material.
Berm	A constructed barrier typically made of compacted earth, rock, or gravel. In a stormwater facility, a berm may serve as a vertical divider.
Best Management Practice (BMP)	The schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants and other adverse impacts to waters of Washington.

Biochemical Oxygen Demand (BOD)	An indirect measure of the concentration of biologically degradable materials present in organic wastes. Also called biological oxygen demand.
Biodegradable	Capable of being readily broken down by biological means, especially by microbial action.
Bioengineering	The combination of biological, mechanical, and ecological concepts (and methods) to control erosion and stabilize soil with vegetation or in combination with natural and synthetic construction materials.
Biofilter	A designed treatment facility using a combined soil and vegetation system for filtration, infiltration, adsorption, and biological uptake of pollutants in stormwater when runoff flows over and through the facility. Vegetation growing in these facilities acts as both a physical filter, which causes gravity settling of particulates by regulating velocity of flow, and as a biological sink when direct uptake of dissolved pollutants occurs.
Biofiltration	The process of reducing pollutant concentrations in water by filtering the polluted water through biological materials.
Biological Control	A method of controlling pest organisms by means of introduced or naturally occurring predatory organisms, sterilization, the use of inhibiting hormones, or other means, rather than by mechanical or chemical means.
Bioretention Areas	Small-scale, shallow retention/detention facilities dispersed through the development site that utilize specific soil mixes and plant species to infiltrate and filter runoff from developed sites.
Bioretention BMP	Engineered facilities that store and treat stormwater by passing it through a specified soil profile, and either retain or detain the treated stormwater for flow attenuation. Refer to Section 3.4 of Volume III for Bioretention BMP types and design specifications.
Bollard	A post (may or may not be removable) used to prevent vehicular access.
Bond	A surety bond to guarantee that work is completed in compliance with City of Gig Harbor requirements.
Buffer	The zone contiguous with a sensitive area that is required for the continued maintenance, function, and structural stability of the sensitive area.
Building Setback Line	A line measured parallel to a property, easement, drainage facility, or buffer boundary, that delineates the area (defined by the distance of separation) where buildings or other obstructions are prohibited.
Catch Basin	A chamber or well, usually built at the curb line of a street, for the admission of surface water to a stormwater drainage system, having at its base a sediment sump designed to retain grit and detritus below the point of overflow.
Catch line	The point where a steeper slope intercepts a different, gentler slope.
Catchment	Surface drainage area or basin.
Cation Exchange Capacity (CEC)	Cations are positively charged ions such as calcium (Ca2+), magnesium (Mg2+), and potassium (K+), sodium (Na+) hydrogen (H+), aluminum (Al3+), iron (Fe2+), manganese (Mn2+), zinc (Zn2+) and copper (Cu2+). The capacity of the soil to hold on to these cations called the cation exchange capacity (CEC). Units are milli-equivalents per 100 g of soil, typically abbreviated simply as meq. Soil found to have a CEC of 5 meq at pH 7 will have CEC < 5 meq when pH < 7.

Certification	Means a written engineering opinion, stamped, signed, and dated by an engineer, concerning the progress or completion of work.
Certified Erosion and Sediment Control Lead (CESCL)	An individual who has current certification through an approved erosion and sediment control training program that meets the minimum training standards established by the Department (see BMP C160 in the *Stormwater Management Manual* for *Western Washington*). A CESCL is knowledgeable in the principles and practices of erosion and sediment control. The CESCL must have the skills to assess site conditions and construction activities that could impact the quality of stormwater and, the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges. Certification is obtained through an Ecology approved erosion and sediment control course. Course listings are provided online at Ecology's web site.
Channel	A feature that conveys surface water and is open to the air.
Channel, Constructed	Channels or ditches constructed (or reconstructed natural channels) to convey surface water.
Channel, Natural	Streams, creeks, or swales that convey surface/groundwater and have existed long enough to establish a stable route and/or biological community.
Channelization	Alteration of a stream channel by widening, deepening, straightening, cleaning, or paving certain areas to change flow characteristics.
Check Dam	Small dam constructed in a channel or other small watercourse to decrease the streamflow velocity, minimize channel scour, and promote deposition of sediment.
Chemical Oxygen Demand (COD)	A measure of the amount of oxygen required to oxidize organic and oxidizable inorganic compounds in water. The COD test, like the BOD test, is used to determine the degree of pollution in water.
Civil Engineer	see professional engineer
Civil Engineering	The application of the knowledge of the forces of nature, principles of mechanics and the properties of materials to the evaluation, design and construction of civil works for the beneficial uses of mankind.
Clearing	The destruction and/or removal of vegetation by manual, mechanical, or chemical methods
Closed Depression	An area which is low-lying and either has no, or such a limited, surface water outlet that during storm events the area acts as a retention basin or pothole area.
Cluster Subdivision	A form of development that permits a reduction in lot area, setbacks, and the arrangement of lots such that there is no increase in the number of lots permitted under a conventional subdivision or increase in the overall density of development. The remaining land area is devoted to open space, active recreation, preservation of sensitive areas, or agriculture.
Cohesion	The capacity of a soil to resist shearing stress, exclusive of functional resistance.
Coliform Bacteria	Microorganisms common in the intestinal tracts of man and other warm-blooded animals; all the aerobic and facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35 degrees Celsius. Used as an indicator of bacterial pollution.

Compaction	The densification, settlement, or packing of soil in such a way that permeability of the soil is reduced. Compaction effectively shifts the performance of a hydrologic group to a lower permeability hydrologic group. Compaction may also refer to the densification of a fill by mechanical means.
Compost	Organic material that has undergone biological degradation and transformation under controlled conditions designed to promote aerobic decomposition at a solid waste facility in compliance with the requirements of Chapter 173-350 WAC, or biosolids composted in compliance with Chapter 173-308 WAC. Composting is a form of organic material recycling. Natural decay of organic solid waste under uncontrolled conditions does not result in composted material. (Note: Various BMPs have restrictions on the percentage of biosolids in compost, or do not allow biosolids in compost.)
Comprehensive Planning	Planning that takes into account all aspects of water, air, and land resources and their uses and limits.
Conservation District	A public organization created under state enabling law as a special-purpose district to develop and carry out a program of soil, water, and related resource conservation, use, and development within its boundaries, usually a subdivision of state government with a local governing body and always with limited authority. Often called a soil conservation district or a soil and water conservation district.
Constructed Wetland	Those wetlands intentionally created on non-wetland areas for the primary purpose of stormwater treatment and managed as such. Constructed wetlands are normally considered as part of the stormwater collection and treatment system and are subject to maintenance requirements. (These wetlands are not the same as wetlands created for mitigation purposes, which are viewed in the same manner as natural, regulated wetlands.)
Construction Stormwater Pollution Prevention Plan (SWPPP)	A document that describes the potential for pollution problems on a construction project, and explains and illustrates the measures to be taken on the construction site to control those problems.
Contour	An imaginary line on the surface of the earth connecting points of the same elevation.
Converted Vegetation (Areas)	The surfaces on a project site where native vegetation, pasture, scrub/shrub, or unmaintained non-native vegetation (e.g., Himalayan blackberry, scotch broom) are converted to lawn or landscaped areas, or where native vegetation is converted to pasture.
Conveyance	A mechanism for transporting water from one point to another, including but not limited to: pipes, ditches, channels, culverts, gutters, manholes, weirs, man-made and natural channels, water quality filtration systems, drywells, etc.
Conveyance system	The drainage facilities, both natural and man-made, which collect, contain, and provide for the flow of surface and stormwater from the highest points on the land down to a receiving water. The natural elements of the conveyance system include swales and small drainage courses, streams, rivers, lakes, and wetlands. The human-made elements of the conveyance system include gutters, ditches, pipes, channels, and most retention/detention facilities.
City, the	The City of Gig Harbor Public Works Director or designee; also Gig Harbor, its duly authorized representatives, and the jurisdictional boundaries of Gig Harbor.

Critical Areas	As defined by Chapter 18.08 Critical Areas GHMC.
Critical Tree Root Zone	The area surrounding the tree trunk where the roots of the tree should not be disturbed. The radius of the area is usually based on trunk diameter at diameter breast height and tree species.
Culvert	Pipe or concrete box structure that drains open channels, swales, or ditches under a roadway or embankment. Typically has no catch basins or manholes along its length.
Cut	Portion of land surface or area from which earth has been removed or will be removed by excavating; the depth below original ground surface to excavated surface.
Cut-and-Fill	Process of earth moving by excavating part of an area and using the excavated material for adjacent embankments or fill areas.
Cut Slope	A slope formed by excavating overlying material to connect the original ground surface with a lower ground surface created by the excavation. A cut slope is distinguished from a bermed slope, which is constructed by importing soil to create the slope.
Dead Storage	The volume available in a depression in the ground below any conveyance system, or surface drainage pathway, or outlet invert elevation that could allow the discharge of surface and stormwater runoff.
Dedication	Is the deliberate appropriation of land by an owner for any general and public uses, reserving to himself no other rights than such as are compatible with the full exercise and enjoyment of the public uses to which the property has been devoted. The intention to dedicate land within a subdivision or short subdivision shall be evidenced by the owner by the presenting for filing a final plat or short plat showing the dedication thereon; and the acceptance by the public shall be evidenced by the approval of such plat for filing by the appropriate governmental unit. See RCW 58.17.020(3).
Degradation	The breakdown (biological or chemical) of complex organic or other chemical compounds into simpler substances, usually less harmful than the original compound, as with the degradation of a persistent pesticide. The (geological) wearing down by erosion. The lowering of the water quality of a watercourse by an increase in the pollutant loading.
Degraded (Disturbed) Wetland (Community)	A wetland (community) in which the vegetation, soils, and/or hydrology have been adversely altered, resulting in lost or reduced functions and values. Generally, implies topographic isolation; hydrologic alterations such as hydroperiod alteration (increased or decreased quantity of water), diking, channelization, and/or outlet modification; soils alterations such as presence of fill, soil removal, and/or compaction; accumulation of toxicants in the biotic or abiotic components of the wetland; and/or low plant species richness with dominance by invasive weedy species.
Design Engineer	See professional engineer
Design Storm (Design Event)	A prescribed hyetograph and total precipitation amount (for a specific duration recurrence frequency) used to estimate runoff for a hypothetical storm of interest or concern for the purposes of analyzing existing drainage, designing new drainage facilities or assessing other impacts of a proposed project on the flow of surface water.
Design Year Average Daily Traffic	The planned average daily traffic five years after the road is scheduled to be built.

Detention	The release of stormwater runoff from the site at a slower rate than it is collected by the stormwater facility system, the difference being held in temporary storage.
Detention Facility	An above or below ground facility, such as a pond or tank, that temporarily stores stormwater runoff and subsequently releases it at a slower rate than it is collected by the drainage facility system. There is little or no infiltration of stored stormwater.
Detention Pond	A detention facility in the form of an open pond.
Detention Time	The theoretical time required to displace the contents of a stormwater treatment facility at a given rate of discharge (volume divided by rate of discharge).
Developer	The person or legal entity who holds title to the property or has a sufficient interest in the project to propose the project. The developer of the project.
Development	Any man-made change to improved or unimproved real estate including, but not limited to, buildings or other structures, placement of manufactured home/mobile home, mining, dredging, clearing, filling, grading, paving, excavation, drilling operations, or the subdivision of property. See also the definitions for new development, redevelopment, and land disturbing activities.
Director	The Gig Harbor Public Works Director , or their designees, as necessary to ensure compliance with these Regulations, unless explicitly referenced otherwise.
Discharge	Runoff leaving a new development or redevelopment via overland flow, built conveyance systems, or infiltration facilities. A hydraulic rate of flow, specifically fluid flow; a volume of fluid passing a point, per unit of time, commonly expressed as cubic feet per second, cubic meters per second, gallons per minute, gallons per day, or millions of gallons per day.
Discharge Point	The location where a discharge leaves the City's MS4 through MS4 facilities/BMPs designed to infiltrate.
Dispersed Discharge (Dispersion)	The release of surface and stormwater runoff such that the flow spreads over a wide area and is located so as not to allow flow to concentrate anywhere upstream of a drainage channel with erodible underlying granular soils.
Disturbed Area	An area inside project boundaries altered from its natural state.
Disturbed Soils	An area inside the project boundaries where the soils have reduced infiltration, retention, and soil permeability than what would be present in a forested or prairie state due to previous development or land use.
Ditch	A long narrow excavation dug in the earth for drainage with its top width less than 10 feet at design flow.
Drain	A buried pipe or other conduit (closed drain). A ditch (open drain) for carrying off surplus surface water or groundwater.
(To) Drain	To provide channels, such as open ditches or closed drains, so that excess water can be removed by surface flow or by internal flow. To lose water (from the soil) by percolation.
Drainage	Refers to the collection, conveyance, containment, and/or discharge of surface and stormwater runoff.
Drainage Basin	A geographic and hydrologic subunit of a watershed.

Drainage Channel	A drainage pathway with a well-defined bed and banks indicating frequent conveyance of surface and stormwater runoff.
Drainage Course	A pathway for watershed drainage often intermittent in flow.
Drainage Easement	A legal encumbrance that is placed against a property's title to reserve specified privileges for the users and beneficiaries of the drainage facilities contained within the boundaries of the easement.
Drainage Pathway	The route that surface and stormwater runoff follows downslope as it leaves any part of the site.
Drainage Review	An evaluation by the City of a proposed project's compliance with the drainage requirements in this manual or its technical equivalent.
Drainage, Soil	As a natural condition of the soil, soil drainage refers to the frequency and duration of periods when the soil is free of saturation; for example, in well-drained soils the water is removed readily but not rapidly; in poorly drained soils the root zone is waterlogged for long periods unless artificially drained, and the roots of ordinary crop plants cannot get enough oxygen; in excessively drained soils the water is removed so completely that most crop plants suffer from lack of water. Strictly speaking, excessively drained soils are a result of excessive runoff due to steep slopes or low available water-holding capacity due to small amounts of silt and clay in the soil material. The following classes are used to express soil drainage: • Well drained - Excess water drains away rapidly and no mottling occurs within 36 inches of the surface. • Moderately well drained - Water is removed from the soil somewhat slowly, resulting in small but significant periods of wetness. Mottling occurs between 18 and 36 inches. • Somewhat poorly drained - Water is removed from the soil slowly enough to keep it wet for significant periods but not all of the time. Mottling occurs between 8 and 18 inches. • Poorly drained - Water is removed so slowly that the soil is wet for a large part of the time. Mottling occurs between 0 and 8 inches. • Very poorly drained - Water is removed so slowly that the water table remains at or near the surface for the greater part of the time. There may also be periods of surface ponding. The soil has a black to gray surface layer with mottles up to the surface.
Drainage System	Refers to the combination of BMPs, collection, conveyance, retention, detention, treatment and outfall features or structures on a project.
Drawdown	Lowering of the water surface (in basins or open channel flow), water table or piezometric surface (in groundwater flow) resulting from a withdrawal of water.
Driveway	A vehicle driving surface within a single lot or parcel that connects a building or structure with a road, shared access facility, alley, or vehicle driving surface within an ingress/egress easement (or tract). A driveway begins at the right-of-way line, private road easement (or tract) line, shared access easement (or tract) line, alley easement (or tract) line, or ingress/egress easement (or tract) line, and extends to the building or structure.
Driveway Approach	A privately maintained vehicle driving surface that provides a transition between a road and a driveway, a road and a shared access facility, or a road and an alley.

Drop Structure	A structure for dropping water to a lower level and dissipating its surplus energy; a fall. A drop may be vertical or inclined.
Earth / Earth Material	Means naturally occurring rock, soil, stone, dirt, or a combination thereof.
Earthwork	Means any operation involving the excavation, grading, filling, or moving of earth materials.
Easement	The legal right to use a described piece of land for a particular purpose. It does not include fee ownership, but may restrict the owner's use of the land. All easements granted pursuant to the manual shall be legally recorded with the County Auditor.
Effective Impervious Surface	Those impervious surfaces that are connected via sheet flow or discrete conveyance to a drainage system. See also “Ineffective Impervious Surface.”
Embankment	A structure of earth, gravel, or similar material raised to form a pond bank or foundation for a road, building pad, or similar fill for a particular use.
Emergency Spillway	A channel used to safely convey flood discharges in excess of the capacity of the principal outlet, or in the event of a failure of the outlet to function as designed, e.g. a blockage.
Emergent Plants	Aquatic plants that are rooted in the sediment but whose leaves are at or above the water surface. These wetland plants often have high habitat value for wildlife and waterfowl, and can aid in pollutant uptake.
Emerging Technology	Treatment technologies that have not been evaluated with approved protocols, but for which preliminary data indicate that they may provide a necessary function(s) in a stormwater treatment system. Emerging technologies need additional evaluation to define design criteria to achieve, or to contribute to achieving, state performance goals, and to define the limits of their use.
Energy Dissipater	Any means by which the total energy of flowing water is reduced. In stormwater design, they are usually mechanisms that reduce velocity prior to, or at, discharge from an outfall in order to prevent erosion. They include rock splash pads, drop manholes, concrete stilling basins or baffles, and check dams.
Energy Gradient	The slope of the specific energy line (i.e., the sum of the potential and velocity heads).
Engineer	A professional engineer currently licensed in the State of Washington in civil engineering, retained by and acting on behalf of the applicant. The term “engineer” also means design engineer and project engineer.
Engineered Soil	This is a self-sustaining soil and plant system that simultaneously supports plant growth, soil microbes, water infiltration, nutrient and pollutant adsorption, sediment and pollutant biofiltration, water interflow, and pollution decomposition. The system shall be protected from compaction and erosion. The system shall be planted and/or mulched as part of the installation.
Enhancement	Actions performed to improve the condition of existing critical areas and/or buffers so that the quality of their functions or values are increased (e.g., increasing plant diversity, increasing fish and wildlife habitat, installing environmentally compatible erosion controls, removing non-indigenous plant or animal species, removing fill material or solid waste).
Environmental Impact Statement (EIS)	A document that discusses the likely significant adverse impacts of a proposal, ways to lessen the impacts, and alternatives to the proposal.

	They are required by the national and state environmental policy acts when projects are determined to have significant environmental impact.
Environmentally Sensitive Area (Sensitive Area)	See Critical Areas Chapter 18.08 GHMC
Erodible Granular Soils	Soil materials that are easily eroded and transported by running water, typically fine or medium grained sand with minor gravel, silt, or clay content. Such soils are commonly described as Everett or Indianola series soil types in the SCS classification. Also included are any soils showing examples of existing severe stream channel incision as indicated by unvegetated stream banks standing over 2 feet high above the base of the channel.
Erodible or leachable materials	Wastes, chemicals, or other substances that measurably alter the physical or chemical characteristics of runoff when exposed to rainfall. Examples include erodible soils that are stockpiled, uncovered process wastes, manure, fertilizers, oily substances, ashes, kiln dust, and garbage dumpster leakage.
Erosion	The wearing away of the land surface by running water, wind, ice, or other geological agents, including such processes as gravitational creep. Also, detachment and movement of soil or rock fragments by water, wind, ice, or gravity. The following terms are used to describe different types of water erosion: Accelerated erosion – Erosion much more rapid than normal or geologic erosion, primarily from the influence of the activities of man or, in some cases, of the animals or natural catastrophes that expose bare surfaces (e.g., fires). Geological erosion – The normal or natural erosion caused by geological processes acting over long geologic periods and resulting in the wearing of mountains, the building up of floodplains, coastal plains, etc. Synonymous with natural erosion. Gully erosion – The erosion process whereby water accumulates in narrow channels and, over short periods, removes the soil from this narrow area to considerable depths, ranging from 1 to 2 feet to as much as 75 to 100 feet. Natural erosion – Wearing away of the earth's surface by water, ice, or other natural agents under natural environmental conditions of climate, vegetation, etc., undisturbed by man. Synonymous with geological erosion. Normal erosion – The gradual erosion of land used by man that does not greatly exceed natural erosion. Rill erosion – An erosion process in which numerous small channels only several inches deep are formed; occurs mainly on recently disturbed and exposed soils. See Rill. Sheet erosion – The removal of a fairly uniform layer of soil from the land surface by runoff. Splash erosion – The spattering of small soil particles caused by the impact of raindrops on wet soils. The loosened and spattered particles may or may not be subsequently removed by surface runoff.
Erosion and Sediment Control Facility	A type of drainage facility designed to hold water for a period to allow sediment contained in the surface and stormwater runoff directed to the facility to settle out to improve the quality of the runoff.
Erosion and Sedimentation Control	Any temporary or permanent measures taken to reduce erosion; control siltation and sedimentation; and ensure that sediment-laden water does not leave the site.

Erosion and Sedimentation Control Plan	See Construction Stormwater Pollution Prevention Plan (SWPPP).
Erosive Soils	See Erodible Granular Soils.
Estuarine wetland	Generally, a vegetated wetland where the salinity of the surface or port waters is greater than 0.5 parts per thousand.
Estuary	A water passage where saltwater meets fresh water. Estuaries often contain saltmarshes and other wetlands, which are important habitat for many species.
Eutrophication	Refers to the process where nutrient over-enrichment of water leads to excessive growth of aquatic plants, especially algae.
Evapotranspiration	The collective term for the processes of evaporation and plant transpiration by which water is returned to the atmosphere.
Excavation	The mechanical removal of earth material.
Exfiltration	The downward movement of runoff through the bottom of an infiltration BMP into the soil layer or the downward movement of water through soil.
Existing Site Conditions	Existing site conditions may be described as follows: For previously developed sites with stormwater facilities that have been constructed to meet the standards of this manual, this shall mean the current conditions on the site. For previously developed sites that do not have stormwater facilities that meet the standards of this manual, existing site conditions shall be considered under redevelopment regulations For undeveloped sites, this shall mean the condition of the site prior to the influence of Euro-American settlement. The predeveloped condition shall be assumed to be forested land cover unless reasonable, historic information is provided that indicates the site was prairie prior to settlement. Exception: If the site is located in a critical and/or sensitive area that affects drainage as defined by city ordinances, the Director may require that a more restrictive definition of existing site conditions be utilized for calculating runoff characteristics.
Experimental Best Management Practice (BMP)	A BMP that has not been tested and evaluated by the Washington State Department of Ecology in collaboration with local governments and technical experts.
Fertilizer	Any material or mixture used to supply one or more of the essential plant nutrient elements.
Fill	“Fill or fill material” means the deposit of organic or inorganic material by human or mechanical means.
Filter Fabric	A woven or non-woven, water-permeable material generally made of synthetic products such as polypropylene and used in stormwater management and erosion and sedimentation control applications to trap sediment or prevent the clogging of aggregates by fine soil particles. See the WSDOT standard specifications and amendments, specifically, Section 9-33 Construction Geotextiles.
Filter Fabric Fence	A temporary sediment barrier consisting of a filter fabric stretched across and attached to supporting posts, and entrenched. The filter fence is constructed of stakes and synthetic filter fabric with a rigid wire fence backing where necessary for support. Also commonly referred to in the Washington Department of Transportation standard specifications as “construction geotextile for temporary silt fences.”

Filter Strip	A grassy area with gentle slopes that treats stormwater runoff from adjacent paved areas before it concentrates into a discrete channel.
Flocculation	The process by which suspended colloidal or very fine particles are assembled into larger masses or floccules that eventually settle out of suspension. This process occurs naturally but can also be caused by such chemicals as alum.
Flood	"Flood" or "flooding" means a general and temporary condition of partial or complete inundation of normally dry land areas from: (1) The overflow of inland or tidal waters, and/or (2) The unusual and rapid accumulation of runoff of surface waters from any source.
Flood Control	Methods or facilities for reducing flood risks and the extent of flooding.
Flood Frequency	The frequency with which the flood of interest may be expected to occur at a site in any average interval of years. Frequency analysis defines the "n-year flood" as being the flood that will, over a long period of time, be equaled or exceeded on the average once every "n" years.
Flood Fringe	The area subject to inundation by the base flood, but outside the limits of the floodway, and which may provide needed temporary storage capacity for flood waters.
Flood Hazard Areas	Those areas subject to inundation by the base flood. Includes, but is not limited to streams, lakes, wetlands, and closed depressions. Also referred to as special flood hazard areas.
Flood Insurance Rate Map (FIRM)	The official map on which the Federal Insurance Administration has delineated areas of special flood hazard and the risk premium zones applicable to the City of Gig Harbor.
Flood Routing	An analytical technique used to compute the effects of system storage dynamics on the shape and movement of flow represented by a hydrograph.
Flood Stage	The stage at which overflow of the natural banks of a stream begins.
Floodplain	The total area subject to inundation by a flood including the flood fringe and floodway.
Floodway	The channel of a river, marine water, or other watercourse, and the adjacent land areas that must be reserved in order to convey and discharge the base flood without cumulatively increasing the water surface elevation by more than one foot, those areas designated as deep and/or fast-flowing water or mapped at severe risk of channel migration.
Flow Control BMP (or facility)	A drainage facility designed to mitigate the impacts of increased surface and stormwater runoff flow rates generated by development. Flow control facilities are either designed to hold water for a considerable length of time and then release it by evaporation, plant transpiration, and/or infiltration into the ground, or designed to hold runoff for a short period, releasing it to the conveyance system at a controlled rate.
Flow duration	The aggregate time that peak flows are at or above a particular flow rate of interest. For example, the amount of time that peak flows are at or above 50 percent of the 2-year recurrence interval peak flow rate for a period of record.
Flow Frequency	The inverse of the probability that the flow will be equaled or exceeded in any given year (the exceedance probability). For example, if the exceedance probability is 0.01 or 1 in 100, that flow is referred to as the 100-year recurrence interval flow.

Flow Path	The route that surface water follows between two points of interest.
Forebay	An easily maintained, extra storage area provided near an inlet of a BMP to trap incoming sediments before they accumulate in a pond or wetland BMP.
Forest Practice	Any activity conducted on or directly pertaining to forest land and relating to growing, harvesting, or processing timber, including but not limited to: Road and trail construction, Harvesting, final and intermediate, Precommercial thinning, Reforestation, Fertilization, Prevention and suppression of diseases and insects, Salvage of trees, Brush control.
Forest Practices Permit	A permit issued by the Washington State Department of Natural Resources (WDNR) for the removal of timber and construction of necessary roads.
Forested Wetlands	In general terms, communities (wetlands) characterized by woody vegetation that is greater than or equal to 6 meters in height; in this manual the term applies to such communities (wetlands) that represent a significant amount of tree cover consisting of species that offer wildlife habitat and other values and advance the performance of wetland functions overall.
Freeboard	The vertical distance between the highest designed water surface elevation and the elevation of the crest of the facility. For example, in pond design, freeboard is the vertical distance between the emergency overflow water surface as measured passing over the overflow discharge point and the top of the pond embankment. In floodplain management it's the vertical distance between the base flood elevation and lowest floor or support of a structure.
Frequency Of Storm (Design Storm Frequency)	The anticipated period in years that will elapse, based on average probability of storms in the design region, before a storm of a given intensity and/or total volume will recur; thus a 10 recurrence interval storm can be expected to occur on the average once every 10 years. Conveyances designed to handle flows that occur under such storm conditions would be expected to be surcharged by any storms of greater amount or intensity.
Functions	The ecological (physical, chemical, and biological) processes or attributes of a wetland. Functions are often defined in terms of the processes that provide value to society, but they can be defined on processes that are not value based. Wetland functions include food chain support, provision of ecosystem diversity and fish and wildlife habitat, flood flow alteration, groundwater recharge and discharge, water quality improvement, and soil stabilization.
Gabion	A rectangular or cylindrical wire mesh cage filled with rock and used as a protecting agent, revetment, etc., against erosion. Soft gabions, often used in streambank stabilization, are made of geotextiles filled with dirt, in between which cuttings are placed.
Gauge	A measuring device for registering precipitation, water level, discharge, velocity, pressure, temperature, etc. Also, a measure of the thickness of metal.
Geologist	A person currently licensed and registered in the State of Washington as a licensed geologist per WAC 308-15.
Geometrics	The mathematical relationships between points, lines, angles, and surfaces used to measure and identify areas of land.
Geotechnical Professional	A person with experience and training in analyzing, evaluating, and mitigating any of the following: landslide, erosion, seismic, and/or mine

	hazards, or fluvial geomorphology and river dynamics. A geotechnical professional shall be licensed in the State of Washington as an engineering geologist or professional engineer. Per Washington Administrative Code 308-15-140 and 196-27-020, engineering geologists and professional engineers shall affix their signatures or seals only to plans or documents dealing with subject matter in which they are qualified by training or experience.
Geotechnical Professional Civil Engineer	A practicing, geotechnical/civil engineer licensed as a professional Civil Engineer with the State of Washington who has at least 4 years of professional employment as a geotechnical engineer in responsible charge, including experience with landslide evaluation.
Grade	The slope of a road, channel, or natural ground. The finished surface of a canal bed, roadbed, top of embankment, or bottom of excavation; any surface prepared for the support of construction such as paving or the laying of a conduit.
(To) Grade	To finish the surface of a ditch, roadbed, top of embankment or bottom of excavation.
Gradient Terrace	An earth embankment or a ridge-and-channel constructed with suitable spacing and an acceptable grade to reduce erosion damage by intercepting surface runoff and conducting it to a stable outlet at a stable nonerosive velocity.
Grading	Any excavating, filling, clearing, or creating of hard surfaces or combination thereof.
Grassed Waterway	A natural or constructed waterway, usually broad and shallow, covered with erosion-resistant grasses, used to conduct surface water from an area at a reduced flow rate. See also biofilter.
Groundwater	Water in a saturated zone or stratum beneath the land surface or a surface water body.
Groundwater Recharge	Inflow to a groundwater reservoir.
Groundwater Table	The free surface of the groundwater, that surface subject to atmospheric pressure under the ground, generally rising and falling with the season, the rate of withdrawal, the rate of restoration, and other conditions. It is seldom static.
Grubbing	Means the removal and disposing of all unwanted vegetative matter from underground, such as sod, stumps, roots, buried logs, or other debris.
Gully	A channel caused by the concentrated flow of surface and stormwater runoff over unprotected erodible land.
Habitat	The specific area or environment in which a particular type of plant or animal lives. An organism's habitat must provide all of the basic requirements for life and should be protected from harmful biological, chemical, and physical alterations.
Hardpan	A cemented or compacted and often clay-like layer of soil that is impenetrable by roots. Also known as glacial till.
Hard Surface	An impervious surface, a permeable pavement, or a vegetated roof.
Harmful Pollutant	A substance that has adverse effects to an organism including immediate death, chronic poisoning, impaired reproduction, cancer or other effects.
Head (Hydraulics)	The height of water above any plane of reference. The energy, either kinetic or potential, possessed by each unit weight of a liquid, expressed as the vertical height through which a unit weight would

	have to fall to release the average energy possessed. Used in various compound terms such as pressure head, velocity head, and head loss.
Head Loss	Energy loss due to friction, eddies, changes in velocity, or direction of flow.
Heavy Metals	Metals of high specific gravity, present in municipal and industrial wastes that pose long-term environmental hazards. Such metals include antimony, arsenic, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, selenium, thallium, and zinc.
High-Use Site	High-use sites are those that typically generate high concentrations of oil due to high traffic turnover or the frequent transfer of oil. High-use sites include: An area of a commercial or industrial site subject to an expected average daily traffic count equal to or greater than 100 vehicles per 1,000 square feet of gross building area; An area of a commercial or industrial site subject to petroleum storage and transfer in excess of 1,500 gallons per year, not including routinely delivered heating oil; An area of a commercial or industrial site subject to parking, storage or maintenance of 25 or more vehicles that are over 10 tons gross weight (trucks, buses, trains, heavy equipment, etc.); A road intersection with a measured count of 25,000 vehicles or more on the main roadway and 15,000 vehicles or more on any intersecting roadway, excluding projects proposing primarily pedestrian or bicycle use improvements.
Hog Fuel	See wood-based mulch.
Humus	Organic matter in or on a soil, composed of partly or fully decomposed bits of plant tissue or from animal manure.
Hydraulic Conductivity	The quality of saturated soil that enables water or air to move through it. Also known as permeability coefficient
Hydraulic Gradient	Slope of the potential head relative to a fixed datum.
Hydrodynamics	The science involving the energy and forces acting on water or other liquids and the resulting impact on the motion of the liquid.
Hydrograph	A graph of runoff rate, inflow rate or discharge rate, past a specific point over time.
Hydrologic Cycle	The circuit of water movement from the atmosphere to the earth and return to the atmosphere through various stages or processes as precipitation, interception, runoff, infiltration, percolation, storage, evaporation, and transpiration.
Hydrologic Soil Groups	A soil characteristic classification system defined by the SCS in which a soil may be categorized into one of four soil groups (A, B, C, or D) based upon infiltration rate and other properties. Type A: Low runoff potential. Soils having high infiltration rates, even when thoroughly wetted, and consisting chiefly of deep, well drained to excessively drained sands or gravels. These soils have a high rate of water transmission Type B: Moderately low runoff potential. Soils having moderate infiltration rates when thoroughly wetted, and consisting chiefly of moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission. Type C: Moderately high runoff potential. Soils having slow infiltration rates when thoroughly wetted, and consisting chiefly of soils with a layer that impedes downward movement of water, or soils with

	moderately fine to fine textures. These soils have a slow rate of water transmission. Type D: High runoff potential. Soils having very slow infiltration rates when thoroughly wetted, and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a hardpan, till, or clay layer at or near the surface, soils with a compacted subgrade at or near the surface, and shallow soils or nearly impervious material. These soils have a very slow rate of water transmission (Novotny and Olem 1994).
Hydrological Simulation Program—Fortran (HSPF)	A continuous simulation hydrologic model that transforms an uninterrupted rainfall record into a concurrent series of runoff or flow data by means of a set of mathematical algorithms that represent the rainfall-runoff process at some conceptual level.
Hydrology	The science of the behavior of water in the atmosphere, on the surface of the earth, and underground.
Hydroperiod	A seasonal occurrence of flooding and/or soil saturation; it encompasses depth, frequency, duration, and seasonal pattern of inundation.
Hyetograph	A graph percentages of total precipitation for a series of time steps representing the total time in which the precipitation occurs.
Illicit Discharge	All non-stormwater discharges to stormwater drainage systems that cause or contribute to a violation of state water quality, sediment quality or groundwater quality standards, including but not limited to sanitary sewer connections, industrial process water, interior floor drains, car washing, and greywater systems.
Impervious	A surface that cannot be easily penetrated. For instance, rain does not readily penetrate paved surfaces.
Impervious Surface	A non-vegetated surface area that either prevents or retards the entry of water into the soil mantle as under natural conditions prior to development. A non-vegetated surface area that causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, rooftops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled, macadam or other surfaces that similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces for the purposes of determining whether the thresholds for application of minimum requirements are exceeded. Open, uncovered retention/detention facilities shall be considered impervious surfaces for purposes of runoff modeling.
Impoundment	A natural or man-made containment for surface water.
Improvement	Shall mean things or structures constructed for the benefit of all or some residents of the subdivision or the general public such as but not limited to roads, alleys, stormwater drainage systems and ditches, sanitary sewer pipes or main lines, and storm drainage containment facilities. Streets (with or without curbs or gutters), sidewalks, crosswalks, parking lots, water mains, sanitary and storm sewers, drainage facilities, street trees and other appropriate items.
Industrial Activities	Material handling, transportation, or storage; manufacturing; maintenance; treatment; or disposal. Areas with industrial activities include plant yards, access roads and rail lines used by carriers of raw materials, manufactured products, waste material, or by-products;

	material handling sites; refuse sites; sites used for the application or disposal of process wastewaters; sites used for the storage and maintenance of material handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas for raw materials, and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater.
Ineffective Impervious Surfaces	Impervious surfaces are considered ineffective if: 1) the runoff is dispersed through at least one hundred feet of native vegetation in accordance with Full Dispersion as described in Volume III, Chapter 3; 2) residential roof runoff is infiltrated in accordance with Downspout Infiltration Systems Volume III, Chapter 3; or 3) approved continuous runoff modeling methods indicate that the entire runoff file is infiltrated.
Infiltration	Means the downward movement of water from the surface to the subsoil.
Infiltration Facility (or System)	A drainage facility designed to use the hydrologic process of surface and stormwater runoff soaking into the ground, commonly referred to as a percolation, to dispose of surface and stormwater runoff.
Infiltration Rate	The rate, usually expressed in inches/hour, at which water moves downward (percolates) through the soil profile. Short-term infiltration rates may be inferred from soil analysis or texture or derived from field measurements. Long-term infiltration rates are affected by variability in soils and subsurface conditions at the site, the effectiveness of pretreatment or influent control, and the degree of long-term maintenance of the infiltration facility.
Ingress/Egress	The points of access to and from a property.
Inlet	A form of connection between surface of the ground and a drain or MS4 for the admission of surface and stormwater runoff.
Insecticide	A substance, usually chemical, that is used to kill insects.
Interception (Hydraulics)	The process by which precipitation is caught and held by foliage, twigs, and branches of trees, shrubs, and other vegetation. Often used for “interception loss” or the amount of water evaporated from the precipitation intercepted.
Interflow	That portion of rainfall that infiltrates into the soil and moves laterally through the upper soil horizons until intercepted by a stream channel or until it returns to the surface, for example, in a roadside ditch, wetland, spring or seep. Interflow is a function of the soil system depth, permeability, and water-holding capacity.
Intermittent Stream	A stream where portions flow continuously only at certain times of the year, for example when it receives water from a spring, groundwater source or from a surface source, such as melting snow (i.e. seasonal). At low flow there may be dry segments alternating with flowing segments.
International Building Code (IBC)	The most recent version of the International Building Code adopted by the City of Gig Harbor.
Invasive Species	Opportunistic plant species (either native or non-native) that colonize disturbed ecosystems and come to dominate the plant community in ways that are seen by us as reducing the values provided by the previous plant community. Most often, opportunistic plants are considered invasive if they reduce the value of an area as habitat for valuable species.

Invert	The lowest point on the inside of a pipe or other conduit.
Invert Elevation	The vertical elevation of a pipe or orifice in a pond that defines the water level.
Isopluvial Map	A map with lines representing constant depth of total precipitation for a given return frequency and duration.
Junction	Point where two or more drainage pipes or channels converge (e.g., manhole).
Jurisdiction	For purposes of this manual, a governmental body which has adopted this manual.
Lag Time	The interval between the center of mass of the storm precipitation and the peak flow of the resultant runoff.
Land-Disturbing Activity	Any activity that results in a change in the existing soil cover (both vegetative and nonvegetative) and/or the existing soil topography. Land disturbing activities include, but are not limited to clearing, grading, filling, and excavation. Compaction that is associated with stabilization of structures and road construction shall also be considered a land-disturbing activity. Vegetation maintenance practices, including landscape maintenance and gardening, are not considered land-disturbing activity. Stormwater facility maintenance is not considered land disturbing activity if conducted according to established standards and procedures
Landscape unit	An area of land that has a specified boundary used for planning purposes that defines an area of interrelated physical, chemical, and biological processes. A watershed or drainage basin is a common type of landscape unit. A groundwater aquifer is another type of landscape unit.
Landscaping	The improvement or installation on a parcel or portion thereof of objects or vegetation for decorative or ornamental effect. Examples include trees, bushes, shrubs, flowers, grass, weeds, ornamental rocks or figures, low-lying ground cover, sprinkler systems, sidewalks, and lighting fixtures.
Landslide	Episodic downslope movement of a mass of soil or rock that includes but is not limited to rockfalls, slumps, mudflows, and earthflows. For the purpose of these rules, snow avalanches are considered to be a special case of landsliding.
Large Lot Divisions	Any number of divisions of land into lots, tracts or parcels for any purpose, each of which the smallest lot size is 5 acres or larger or 1/128 of a Section or larger. A tract created for the purpose of accommodating critical areas or infrastructure, and otherwise deemed unbuildable for a dwelling unit, shall be allowed and not subject to the size requirements prescribed above.
Lattice Block Pavement	A pavement, either cast in place or interlocking paving bricks, with interstices allowing infiltration and the growth of vegetation.
Leachable Materials	Those substances that, when exposed to rainfall, measurably alter the physical or chemical characteristics of the rainfall runoff. Examples include erodible soils, uncovered process wastes, manure, fertilizers, oil substances, ashes, kiln dust, and garbage dumpster leakage.
Leachate	Liquid that has percolated through soil and contains substances in solution or suspension.
Leaching	Water or other liquid that has been contaminated by dissolved or suspended materials due to contact with solid waste or gases.

Legume	A member of the legume or pulse family, *Leguminosae*, one of the most important and widely distributed plant families. Practically all legumes are nitrogen-fixing plants.
Level Pool Routing	The basic technique of storage routing used for sizing and analyzing detention storage and determining water levels for ponding water bodies. The level pool routing technique is based on the continuity equation: Inflow – Outflow = Change in storage.
Level Spreader	A device used to spread out stormwater runoff uniformly over the ground surface as sheet flow (i.e., not through channels). The purpose of level spreaders is to prevent concentrated, erosive flows from occurring, and to enhance infiltration.
Live Storage	The amount of storage in a stormwater facility that is intended to completely drain after a storm event.
Local Government	Any county, city, town, or special purpose district having its own incorporated government for local affairs.
Lot	A designated parcel, tract, or area of land established by plat, subdivision, or as otherwise permitted by law, to be used, developed, or built upon as a unit.
Low Flow Channel	An incised or paved channel from inlet to outlet in a dry basin that is designed to carry low runoff flows and/or base flow, directly to the outlet without detention.
Low Impact Development (LID)	A stormwater and land use management strategy that strives to mimic pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration by emphasizing conservation, use of onsite natural features, site planning, and distributed stormwater management practices that are integrated into a project design.
Low Impact Development (LID) Best Management Practices	Distributed stormwater management practices, integrated into a project design, that emphasize pre-disturbance hydrologic processes of infiltration, filtration, storage, evaporation and transpiration. LID BMPs include, but are not limited to: bioretention, rain gardens, permeable pavements, roof downspout controls, dispersion, soil quality and depth, minimal excavation foundations, vegetated roofs, and water re-use.
Low Impact Development (LID) Principles	Land use management strategies that emphasize conservation, use of onsite natural features, and site planning to minimize impervious surfaces, native vegetation loss, and stormwater runoff.
Maintenance	Repair and maintenance includes activities conducted on currently serviceable structures, facilities, and equipment that involves no expansion or use beyond that previously existing and resulting in no significant adverse hydrologic impact. It includes those usual activities taken to prevent a decline, lapse, or cessation in the use of structures and systems. Those usual activities may include replacement of dysfunctional facilities, including cases where environmental permits require replacing an existing structure with a different type structure, as long as the functioning characteristics of the original structure are not changed. One example is the replacement of a collapsed, fish blocking, round culvert with a new box culvert under the same span, or width, of roadway. In regard to stormwater facilities, maintenance includes assessment to ensure ongoing proper operation, removal of built-up pollutants (i.e., sediments), replacement of failed or failing treatment media, and other actions taken to correct defects as identified in the maintenance checklists of Appendix I-A.
Manning's Equation	An equation used to predict the velocity of water flow in an open channel or pipelines:

	$V = \frac{1.486R^{2/3}S^{1/2}}{N}$ where: V is the mean velocity of flow in feet per second R is the hydraulic radius in feet S is the slope of the energy gradient or, for assumed uniform flow, the slope of the channel in feet per foot; and N is Manning's roughness coefficient or retardance factor of the channel lining.
Manual, The	The City of Gig Harbor Stormwater Management and Site Development Manual including all amendments, corrections, and changes made through subsequent city ordinance.
Manufactured Home/Mobile Home	A structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when connected to the required utilities.
Material	Any solid or semi-solid substance that displaces volume.
Metals	Elements, such as mercury, lead, nickel, zinc and cadmium, which are of environmental concern because they can be toxic to life in high enough concentrations and do not degrade over time. Although many are necessary nutrients, they are sometimes magnified in the food chain. They are also referred to as heavy metals.
Microbes	The lower trophic levels of the soil food web. They are normally considered to include bacteria, fungi, flagellates, amoebae, ciliates, and nematodes. These in turn support the higher trophic levels, such as mites and earthworms. Together they are the basic life forms that are necessary for plant growth. Soil microbes also function to bioremediate pollutants such as petroleum, nutrients, and pathogens.
Mitigation	Means, in the following order of preference: Avoiding the impact altogether by not taking a certain action or part of an action; Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps to avoid or reduce impacts; Rectifying the impact by repairing, rehabilitating or restoring the affected environment; Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and Compensating for the impact by replacing, enhancing, or providing substitute resources or environments.
Modification, Modified (Wetland)	A wetland whose physical, hydrological, or water quality characteristics have been purposefully altered for a management purpose, such as by dredging, filling, forebay construction, and inlet or outlet control.
Monitor	To systematically and repeatedly measure something in order to track changes.
Monitoring	The collection of data by various methods for the purposes of understanding natural systems and features, evaluating the impacts of development proposals on such systems, and assessing the performance of mitigation measures imposed as conditions of development.
Mulch	A layer of organic material or aggregate applied to the surface of soil. Its purpose is any or all of the following:

	• To conserve soil moisture or temperature • To improve the fertility and health of the soil • To reduce weed growth • To hold fertilizer, seed, and soil in place • To enhance the visual appeal of the area. Types of mulches used in this manual include: Chipped site vegetation, compost, hydromulch, wood-based or wood straw, wood strand, straw, and aggregate.
Municipality The	City of Gig Harbor government or any jurisdiction adopting this manual for control of stormwater quantity and quality.
National Environmental Policy Act (NEPA)	National Environmental Policy Act, a federal law.
National Pollutant Discharge Elimination System (NPDES)	The part of the Clean Water Act that requires point source dischargers to obtain permits. These permits are referred to as NPDES permits and, in Washington, are administered by the Washington State Department of Ecology.
Native Growth Protection Easement	An easement granted for the protection of native vegetation within a sensitive area or its associated buffer. The native growth protection easement shall be recorded on the appropriate documents of title and filed with the County Auditor.
Native Vegetation	Vegetation comprised of plant species, other than noxious weeds, that are indigenous to the coastal region of the Pacific Northwest and which reasonably could have been expected to naturally occur on the site.
Natural Buffer Area	A parcel or strip of land that is designated to remain permanently in an undisturbed and untouched condition. No building, clearing, filling, or grading is permitted within this area, except for minor firewood harvest and watercourse maintenance when applicable. Roads, septic tank drainfield areas, and reserved drainfield areas are not permitted in natural buffer areas.
Natural Channel	Stream, creek, river, lake, wetland, estuary, gully, swale, ravine, or any open conduit where water will concentrate and flow intermittently or continuously. Only includes manmade channels designed to mimic natural systems.
Natural Hydrologic Function	Refers to the processing of precipitation over and through the landscape in a forest or prairie condition. Includes evapotranspiration by onsite vegetation, storage of rainfall in the soil structure or on the soil surface within depressions in the topography, and the release of stormwater through either infiltration, interflow, or surface flow off the site.
Natural Location	The location of those channels, swales, and other non-manmade conveyance systems as defined by the first documented topographic contours existing for the subject property, from either maps or photographs, or such other means as appropriate. In the case of outwash soils with relatively flat terrain, no natural location of surface discharge may exist.
Nephlometric Turbidity Unit (NTU)	A measure of turbidity for stormwater.
New Development	Land disturbing activities, including Class IV general forest practices that are conversions from timber land to other uses; structural development, including construction or installation of a building or other structure; creation of hard surfaces; and subdivision, short subdivision

	and binding site plans, as defined and applied in Chapter 58.17 RCW. Projects meeting the definition of redevelopment shall not be considered new development. All other forest practices and commercial agriculture are not considered new development.
New Hard Surface	Hard surface created on or added to a site or structural development including construction, installation, or expansion of a building or other structure. Includes the addition of a hard or compacted surface like roofs, pavement, gravel, or dirt; or resurfacing by upgrading from dirt to gravel, asphalt, or concrete; upgrading from gravel to asphalt, or concrete; or upgrading from a bituminous surface treatment ("chip seal") to asphalt or concrete. New hard surface may also include existing hard surface that is removed and replaced. To be considered new, the removal and replacement activity must result in changes in hard surface locations, grade, and/or drainage system features, and/or must involve construction, installation, or expansion of a building or structure after complete or substantial intentional demolition thereof by or for the benefit of the applicant.
Nitrate (NO_3)	A form of nitrogen that is an essential nutrient to plants. It can cause algal blooms in water if all other nutrients are present in sufficient quantities. It is a product of bacterial oxidation of other forms of nitrogen, from the atmosphere during electrical storms and from fertilizer manufacturing.
Nitrogen, Available	Usually ammonium, nitrite, and nitrate ions, and certain simple amines available for plant growth. A small fraction of organic or total nitrogen in the soil is available at any time.
Nonpoint Source Pollution	Pollution that enters a water body from diffuse origins on the watershed and does not result from discernible, confined, or discrete conveyances.
NPDES	The National Pollutant Discharge Elimination System as established by the Clean Water Act.
NRCS Method	A single-event hydrologic analysis technique for estimating runoff based on the Curve Number method. The Curve Numbers are published by NRCS in Technical Release No. 55: Urban Hydrology for Small Watersheds, 1986. With the change in name to the Natural Resource Conservation Service, the method may be referred to as the NRCS Method.
Normal depth	The depth of uniform flow. This is a unique depth of flow for any combination of channel characteristics and flow conditions. Normal depth is calculated using Manning's Equation.
Nutrients	Essential chemicals needed by plants or animals for growth. Excessive amounts of nutrients can lead to degradation of water quality and algal blooms. Some nutrients can be toxic at high concentrations.
Off-Line Facilities	Water quality treatment facilities to which stormwater runoff is restricted to some maximum flow rate or volume by a flow-splitter.
Offsite	Any area lying upstream of the site that drains onto the site and any area lying downstream of the site to which the site drains.
Off-System Storage	Facilities for holding or retaining excess flows over and above the carrying capacity of the stormwater conveyance system, in chambers, tanks, lagoons, ponds, or other basins that are not a part of the subsurface sewer system.

Oil/Water Separator	A vault, usually underground, designed to provide a quiescent environment to separate oil from water.
On-Line Facilities	Water quality treatment facilities that receive all of the stormwater runoff from a drainage area. Flows above the water quality design flow rate or volume are passed through at a lower percent removal efficiency.
Onsite	The entire property that includes the proposed development.
Onsite Stormwater Management BMPs	As used in this manual, a synonym for Low Impact Development BMPs.
Operational BMPs	Source Control BMPs.
Ordinary High Water Mark	The mark on all lakes, streams, and tidal water that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation as that condition exists on the effective date of this Chapter or as it may naturally change thereafter. Provided, that in any area where the ordinary high water mark cannot be found, the ordinary high water mark adjoining fresh water shall be the line of mean high water.
Organic Matter	Organic matter is decomposed animal or vegetable matter.
Orifice	An opening with closed perimeter, usually sharp-edged, and of regular form in a plate, wall, or partition through which water may flow, generally used for the purpose of measurement or control of water.
Outfall	A point source as defined by 40 CFR 122.2 at the point where a discharge leaves the Permittee's MS4 and enters a surface receiving waterbody or surface receiving waters. Outfall does not include pipes, tunnels, or other conveyances which connect segments of the same stream or other surface waters and are used to convey primarily surface waters (i.e., culverts).
Outlet	Point of water disposal from a stream, river, lake, tidewater, or artificial drain.
Outlet Channel	A waterway constructed or altered primarily to carry water from man-made structures, such as terraces, tile lines, and diversions.
Outwash Soils	Soils formed from highly permeable sands and gravels.
Overtopping	To flow over the limits of a containment or conveyance element.
Parcel	Any portion, piece, or division of land. Fractional part or subdivision of block, according to plat or survey; portion of platted territory measured and set apart for individual and private use and occupancy.
Particle Size	The effective diameter of a particle as measured by sedimentation, sieving, or micrometric methods.
Paved Road	A road that has been treated or covered with asphalt to create an oil mat surface; a road that has a bituminous surface treatment, asphalt, or cement concrete surface.
Peak Discharge	The maximum instantaneous rate of flow during a storm, usually in reference to a specific design storm event.
Percolation	The movement of water through soil.
Percolation Rate	The rate, often expressed in inches/hour, at which clear water, maintained at a relatively constant depth, will seep out of a standardized test hole that has been previously saturated. The term

	percolation rate is often used synonymously with infiltration rate (short-term infiltration rate).
Permanent Stabilization	Permanent site stabilization is the covering of exposed surfaces through paving, gravels, landscaping materials, sodding, seeding, etc. but shall not mean the temporary use of erosion/sediment control materials unless used in conjunction with the above measures to aid in seed or landscaping vegetation establishment.
Permanent Stormwater Control (PSC) Plan	A plan which includes permanent BMPs for the control of pollution from stormwater runoff after construction and/or land-disturbing activity has been completed.
Permeable pavement	Pervious concrete, porous asphalt, permeable pavers or other forms of pervious or porous paving material intended to allow passage of water through the pavement section. It often includes an aggregate base that provides structural support and acts as a stormwater reservoir.
Permeable Soils	Soil materials with a sufficiently rapid infiltration rate to greatly reduce or eliminate surface and stormwater runoff. These soils are generally classified as SCS hydrologic soil types A and B.
Person	Any individual, partnership, corporation, association, organization, cooperative, public or municipal corporation, agency of the state, or local government unit, however designated.
Pervious Surface	A surface material that allows stormwater to infiltrate into the ground. Examples include lawn, landscape, pasture, native vegetation areas, and permeable pavements.
Pesticide	A general term used to describe any substance – usually chemical – used to destroy or control organisms; includes herbicides, insecticides, algicides, fungicides, and others. Many of these substances are manufactured and are not naturally found in the environment. Others, such as pyrethrum, are natural toxins that are extracted from plants and animals.
pH	A measure of the alkalinity or acidity of a substance that is based on measuring the concentration of hydrogen ions in the substance. A pH of 7.0 indicates neutral water. A 6.5 reading is slightly acid.
Plan	For purposes of this manual, a Plan shall mean the Abbreviated Plan, Drainage Control Plan, or Construction Stormwater Pollution Prevention Plan.
Planned Unit Development (PUD)	A flexible zoning concept which provides an opportunity to mold a district so that it creates a more desirable environment, and results in as good or better use of land than that produced through the limiting standards provided in the regular zoning classifications.
Plat	A map or representation of a subdivision, short subdivision, large lot or binding site plan, showing thereon the division of a tract or parcel of land into lots, blocks, streets and alleys or other divisions and dedications.
Point Discharge	The release of collected and/or concentrated surface and stormwater runoff from a pipe, culvert, or channel.
Point Of Compliance	The location at which compliance with a discharge performance standard or a receiving water quality standard is measured.
Polishing	Additional treatment of a waste stream that has already received one or more stages of treatment by other means. This is also called advance treatment. The conditions present across a landscape after a specific stormwater management project (e.g., raising the outlet, building, and outlet control structure) are placed in the wetland or a

	land use change that occurs in the landscape unit that will potentially affect the wetland.
Pollution	Contamination or other alteration of the physical, chemical, or biological properties, of waters of the State, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive or other substance into any waters of the State as will or is likely to create a nuisance or render such waters harmful, detrimental or injurious to the public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life.
Pollution-Generating Hard Surface (PGHS)	Those hard surfaces considered to be a significant source of pollutants in stormwater runoff. See the listing of surfaces under pollution-generating impervious surface.
Pollution-Generating Impervious Surface (PGIS)	Those impervious surfaces considered to be a significant source of pollutants in stormwater runoff. Such surfaces include those that receive direct rainfall or runon or blow-in of rainfall and are subject to: vehicular use; industrial activities (as further defined in this glossary); or storage of erodible or leachable materials, wastes, or chemicals. In addition, metal roofs unless they are coated with an inert, non-leachable material (e.g., baked-on enamel coating); or roofs that are subject to venting significant amounts of dusts, mists, or fumes from manufacturing, commercial, or other indoor activities are considered PGIS.
Pollution-Generating Pervious Surface (PGPS)	Any non-impervious surface that receives direct rainfall or runon or blow-in of rainfall and is subject to: vehicular use; industrial activities (as further defined in this glossary); storage of erodible or leachable materials, wastes, or chemicals; use of pesticides and fertilizers; or loss of soil. Typical PGPS include permeable pavement subject to vehicular use, lawns and landscaped areas including: golf courses, parks, cemeteries, and sports fields. (natural and artificial turf)
Postdevelopment Conditions	The condition of site after the project has been constructed.
Post-project	For use with Appendix I-B: The conditions present across a landscape after a specific stormwater management project (e.g., raising the outlet, building an outlet control structure) is completed that will potentially affect wetlands.
Pothole	A closed basin. See also closed depression.
Predeveloped Condition	The native vegetation and soils that existed at a site prior to the influence of Euro-American settlement. The predeveloped condition shall be assumed to be forested land cover unless reasonable, historic information is provided that indicates the site was prairie prior to settlement.
Preliminary Plat	A neat and approximate drawing of a proposed subdivision showing the general layout of streets, alleys, lots, blocks and restrictive covenants to be applicable to the subdivision, which shall furnish a basis for the approval or disapproval of the general layout of a subdivision.
Pre-project	For use with Appendix I-B: The conditions present across a landscape before a specific project is constructed.
Pretreatment	A BMP that removes at least 50% solids. Typically installed upstream of a UIC well or a Runoff Treatment BMP.

Private Road	A roadway facility in private ownership providing private access and used for travel of vehicles by the owner(s) or those having express or implied permission from the owner(s), but not by other persons.
Professional Engineer	A person currently licensed and registered in the State of Washington as a professional engineer in civil engineering.
Project	The proposed action of a permit application or an approval which requires a Drainage Control Plan, Construction Stormwater Pollution Prevention Plan, or Abbreviated Plan.
Project Engineer	Professional Engineer.
Project Site	That portion of a property, properties, or right-of-way subject to land disturbing activities, new hard surfaces, or replaced hard surfaces.
Public Storm Drainage Facility	A conveyance, system of conveyances, or stormwater control facility(ies) (including roads with drainage systems, catch basins, curbs, gutters, ditches, man-made channels, storm drains, retention/detention facilities and infiltration facilities) owned and operated by the City, which is (are) designed or used for collection, storage, conveyance and treatment of stormwater.
Rain garden	A non-engineered shallow, landscaped depression, with compost-amended native soils and adapted plants. The depression is designed to pond and temporarily store stormwater runoff from adjacent areas, and to allow stormwater to pass through the amended soil profile.
Rare, Threatened, Or Endangered Species	Plant or animal species that are regional relatively uncommon, are nearing endangered status, or whose existence is in immediate jeopardy and is usually restricted to highly specific habitats. Threatened and endangered species are officially listed by federal and state authorities, whereas rare species are unofficial species of concern that fit the above definitions.
Rational Method	A means of computing storm drainage flow rates (Q) by use of the formula Q = CIA, where C is a coefficient describing the physical drainage area, I is the rainfall intensity and A is the area. This method is only allowed for sizing conveyances in certain small basins.
Reach	A length of channel with uniform characteristics.
Receiving Waters (or Receiving Waterbody)	Bodies of water or surface water systems to which surface runoff is discharged via a point source of stormwater or via sheet flow. Groundwater to which surface runoff is directed by infiltration.
Recharge	The addition of water to the zone of saturation (i.e., an aquifer).
Redevelopment	On a site that is already substantially developed (i.e., has 35 percent or more of existing hard surface coverage), the creation or addition of hard surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including construction, installation or expansion of a building or other structure; replacement of hard surface that is not part of a routine maintenance activity; and land disturbing activities.
Regional Detention (or Retention) Facility	A stormwater quantity control structure designed to correct existing surface water runoff problems of a basin or subbasin. The area downstream has been previously identified as having existing or predicted significant and regional flooding and/or erosion problems. This term is also used when a detention or retention facility is sited to detain or infiltrate stormwater runoff from a number of new developments or areas within a catchment.

Replaced Hard Surface	For structures, the removal and replacement of hard surfaces down to the foundation. For other hard surfaces, the removal down to bare soil or base course and replacement.
Replaced Impervious Surface	For structures, the removal and replacement of impervious surfaces down to the foundation. For other impervious surfaces, the removal down to bare soil or base course and replacement.
Restoration	The re-establishment of a viable plant community, forest, wetland, or critical fish or wildlife habitat area from a previously filled or degraded site.
Retention	The process of collecting and holding surface and stormwater runoff with no surface outflow.
Retention Pond	A retention facility that is an open pond.
Retention/Detention Facility	A facility with an outlet to surface water but which is intended to primarily discharge to groundwater and evaporation.
Retrofitting	The renovation of an existing structure or facility to meet changed conditions or to improve performance.
Return Frequency	A statistical term for the average time of expected interval that an event of some kind will equal or exceed given conditions (e.g., a stormwater flow that occurs every 2 years).
Rill	A small intermittent watercourse with steep sides, usually only a few inches deep. Often rills are caused by an increase in surface water flow when soil is cleared of vegetation.
Riparian	Pertaining to the banks of streams, wetlands, lakes, or tidewater.
Riparian Areas	Transition zones between water bodies and upland areas that exhibit vegetation or soil characteristics reflective of permanent surface or subsurface water influence. Lands along, adjacent to, or contiguous with perennially and intermittently flowing rivers and streams, glacial potholes, and the shores of lakes and reservoirs with stable water levels are typical riparian areas.
Riprap	A facing layer or protective mound of rocks placed to prevent erosion or sloughing of a structure or embankment due to flow of surface and stormwater runoff.
Riser	A vertical pipe extending from the bottom of a pond BMP that is used to control the discharge rate from a BMP for a specified design storm.
Roadway Width	The sum of the traveled way width and the shoulder width measured at its narrowest location.
Rodenticide	A substance used to destroy rodents.
Runoff	Water originating from rainfall and other precipitation that is found in drainage facilities, rivers, streams, springs, seeps, ponds, lakes and wetlands as well as shallow groundwater. As applied in this manual, it also means the portion of rainfall or other precipitation that becomes surface flow and interflow.
Salmonid	Any member of the family *Salmonidae*, which includes all species of salmon, trout, and char.
Sand Filter	A man-made depression or basin with a layer of sand that treats stormwater as it percolates through the sand.
Saturation Point	In soils, the point at which a soil or an aquifer will no longer absorb any amount of water without losing an equal amount.

Scour	Erosion of channel banks due to excessive velocity of the flow of surface and stormwater runoff.
SCS	Soil Conservation Service (now the Natural Resources Conservation Service), USDA.
SCS Method	See NRCS Method.
Seasonal High Groundwater	Seasonal high groundwater is the highest annual groundwater elevation as determined by a qualified soil scientist, geohydrologist, or licensed engineer in the state of Washington based on monitoring wells or other recognized methods.
Seasonal High Groundwater Level	The upper level at which the groundwater table normally is located during the season of the year when such levels are at their highest (typically December 1 through April 30).
Sediment	Fragmented material that originates from weathering and erosion of rocks or unconsolidated deposits, and is transported by, suspended in, or deposited by water.
Sedimentation	The depositing or formation of sediment.
Sensitive Area	Those areas designated by resolution or ordinance of the Gig Harbor City Council pursuant to WAC 197-11-908 and Chapter 18.08 GHMC or the most recent amendments thereto. See Environmentally Sensitive Area.
SEPA	See State Environmental Policy Act.
Settleable Solids	Those suspended solids in stormwater that separate by settling when the stormwater is held in a quiescent condition for a specified time.
Shared Access Facility	A privately-owned drivable surface which serves up to and including four lots in the rural area or two lots in the urban area for access to single family and two family dwelling units.
Sheet Erosion	The relatively uniform removal of soil from an area without the development of conspicuous water channels.
Sheet Flow	Runoff that flows over the ground surface as a thin, even layer, not concentrated in a channel.
Shoreline Development	The proposed project as regulated by the Shoreline Management Act. Usually the construction over water or within a shoreline zone (generally 200 feet landward of the water) of structures such as buildings, piers, bulkheads, and breakwaters, including environmental alterations such as dredging and filling, or any project which interferes with public navigational rights on the surface waters.
Short Circuiting	The passage of runoff through a BMP in less than the design treatment time.
Short Plat or Short Subdivision	As defined in Title 16 GHMC, or most recent version thereof.
Shoulder Width	The improved and maintained area between the edge of the traveled way and the point of intersection of shoulder slope with the fore slope or ditch slope.
Siltation	The process by which a river, lake, or other water body becomes clogged with sediment. Silt can clog gravel beds and prevent successful salmon spawning.
Single-Family Residential Structure	A structure used to house one or two families, including appurtenant structures such as a garage, storage shed, or other structure not used for living purposes, all for the private, non-commercial use of the property owner or renter.

Site	The area defined by the legal boundaries of a parcel or parcels of land that is (are) subject to new development or redevelopment. For road projects, the length of the project site and the right-of-way boundaries define the site.
Site Development Permit	A permit issued by the City of Gig Harbor giving an applicant permission to: perform land disturbing activity; remove vegetation; construct roads, shared accesses, alleyways, driveways, parking areas, impervious surfaces or other hard surfaces; perform grading and or clearing; and construct stormwater facilities.
Site Suitability Criteria	Eight criteria that must be considered for siting infiltration BMPs for Flow Control and Runoff Treatment. See Volume I, Appendix I-C Site Suitability Criteria (SSC).
Slope	Degree of deviation of a surface from the horizontal measured as a numerical ratio, percent, or in degrees. Expressed as a ratio, the first number is the horizontal distance (run) and the second is the vertical distance (rise), as 2:1. A 2:1 slope is a 50 percent slope. Expressed in degrees, the slope is the angle from the horizontal plane, with a 90-degree slope being vertical (maximum) and 45-degree being a 1:1 or 100 percent slope.
Sloughing	The sliding of overlying material. It is the same effect as caving, but it usually occurs when the bank or an underlying stratum is saturated or scoured.
Soil	The unconsolidated mineral and organic material on the immediate surface of earth supporting plant life. See also topsoil, engineered soil/landscape system, and properly functioning soil system.
Soil Group, Hydrologic	A classification of soils by the SCS into four runoff potential groups. The groups range from A soils, which are very permeable and produce little or no runoff, to D soils, which are not very permeable and produce much more runoff.
Soil Horizon	A layer of soil, approximately parallel to the surface, which has distinct characteristics produced by soil-forming factors.
Soil Permeability	The ease with which gases, liquids, or plant roots penetrate or pass through a layer of soil.
Soil Profile	A vertical section of the soil from the surface through all horizons, including C horizons.
Soil Stabilization	The use of measures such as rock lining, vegetation or other engineering structures to prevent the movement of soil when loads are applied to the soil.
Soil Structure	The relation of particles or groups of particles which impart to the whole soil a characteristic manner of breaking; some types are crumb structure, block structure, platy structure, and columnar structure.
Soil Texture Class	The relative proportion, by weight, of particle sizes, based on the USDA system, of individual soil grains less than 2 mm equivalent diameter in a mass of soil. The basic texture classes in the approximate order of increasing proportions of fine particles include sand, loamy sand, sandy loam, loam, silt loam, silt, clay loam, sandy clay, silty clay, and clay.
Soils Professional	A person certified by the Soil Science Society of America (or an equivalent national program); a locally licensed onsite sewage designer; or a suitably trained person working under the supervision of a professional engineer, geologist, hydrogeologist, or engineering geologist registered in the State of Washington.

Sorption	The physical or chemical binding of pollutants to sediment or organic particles.
Source Control BMP	A structure or operation that is intended to prevent pollutants from coming into contact with stormwater through physical separation of areas or careful management of activities that are sources of pollutants. This manual separates source control BMPs into two types. Structural source control BMPs are physical, structural, or mechanical devices or facilities that are intended to prevent pollutants from entering stormwater. Operational BMPs are non-structural practices that prevent or reduce pollutants from entering stormwater. See Volume IV for details.
Spill Control Device	A T-section or turned-down elbow designed to retain a limited volume of pollutant that floats on water, such as oil or antifreeze. Spill control devices are passive and must be cleaned-out for the spilled pollutant to be removed.
Spillway	A passage such as a paved apron or channel for surplus water over or around a dam or similar obstruction. An open or closed channel, or both, used to convey excess water from a reservoir. It may contain gates, either manually or automatically controlled, to regulate the discharge of excess water.
Standard Plans and Standard Specifications	The most recent edition of the *Standard Plans for Road, Bridge, and Municipal Construction* and the *Standard Specifications for Road, Bridge, and Municipal Construction* by WSDOT in cooperation with the APWA and as amended by the City of Gig Harbor.
State Environmental Policy Act (SEPA)	The Washington law (RCW 43.21c) intended to minimize environmental damage. SEPA requires that state agencies and local governments consider environmental factors when making decisions on activities, such as development proposals over a certain size and comprehensive plans. As part of this process, environmental documents are prepared and opportunities for public comment are provided.
Steep Slope	Slopes of 20 percent gradient or steeper, with 10 feet of vertical relief.
Storage Routing	A method to account for the attenuation of peak flows passing through a detention facility or other storage feature.
Storm Drains	The enclosed conduits that transport surface and stormwater runoff toward points of discharge (sometimes called storm sewers).
Storm Sewer	A sewer that carries stormwater and surface water, street wash and other washwaters or drainage, but excludes sewage and industrial wastes. Also called a storm drain.
Stormwater	Runoff during and following precipitation and snowmelt events, including surface runoff, drainage, and interflow.
Stormwater Drainage System	Constructed and natural features that function together as a system to collect, convey, channel, hold, inhibit, retain, detain, infiltrate, divert, treat, or filter stormwater.
Stormwater Facility	A constructed component of a stormwater drainage system designed or constructed to perform a particular function, or multiple functions. Stormwater facilities include, but are not limited to, pipes, swales, ditches, culverts, street gutters, detention ponds, retention ponds, constructed wetlands, infiltration devices, catch basins, oil/water separators, bioretention, permeable pavement, and biofiltration swales.

Stormwater Management Manual for Western Washington	The Stormwater Manual prepared by Ecology to provide guidance on measures necessary in western Washington to control the quantity and quality of stormwater runoff from new development and redevelopment.
Stormwater Program	Either the basic stormwater program or the comprehensive stormwater program (as appropriate to the context of the reference) called for under the Puget Sound Water Quality Management Plan.
Streambanks	The usual boundaries, not the flood boundaries, of a stream channel. Right and left banks are named facing downstream.
Streams	Those areas where surface waters flow sufficiently to produce a defined channel or bed. A defined channel or bed is an area that demonstrates clear evidence of the passage of water and includes, but is not limited to, indicated by hydraulically sorted sediments or the removal of vegetative litter or loosely rooted vegetation by the action of moving water. The channel or bed need not contain water year-round. This definition is not meant to include irrigation ditches, canals, stormwater runoff devices, or other entirely artificial watercourses unless they are used to convey streams naturally occurring prior to construction. Those topographic features that resemble streams but have no defined channels (i.e., swales) shall be considered streams when hydrologic and hydraulic analyses done pursuant to a development proposal predict formation of a defined channel after development.
Structural Source Control BMPs	See Source Control BMPs.
Structure (habitat)	The physical components of an ecosystem, both the abiotic (physical and chemical) and biotic (living).
Stub-Out	A short length of pipe provided for future connection to a stormwater drainage system.
Subbasin	A drainage area that drains to a point contained within a larger basin.
Subdivision	As defined in Title 16 GHMC or the most recent version thereof.
Subgrade	A layer of stone or soil used as the underlying base for a BMP.
Subsoil	The B horizons of soils with distinct profiles. In soils with weak profile development, the subsoil can be defined as the soil below the plowed soil (or its equivalent of surface soil), in which roots normally grow. Although a common term, it cannot be defined accurately. It has been carried over from early days when “soil” was conceived only as the plowed soil and that under it as the “subsoil.”
Substrate	The natural soil base underlying a BMP.
Suspended Solids	Organic or inorganic particles that are suspended in and carried by the water. The term includes sand, mud, and clay particles (and associated pollutants) as well as solids in stormwater.
Swale	A shallow drainage conveyance with relatively gentle side slopes, generally with flow depths less than 1 foot.
Terrace	An embankment or combination of an embankment and channel across a slope to control erosion by diverting or storing surface runoff instead of permitting it to flow uninterrupted down the slope.
Threshold Discharge Area	An onsite area draining to a single natural discharge location or multiple natural discharge locations that combine within one-quarter mile downstream (as determined by the shortest flow path). The examples in Volume I, Figure 4.1 illustrate this definition. The purpose

	of this definition is to clarify how the thresholds of this manual are applied to project sites with multiple discharge points.
Tightline	A continuous length of pipe that conveys water from one point to another (typically down a steep slope) with no inlets or collection points in between.
Tile, Drain	Pipe made of burned clay, concrete, or similar material, in short lengths, usually laid with open joints to collect and carry excess water from the soil.
Till	A layer of poorly sorted soil deposited by glacial action that generally has very low infiltration rates.
Time of concentration	The time period necessary for surface runoff to reach the outlet of a subbasin from the hydraulically most remote point in the tributary drainage area.
Toe of Slope	A point or line of slope in an excavation or cut where the lower surface changes to horizontal or meets the existing ground slope.
Top of Slope	A point or line on the upper surface of a slope where it changes to horizontal or meets the original surface.
Topography	General term to include characteristics of the ground surface such as plains, hills, mountains, degree of relief, steepness of slopes, and other physiographic features.
Topsoil	The upper portion of a soil, usually dark colored and rich in organic material. It is more or less equivalent to the upper portion of an A horizon in an ABC soil.
Total Maximum Daily Load (TMDL) – Water Cleanup Plan	A calculation of the maximum amount of a pollutant that a water body can receive and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL (also known as a Water Cleanup Plan) is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The calculation must include a margin of safety to ensure that the waterbody can be used for the purposes the State has designated. The calculation must also account for seasonable variation in water quality. Water quality standards are set by states, territories, and tribes. They identify the uses for each waterbody, for example, drinking water supply, contact recreation (swimming), and aquatic like support (fishing), and the scientific criteria to support that use. The Clean Water Act, Section 303, establishes the water quality standards and TMDL programs.
Total Solids	The solids in water, sewage, or other liquids, including the dissolved, filterable, and nonfilterable solids. The residue left when the moisture is evaporated and the remainder is dried at a specified temperature, usually 130 degrees Celsius.
Total Suspended Solids	That portion of the solids carried by stormwater that can be captured on a standard glass filter.
Toxic	Poisonous, carcinogenic, or otherwise directly harmful to life.
Tract	Any parcel of land that is exclusive of a lot. An example of a tract for the purpose of this Title is a parcel of land that consists of sensitive areas such as open space, wetlands or steep slopes or land dedicated for roads or utility purposes. For the purpose of this definition, a tract may be buildable or unbuildable.
Trash Rack	A structural device used to prevent debris from entering a spillway or other hydraulic structure.

Travel Time	The estimated time for surface water to flow between two points of interest.
Traveled Way	That portion of the roadway used for the movement of vehicles exclusive of the portion of the roadway width that is used, or available for parking of vehicles. The traveled way does not include curbs and gutters.
Treatment BMP or Facility	A BMP that is intended to remove pollutants from stormwater. A few examples of treatment BMPs are bioretention areas, detention ponds, oil/water separators, biofiltration swales, and constructed wetlands.
Treatment Liner	A layer of soil that is designed to slow the rate of infiltration and provide sufficient pollutant removal to protect groundwater quality.
Turbidity	Dispersion or scattering of light in a liquid, caused by suspended solids and other factors; commonly used as a measure of suspended solids in a liquid.
Underdrain	Plastic pipes with holes or slots drilled through the top, installed on the bottom of an infiltration BMP, which are used to collect and remove excess runoff.
Underground Injection Control (UIC) Program	A federal regulatory program established to protect underground sources of drinking water from UIC well discharges. In Washington, the U.S. EPA has granted Ecology authority to regulate UIC wells, except for UIC wells on tribal land.
Underground Injection Control (UIC) Well	A UIC well is defined as a structure built to discharge fluids from the ground surface into the sub-surface; a bored, drilled, or driven shaft whose depth is greater than the largest surface dimension; or a dug hole whose depth is greater than the largest surface dimension; or an improved sinkhole, which is a natural crevice that has been modified; or a subsurface fluid distribution system that includes an assemblage of perforated pipes, drain tiles, or other similar mechanisms intended to distribute fluids below the surface of the ground. Examples of UIC wells or sub-surface infiltration systems include drywells, drainfields, infiltration trenches with perforated pipe, storm chamber systems with the intent to infiltrate, french drains, bioretention systems intended to distribute water to the subsurface by means of perforated pipe installed below the treatment soil, and other similar devices that discharge to the ground.
Undisturbed Buffer	A zone where development activity shall not occur, including logging, and/or the construction of utility trenches, roads, and/or surface and stormwater facilities.
Uninterruptible Services	Those services to the public which the City has identified as important enough to merit a higher standard of protection against flooding such as hospitals, police, and fire stations.
Unpaved Road	A road that consists of gravel, crushed surfacing top course, or other dirt surface that has not received a surfacing coat of asphalt. A road treated with only a dust preventative or dust treatment shall be considered an unpaved road.
Unstable Slopes	Those sloping areas of land which have in the past exhibited, are currently exhibiting, or will likely in the future exhibit, mass movement of earth.
Utility Line	Pipe, conduit, cable, or other similar facility by which services are conveyed to the public or individual recipients. Such services shall include but are not limited to water supply, electric power, gas, communications, and sanitary sewers.

Values	Wetland processes or attributes that are valuable or beneficial to society (also see Functions). Wetland values include support of commercial and sport fish and wildlife species, protection of life and property from flooding, recreation, education, and aesthetic enhancement of human communities.
Variance	Relief from the application of a Minimum Requirement to a project. See Chapter 12.16 GHMC.
Vegetated Flow Path	A vegetated flow path consists of well-established lawn or pasture, landscaping with well-established groundcover, native vegetation with natural groundcover, or an area that meets Soil Preservation and Amendment (see Volume III, Section 3.1). The groundcover shall be dense enough to help disperse and infiltrate flows and to prevent erosion.
Vegetation	Any organic plant life growing on the surface of the earth.
Vehicular Use	Regular use of an impervious or pervious surface by motor vehicles. The following are subject to regular vehicular use: roads, un-vegetated road shoulders, bike lanes within the traveled lane of a roadway, driveways, parking lots, unrestricted access fire lanes, vehicular equipment storage yards, and airport runways. The following are not considered subject to regular vehicular use: paved bicycle pathways separated from and not subject to drainage from roads for motor vehicles, restricted access fire lanes, and infrequently used maintenance access roads.
Water Body	Surface waters including rivers, streams, lakes, marine waters, estuaries, and wetlands.
Water Cleanup Plan	See total maximum daily load.
Water Quality	A term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose.
Water Quality BMP	A BMP specifically designed to control the quality of runoff.
Water Quality Design Storm	The 24-hour rainfall amount with a 6-month return frequency. Commonly referred to as the 6-month, 24-hour storm.
Water Quality Standards	Minimum requirements of purity of water for various uses; for example, water for agricultural use in irrigation systems should not exceed specific levels of sodium bicarbonate, pH, total dissolved salts, etc. In Washington, the Department of Ecology sets water quality standards.
Water Table	The upper surface or top of the saturated portion of the soil or bedrock layer indicates the uppermost extent of groundwater.
Watercourse	A river, stream, creek, or other course of flowing water that flows intermittently or perennially and discharges into another watercourse or body of water.
Watershed	The region drained by or contributing water to a stream, lake, or other body of water.
Wet Pool	A pond or constructed wetland that stores runoff temporarily and whose normal discharge location is elevated so as to maintain a permanent pool of water between storm events.
Wet Ponds and Wet Vaults	Drainage facilities for water quality treatment that contain permanent pools of water that are filled during the initial runoff from a storm event. They are designed to optimize water quality by providing retention time in order to settle out particles of fine sediment to which pollutants such

	as heavy metals absorb, and to allow biologic activity to occur that metabolizes nutrients and organic pollutants.
Wetlands	Defined by Title 18 GHMC.
WSDOT Specifications	The requirements or standards of the latest edition of the WSDOT Standard Plans and Specifications.

Acronyms

APWA	American Public Works Association (Washington State Chapter)
API	American Petroleum Institute
ADA	Americans with Disabilities Act
APWA	American Public Works Association
ASTM	American Society for Testing and Materials
BFE	Base Flood Elevation
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
CEC	Cation Exchange Capacity
CESCL	Certified Erosion and Sediment Control Lead
CIP	Capital Improvement Project or Program
COD	Chemical Oxygen Demand
CWA	Clean Water Act
DNS	Determination of Nonsignificance
EIA	Effective Impervious Areas
ESA	Endangered Species Act
ESC	Erosion and Sediment Control
EIS	Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
GHMC	Gig Harbor Municipal Code
HPA	Hydraulic Project Approvals
HSPF	Hydrological Simulation Program—Fortran
IBC	International Building Codes (also I Codes)
JARPA	Joint Aquatic Resources Permit Application
LID	Low Impact Development
MSDS	Material Safety Data Sheets
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NGVD 29	National Geodetic Vertical Datum of 1929
NAVD 88	North American Vertical Datum of 1988
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NTU	Nephlometric Turbidity Unit
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
PAHs	Polyacrylamide Aromatic Hydrocarbons
PAM	Polyacrylamide
PCB	Polychlorinated Biphenyls

PCCD	Pierce County Conservation District
PDD	Planned Development District
PUD	Planned Urban Development
PGHS	Pollution-Generating Hard Surface
PGIS	Pollution-Generating Impervious Surface
PGPS	Pollution-Generating Pervious Surface
RCW	Revised Code of Washington
SCS	Soil Conservation Service
SBUH	Santa Barbara Urban Hydrograph method
SEPA	State Environmental Policy Act
SFR	Single Family Residential
SWPPP	Stormwater Pollution Prevention Plan
TESC	Temporary Erosion and Sediment Control
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
UGA	Urban Growth Area
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
U.S. EPA	The United States Environmental Protection Agency
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WDFW	Washington State Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WSDOT	Washington State Department of Transportation
WISHA	Washington Industrial Safety and Health Act
WRIA	Water Resource Inventory Area
WWHM	Western Washington Hydrology Model

Notations

This list of notations is provided only as a guide to some of the notations to be used in a submittal. The exact definition and units are listed when the symbol is used. Since the same symbol can be used for different design methods, the exact definition should be described in the appropriate section of the submittal.

A = drainage area (square miles), also full cross-sectional area of culvert barrel (square feet)

A_b = top surface area of basin (square feet), also area of pond bottom (square feet)

A_d = drainage area

A_s = surface area of swale (square feet), also average surface area for detention BMP

A_t = total area (acres)

C = estimated runoff coefficient

CN = SCS runoff curve number

CN = change in curve number

D = interior height of culvert barrel (feet)

D_{50} = median stone diameter (riprap)

d = average permanent pool depth of a detention BMP

d_b = basin depth (feet)

d_c = critical depth (feet)

d_s = depth of swale check dam (feet)

d_t = time interval in minutes

d_x = a mixture of riprap sizes where the percent of stone by weight is less than x (the specified diameter)

E = designated fraction of particulates to be removed by a BMP

f = final infiltration rate of soil (in/hr)

f_d = infiltration rate including a safety factor of two

g = acceleration due to gravity, 32.2 ft/sec^2

H = stage height (feet) or water depth above pond bottom, also $H=H_f+H_e+H_{ex}$; head on orifice

H_c = specific head at critical depth ($d_c + V_c^2/2g$) (feet)

H_d = design depth of pond

H_e = entrance head loss (feet) = K_c ($V^2/2g$)

H_{ex} = exit head loss (feet) = $V^2/2g$)

H_f = Friction loss (feet) = $V^2n^2L/2.22R^{1.33}$ Note: if (H_f+TW-L*S) less than D, adjust H_f such that (H_f+TW-L*S) = D. This will keep the analysis simple and still yield reasonable results (erring on the conservative side)

HW = headwater depth above inlet invert (feet)

h_b = height from the hydraulic grade line at the 2-year recurrence interval flow on the outflow pipe to the overflow elevation

I = inflow at time 1 and time 2

I(t) = instantaneous hydrograph, in cubic feet per second, (Santa Barbara Urban Hydrograph [SBUH] method)

I = hydraulic gradient (ft/ft)

K_e = entrance loss coefficient

k = time of concentration velocity factor (feet/second)

k_c = time of concentration velocity factor; channel flow

k_s = time of concentration velocity factor; shallow flow

L = distance of flow across a given segment, also length of culvert (feet), also width of emergency overflow weir

MB_{el} = mean tributary basin elevation above sea level (feet)

M_s = potential average snowmelt during storms (in)

m = number of flow segments

N_s = number of check dams along total length of swale

n = Manning's “n”, effective roughness coefficient

n_s = sheet flow; Manning's effective roughness coefficient

O = outflow at time 1 and time 2

P = rainfall depth (inches), total for a storm event

P_R = the total precipitation at a site for the 24-hour design storm event for the given return frequency (R)

Q = flow or discharge (cubic feet per second)

Q_a = after development depth of runoff (inches)

Q_b = before development depth of runoff (inches)

Q_c = depth of runoff from contributing area (feet)

Q_d = runoff depth in inches over a given area

Q_o = average release rate from detention BMP

Q_s = depth of runoff controlled by vegetated swale (inches)

Q_t = release rate for orifice

Q_{total} = total flow at maximum head

$Q(t)$ = the routed flow of the runoff hydrograph (SBUH method)

$Q_{10\%}$ = the flow that is not exceeded more than 10 percent of the time during the months of adult salmonid migration

$\_Q$ = change in runoff depth (inches)

$\_q$ = change in peak discharge (cubic feet per second)

R = hydraulic radius (feet) in Manning's Equation, equals the cross-sectional area divided by the wetted perimeter

$R(t)$ = the total runoff depth at time increment dt, in inches; also known as precipitation excess

S = storage, also culvert barrel slope (ft/ft)

$S(H)$ = storage (ft^3) at stage height (H)

S_d = the largest volume from an initial pond sizing

s_f = friction slope = $n^2V^2/2.22R^{4/3}$

s_o = slope of flow path (ft/ft), also bottom slope

T = width of swale or vegetated filter strip

T_c = time of concentration (hrs)

T_t = travel time of overland flow across separate flow path segments

$T_{1,2,n}$ = the consecutive flow paths of different land cover categories having significant differences in flow path slope

TW = tailwater depth above invert of culvert outlet (feet) Note: if TW is less than $(D+d_c)/2$, set $TW=(D+d_c)/2$

t_d = design detention time of a BMP

_t = time interval; time 2 – time 1

V = average velocity across the land cover (ft/sec), also barrel velocity (fps), also mean velocity

V_c = flow velocity at critical depth (fps)

V_{max} = maximum allowed velocity of runoff in a Biofilter

V_{pp} = permanent pool volume

V_r = void ratio

V_{sed} = settling velocity of the design soil particle

W_{50} = the median stone size (riprap)

w = settling velocity of target particle

y = depth of flow

y_n = normal flow depth

Z = basin side slope ratio (h:v)

Z^1,Z^2 = side slope ratio of swale cross-section (h:v)

_Z = energy coefficient which corrects for the non-uniform distribution of velocity over the channel cross-section