CITY OF REDMOND

CLEARING, GRADING AND STORMWATER MANAGEMENT PLAN REVIEW CHECKLISTS - F068

	Submittal Dates:	Review Dates/Initials:
Project Name:_____		
Tax Parcel or Plat #:_____	_____	_____/_____
Engineer:_____	_____	_____/_____
Contact:_____	_____	_____/_____
Phone:_____	_____	_____/_____

Review Notes: I = Incomplete/Incorrect/Must be Addressed,
C = Complete/Correct
N = Non-Applicable
[ ] = Reference
__/__/__ = 1st/2nd/3rd Review

REDMOND MUNICIPAL CODE

Plans shall conform to Redmond Municipal Code Chapter 15.24, and the Stormwater Technical Notebook. The general headings listed below must be addressed.

__/__/__Erosion and Sediment Control
__/__/__Conveyance Facilities
__/__/__Water Quality Control
__/__/__Water Quantity Control
__/__/__Stabilization of Disturbed Areas
__/__/__Protection of Adjacent Properties
__/__/__Maintenance
__/__/__Identification of Critical Areas and Associated Buffers
__/__/__Identification of Easements
__/__/__Accurate Description of Work Area
__/__/__Control of Pollutants other than Sediment on Construction Sites
__/__/__Source Control of Pollution
__/__/__Controlling Off-Site Erosion
__/__/__Other BMPs
__/__/__Separate Public and Private Drainage
__/__/__Limited Topographic Change
__/__/__Tree Preservation Plan

DRAWING FORMAT AND CONTENT

__/__/__ Construction Drawing Size - 22” x 34”
__/__/__ Drawing Content - shall contain all information necessary to review the design and to construct the improvements.
__/__/__ Title Block/Drawing Title
- __/__/__ Issue or Revision Date
- __/__/__ Section, Township, and Range
- __/__/__ Project Name & Phase
- __/__/__ Tax Parcel/Plat Number
- __/__/__ Legal Description
- __/__/__ Engineer Information - name, address, phone and contact
- __/__/__ Owner Information - name, address, phone and contact

__/__/__ Vicinity Map - showing the general location of the project
__/__/__ City Approval Block - must be on every sheet at lower right hand corner
__/__/__ Horizontal Scale - 1”=20’
__/__/__ Vertical Scale - 1”=5’
__/__/__ Vertical Datum - minimum of two (2) C.O.R. datum must be shown
__/__/__ Horizontal Datum - minimum of two (2) C.O.R. datum and NAD 83-91 coordinates on two (2) minimum points at exterior lot/boundary corners must be shown
__/__/__ North Arrow & Scale Bar - shown in the upper left hand corner of the drawings
__/__/__ Drawing Layout - shall be laid out to afford the maximum understanding possible
__/__/__ Profiles of Storm Drainage Systems - required for public drainage systems and may be required for private systems where conflicts with other utilities are possible
__/__/__ Profile Information - include existing and proposed grade, all utility crossings and crossings clearances, pipe slope, pipe size, pipe length, pipe material, manhole depths, inverts, etc.
__/__/__ Plan View Information - shall indicate and identify all existing and proposed features, utilities, street improvements and paving, and other features that will affect the design and construction of the site grading and the drainage system.
__/__/__ Engineer Stamp and Signed and Dated Consistently with Issued or Revised Date - drawings shall be stamped before submittal and review by the City.
__/__/__ Legend - identify line types and symbols used
__/__/__ Property Data - shall include property lines with bearings and distances, right-of-way lines, parcel numbers, lot numbers, plat names, and street names.
__/__/__ Phased Project Drawings - depict all construction necessary to complete the phase (each phase shall be independently approved).
__/__/__ Standard Notes found in Appendix of the Stormwater Notebook
__/__/__ Identify source and dates of survey information used in design.

SITE PLAN (All Proposed Information must be Distinguishable from Existing Information)

__/__/__ Property Lines - including bearings and distances
__/__/__ Right of Way - including bearings and distances
__/__/__ Lot Numbers
__/__/__ Site Area - shown in s.f. and acres
__/__/__ Streets - edge of pavement or curb and sidewalk, centerline, and name shown
__/__/__ Contours - (dashed lines for existing and solid lines for proposed) 1' or 2' interval (slopes 40% or greater may be shown with 5 foot contours)
__/__/__ Onsite Features - easements, buffers, +40% slopes, etc.
__/__/__ Offsite Information - all features within offsite areas that drain onsite, and all information within 20' of all property lines
__/__/__ Utilities (water, sewer, telephone, cable television, gas, power, etc.)
__/__/__ All Utilities Easements Shown with Dimensions Labeled
__/__/__ Setbacks
    __/__/__ Building
    __/__/__ Steep Slope (in accordance with geotechnical recommendations)
    __/__/__ Other_____
__/__/__ Parcel Information – Area (s.f.), existing, new, and proposed impervious area, and water quality and quantity design storms

CLEARING AND GRADING

__/__/__ Fully Identify Work - clearing and grading limits shown, with stockpile/staging areas and sequence of construction
__/__/__ Disturbed Area - in acres must be shown on the clearing and grading plans
__/__/__ Limits of Clearing - fenced with 42" orange safety fence or approved filter fence
__/__/__ Trees to Remain - shall be shown with the dripline designated (must have protective fencing at five feet (5') beyond the dripline if adjacent to cleared areas) - no grading or filling permitted within the dripline. Show pertinent information within 50' of clearing.
__/__/__ Buffers of Critical Areas
__/__/__ Steep Slope Setback
__/__/__ Grades - show existing and proposed contours
__/__/__ Cut/Fill - shall not exceed 8'
__/__/__ Stabilization of Disturbed Areas
__/__/__ Stockpile location and ground slopes
__/__/__ Estimate of Earthwork Quantities

TEMPORARY EROSION AND SEDIMENTATION CONTROL

__/__/__ Timing and Stabilization of Sediment Trapping Measures
__/__/__ Silt Fence [COR Std 502] (no straw bale permitted - must use silt fence)
__/__/__ Construction Entrance [COR Std 503]
__/__/__ Clean Water Diversion - areas onsite and offsite that are not disturbed must be diverted away from disturbed areas.
__/__/__ Dewatering Construction Sites – show sediment traps
__/__/__ Stabilization of Temporary Conveyance Channels and Outlets – no erosion for 10-year/24-hour storm
__/__/__ Storm Drain Inlet Protection – inlet protection must be provided for all storm drain inlets within the construction vicinity
__/__/__ Temporary Swales and/or Trenches - show shape, dimensions, spot elevations every 50', drainage area, channel stabilization treatment type and computations of flow and velocity (cannot exceed 4 fps without rip-rap lining) [COR Std 504].
__/__/__ Check Dams - show detail, dimensions and quantity of rock protection. No straw bales allowed.
__/__/__ Temporary Culverts - show drainage area, 1' minimum cover, type of pipe, length and diameter, and slope.
__/__/__ Temporary Sediment Pond(s) - show size, bottom elevation, top elevation, cleanout elevation, outlet protection, drainage area, volume required, volume provided, cross-section through the dam, profile through the pond, spillway and consistent with calculations. Not allowed near future infiltration sites.
__/__/__ Rip-rap Outlet Protection - show size of stone, quantity and stabilization fabric under stone [COR Std 620].
__/__/__ Maximum open trench length = 300'
__/__/__ TESC performance bond posted
__/__/__ Construction Access Routes
__/__/__ Note concerning Removal of Temporary BMPs upon completion of project
__/__/__ Preservation of Natural Drainage Systems
__/__/__ Sequence of Construction - describe how construction will proceed in order to limit erosion, include phasing if appropriate.

STORMWATER PLAN

__/__/__ Minimum Pipe Size - 12” minimum for public storm drain systems and 6” minimum for private systems.
__/__/__ Pipe Data - pipe size, length, slope, and material labeled
__/__/__ Horizontal Clearance - 5’ from all other utilities and structures, and 8’ from trees (street trees may be 3’ minimum with root barrier).
__/__/__ Vertical Clearance - 1’ from other utilities - 18” for sewer with storm above sewer
__/__/__ Rockeries/Retaining Walls - shall not cross or be near storm drain pipes. Exceptions shall only be approved where no alternatives exist. Any crossing of a wall shall be perpendicular to the wall and special construction techniques including steel casings may be required. No rockeries allowed over roof or footing drains
__/__/__Structure Data - structure number, structure type and/or size, type of cover, rim elevation, and all pipe inverts labeled
__/__/__Structure Spacing – 300’ typical, varies by size of pipe.
__/__/__Easements – shown with dimensions labeled - 20’ minimum width - no obstructions allowed in easements
__/__/__Drains Behind Sidewalk - required in all cut situations and at the base of slopes
__/__/__Cleanouts Spacing - to be at bends, end of lines and at 100’ o.c. (required in all cut situations and at the base of slopes)
__/__/__Cleanouts Specifications - shall be specified with Carson boxes or equal with ungasketted caps in soft area and traffic bearing in paved areas [COR Std 621].
__/__/__Footing/Foundation Drains - including pipe size, material, and cleanouts shall be connected to the storm drain system (shown as stubbed to lots only for plats).
__/__/__Roof Drains - including pipe size, material, and cleanouts shall be connected to the stormdrain system (shown as stubbed to lots only for plats) 6” minimum. Maximum of three roof drain stubs are allowed to be connected per collection pipe.
__/__/__Footing/Foundation Drains and Roof Drains - shall be connected at a structure only (private onsite structure or at the street).
__/__/__3’ Paved Area - around roof drain cleanout or catch basin Type 1A required
__/__/__Tracer Wire – must be shown on roof drains from the building to the property line.
__/__/__Outfall Protection - sized for 10-year storm (unless otherwise specified by Development Services Division); provide: type, size dimensions and quantity of stone. Stone must be laid on approved filter fabric. Maximum allowable discharge velocity to rock outlet is 10 fps without special design [COR Std 620].
__/__/__In control structures, hoods for risers over 15” in diameter shall have an annular space equal to the riser pipe flow area.

STORMWATER PROFILES (Required for Public System)

__/__/__Profile - pipes and structures
__/__/__Other Utilities - labeled and designate size and type
__/__/__Profile grades - show and label existing and proposed grades
__/__/__Pipe Cover - 18" minimum
__/__/__Pipe Profile Information - show invert and top of pipe, pipe size, pipe material, and design slope.
__/__/__Drop structures only allowed per approval of Stormwater Engineer
__/__/__Grates: - through-curb inlets at sag curves, possible bypass points and every third inlet; Vaned Grates for public system, herringbone OK for private.
__/__/__Utility Crossings - all crossings must be shown, label utility type, line size, invert of utility and storm lines and clearance between pipes (1' minimum vertical clearance and 30 degrees minimum crossing angle).
__/__/__Structure Profile Information - label type of structure, structure number, size, and pipe inverts
__/__/__Berm Section - in accordance with geotechnical recommendation for open ponds
__/__/__Public Storm Structure – with 4' or greater from the top to the invert must be Type II catch basin - 5' for private structure - see Standard detail 608
__/__/__Type III catch basin required for structures with bottoms between 12' and 25'. See Standard Detail 615.

DRAINAGE BASIN MAP

__/__/__ North Arrow
__/__/__ Scale (larger engineering scale may be used as appropriate)
__/__/__ Title Block
__/__/__ Property Lines
__/__/__ Proposed and Existing Contours
__/__/__ Proposed Storm Drainage Inlets and Numbers
__/__/__ Existing Storm Drainage
__/__/__ Drainage Area to Each Inlets
__/__/__ Drainage Area to SWM Facility
__/__/__ Offsite Areas Draining Onsite
__/__/__ Flow Path for Time of Concentration Computations
__/__/__ Legend of Symbols
__/__/__ Storm Drainage Table (include: inlet number, drainage area, rational method "C" factor and t_c,)
__/__/__ Stormwater Management Data (include: facility number, drainage area and compensated area)
__/__/__ Zoning
__/__/__ Road and Stream Names

STORMWATER QUALITY TREATMENT AND FLOW CONTROL FACILITIES

Wetpond / Detention Pond

__/__/__Setbacks - 10' minimum away from structure and ROW, and 50' minimum away from steep slope (15% or greater)

__/__/__Length/Width Ratio - minimum of 3.0 (preferred)

__/__/__Interior Slope - maximum of 3H:1V. A 2:1 slope below water surface OK where no geotechnical liner is used and pool depth is under 4'.

__/__/__Pond fencing is required where walls or slopes steeper than 3:1 are designed.

__/__/__Permanent Pool - minimum of 6-month/24-hour basin runoff volume.

__/__/__Live Storage - maximum of 50-year/24-hour release.

__/__/__ Berm Embankment - maximum of 6' high (preferred)

__/__/__ Toe of Embankment - minimum of 55' from ROW.

__/__/__ Pond permanent pool depth under 8'

__/__/__ Multi-Celled - minimum of 2 cell (preferred)

__/__/__ Emergency Overflow - for open pond, shall be completely separated from pond outlet.

__/__/__ 5' wide safety bench set at or 1' below the permanent water surface elevation around perimeter of pond. Plant bench with wetland planting.

__/__/__Trees must be setback from the 50-year storm stage. Maintenance access to the pond must be unhindered by trees.

__/__/__ Natural shape preferred

__/__/__ Maintenance access - a Vactor truck shall be able to access the control structure, a backhoe shall be able to access the pond bank.

__/__/__ Inflow pipes to the pond discharge at or above the control elevation. (Stormwater Engineer may approve submerged inflow).

Underground Detention

__/__/__Runoff Determination - per 2005 Ecology Manual, for the design storms as established by the Technical Committee review.

__/__/__Area Draining to SWM System, Bypass and Compensation Areas

__/__/__Offsite Areas Draining on Site - generally do not need to be controlled but, must be safely conveyed

__/__/__Detention Volume Computation - show volume required and volume provided - stage/storage curve must match proposed facility

__/__/__Controlling Orifice Computation - plans and computation must match

__/__/__Control Structure - designed and detailed (plan view and cross section required) shall conform to COR Std 610 or equivalent.

__/__/__Profile of Detention Pipe or Vault

__/__/__Structural Details and Vault Calculations (separate building division review and permit required)

__/__/__Inverts - show for all pipes entering and leaving control structure or vault

__/__/__Vent - minimum 2" diameter for pipe detention systems

__/__/__Maintenance Vehicle Access - required to both ends of detention pipes and two (2) accesses to vaults (one near control structure)

__/__/__Maximum Distance between Detention System Access Points - 100' and ladder access must be provided at all ends.

__/__/__Easement - 5' minimum around all public detention systems (20' min. width)
__/__/__Minimum 10-foot setback from structures, property lines, and right-of-way, or minimum distance to allow construction of a 1:1 slope to the bottom of the facility, whichever is greater.
__/__/__Fire Hydrant - within 100 feet of detention pipe systems 4' in diameter or larger, and for all vault systems over 1000 cubic feet of total volume may be required.
__/__/__Tank Note- "Detention tanks may be air tested before final acceptance".

Infiltration

__/__/__Wellhead Protection Zone noted and accommodated.
__/__/__Soil Permeability Tests or Gradation per DOE - two (2) tests minimum or one (1) for every 5000 s.f. of infiltration system bottom area. Test must end up being not more than 20' from the final location of the infiltration system. Note on plans - to be verified by field observation.
__/__/__Soil Test - must be taken at the proposed bottom of infiltration system.
__/__/__Excavation or Boring - is required in the trench area to a minimum depth of 4' below the proposed bottom of the trench. Infiltration not feasible if evidence of ground water or bedrock/hard pan.
__/__/__Infiltration Bed - all infiltration system should be a minimum of 3' above the seasonal high water mark, bedrock, hardpan and impermeable layer.
__/__/__Setbacks
- __/__/__Minimum 200' from drinking water wells and springs, septic tanks and drain fields
- __/__/__Minimum 20' down slope and 100' up slope of building foundations
- __/__/__Minimum 10' from NGPE and property line

__/__/__Down Spout Infiltration System - shall be designed with overall project for typical lot with individual homes.
__/__/__Maximum Drainage Area
- __/__/__Down Spout Infiltration Systems - 5000 s.f.
- __/__/__Infiltration Basin - 50 acres
- __/__/__Infiltration Trench - 15 acres

__/__/__Infiltration System Location - may not be located in an area previously used as a sediment trap.
__/__/__Inflow to an Infiltration System - must first pass through a pre-settling BMP or a biofilter. Disturbed areas shall not drain to the infiltration system.
__/__/__Add the following note to the plan: "The contractor shall construct infiltration systems only after the entire area draining to it has been stabilized".
__/__/__Filter fabric is required on all sides, top and bottom of infiltration trenches.
__/__/__Maximum Trench Length - 100'
__/__/__Observation Well - one is required per trench
__/__/__Provisions for the 100-year overflow path required.
__/__/__Maximum Ponding - in an open infiltration basins is 3' for the maximum storm entering the basin (not to exceed the 100 year - this includes headwater to pass storm flow out any overflow) 1' of freeboard is required to the top of the structure.
__/__/__Basins Side Slopes - shall not exceed 3:1

__/__/__Infiltration Basin Berm - must use impervious material for berm and the berm must be 2' wide at the top for each foot in height as measured from the ponding area bottom.

Biofiltration

__/__/__Required Length - 200' minimum (may be reduced to 150' for redevelopment projects only).

__/__/__Designed Storm - 6-month/24-hour storm, high flow bypass required unless otherwise designated.

__/__/__Maximum Velocity - 1 fps for the design storm. 3 fps for stability

__/__/__Swale Slope - For slope greater than 2.5%, check dams must be provided.

__/__/__Swale bottom width – Maximum 8 feet

__/__/__Setbacks - no buildings or trees within 8' of the normal high water.

__/__/__Maintenance Access – A backhoe must be able to access at least one side of each biofiltration swale.

__/__/__Easement - public systems shall be in tracts, or easements, unless approved during site review.

__/__/__Cross Section - show dimensions, design flow depth and 1' minimum freeboard

__/__/__Vegetation Specifications - shall provide for water tolerant plants and shall address shading of vegetation. Biofilter planting shall be shown on the civil drawings and subject to approval from the Construction Division.

__/__/__Swales/Trenches - including, grading, slope, spot elevations (a minimum of every 50' and at both ends), bottom width, side slopes, and lining.

__/__/__Biofiltration swales lined or over impermeable soil in WPZ 1,2,3

__/__/__Setback from biofiltration swale top of bank to property line shall be a minimum of 5'.

LOW IMPACT DEVELOPMENT SITE ASSESSMENT

__/__/__Survey

__/__/__Soils report

__/__/__Land cover assessment

__/__/__Streams, wetlands, buffers

__/__/__Flood hazard areas

__/__/__Drainage Report

__/__/__Compost Amended Soil or Protection of Undisturbed soils

__/__/__LID BMPs to be used_____

__/__/__Credits used in modeling_____

OPERATIONS AND MAINTENANCE

__/__/__O&M Manual

__/__/__Provisions for long term maintenance noted on plat

DRAINAGE REPORT

Hydrologic Calculations

__/__/__ Pre-develop Condition
- __/__/__ Forest Area _____
- __/__/__ Pasture Area _____

- __/__/__ Outwash Soil Area _____
- __/__/__ Till Soil Area _____
- __/__/__ Saturated Soil Area _____

__/__/__ Post-develop Condition
- __/__/__ Impervious Roof Area _____
- __/__/__ PGIS Area _____
- __/__/__ Landscaped Area _____
- __/__/__ Forest Area _____
- __/__/__ Pasture Area _____
- __/__/__ Pond Area _____

- __/__/__ Outwash Soil Area _____
- __/__/__ Till Soil Area _____
- __/__/__ Saturated Soil Area _____

Quantity Control

__/__/__ Option 1: Discharge Durations: Match developed condition discharge durations to predeveloped condition discharge durations for the range of discharge rates from one half of the 2-year peak flow up to the 50-year peak flow.

__/__/__ Option 2: Modified Detention Alternative. (Assume outwash soils in WPZ 1, 2, 3 are till in existing and proposed condition.) Discharge Durations: Match developed condition discharge durations to predeveloped condition discharge durations for the range of discharge rates from one half of the 2-year peak flow up to the 50-year peak flow.

__/__/__ Option 3: Infiltration with enhanced treatment in WPZ 3.

__/__/__ Option 4: Infiltration in WPZ 4.

__/__/__ Option 5: Direct discharge. 50-year flow conveyed to river or lake in manmade conveyance.

__/__/__ Option 6: Modified detention for direct discharge. Release 50 year at 10 year peak.

__/__/__ Option 7: Fee in lieu. Include proposal. Letter from Natural Resources Division included.

__/__/__ Storage Volume Required _____

__/__/__ Storage Volume Provided _____

__/__/__ Control Structure(s)

__/__/__ Quantity Control Facilities

Water Quality Design Storm

__/__/__ Approved Continuous flow runoff model
__/__/__ Online BMP
    __/__/__ 24 hour volume (cf) _____
    __/__/__ Hourly flow rate (cfs) _____
    __/__/__ 15 min flow rate (cfs) _____
__/__/__ Offline BMP
    __/__/__ Hourly flow rate (cfs) _____
    __/__/__ 15 min flow rate (cfs) _____

__/__/__ Treatment Volume Provided _____
__/__/__ Control Structure(s)
__/__/__ Quality Control Facility type_____
__/__/__ Quality Control Fee in Lieu Proposal_____

Conveyance System

__/__/__Storm Drain Computations - rational method may be used for pipe sizing. Include: "C" factor determination, time of concentration determination and flow calculations.
__/__/__Design Slope - 0.25% minimum and 20% maximum
__/__/__Hydraulic Grade Line Computations – hgl for 10 year must be 12-inches below overflow condition (allowances may be made near detention system or large bodies of water surcharge). 25 year = 6 inches below. 50 year = no overtopping.
__/__/__Downstream Analysis - provide storm drain computations and hydraulic grade line computations for existing storm drainage systems which are being revised by changes to the drainage area or system expansion.
__/__/__Safe 100-Year Flow Conveyance - the 100-year storm flow shall not impact any buildings (this is beyond traditional conveyance system).
__/__/__Information presented in the calculations is consistent with plan.
__/__/__Concrete inlets may be installed only where downstream catch basins are available to collect sediment. They should be used where sump maintenance would be difficult.
__/__/__Maintenance access to all catch basins and drainage structures has been provided. Extreme cases may be waived by the Stormwater Engineer.
__/__/__Roof drain stubs should cross sidewalk at close to a 90 degree angle.
__/__/__A maximum of three (3) single family houses may share a common roof drain stub.

Off-site Analysis

_/_/_ Upstream analysis of off-site area tributary to the site
_/_/_ Downstream analysis (minimum of 1/4 mile downstream in accordance with DOE standards, etc.)

ADDITIONAL COMMENTS

1. _____
2. _____
_____
_____
_____
_____