CHAPTER 8: LOCAL DESIGN STANDARDS

This chapter contains information on specific issues for projects in Redmond to help define what is necessary to meet our local codes and regulations and to help define terms in ways that are meaningful to specific engineering design situations in Redmond.

8.1 Standard Specifications and Details

All projects shall be designed and constructed to conform to the City of Redmond Standard Specifications and Details, Current Edition. These are available on the City's website at: http://www.redmond.gov/insidecityhall/publicworks/standarddetails.asp.

8.2 Proper Drainage

The Stormwater Notebook describes minimum drainage requirements. These requirements must be addressed in all projects (Small, Medium, or Large) whether or not plans and permits are required. Even though plans and permits are not required for most Small Projects, proper drainage facilities are required with all projects.

Proper drainage directs runoff away from structures, meets legally accepted practice, and meets the intent of RMC 15.24. For projects not requiring plans or permits, drainage systems are not required by code to have detention or formally designed water quality facilities. Nevertheless, if downstream conveyance capacity is not adequate, the project proponent may elect to provide detention or infiltration. Drainage systems shall be provided to prevent flooding of developed areas, connect downspouts, and provide positive drainage for footing drains.

Runoff from upslope properties must be accepted at natural and established locations at property boundaries and be discharged at natural or established downslope locations along property boundaries or to a constructed drainage system if authorized, subject to required on-site quantity and quality controls.

8.3 Stormwater Management in Wellhead Protection Zones

Wellhead Protection Zones (WPZ) were established, based on proximity to City groundwater wells and groundwater travel times to the various well locations. A map of the WPZ is available at: http://www.redmond.gov/cityservices/citymaps.asp. Zones 1 and 2 delineate the 6-month and 1-year time of travel zones for groundwater to reach the wells and are, therefore, the areas of greatest concern. Zone 3 delineates the 5 to 10-year time of travel zone. An excerpt from the Redmond Community Development Guide, concerning protection of Wellhead Protection Zones is included in Appendix B.

In Zones 1, 2, and 3, certain land uses and activities are prohibited, as noted in the current Redmond Community Development Guide Regulations (20D.140.10-220). Other special requirements for these zones are listed in 20D.140.

If a project area includes portions that are in more than one Wellhead Protection Zone, then the Stormwater Engineer will assess, based on drainage patterns and soil types, whether any portion of the site may be considered to be in the Wellhead Protection Zone with fewer restrictions. Otherwise, the whole site shall be considered to be within the Wellhead Protection Zone with more restrictions.

Stormwater systems for new development and redevelopment projects in Zones 1, 2, and 3 shall address the following:

1. During construction, if construction vehicles will be refueled onsite and/or the quantity of hazardous materials that will be stored, dispensed, used, or handled on the construction site is in aggregate quantities equal to or greater than 20 gallons liquid or 200 pounds solid, exclusive of the quantity of hazardous materials contained in fuel or fluid reservoirs of construction vehicles, the City may require any or all of the items listed in the Redmond Community Development Guide 20D.140.50-040 (1)(f). Generally, the following items will be required in writing as part of the TESC Plan:
    a. Monitoring plan.
    b. Designated project contact.
    c. Secondary containment.
    d. Provisions to secure hazardous materials.
    e. Response to leaking vehicles and equipment.
    f. Practices and procedures regarding transfer of flammable and combustible liquids.
    g. On-site cleanup materials (materials are to be listed in the TESC Plan) and other containment and cleanup provisions. All hazardous material releases shall be contained, cleaned up, and reported.
2. The Drainage Report required for projects shall include a section describing how each of the items above has been addressed in the plans for the proposed project.
3. Infiltration for flow control or water quality treatment is limited within Wellhead Protection Zones. See Chapter 2 for more information.

8.4 Conveyance System Design

8.4.1 Guidance Documents

For basic conveyance system design in Redmond use the latest edition of the Washington State Department of Transportation (WSDOT) "Hydraulics Manual" (M23-03). The manual is available from WSDOT's website at: http://www.wsdot.wa.gov/eesc/design/hydraulics/#HydMan.

Note that the 2005 Ecology Manual shall be used for detention sizing and stormwater treatment.

For computation of hydraulic grade lines in Redmond use one of the following models:

1. King County Surface Water Management Backwater Analysis Program
2. PCSWMM by Computational Hydraulics
3. StormCad by Haestad Methods
4. Mouse by DHI Software
5. Equivalent model approved by the Stormwater Engineer

8.4.2 Pipe Materials

The City of Redmond Standard Specifications and Details describes pipe material requirements. In general,

- sewer grade PVC is preferred for normal installations;
- ductile iron pipe is preferred for shallow bury installations; and
- fusion-welded HDPE pipe is preferred for overland installations on steep slopes.

Due to concerns about the quality of final installation of some pipe materials, the City has implemented a detailed inspection protocol for stormwater pipe. A fee shall be charged to all Contractors installing pipe in Redmond, on the basis of the length of pipe installed, to cover the cost of the stormwater pipe inspection protocol. Pipes that fail the inspection protocol will be replaced by the Contractor and reinspected. The project's performance bond will be used to ensure performance of the Contractor and the Pipe. A summary of the City's stormwater pipe inspection protocol can be found in Appendix R.

Corrugated polyethylene pipe (CPEP) or concrete pipe may be allowed with approval from the Stormwater Engineer. Corrugated aluminum pipe may be allowed for stream culverts with approval from the Stormwater Engineer.

8.4.3 Pipe Sizing

Pipe sizing analysis shall be for the 10-year fully-developed, peak flow unless otherwise specified.

If a stormwater detention or water quality facility lies downstream of the conveyance system, that conveyance system shall be sized to convey the peak flow to the facility (i.e. a pipe draining to a pond that detains or treats the 50-year developed flow must convey the 50-year developed flow).

If a culvert (pipe section that passes under a road with an open channel at each end) conveys water under and across a City right-of-way, the design shall be for the 25-year fully-developed peak flow.

Stormwater shall be managed such that the 50-year frequency event does not flood proposed buildings, any existing on-site buildings, or other existing buildings on contiguous parcels. Required conveyance standards may be adjusted by the Stormwater Engineer based on site and downstream conditions.

For public stormwater pipe, the minimum size shall be 12-inches. For private stormwater pipe, the minimum size shall be 6-inches. To accommodate special installation scenarios, smaller pipe may be used with Stormwater Engineer approval.

8.4.4 Catch Basin and Manhole Freeboard

Pipe systems shall be designed such that the following freeboard requirements are met at catch basins and manholes:

Table 8.1: Catch Basin and Manhole Freeboard	
Design Storm	**Freeboard**
10-year	12-inches
25-year	6-inches
50-year	0-inches (no overtopping)

8.4.5 Horizontal Clearance and Crossing Angle

The minimum horizontal spacing between closed storm drains and water mains, gas mains, other underground utility facilities, and all structures shall be five feet (5') horizontally. The minimum horizontal distance between any open storm drainage facilities (swales, open channels, biofiltration swales, etc.) and water mains, gas mains, and other underground facilities shall be 10 feet.

For pipe crossings, the preferred angle is 90 degrees, but 20 degrees obtuse or acute of 90 degrees is acceptable.

8.4.6 Vertical Clearance - Utilities

The minimum vertical clearance spacing between the outside of storm drain pipelines and water mains, gas mains, electrical or communication conduits, and other underground utility facilities, shall be as noted in Table 8.2. It is expected that the "Standard" vertical clearance will be provided. If that is not possible, use of Ethafoam pads or pipe sleeves may be allowed with approval from the Stormwater Engineer.

Table 8.2: Vertical Clearance – Utilities			
Utility	**Location (Above or below Storm Pipe)**	**Minimum Clearance**	**Special Requirement**
Electrical	Above or below	12-inches	Standard
Communications	Above or below	12-inches	Standard
Water main or gas main	Above or below	12-inches	Standard
Water main or gas main	Above or below	6-inches	Ethafoam pad
Sanitary Sewer	Below storm pipe	12-inches	Standard
Sanitary Sewer	Above storm pipe	18-inches	Standard
Sanitary Sewer	Above or below storm pipe	6-inches	Pipe sleeve and Ethafoam pad
Liquid petroleum	Above or below	See Stormwater Engineer	

An Ethafoam pad is required for some installations to provide additional protection between adjacent utilities. The size of the pad shall be based on the outside diameter (O.D.) of the larger crossing pipe. The pad shall be O.D. by O.D. square by 2.5 inches thick minimum or as required to protect the pipes. The pad shall be a strong, resilient, medium-density, closed-cell, polyethylene foam plank (Dow Ethafoam 220, or accepted equivalent.)

A pipe sleeve is required for some installations to provide additional protection of stormwater from potential leakage from other utilities. A pipe sleeve shall be a single section of PVC pipe (no joints) with a minimum length of 3 feet to each side of pipe crossing. The pipe sleeve shall be placed around the stormwater pipe with the annular space between the pipe sleeve and the stormwater pipe filled with grout.

Additional measures may be necessary to ensure system integrity and may be required as determined by the Stormwater Engineer on a case by case basis.

8.4.7 Minimum Cover

The standard minimum cover over storm drainage lines is dependent on the pipe material. The Redmond Design Standards and Specifications outline cover requirements. The minimum cover over yard drain lines is 18 inches.

8.4.8 Unstable Soils

Unstable soil conditions, such as peat, shall be removed from under pipes unless special measures are approved by the Stormwater Engineer.

8.4.9 Maximum and Minimum Slopes

Maximum slope on storm drain lines is 20%, unless approved by the Stormwater Engineer. Minimum slope on storm drain lines is 0.25%, unless approved by the Stormwater Engineer.

8.4.10 Stream Culverts

Stream culverts shall be designed to have natural bottom conditions, with 1/3 of the pipe diameter buried. Culverts used for stream conveyance shall be a minimum of 24 inches in diameter. Bridges shall be the first choice for stream crossings. More information can be found in the Redmond Community Development Guide, Section 20D.140.

8.4.11 Conveyance System Emergency Overflow

Sites shall be designed to prevent flooding of inhabitable buildings in the 100-year, 24-hour storm as determined by the Rational Method. The Stormwater Engineer may require this analysis as part of the design submittal.

8.4.12 Trees

Trees shall not be located within 8 feet horizontally from storm drain pipe unless root barriers are provided as approved by the Stormwater Engineer. With root barriers, trees may be no closer than 3 feet to pipes.

8.4.13 Pump System Requirements

Pumping stormwater is the method of last resort. When no other alternatives are feasible, pump systems may be considered provided they meet the following:

- Pump: 10-year peak flow rate as calculated by the rational method
- Backup Pump
- Alternative Power Source (Emergency Generator)
- Auto-Transfer Switch Disconnecting Generator from Public Grid. Auto-Start Required.
- Audio Alarm for High Water / Pump Failure
- 3-Hour Flow Storage Volume (may be combined with water quality treatment)

In addition to these requirements, a note shall be placed on the plat or title that says, "Property owner is responsible for operation of the stormwater pump, and for any damages to offsite property if the pump fails to transfer stormwater as designed."

8.5 Catch Basin and Manhole Requirements

8.5.1 Structure Materials

The City of Redmond Standard Specifications and Details describes structure material requirements.

8.5.2 Structure Spacing

Space catch basins in accordance with best engineering practice and the WSDOT Hydraulics manual. To accommodate maintenance of the pipes, a manhole or catch basin (structure) shall be placed periodically with the following maximum spacing:

- 200 feet for pipes less than 12-inch or with design velocities less than 3 feet per second (fps); otherwise,
- 300 feet for pipes less than 30-inch diameter with design velocities greater than 3 fps; or
- 400 feet for pipes equal or greater than 30-inch but less than 42-inch diameter with design velocities greater than 3 fps; or
- 600 feet for pipes of 42-inch diameter or larger with design velocities greater than 3 fps; or
- 600 feet for tightlines down steep slopes.

Structures shall be installed at the end of all dead end mainlines, at horizontal or vertical pipe bends, at changes in pipe size or material, and at pipe junctions for access.

8.5.3 Pipe Connections

Inlet pipe crowns shall not be lower than outlet pipe crowns unless specifically waived by the Stormwater Engineer. Pipe connections shall be water-tight.

8.5.4 Spill Prevention Device

Multifamily, commercial, and industrial properties shall include at a minimum a spill prevention device at the last structure on the property before connecting to the public stormwater system. The minimum requirement for a spill prevention device is a downturned elbow, removable for maintenance, located on the outlet pipe leaving a type 2 catch basin. Depending on the uses on the site, the Stormwater Engineer may require additional measures of protection.

8.5.5 Knockouts

Knockouts shall be provided in structures where future extensions are anticipated. These shall be shown on the plans.

8.5.6 Drop Structures

Drop structures shall only be allowed where approved by the Stormwater Engineer. Generally, drop structures will not be approved if the drop is less than 5 feet.

8.5.7 Maximum Depth

The maximum depth for catch basins shall be as follows:

- Type I Catch Basin: 4 feet
- Type II Catch Basin: 12 feet
- Type III Catch Basin: 25 feet

For greater depths, structures shall be designed by a structural engineer.

8.5.8 Lot and Area Drains

Lot drains or area drains in excess of two feet deep and up to four feet deep shall be Type I catch basins. Area drains exceeding four feet deep shall be Type 2 catch basins with bolt-down lids.

8.5.9 Through-Curb Inlet Frames

Through-curb inlet frames shall be specified on plans at sag points, at any inlet where by-passing runoff would escape the intended control system and at every third inlet on a continuous run along a continuous slope. Through-curb inlet frames may be used at all points except at proposed or likely driveway locations.

8.5.10 Grates

Vaned grates shall be used on all slopes over five percent and on all public systems. Herringbone grates may be used on flatter slopes in private systems. All grates shall be ductile iron.

8.6 Site Design

8.6.1 Flood Protection

All parts of any structure constructed below the 100-year flood elevation of associated waterways shall be protected from flooding using floodproofing.

Floodproof to the 100-year elevation plus one foot. Floodproofing shall conform to Federal Emergency Management Agency standards in effect at project vesting.

Projects planning work within flood control zones shall submit a Flood Control Zone Application (Appendix H).

8.6.2 Impervious Area for Single Family Residential Plats and Short Plats

Projects creating lots for single-family houses (residential plat and short plat projects) shall provide drainage systems for all lots. The drainage systems shall address runoff quantity and quality, based on the impervious area assuming no impervious areas in the existing pre-developed condition.

These projects shall assume each lot has impervious surface based on the following formula. For each lot created, the assumed impervious area is taken as the area of the lot, less any unbuildable area as defined in Critical Area regulations times the percentage of allowable coverage (from the Land Use section of the Redmond Community Development Guide) times 0.80. However, the maximum impervious area one is required to assume for a lot is 4,200 square feet (unless specific building plans indicate larger areas).

The total impervious area for these projects is taken to equal the paving, sidewalks, etc., required of the project plus the assumed impervious area of each lot.

8.6.3 Drainage Connections for All lots

All types of plats and short plats (residential, commercial, industrial, and others) shall provide for drainage connections on each lot, unless otherwise approved by the Stormwater Engineer. (Low impact development measures may make the use of lot connections unnecessary.)

Drainage connection points are to be located at the low elevation point of the allowable building area of each lot. The connections must be below finished grade so as to allow connection of footing drains, roof drain leaders, and other drains.

Providing for drainage connections typically means providing a piped system from the drainage connection points described above to the drainage system in the plat or short plat. A maximum of three (3) lots may be connected to a common private collection pipe. Multiple collection pipes may be used.

In some cases it may be acceptable to include only the plan for the lot drainage connections as part of the City-approved drainage plan for the plat or short plat and defer construction until building construction on the lots.

In some cases, it may be possible (and even desirable) to infiltrate runoff from buildings. Infiltration of clean water can reduce runoff problems and maintain groundwater supplies. Infiltration is generally acceptable where the soils and geology are suitable, and at locations outside Wellhead Protection Zones 1, 2 and 3. Treatment to provide acceptable water quality is still required and is particularly critical in the vicinity of the City's wells (see section in this chapter regarding the Wellhead Protection Program). Percolation tests are required at all proposed infiltration locations.

In all cases, appropriate easements must be provided, as part of the plat or short plat, for the specific drainage systems shown on the construction documents. Those documents shall also show anticipated grading, rockeries, retaining walls, etc. Construction of the lot drainage connection systems must be feasible and allow connection to the proposed plat improvements or to the documented infiltration areas. The minimum private easement width is 5 feet.

8.6.4 Single Family Roof and Foundation Drain Requirements

Size and Connection – Roof drain/foundation drain connection from the house shall be 6-inch diameter and shall be extended to a storm drain structure (not connected directly to a stormwater pipe). Foundation drains shall be separate from roof drains around the building foundation. Pipes shall be smooth wall, rigid type (sewer grade). Pipes shall not be corrugated polyethylene (such as flexible ADS). Roof and footing drain connection stubs shall be at least one (1) foot below the lowest existing elevation of the building envelope on all newly-created lots, unless a different elevation is approved or required by the Stormwater Engineer. The minimum cover over yard drain lines is 18 inches. For subdivisions, no more than three (3) roof drain stubs are allowed on a single roof drain collection pipe. Provide a tracer wire along plastic pipe from the building to the property line.

Building Footings – Building footings shall be designed, or pipe located, such that the footing shall not bear on the pipe.

8.6.5 Separation of Systems Serving Separate Owners

Stormwater facilities provided to control quantity and quality generally should be provided within the site they are serving although certain exceptions are acceptable.

Facilities for single family plats may be located in common areas (even in public roads that are created by the plat or short plat).

Water quantity and quality controls provided for the private part of a project shall be separate from water quantity and quality controls for public impervious surfaces that are part of the project. Individual lots within single family plats and short plats with public road improvements may drain to the public water quantity and quality control systems constructed to serve the development.

In some circumstances, water quantity and quality control requirements for the proposed impermeable areas may be met by adding such control(s) to equivalent existing developed areas of the site, which do not already have such controls.

8.6.6 Grading

The maximum ground slope on graded surfaces is 3 horizontal to 1 vertical (3:1) except as approved in association with roadway section in City rights-of-way where the maximum ground slope may be up to 2:1.

Proposed contours shall not create undrained, ponding areas where such areas would not be appropriate (onsite or offsite).

8.6.7 Rockeries/Retaining Walls

Rockeries or retaining walls should not cross or be near storm-drain pipes. Any crossing of a wall shall be perpendicular to the wall and special construction techniques including steel casings may be required.

Rockeries under 4 feet are not regulated. Rockeries over 4 feet shall only be used against cut slopes.

Rockeries and retaining walls shall have foundation drains (6 inches in diameter of approved materials) behind the wall connected to a defined conveyance system. Rockeries 48 inches and taller and retaining walls must be designed by a structural or geotechnical engineer. No retaining structure may be higher than 8 feet (unless a relief from general design standards is obtained). Structural retaining walls (not rockeries) over four feet in height are reviewed and permitted by the Building Department following UBC Section 106.2.

8.6.8 Public Easements

Where public storm drain line easements are necessary, they shall be 20 feet in width. Easement widths of less than 20 feet may be considered by the Stormwater Engineer, in special situations, but shall not be less than 15 feet in width.

Publicly maintained water quality and detention facilities shall be located in tracts dedicated to the City. The size of the tract shall be based on the size of the stormwater facility. At a minimum, the tract shall include the entire facility, site access area, and at least 5 feet around the facility. In limited cases an easement may be permitted. If an easement is permitted, dimensions shall be determined by the Stormwater Engineer.

In cases where pipes and/or other facilities are deeper than 8 feet or have other special conditions, larger tracts or easements may be required.

All easements needed for City stormwater systems shall be provided by the developer in the name of the City. The required easements shall be shown on the construction drawings and the easement legal description or plat markup shall be submitted for review at the same time construction drawings are submitted for review.

Easements shall have language acceptable to the City, similar to the example in Appendix K.

An alternative to separately recording a City of Redmond easement form is to record an easement on the face of a plat. If this is the method used, a standard City of Redmond easement statement shall be included in the plat documents.

Buildings, structures, garages, carports, dumpster enclosures, decks, rockeries over 4 feet, etc., shall not be located in easement areas.

8.6.9 Stormwater Facilities

8.6.9.1 Maintenance Access

Access for maintenance is a very important design feature. Facilities designed with improper access may be subject to additional review iterations and cost. Unless specifically waived by the Stormwater Engineer, all stormwater facilities shall be accessible to maintenance vehicles. If not located in or adjacent to a vehicle access way, then access by an improved roadway surface shall be provided. Materials of construction for an improved roadway surface may include asphalt concrete, cement concrete, structurally stabilized vegetated surface, crushed surfacing, or other surfacing as approved by the Stormwater Engineer. Access roads shall be designed with 40 foot inside radius on curves, with slopes less than 15% and with widths as determined by the Stormwater Engineer (but not less than 10 feet). The Stormwater Engineer may require access ways to be located in separate tracts.

Outlet control valves shall be detailed so as to be operable from the surface (not subject to confined space entry requirements) unless approved otherwise by the

Stormwater Engineer. The specific detail for these valves depends on the type of valve and shall be subject to approval by the Stormwater Engineer. Gravity-flow draw-down systems (for ponds, vaults, etc.) shall be provided with an outlet control valve.

8.6.9.2 Facility Maintenance

Provision shall be made for long-term maintenance of water quality and detention facilities.

8.6.10 Transfer of Assets to the Public

When projects include construction of improvements that will be turned over to the Public, a Public Utility & Stormwater Facilities Bill of Sale Form (Appendix I) and a Developer Extension Asset Summary (Appendix J) shall be completed and submitted to the Development Services Division of Public Works.

8.7 Low Impact Development (LID)

8.7.1 LID Overview

Low impact development (LID) is a stormwater management and land development strategy applied at the parcel and subdivision scale that emphasizes conservation and use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely mimic predevelopment hydrologic functions. Implementation of LID benefits streams, lakes, and Puget Sound by moderating the impacts of stormwater runoff generated by the built environment. These techniques may be accessory or alternative to traditional, structural stormwater management solutions. Information on the scope, benefit, and applicability of LID can be found in the Low Impact Development Technical Guidance Manual prepared by the Puget Sound Action Team and Washington State University Pierce County Extension.

Use of LID is one way to implement the following Comprehensive Plan policies:

- **NE-9** Encourage environmentally friendly construction practices such as the build green program and low impact development.
- **NE-10** Encourage projects which utilize alternative technologies, engineering, and plans which emphasize Low Impact Development strategies through incentives and flexibility in application of regulatory requirements.

8.7.2 Intent of LID

The City encourages the use of LID techniques, including techniques for stormwater management.

These goals are to:

- Maintain or restore the pre-developed condition surface water flow volumes, durations and frequencies;
- Retain or restore native forest cover to capture, infiltrate and evaporate all or a portion of the rainfall on the site;
- Cluster development and minimize land disturbance;
- Preserve or restore the health and water-holding capacity of soils;
- Incorporate natural site features that promote infiltration of stormwater;
- Minimize total impervious surfaces and effective impervious surfaces;
- Reduce or eliminate piped stormwater conveyance and conventional detention ponds;
- Manage stormwater through infiltration, bioretention, and dispersion; and
- Manage stormwater runoff as close to its origin as possible.

8.7.3 Land Use

LID is not merely the use of specific stormwater management facilities, but is an approach to land development that integrates with and responds to the natural conditions of a site. A low impact development should strive to minimize the impact of development on the pre-developed hydrologic condition. From a land use perspective, this is accomplished by minimizing the development envelope and minimizing impervious surfaces.

8.7.3.1 Minimize development envelope

Minimizing the development envelope means confining lots and land uses to confine development and activity areas to the smallest impact area. While the City's development standards are generally designed for conventional development that consumes most or all of a development site with buildings, infrastructure and activity areas, the Community Development Guide provides several mechanisms to focus development on a site. Residential clustering can be accomplished through the clustering provisions of RCDG 20C.30.50 and the modifications allowed under RCDG 20C.30.105, Planned Residential Development.

8.7.3.2 Retain areas of native vegetation

Minimizing the development envelope allows retention of a portion of the site in its natural or pre-developed state. In addition to offering an aesthetic amenity and opportunities for passive recreation, preservation of natural open spaces provides areas for dispersion of stormwater generated on the developed portion of the site. The extent to which dispersion to a natural area may be allowed depends on the size of the preserved area relative to the tributary area as well as underlying soil types. Where native forest is preserved or restored to disturbed areas, a portion of the rain that falls on the site will be intercepted and evaporated or absorbed. In recent years, researchers

have speculated that retention of 65 to 75 percent of the natural land cover and soils should be preserved in a watershed to retain sufficient hydrologic conditions to prevent stream channel degradation, maintain base flows, and contribute toward properly functioning conditions for salmonids. While preservation of significant natural areas is a challenge in urban areas, conservation of existing habitat is a key element of LID. LID projects should preserve or re-establish a minimum of 35 percent of the overall site area in native vegetation. (This 35% does not include any critical areas that are already required to be set aside.) Areas retained as native open space are most effective for dispersion when located downslope of proposed development areas.

8.7.3.3 Preserve native soils

In addition to retention of areas of native vegetation, preservation of native soils is an important aspect of low impact development. Native soils have a significantly higher capacity to absorb, retain and transmit water than soils remaining on a site following conventional development. Commonly, native soils are graded and removed from development sites. In the process, the underlying soils are significantly compressed, resulting in a reduction in the ability of the soils to absorb water from the surface. Vehicles with tracks or tires with axle loads exceeding 10 tons per axle can compact soils as deep as three feet. A majority of the total soil compaction (70-90 percent) can occur in the first pass with equipment. Minimal disturbance techniques can be employed to reduce the limits of clearing and grading and minimize hydrologic impacts.

Prior to any clearing or grading, areas of the site more conducive to infiltration should be identified (see Site Assessment, below), and site design should preserve such areas. Ground disturbance should be limited to road, utility, building pad, landscape areas, and the minimum additional area needed to maneuver equipment. A ten-foot perimeter around the building site can provide adequate work space for most activities. The number and extent of construction access roads should be limited and located where future roads and utility corridors will be placed. Where prior clearing or grading has occurred, soils should be restored according to the guidelines in RCDG 20D.80.10-170 in all areas except where impervious surfaces are proposed.

8.7.3.4 Compost Amendment of Soils

Compost amendment of soils may be a more viable alternative to preservation of native soils for some sites, but can realize many of the same benefits. Compost amendment of soils shall be performed in accordance with the requirements found in Appendix Q. See Chapter 2 for incentives for use of compost amended soils in sizing detention facilities.

8.7.3.5 Minimize impervious surfaces

Minimizing the development envelope may also limit the extent of new roadways and other impervious surfaces. Limiting impervious surfaces is a primary emphasis of low impact development. Impervious surfaces can be minimized by limiting vehicular and pedestrian infrastructure, e.g., roads, driveways, parking areas, and sidewalks, to the minimum functional needs of the facilities. The City's Community Development Guide

provides opportunities for modifying street standards through RCDG 20C.30.105, Planned Residential Development, and RCDG 20C.60.60, Planned Commercial Development. The Rustic Street Standards in RCDG Appendix B0D-3, while not applicable to all areas or all roadway use conditions, represent a good template for LID road design. LID techniques to minimize impervious surface area also include the use of various pervious paving materials, minimal excavation foundations, and green roofs. These alternatives to conventional development techniques decrease the effective impact of new surfaces and buildings on the pre-developed conditions.

8.7.4 LID BMPs

To achieve the intent of LID, stormwater should be managed on-site to the greatest extent possible.

8.7.4.1 LID BMPs

The following onsite BMPs, subject to modifications within this Stormwater Notebook or requirements in the Redmond Municipal Code, should be considered:

- Permeable pavements;
- Dispersion;
- Vegetated rooftops;
- Rainwater harvesting;
- Reverse slope sidewalks;
- Minimal excavation foundations; and
- Bioretention.

Descriptions of these BMPs, along with design criteria, maintenance standards, and modeling guidance, can be found in Appendix F of Volume III of the 2005 Ecology Manual.

Other BMPs may be considered for use by the Technical Committee, provided that the committee finds that there is reasonable scientific justification that such BMPs will provide equal or better flow control and water quality results, and that long-term performance is assured.

8.7.4.2 Treatment BMPs

The only LID BMPs that may be approved for water quality treatment are:

- Dispersion (lots 5 acres and greater), when consistent with DOE BMP T5.30; and
- Bioretention, when consistent with the design criteria in the Ecology Manual. Any stormwater that infiltrates through the imported soil mix be considered to have received the equivalent of Enhanced Treatment.

8.7.4.3 LID in Wellhead Protection Zones

Infiltration as treatment is limited to Wellhead Protection Zone 4. Infiltration of clean water from roofs and sidewalks is encouraged throughout the City.

8.7.5 Site Assessment for LID

Unless waived or modified by the City Engineer, all requests to use LID BMPs to achieve conformance with the City's stormwater regulations shall require a site assessment. This initial inventory and assessment process will provide the baseline information necessary to design strategies that preserve natural resources, preserve areas most appropriate to evaporate, transpire, and infiltrate stormwater, and help to achieve the goal of maintaining pre-development natural hydrologic conditions on the site. The assessment should result in a series of maps identifying streams, lakes, wetlands, buffers, steep slopes and other hazard areas and hydrologic features, significant wildlife habitat areas, and permeable soils offering the best available infiltration potential. Maps can be combined as hard copies or in electronic mapping formats to delineate the best areas to direct development.

The site assessment shall be a component of the project submittal. At a minimum, the site assessment shall include the following:

1. A survey prepared by a registered land surveyor showing existing public and private development, including utility infrastructure, on and adjacent to the site, major and minor hydrologic features, including seeps, springs, closed depression areas, drainage swales, and two-foot contours up to ten percent slope and five foot contours for slopes above ten percent. Spot elevations shall be at 25-foot intervals.
2. Location of all existing lot lines, lease areas and easements.
3. A soils report prepared by a licensed geotechnical engineer or licensed engineering geologist. The report shall identify:
    a. Underlying soils on the site utilizing soil pits and soil grain analysis to assess infiltration capability on site. The frequency and distribution of test pits shall be adequate to direct placement of the roads and structures away from soils that can most effectively infiltrate stormwater;
    b. Percolation tests if appropriate, or requested by the Stormwater Engineer;
    c. Topographic and geologic features that may act as natural stormwater storage or conveyance and underlying soils that provide opportunities for storage and partial infiltration;
    d. Depth to wet season high groundwater;
    e. Geologic hazard areas and associated buffer requirements as defined in RCDG 20D.140;
    f. Distance from site boundaries to any areas within 200 feet of the site identified as landslide hazard areas or having a slope of 40 percent or steeper with a vertical relief of 10 feet or more; **[Note: the City may require the applicant to expand the 200 feet to encompass a larger area if there are concerns for downstream geological hazards.]**
    g. Identification of wellhead protection zone(s); and
    h. For previously cleared or graded sites, analysis of topsoil according to the soil guidelines in RCDG 20D.80.10-170.
4. A survey of existing native vegetation cover and wildlife habitat by a qualified biologist identifying any forest areas on the site, species and condition of ground cover and shrub layer, and tree species, seral stage, and canopy cover.

5. A streams, wetland, and water body survey and classification report by a qualified biologist showing wetland and buffer boundaries consistent with the requirements of RCDG 20D.140 and Critical Areas Ordinance Reporting Requirements.
6. Flood hazard areas on or adjacent to the site.
7. A preliminary drainage report providing analysis of the existing site hydrologic conditions on the site and recommendations for type, location, and restrictions on LID BMPs.
8. Other studies as deemed necessary by the Stormwater Engineer.

Applicants for LID projects should meet with engineering and planning staff following completion of the site assessment and prior to site design. Staff will provide feedback on additional analysis that may be required, preliminary recommendations on meeting the City's stormwater regulations and options for low impact options for site design. It is recommended that applicants consult the Low Impact Development Technical Guidance Manual for additional information on LID site planning, site preparation, and BMPs.

8.7.6 Maintenance

All BMPs, impervious surface area restrictions, maintenance agreements, preserved native areas and any other requirements or restrictions imposed as conditions of approval under this chapter shall be recorded as covenants, deed restrictions, easements, or other legally binding limitations and commitments in a form approved by the City. Easements or rights of access shall be provided to the City to allow inspection, maintenance and repair, as necessary, to ensure that approved drainage systems are preserved and maintained according to the conditions of approval. BMPs approved on private property under the provisions of this chapter shall remain the responsibility of the person or persons holding title to the property, their heirs and assigns.

Native forest or other natural areas preserved or established as part of a dispersion BMP approved under the provisions of this chapter shall require, as a permit condition, that the native forest area tract or tracts be protected in accordance with the requirements set forth for general critical area protective measures in Chapter 20D.140.10-180 of the Community Development Guide.

8.7.7 Evaluation and Monitoring

The Stormwater Engineer may require implementation of a monitoring and evaluation program designed to measure the performance of the drainage system or specific elements that are approved for a project under the provision of this chapter.

8.8 Contribution in Lieu of Onsite Facilities

In recognition of the need to improve the water quality of streams, and to meet the requirements of the City's National Pollutant Discharge Elimination Systems (NPDES) Municipal Stormwater Permit, the City requires new development and redevelopment to provide flow control and water quality treatment of stormwater. At the same time, the City is working to identify and construct Regional Stormwater Facilities that meet the requirements for flow control and water quality treatment for new projects while retrofitting areas that have not developed under current standards.

As a part of the City's coordinated, regional approach to managing stormwater City-wide, some projects will have the requirement or option of contributing a fee, in lieu of building site-specific facilities. The fee shall be used toward construction of regional stormwater facilities. The City has responsibility for ensuring that:

- Potential impacts from all new development or redevelopment within the City are addressed in a manner that meets the City's obligations on a watershed basis to protect water quality and prevent erosion of streams.
- Funds received for construction of regional facilities are used for that purpose.

To meet these responsibilities, the City's program, administered by the Natural Resources Division of the Public Works Department, includes procedures for:

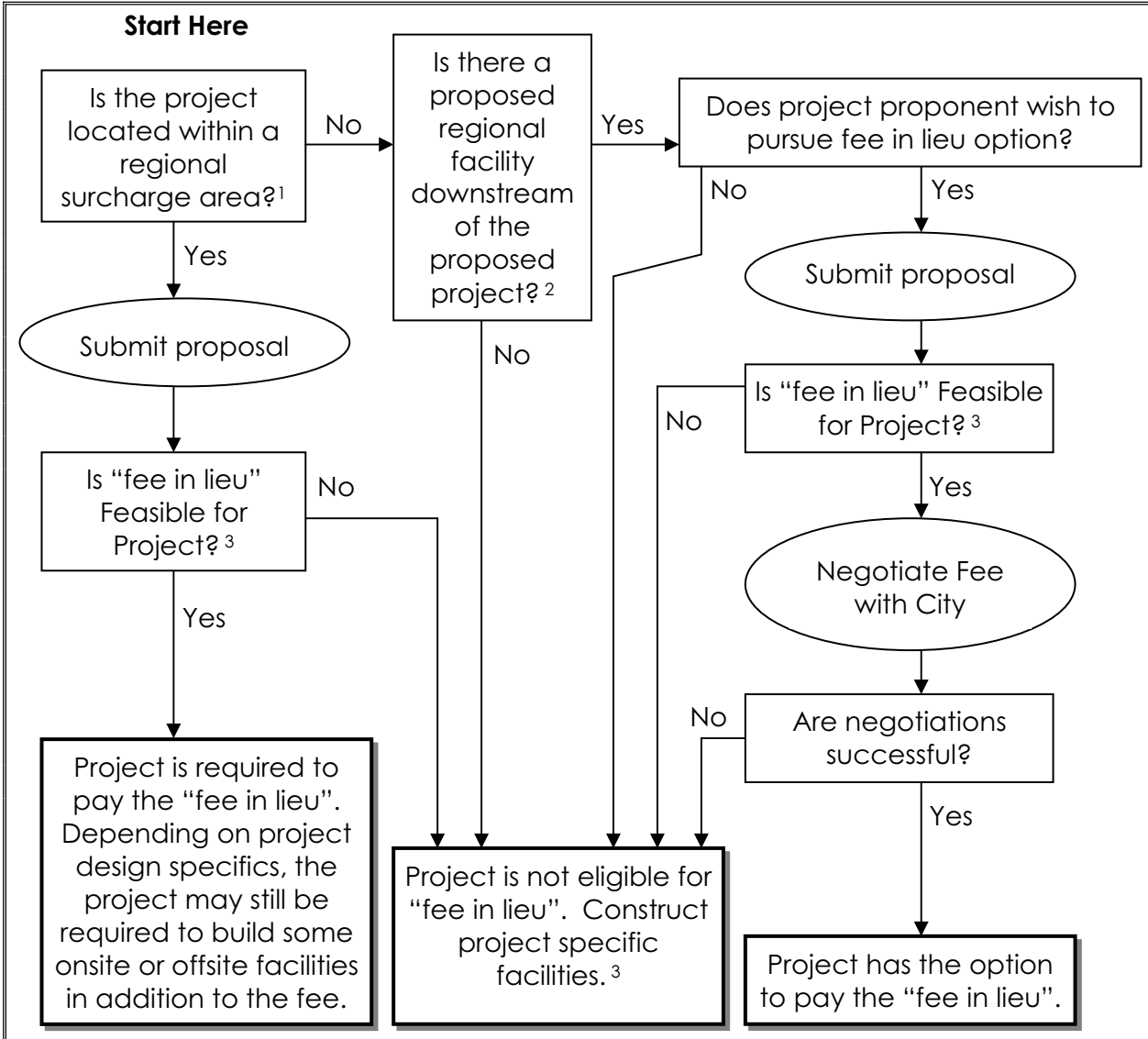
- coordinating with the Development Services Division's review of development and redevelopment projects;
- determining what projects are eligible for "fee in lieu";
- accounting for areas that have been treated by existing regional facilities;
- accounting for funds that have been received for construction of new regional facilities; and
- locating, designing, and constructing regional facilities.

8.8.1 <u>Determine "Fee in Lieu" Eligibility</u>

As noted in Chapter 2 of the Stormwater Notebook, some projects may be required or have the option to pay a fee in lieu of constructing project specific flow control or water quality facilities. A specific project's eligibility for "fee in lieu" depends upon the:

- scope of the project;
- project location in relation to regional surcharge areas or proposed regional stormwater facilities;
- project specific drainage issues; and
- feasibility of constructing the project using the fee in lieu option without causing harm to downstream systems.

Figure 8.1 addresses these issues to help project proponents understand the process by which "fee in lieu" eligibility is determined.



Notes:

1. See Appendix O for locations of regional surcharge areas.
2. See Appendix O for locations of proposed regional facilities.
3. See discussion of feasibility criteria in Section 8.8.2.

Figure 8.1 Flow Chart for Determining Eligibility for "Fee in Lieu".

8.8.2 Determining Feasibility of Fee in Lieu Proposal

The feasibility of a project's fee in lieu proposal will be determined by the Stormwater Engineer.

Criteria used to make this determination include:

- If the fee is accepted in lieu of project specific facilities, will there be harm to streams or property?
- Is there available capacity within the regional facility (flow control or water quality)?
- Are there cumulative impacts from multiple project proposals that if combined would make the proposal infeasible?
- Does the project benefit from the regional facility?
- Does accepting the fee in lieu meet the overall objectives of the regional facilities program?

The following elements will also apply in the determination of feasibility:

- Many projects will be required to build some onsite facilities and some offsite facilities to get stormwater to the City's proposed or existing regional stormwater facility. (As noted in Section 2.3.1.3, improvements to downstream systems shall be sized for full buildout conditions, based on current zoning.) This shall not result in a project's proposal being considered not feasible.
- The feasibility of a fee in lieu of water quality proposal shall not impact the feasibility of a fee in lieu of flow control proposal, and vice versa.
- Incomplete fee in lieu proposals will not be considered.
- If the fee in lieu proposal is found to be not feasible, then the project shall be required to construct project specific facilities and will not be required to pay the fee in lieu or regional surcharge. Some combination of these two options may be appropriate for some projects with approval from the Stormwater Engineer.
- With approval from the Stormwater Engineer, project areas may be separated to use fee in lieu for some portions of the project site and project specific facilities for other areas.

8.8.3 Contribution in Lieu of Providing Flow Control

The City requires flow control measures for projects, as outlined by Minimum Requirement #7 of the Ecology Manual (Section 2.5.7 of the Stormwater Notebook.) One alternative for meeting flow control requirements is to provide a contribution in lieu of providing project specific facilities. This alternative is mandatory in some cases and optional in others. In either case, projects may still be required to provide some flow control facilities to address existing deficiencies or prevent new ones, as determined through development of the Contribution in Lieu of Flow Control Proposal.

8.8.3.1 Project Site in Regional Surcharge Area

If a project site is located within a regional surcharge area, as noted on the City's Regional Stormwater Facilities Map (Appendix O), then the project is required to pay the regional surcharge for flow control that has been established for that area, unless the fee in lieu of proposal is determined to be not feasible (See Section 8.8.2 above). This payment will satisfy the site specific flow control requirements that relate to the improvements that are not being built for the site. The project proponent will be required to submit a "Fee in Lieu of Flow Control Proposal" as described below as part of the project's Drainage Report.

8.8.3.2 Project Site Drains to Regional Stormwater Facility

If a project site is located such that it naturally drains to the proposed location for a proposed or existing regional stormwater facility, as noted on the City's Regional Stormwater Facilities Map (Appendix O), then the project may have the option to pay a fee, in lieu of constructing site specific stormwater facilities. (Some facilities may be required in addition to the fee, depending upon site specific issues.) This payment will satisfy the site specific flow control requirements that relate to the improvements that are not being built. If the project proponent wishes to pursue this option, the project proponent shall submit a "Fee in Lieu of Flow Control Proposal" as described below as part of the project's Drainage Report. If the City cannot come to an agreement with the project proponent of the amount of the fee, or the other improvements that may be required in addition to the fee, then payment of a fee in lieu of flow control will not be an option and the project will be required to provide site specific improvements accordingly.

8.8.3.3 Contribution in Lieu of Flow Control Proposal

A contribution in lieu of flow control proposal shall include the following key elements:

- Identify the regional surcharge area or the relevant Potential Regional Stormwater Facility.
- Provide a drainage report describing what would be required for flow control if the project were constructed instead of using the fee in lieu option.
- Provide a description of what flow control facilities (if any) are proposed as part of the project. (In some cases, the contribution may not fully meet all project flow control requirements.)
- Unless specifically waived by the Stormwater Engineer, provide a downstream hydrologic and hydraulic analysis that evaluates the potential impacts of contribution in lieu of providing flow control. The downstream analysis shall continue to:
    1. an existing regional stormwater facility;
    2. an infiltration facility;
    3. the Sammamish River;
    4. Lake Sammamish; or
    5. ¼ mile beyond the City Limits.

- Document how this project will meet the following conditions:
  1. Allowing the contribution in lieu of providing site specific flow control shall not create an unsafe situation.
  2. The downstream system shall have adequate capacity to convey the undetained flow for the required maximum return period storm events without causing or aggravating any downstream flow-related problems such as flooding or erosion.
  3. A regional flow control project downstream of the project site (or within the regional surcharge area) with available capacity for new development is on the City's Regional Stormwater Facility Map (Appendix O).
  4. If the project drains into Bellevue, site specific flow control facilities that meet Bellevue's current design standards shall be constructed in addition to payment of the fee in lieu of flow control. Document how Bellevue's requirements will be met. (No review by the City of Bellevue is required.)
  5. The Natural Resources Division Manager or his/her designee approves the contribution in lieu of flow control as being consistent with the City's goals and objectives of the regional facilities program. (Include a letter from the Natural Resources Division. Contact the Natural Resources Division early in the process to develop a timeline and review schedule.)

8.8.3.4 Contribution in Lieu of Flow Control Fee

If a project lies within an identified regional facility surcharge area then the project proponent shall pay the regional surcharge fee as identified on the current permit review fee schedule. The fee is based on the final amount of impervious surfaces within the project limits that drain to the public stormwater system.

If a regional surcharge area has not yet been identified for the project site, then the cost of the fee in lieu of flow control will be negotiated between the project proponent and the City, and will be based on the full costs that would be expended if flow control were addressed with site specific facilities (site studies, geotechnical, structural, site, landscaping design, construction, construction administration, sales tax, etc.). (Land costs are not required to be included in the negotiated fee.)

For bookkeeping purposes, costs for joint water quality / detention facilities shall be divided into a water quality component and a flow control component.

8.8.4 Contribution in Lieu of Providing Stormwater Quality Treatment

The City requires stormwater quality treatment measures for projects, as outlined by Minimum Requirement #6 of the Ecology Manual (Section 2.5.6 of the Stormwater Notebook.) One alternative to meeting this requirement is to provide a contribution in lieu of providing site specific facilities. This alternative is mandatory in some cases and optional in others. In either case, projects may still be required to provide some water quality facilities to address existing deficiencies, prevent new ones, or meet site-specific treatment needs as determined through development of the Contribution in Lieu of Stormwater Quality Treatment Proposal.

8.8.4.1 Project Site in Regional Surcharge Area

If a project site is located within a regional surcharge area, as noted on the City's Regional Stormwater Facilities Map (Appendix O), then the project is required to pay the regional surcharge for stormwater quality treatment that has been established for that area, unless the fee in lieu of proposal is determined to be not feasible (See Section 8.8.2 above). This payment will satisfy the site specific stormwater quality treatment requirements that relate to the improvements that are not being built. The project proponent will be required to submit a "Fee in Lieu of Stormwater Quality Treatment Proposal" as described below as part of the project's Drainage Report.

8.8.4.2 Project Site Drains to Regional Stormwater Facility

If a project site is located such that it naturally drains to the proposed location for a proposed or existing regional stormwater facility, as noted on the City's Regional Stormwater Facilities Map (Appendix O), then the project may have the option to pay a fee in lieu of constructing site specific stormwater facilities. This payment will satisfy the site specific stormwater quality treatment requirements that relate to the improvements that are not being built. If the project proponent wishes to pursue this option, the project proponent will be required to submit a "Fee in Lieu of Stormwater Quality Treatment Proposal" as described below as part of the project's Drainage Report. If the City cannot come to an agreement with the project proponent of the amount of the fee, or the other improvements that may be required in addition to the fee, then payment of a fee in lieu of stormwater quality treatment will not be an option and the project will be required to provide site specific improvements accordingly.

8.8.4.3 Contribution in Lieu of Stormwater Quality Treatment Proposal

A contribution in lieu of stormwater quality treatment proposal shall include the following key elements:

- Identify the regional surcharge area or the relevant Potential Regional Stormwater Facility.
- Provide a drainage report describing what would be required for stormwater quality treatment if the project specific improvements were constructed instead of using the fee in lieu option.
- Provide a description of what stormwater quality treatment facilities (if any) are proposed as part of the project. (In some cases, the contribution may not fully meet all stormwater quality treatment requirements.)
- Document how this project will meet the following conditions:
    1. Allowing the contribution in lieu of providing site specific stormwater quality treatment shall not create an unsafe situation.
    2. Appropriate source control procedures are still implemented on the site.
    3. If the site drains to an infiltration system in Wellhead Protection Zone 3, it shall pass through an existing facility for enhanced treatment.
    4. The site may not drain to an infiltration system in Wellhead Protection Zones 1 or 2.

5. A regional water quality project downstream of the project site (or within the regional surcharge area) with available capacity for new development shall be on the City's Regional Stormwater Facility Map (Appendix O).
6. If the project drains into Bellevue, site specific stormwater quality facilities that meet Bellevue's current design standards shall be constructed in addition to payment of the fee in lieu of stormwater quality treatment. Document how Bellevue's requirements will be met. (No review by the City of Bellevue is required.)
7. The Natural Resources Division Manager or his/her designee approves the contribution in lieu of stormwater quality treatment as being consistent with the City's goals and objectives of the regional facilities program. (Include a letter from the Natural Resources Division. Contact the Natural Resources Division early in the process to develop a timeline and review schedule.)

8.8.4.4 Contribution in Lieu of stormwater quality treatment Fee

If a project lies within an identified regional facility surcharge area then the project proponent shall pay the regional surcharge fee as identified on the current permit review fee schedule. The fee is based on the final amount of pollution generating impervious surfaces within the project limits.

If a regional surcharge area has not yet been identified for the project site, then the cost of the fee in lieu of stormwater quality treatment will be negotiated between the project proponent and the City, and will be based on the full costs that would be expended if stormwater quality treatment were addressed with site specific facilities (site studies, geotechnical, structural, site, landscaping design, construction, construction administration, sales tax, etc.). (Land costs are not required to be included in the negotiated fee.)

For bookkeeping purposes, costs for joint water quality / detention facilities shall be divided into a stormwater quality treatment component and a flow control component.

8.9 Other Development Topics

8.9.1 Internal Building Changes as Redevelopment

Re-development projects that are confined to existing interior spaces shall not require new drainage controls (except those drainage systems described above as may be required by the City for proper drainage).

If redevelopment projects include any work involving the exterior part of the site, the project shall be subject to redevelopment requirements under this Stormwater Notebook. Where exterior work occurs, the value of the interior work shall be included in determining the extent of exterior redevelopment requirements.

8.9.2 Site Improvements Involving Hazardous Materials

Site improvements to existing facilities that would otherwise not be subject to stormwater system improvement but involve hazardous materials shall meet the water quality requirements of this Stormwater Notebook, Redmond Municipal Code (RMC) 15.24, RMC 15.06 and RCDG 20D.140. There are also specific source control best management practices in Volume IV of the Ecology Manual.

8.9.3 Dumpster Area Stormwater Drainage

Dumpster areas are classified into one of three (3) groups. Generally, as an introduction, Group 1 is for small containers (not over 1.5 cubic yards) and single family sites, Group 2 is for all other sites that are not listed in Table 8.3, and Group 3 is for all sites involving uses listed in Table 8.3.

Quite often, the land uses at a site change over time. A development may initially have a Group 1 or Group 2 dumpster area. At a later time, if this site's land use changes and a Group 3 dumpster area becomes appropriate, the City may require an upgrade to the Group 3 specifications. For existing developments which need to add dumpster areas, these guidelines generally apply, but requirements may be adjusted or alternatives accepted by the Stormwater Engineer based on the particular characteristics of the existing situation. If compactors are used, the dumpster area is in Group 2 or Group 3 regardless of dumpster capacity. A dumpster area may contain more than one cart or dumpster. To be considered separate areas two (2) dumpster areas need to be separated by at least 25 feet.

8.9.3.1 Group 1: Single Family Parcels and Dumpster Areas having Total Dumpster Capacity not over 1.5 Cubic Yards

Group 1 Dumpster Areas include:

1. All dumpster areas where the volume of the container(s) does not exceed 1.5 cubic yards and compactors are not used.
2. All dumpster areas in single family lots except where certain on-site businesses are conducted. For single-family lots where on-site businesses create additional pollutant potentials in the dumpster area, the dumpster areas may be assigned to Group 2 or Group 3 by the Stormwater Engineer.

No special requirements apply to Group 1 dumpster areas.

8.9.3.2 Group 2: Dumpster Areas having Capacities Over 1.5 Cubic Yards and Uses Not Listed in Table 8.3

Group 2 dumpster areas include areas where the capacity of the dumpster(s) exceed 1.5 cubic yards or dumpsters have compactors and site uses are not included in Table 8.3.

For Group 2 dumpster areas, special requirements apply. Surface drainage from dumpster areas may be connected to the storm drainage system, provided:

1. Dumpster areas are sloped to drain out onto paved, impervious surfaces (such as parking lots).
2. No storm drain inlets are located in the dumpster area.
3. Runoff from the dumpster area flows over the paved surface at least 15 feet prior to entering a catch basin.
4. Catch basins receiving runoff from dumpster areas are Type II, 48-inch diameter minimum, with a "tee" fitting providing floatables separation (and a cleanout port with gasketed cover) but no overflow standpipe.
5. Potential pollutants are not put in the dumpsters on any routine basis.

If pollutants are put in the dumpster on any routine basis the City may require the dumpster area to meet the requirements for Group 3 dumpster areas.

8.9.3.3 Group 3: Dumpster Areas having Capacities Over 1.5 Cubic Yards and Uses Listed in Table 8.3

Group 3 dumpster locations include areas where the capacity of dumpster(s) exceeds 1.5 cubic yards or dumpsters have compactors and the site uses include any uses described in Table 8.3.

In Group 3 dumpster areas, surface drainage from the dumpster areas may be handled in one of two ways:

Preferred Alternative:

Surface drainage from dumpster areas may be connected to the sanitary sewer, provided:

1. The dumpster area is covered.
2. The surface drain from the dumpster area to the sanitary sewer is directed through a City-approved baffle-type oil/water separator.
3. Any issues are resolved with the Fire Department (they may require fire sprinklers) and the Planning Department (regarding aesthetic and site-planning issues).

Alternative if the Preferred Alternative is not feasible:

Surface drainage from dumpster areas may be connected to the storm drainage system, provided:

1. No storm drain inlet is located in the dumpster area.
2. Dumpster areas are sloped to drain out onto paved, impervious surfaces (such as parking lots).
3. Runoff from the dumpster area flows over the paved surface at least 15 feet prior to entering a catch basin.
4. Catch basin(s) receiving runoff from dumpster areas are Type I or Type II.
5. Storm drain pipe(s) from catch basins receiving dumpster area runoff convey the runoff through a baffle-type oil/water separator prior to connection to other parts of the storm drainage system. The flow rate for design of the separator shall be the sum of two rates. The first rate is the peak 50-year storm runoff in cubic feet per second that can enter the separator from contributing areas (Rational Method acceptable). The second rate is the capacity of the dumpster(s) in cubic feet, divided by 5 minutes (300 seconds) to yield cubic feet per second.
6. The storm drain pipes that carry flow from the catch basins receiving dumpster area runoff to the separator shall be gasketed pipe that meets the requirements for sanitary sewer pipe as noted in the City of Redmond Standard Details.

Table 8.3: Dumpster Area Group 3 Land Uses

Dumpster areas are in Group 3 if they serve land uses that are normally associated with the following types of waste materials:

- Accumulated food wastes
- Vegetable or animal grease
- Used oil
- Liquid feedstock
- Cleaning chemicals
- Liquid or solid dangerous waste (as defined by the Department of Ecology under WAC Chapter 173-303). The Development Services Division may require special handling for any items on this list and not allow their discharge to the storm or sanitary sewer systems.

Additional guidance regarding applicable uses is contained in the 2005 Ecology Manual. The determination about a specific use in Redmond will be made by the City's Technical Committee.

Note that multi-family residential uses (including town homes), printing and publishing businesses, restaurants, gas stations, vehicle maintenance facilities, and dry cleaners are examples of common uses in Redmond that are typically included in Group 3.