



# PUBLIC WORKS DEPARTMENT

## ENGINEERING REVIEW CHECKLIST

Project Name: \_\_\_\_\_

Date: \_\_\_\_\_

Project No.: \_\_\_\_\_

By: \_\_\_\_\_

Circled items need to be addressed.  
Checked items are complete.

INSERT SIGNED STAMP HERE

### General Plan Formatting

1. \_\_\_\_\_ Copy of this checklist, filled out, signed and stamped by P.E. or P.L.S.
2. \_\_\_\_\_ Sedro-Woolley spelled correctly with a hyphen.
3. \_\_\_\_\_ Plan sheets and profile sheets or combined plan and profile sheets, specifications and detail sheets as required shall be on sheet sizes 24" x 36". Original sheets shall be good quality, three mil. or thicker, mylar or approved equal.
4. \_\_\_\_\_ Lettering size shall be no smaller than 1/10 of an inch in height and shall be uppercase.
5. \_\_\_\_\_ Existing features shall be shown with dashed lines, and/or half-toned (screened).
6. \_\_\_\_\_ Proposed features shall be shown with solid lines. The intent is to clearly distinguish existing features from proposed improvements.
7. \_\_\_\_\_ Each plan set shall contain a project information/cover sheet with the following:
  - a. \_\_\_\_\_ Project name.
  - b. \_\_\_\_\_ Table of contents (if more than 3 pages).
  - c. \_\_\_\_\_ Vicinity map showing adequate detail and adequate vicinity data (1"=1000'-2000').
  - d. \_\_\_\_\_ Phone number of "One-Call" utility locator, labeled "Call Before You Dig (1-800-424-5555)."
  - e. \_\_\_\_\_ City's Building Department Pre-construction/Inspection Notification phone number. (360-855-0139)
  - f. \_\_\_\_\_ Name and phone number of surveyor.
  - g. \_\_\_\_\_ Name and phone number of engineer.
  - h. \_\_\_\_\_ Name and phone number of owner/agent.
  - i. \_\_\_\_\_ Legal description.
  - j. \_\_\_\_\_ Signature of Postmaster indicating that mail box locations have been designated or approved by

the U.S. Postal Service. (Plat only)

7.  An overall site plan shall be included if more than 3 plan sheets are used. The overall plan shall include the following:
  - a.  All natural and proposed drainage collection and conveyance systems with catch basin numbers shown.
  - b.  Property area development.
  - c.  Right of way layout.
  - d.  Street names, widths, and road classification (principal, secondary, collector arterial, minor collector, or local access).
  - e.  All of the above shall be indexed to the detail plan sheet.
8.  Each sheet of the plan set shall be stamped, signed and dated by a professional civil engineer licensed in the State of Washington. At least one sheet showing all boundary survey information must be provided that has been stamped by a professional land surveyor licensed in the State of Washington.
9.  A title block shall be provided on each plan sheet. The title block shall list at a minimum the development title, the name, address and phone number of the firm or individual preparing the plan, a revision block, page (of pages) numbering and sheet title (e.g. road and drainage, grading, erosion/sedimentation control).
10.  Location and label of each section or detail shall be provided.
11.  Indicate units of measurement for all slope call outs as either % or ft./ft. Do not mix units of measurement on a plan set.
12.  All match lines with matched sheet number (stationing) shall be provided.
13.  All division or phase lines shall be indicated with the proposed limits of construction under the permit being applied for.
14.  Wetland shall be labeled with the number from the wetland inventory, or shall be labeled as "uninventoried" if such.
15.  The City's Standard Notes that apply to the plan shall be provided on the plans.
16.  City's standard approval block located in lower right corner of all drawings. Permit number shown on top of approval block.
17.  Cut & fill quantities of site earthwork.
18.  Engineering Fees paid.

#### Plan View: Site Plan and Roadway Elements

1.  Show property lines, right of way lines and widths for proposed road and intersecting roads.
2.  Show all existing and proposed roadway features such as centerline, edge of pavement and shoulder, ditch lines, curbs and/or sidewalks. In addition, points of access to abutting properties and roadway continuations shall be shown.
3.  Show all roadway classifications, existing and proposed.
4.  Driveway separation.

5. \_\_\_\_\_ Driveway width.
6. \_\_\_\_\_ Maximum of 1 vertical foot of difference at landings.
7. \_\_\_\_\_ Roadside obstacles located per WSDOT Roadside Safety Manual and Utilities Manual.
8. \_\_\_\_\_ Existing and proposed topography contours shall be shown at 2 foot (2') intervals for slopes < 20% and 5 foot (5') intervals for slopes > 20%. Contours shall extend 100 feet beyond property lines to resolve questions of setback, cut and fill slopes, drainage swales, ditches and access or drainage to adjacent property.
9. \_\_\_\_\_ 5' setback from property line(s) to proposed fill.
10. \_\_\_\_\_ 10' setback from property line(s) to proposed cut.
11. \_\_\_\_\_ The location of all existing utilities and proposed utilities (gas, water, sewer, power, etc.) (except those designed by the utility and are not available) shall be shown. All utility poles and related guy wire/anchors shall be clearly identified.
12. \_\_\_\_\_ All roads and adjoining subdivisions shall be identified.
13. \_\_\_\_\_ Right-of-way for all proposed roadways shall be shown with sufficient dimensioning to clearly show exact locations on all sections of existing/proposed dedicated public roadways.
14. \_\_\_\_\_ For subdivision projects, drawing scales shall be 1"=20'. For commercial or multi-family projects, scale shall be 1"=20'. Details may be drawn at a larger common engineering scale.
15. \_\_\_\_\_ North shall be oriented to the top or right side of the sheet.
16. \_\_\_\_\_ Stationing shown in plan view shall read from left to right or bottom to top. The same station shall not be used more than once on a project.
17. \_\_\_\_\_ Street lighting provided on Rights-of-way, except neighborhood access and/or cul-de-sacs.

#### Plan View: Drainage Conveyance

1. \_\_\_\_\_ All storm drainage structures shall be sequentially numbered starting from the furthest downstream structure. If tying into an existing CB or Manhole, label the as "Existing" or "EX" followed by either "CB" or "SDMH" and the City's alphanumeric name.
2. \_\_\_\_\_ Existing storm drainage structures should be represented with hollow symbols and existing pipes represented with dashes and labeled as existing.
3. \_\_\_\_\_ Proposed storm drainage structures should be represented with solid symbols and proposed pipes represented with solid lines.
4. \_\_\_\_\_ Existing storm drainage facilities to be removed shall be clearly labeled as "existing to be removed".
5. \_\_\_\_\_ Existing storm drainage facilities to be abandoned shall be clearly labeled "abandon in place".
6. \_\_\_\_\_ Slope, length, inverts, diameter and material for all pipes, culverts and stub outs shall be shown. Material may be noted in the plan notes.
7. \_\_\_\_\_ Label all catch basins as to size and type or indicate in the plan notes.
8. \_\_\_\_\_ Show downspout and/or footing drain stub out locations to all lots intending to connect to the storm drainage retention/detention system. All stub outs shall be located to allow gravity flow from the lowest corner of the lot to the connecting catch basin. Provide invert and rim elevation of all clean outs.



4. \_\_\_\_\_ Begin Tapers, End Tapers, Begin Stripe, End Stripe, etc. shown with marking description, station, and offset.
5. \_\_\_\_\_ All striping in 3M Stamark installed on warm paving mat or MMA. Thermoplastic allowed only with prior approval.
6. \_\_\_\_\_ Truncated Domes Detectible Warning Pattern Shown at Every ADA curb ramp.

Plan View: Other

1. \_\_\_\_\_ Show the location, identification and dimensions of all buildings, property lines, streets, alleys and easements.
2. \_\_\_\_\_ Show locations of structures on abutting properties within 50 feet of the proposed project site.
3. \_\_\_\_\_ Show the location of all proposed drainage facility fencing, together with a typical section view of each.
4. \_\_\_\_\_ Provide section details of all retaining walls and rockeries including sections through critical portions of the rockeries or retaining walls. Show routing of drain lines behind walls.
5. \_\_\_\_\_ Show all existing and proposed buildings with projections and overhangs.
6. \_\_\_\_\_ Check for water and sewer connections/road cuts.
7. \_\_\_\_\_ Note that backfill over pipes and utilities in Right-of-way is 3/4" minus or 5/8" minus crushed.
8. \_\_\_\_\_ Certificate of Sewer Availability.
9. \_\_\_\_\_ Certificate of Water Availability.
10. \_\_\_\_\_ Location of all wells and wellhead protection zone setback.
11. \_\_\_\_\_ Location of all septic tanks and drainfields.
12. \_\_\_\_\_ Sufficient spot elevations around top and bottom of walls, curb returns at  $\Delta/4$ , ADA ramps, etc.
13. \_\_\_\_\_ Building Setback lines (BSBL) or Building footprint.
14. \_\_\_\_\_ Finish Floor (F.F.) and Garage Floor (G.F.) elevation(s) or building pad elevation(s).
15. \_\_\_\_\_ Sedro-Woolley spelled correctly with a hyphen.
16. \_\_\_\_\_ Other information deemed necessary by the Planning Director, Planning Commission, City Council, Director of Public Works, or City Engineer. (LIST)

Plan: WSDOT Channelization (Per WSDOT Plans Preparation Manual)

1. \_\_\_\_\_ Plan drawn at scale of 1"=50'.
2. \_\_\_\_\_ Show entire roadway width and min 300' of existing highway section beyond the match points.
3. \_\_\_\_\_ Show Section, Township and Range.
4. \_\_\_\_\_ Show north arrow.
5. \_\_\_\_\_ Show street and highway names and/or designations.
6. \_\_\_\_\_ Show property lines and WSDOT Right of way lines.

7. \_\_\_\_\_ Show curve data and control points: PC, PI and PT.
8. \_\_\_\_\_ Show stations of intersecting roadway and road approaches.
9. \_\_\_\_\_ Show roadway centerline: bearing and 100' stations. (See WSDOT Right of way plan for reference stations).
10. \_\_\_\_\_ Show construction centerline: bearing and 100' stations (if applicable).
11. \_\_\_\_\_ Show beginning and ending station of roadway widening.
12. \_\_\_\_\_ Show all pavement markings, arrows, etc.: begin/end stations of tapers and striping on highway and intersecting roadway.
13. \_\_\_\_\_ Show widths of lanes on all roads.
14. \_\_\_\_\_ Show corner radii for intersecting roads.
15. \_\_\_\_\_ Show intersection left turn radii: typical R=50'.
16. \_\_\_\_\_ Show distance from centerline to face of curb. Show dimensions of curb, gutter and sidewalks.

#### Profiles: Sewer, Roadway, and Drainage

1. \_\_\_\_\_ Provide existing centerline ground profile at 50 foot stations and at significant ground breaks and topographic features, with average accuracy to within 0.1 foot on unpaved surface and 0.02 feet on paved surfaces.
2. \_\_\_\_\_ For roadways, provide final road and storm drain profile with the stationing the same as the horizontal plan, reading from left to right, to show stationing of points of curve, tangent and intersection of vertical curves, with elevations shown to the hundredth of a foot.
3. \_\_\_\_\_ On a grid of labeled lines, provide a continuous plot of vertical positioning against horizontal. The grid shall be aligned with and relate to the centerline of the right of way where applicable.
4. \_\_\_\_\_ Show finish road grade and vertical curve data; road data to be measured at centerline. Include stopping sight distance.
5. \_\_\_\_\_ Show all roadway drainage, including detention tanks, that are within the right-of-way or easement.
6. \_\_\_\_\_ Slope, length, size and type (or in plan notes or on a detail sheet) for all pipes and detention tanks shall be shown on the profile.
7. \_\_\_\_\_ Indicate the inverts of all pipes and culverts and the elevations of catch basin grates or lids. If the plan and profile elements are on separate sheets, then the elevations of catch basin grates or manhole lids and pipe inverts shall appear on both the plan view and profile view.
8. \_\_\_\_\_ For pipes that are proposed to be 2.0 feet or less below finished grade, dimension the minimum cover requirements. Pipes with less than 30" cover must be Class 50 ductile iron pipe or better.
9. \_\_\_\_\_ Indicate roadway stationing and offset for all catch basins and manholes.
10. \_\_\_\_\_ Show the profile on the same sheet with, and aligned underneath, the plan view.
11. \_\_\_\_\_ Indicate vertical and horizontal scale.
12. \_\_\_\_\_ Clearly label all profiles with respective street names and plan sheet reference numbers if drawn on separate sheets.
13. \_\_\_\_\_ Locate match points with existing pavements and show elevations.

14. \_\_\_\_\_ Show all property boundaries.
15. \_\_\_\_\_ Label all match line locations.
16. \_\_\_\_\_ Provide profiles for all 8- inch and larger pipes and for channels (including roadside ditches which do not follow the centerline profile).
17. \_\_\_\_\_ Show the location of all existing and proposed gas, water and sanitary sewers appurtenances and piping.
18. \_\_\_\_\_ Show energy dissipater locations.
19. \_\_\_\_\_ Vertical scale shall be 1"=5'. Clarifying details may be done at a larger engineering scale.
20. \_\_\_\_\_ Extend profile a minimum of 200 feet into existing paving when extending an existing centerline.
21. \_\_\_\_\_ Place the road vertical alignment data above the profile and storm drainage data below the proposed profile centerline.
22. \_\_\_\_\_ Plan over profile preferred. Reason if plan over profile cannot be proved: \_\_\_\_\_  
\_\_\_\_\_
23. \_\_\_\_\_ All pipes shall increase in size downstream only, unless written modification obtained from Director of Public Works / City Engineer.
24. \_\_\_\_\_ Manholes shall have 0.1 foot drop between inverts for Azimuth angles less than 75 degrees, and 0.2 foot drop between inverts for Azimuth angles of 75 degrees or greater.

#### Details: Retention/Detention and Infiltration System Details

1. \_\_\_\_\_ Provide a scaled drawing of each R/D pond, tank or vault, including tract boundaries.
2. \_\_\_\_\_ Show existing and proposed contours at 2 foot intervals. Show and label maximum design water elevation and water quality elevation, if applicable.
3. \_\_\_\_\_ Dimension all berm widths.
4. \_\_\_\_\_ Show and label at least 2 sections through facility. One section must include the restrictor.
5. \_\_\_\_\_ Specify soils and compaction requirements of fill sections and berms.
6. \_\_\_\_\_ Show location of access road to control manhole and pond bottom.
7. \_\_\_\_\_ Provide elevations of all pipe inverts, grates, inlets, tanks, vaults and spot elevations of pond bottom.
8. \_\_\_\_\_ Show location and detail of overflow and emergency spillways.
9. \_\_\_\_\_ Provide plan and section view of all energy dissipaters, including rock splash pads. Specify the size of rock and thickness.
10. \_\_\_\_\_ Show bollard location on plans. Typically bollards are located at the entrance to drainage facility access roads.

#### Parking Areas and Driveways

1. \_\_\_\_\_ Locate all parking & circulation areas as far away as possible from any steep slope, well head, stream, regulated lake or regulated wetland.

2. \_\_\_\_\_ Locate parking behind building, if feasible.
3. \_\_\_\_\_ Maximum number of compact stalls is 25%.
4. \_\_\_\_\_ Parking stalls delineated.
5. \_\_\_\_\_ Traffic directions, entrances and exits delineated.
6. \_\_\_\_\_ Traffic circulation does not include backing into a street.
7. \_\_\_\_\_ Surface material equal or superior to R/W material.
8. \_\_\_\_\_ Grass pavers allowed for emergency vehicle access and parking. Not allowed for permanent circulation.
9. \_\_\_\_\_ Streets can not be used for circulation of traffic within site parking areas.
10. \_\_\_\_\_ Maximum driveway width is 30' for two-way traffic with 2 driveway lanes.
11. \_\_\_\_\_ Maximum driveway width is 40' for two-way traffic with 3 driveway lanes.
12. \_\_\_\_\_ Maximum driveway width is 22' for one-way traffic.
13. \_\_\_\_\_ Zero feet or a minimum 165' separation from centerline of driveway to intersection R/W PI or other driveway centerline.
14. \_\_\_\_\_ One driveway per 165' of lot frontage.
15. \_\_\_\_\_ Parking & driveways have vertical curbing along perimeter.
16. \_\_\_\_\_ Minimum commercial/industrial driveway setback for property line is 9'.

#### Detention Tanks

1. \_\_\_\_\_ Capacity/discharge per performance requirements.
2. \_\_\_\_\_ Minimum pipe size 36" Ø.
3. \_\_\_\_\_ Pipe material per WSDOT or APWA.
4. \_\_\_\_\_ Structure placed on stable native material.
5. \_\_\_\_\_ Structure placed in fill section per geotechnical report recommendations.
6. \_\_\_\_\_ Moderately pervious soils, with seasonal adverse groundwater levels has buoyancy tendencies mitigated. Calculations included.
7. \_\_\_\_\_ Configured for "flow-through" design.
8. \_\_\_\_\_ Tank bottom located 0.5' below inlet and outlet inverts.
9. \_\_\_\_\_ Inflow shall enter tank through TYPE-2 CB connected to tank by max. 2 lf of 36" min. Ø pipe.
10. \_\_\_\_\_ Spacing between access openings less than 100'.
11. \_\_\_\_\_ Riser located less than 25' from the terminus of a backup system.
12. \_\_\_\_\_ Tank slope 0%.

13. \_\_\_\_\_ Min. two-foot clearance between parallel tank walls.
14. \_\_\_\_\_ Maintenance road provided to each tank access opening.
15. \_\_\_\_\_ All covers to be round, solid with 1/2" Ø Allen head screw locks.

#### Detention Vaults

1. \_\_\_\_\_ Capacity/discharge per performance requirements.
2. \_\_\_\_\_ Concrete minimum 3000 psi.
3. \_\_\_\_\_ Construction joints fitted with water stops.
4. \_\_\_\_\_ Design assumes HS-20 loading and overburden (where applicable).
5. \_\_\_\_\_ Design stamped by structural engineer.
6. \_\_\_\_\_ Structure placed on stable native material.
7. \_\_\_\_\_ Structure placed in fill section per geotechnical report recommendations.
8. \_\_\_\_\_ Configured for "flow-through" design.
9. \_\_\_\_\_ Vault bottom located 0.5' below inlet and outlet inverts.
10. \_\_\_\_\_ Baffle located to divide cells into 50% of volume.
11. \_\_\_\_\_ Top of baffle set one-foot below design water surface elevation.
12. \_\_\_\_\_ Minimum six-inch wide slot or pipe orifice cast into wall that would pass > two-year/24-hour design storm with invert set six inches above vault.
13. \_\_\_\_\_ One covered access opening per 50' of length or width.
14. \_\_\_\_\_ One covered access with ladder to bottom of vault per cell.
15. \_\_\_\_\_ Minimum internal height of seven feet and width of four feet. (Concrete vaults may be minimum height & width of three feet if used as a tank with access manhole at each end.)
16. \_\_\_\_\_ Access road to one access point of each cell.
17. \_\_\_\_\_ All covers to be round, solid with 1/2"Ø Allen head screw locks.
18. \_\_\_\_\_ 30" max. height of 24"Ø section (rim to inside of vault).
19. \_\_\_\_\_ All stormwater vaults shall be a minimum of 50 feet from any steep slope (40%). A geotechnical report shall accompany any vault within 200 feet of a steep slope.

#### Detention Ponds

1. \_\_\_\_\_ Capacity/discharge per performance requirements.
2. \_\_\_\_\_ Configured with "flow-through" design, with two equal, sequential cells.
3. \_\_\_\_\_ Minimum length to width ratio of 5:1 (3:1 minimum).
4. \_\_\_\_\_ Inlet and outlet located to provide maximum distance between them.

5. \_\_\_\_\_ Interior side slopes less than 3:1 unless fenced.
6. \_\_\_\_\_ Exterior side slopes less than 2:1.
7. \_\_\_\_\_ Pond bottom is level and located 0.5' below inlet and outlet inverts for dead storage.
8. \_\_\_\_\_ Proposed contours and daylight lines, side slopes, top of berm, maximum water elevation, WQ elevation, cell bottom elevations, and access road with slopes, proposed contours, and daylight lines for proposed R/D facilities shown on plan view.
9. \_\_\_\_\_ 20' setback from property line(s) to maximum water surface elevation.
10. \_\_\_\_\_ Pond retaining walls designed and stamped by a structural engineer. Constructed of reinforced, 3000 psi concrete, with a fence along the top. At least 25% of pond perimeter is vegetated with less than 3:1 side slopes.
11. \_\_\_\_\_ Overflow provided that directs flow directly to downstream conveyance system. No part of the pond may overtop or exceed the capacity of the emergency spillway. Designed to accommodate the 100-year/24 hour design storm.
12. \_\_\_\_\_ Emergency spillway provided that directs flow towards downstream conveyance system. Rip rapped to the toe of each slope. Designed to accommodate the 100-year/24 hour design storm.
13. \_\_\_\_\_ Access road provided along entire length of swale or equivalent. 12% max grade, 12' wide along tangent sections, 15' wide along curved sections with 40' outside radius.
14. \_\_\_\_\_ Berm embankment/slope stabilization.
15. \_\_\_\_\_ Fencing, if applicable.
16. \_\_\_\_\_ All ponds shall be a minimum of 50 feet from any steep slope (40%). A geotechnical report shall accompany any pond within 200 feet of a steep slope.
17. \_\_\_\_\_ Aeration / stirring (fountain or other) provided if dead storage exists to minimize West Nile Virus threat.
18. \_\_\_\_\_ Facility Identification Sign. (Contact City for template.)

#### Water Quality Wetvaults

1. \_\_\_\_\_ Biofiltration provided prior to discharge into wetvault.
2. \_\_\_\_\_ Concrete minimum 3000 psi.
3. \_\_\_\_\_ Construction joints fitted with water stops.
4. \_\_\_\_\_ Design assumes HS-20 loading and overburden (where applicable).
5. \_\_\_\_\_ Design stamped by structural engineer.
6. \_\_\_\_\_ Structure placed on stable native material.
7. \_\_\_\_\_ Structure placed in fill section per geotechnical report recommendations.
8. \_\_\_\_\_ Design water depth three feet to six feet.
9. \_\_\_\_\_ Vault bottom located one foot below inlet and outlet inverts.
10. \_\_\_\_\_ Surface area of vault a minimum of 1% of contributing impervious area.

11. \_\_\_\_\_ Volume of vault a minimum of the total volume of water quality event. Use  $P_2/3$  for  $P_t$ -WQ.
12. \_\_\_\_\_ Top of baffles set at design water surface elevation.
13. \_\_\_\_\_ Minimum six-inch wide slot or pipe orifice cast into wall that will pass > two-year/24 hour design storm with invert matching inlet and outlet pipe.
14. \_\_\_\_\_ One covered access opening per 50' of length or width.
15. \_\_\_\_\_ One covered access with ladder to bottom of vault per cell.
16. \_\_\_\_\_ Minimum internal height of seven feet and width of four feet.
17. \_\_\_\_\_ Access road to one access point of each cell.
18. \_\_\_\_\_ All covers to be round, solid with 1/2"Ø Allen head screw locks.
19. \_\_\_\_\_ 30" max. height of 24"Ø section (rim to inside of vault/manholes).
20. \_\_\_\_\_ One foot of sediment storage provided.
21. \_\_\_\_\_ Inlet/outlet placed to maximize travel time.
22. \_\_\_\_\_ Mechanism provided to by pass high flows.
23. \_\_\_\_\_ Mechanism provided to take facility off-line manually for maintenance and repair. Gravity drain sized to drain facility in four hours or less.
24. \_\_\_\_\_ Length-to-width ratio 5:1 (3:1 minimum).
25. \_\_\_\_\_ Facility divided into three cells (10% forebay, 45% second cell and 45% third cell).
26. \_\_\_\_\_ Minimum 20' setback from any structure, property line, buffer or on-site sewage system.
27. \_\_\_\_\_ All stormwater vaults shall be a minimum of 50 feet from any steep slope (40%). A geotechnical report shall accompany any vault within 200 feet of a steep slope.

Water Quality Wetponds \*\*\*\*\*INCOMPLETE\*\*\*\*\*

1. \_\_\_\_\_ Biofiltration provided prior to discharge into wetvault.
2. \_\_\_\_\_ Facility placed in stable native material.
3. \_\_\_\_\_ Facility constructed in fill section per geotechnical report recommendations.
4. \_\_\_\_\_ Design water depth three feet to six feet.
5. \_\_\_\_\_ Pond bottom located one foot below inlet and outlet inverts.
6. \_\_\_\_\_ Surface area of pond a minimum of 1% of contributing impervious area.
7. \_\_\_\_\_ Volume of pond a minimum of the total volume of water quality event. Use  $P_2/3$  for  $P_t$ -WQ.
8. \_\_\_\_\_ Top of spillways set at design water surface elevation.
9. \_\_\_\_\_ Minimum six-inch wide slot or pipe orifice set into wall berm that will pass > two-year/24 hour design storm with invert matching inlet and outlet pipe.
10. \_\_\_\_\_ All covers to be round, solid with 1/2"Ø Allen head screw locks.

11. \_\_\_\_\_ One foot of sediment storage provided.
12. \_\_\_\_\_ Inlet/outlet placed to maximize travel time.
13. \_\_\_\_\_ Mechanism provided to by pass high flows.
14. \_\_\_\_\_ Mechanism provided to take facility off-line manually for maintenance and repair. Gravity drain sized to drain facility in four hours or less.
15. \_\_\_\_\_ Length-to-width ratio 5:1 (3:1 minimum).
16. \_\_\_\_\_ Facility divided into three cells (10% forebay, 45% second cell and 45% third cell).
17. \_\_\_\_\_ 30" max. height of 24"Ø section (rim to inside of manholes).
18. \_\_\_\_\_ Minimum 20' setback from any structure, property line, buffer or on-site sewage system.
19. \_\_\_\_\_ All ponds shall be a minimum of 50 feet from any steep slope (40%). A geotechnical report shall accompany any pond within 200 feet of a steep slope.
20. \_\_\_\_\_ Aeration / stirring (fountain or other) provided to minimize West Nile Virus threat.
21. \_\_\_\_\_ Facility Identification Sign. (Contact City for template.)

#### Infiltration Tanks

1. \_\_\_\_\_ Not allowed on slopes > 25% (4:1).
2. \_\_\_\_\_ Bottom of trench must be in native soil and excavated at least one foot in depth.
3. \_\_\_\_\_ Inflow shall be pretreated for sediment removal by wetpond, wetvault or settling pond. Biofiltration swale or water quality swale is not an accepted alternative.
4. \_\_\_\_\_ Settling vault or settling pond shall be 10% of the design surface area of the infiltration tank.
5. \_\_\_\_\_ Bottom of tank shall be at least one foot above seasonal high ground water level.
6. \_\_\_\_\_ An overflow route shall be shown and designed to convey the 100-year/24-hour design storm event to the natural surface outlet.
7. \_\_\_\_\_ Minimum spacing between parallel tanks shall be 1.5 times the depth from the bottom of the lowest tank and the ground surface.
8. \_\_\_\_\_ All tanks shall be a minimum of 20 feet away from any structure, property line, easement, or sensitive area buffer.
9. \_\_\_\_\_ All ponds shall be a minimum of 50 feet from any steep slope (40%). A geotechnical report shall accompany any pond within 200 feet of a steep slope.
10. \_\_\_\_\_ Filter fabric shall be placed over the top of the tank drain rock prior to backfilling.
11. \_\_\_\_\_ Tank perforations must be one inch Ø and located in bottom half of tank.
12. \_\_\_\_\_ Tank perforations must be six inches above invert elevation.
13. \_\_\_\_\_ Minimum pipe size 15" Ø.
14. \_\_\_\_\_ Pipe material.

15. \_\_\_\_\_ Spacing between access openings less than 100'.
16. \_\_\_\_\_ Tank slope 0%.
17. \_\_\_\_\_ Maintenance road provided to each tank access opening.
18. \_\_\_\_\_ All covers to be round, solid with 1/2"Ø Allen head screw locks.

### Infiltration Ponds

- \_\_\_\_\_ Not allowed on slopes > 25% (1:4).
- \_\_\_\_\_ Bottom of pond must be in native soil and excavated at least 1 foot in depth.
- \_\_\_\_\_ Inflow shall be pretreated for sediment removal by wetpond, wetvault or settling pond. Biofiltration swale or water quality swale is not an accepted alternative.
- \_\_\_\_\_ Settling vault or settling pond shall be 10% of the design surface area of the infiltration pond.
- \_\_\_\_\_ Bottom of pond shall be at least one foot above seasonal high ground water level.
- \_\_\_\_\_ An overflow route shall be shown and designed to convey the 100-year/24-hour design storm event to the natural surface outlet.
- \_\_\_\_\_ All ponds (at the maximum potential water surface elevation) shall be a minimum of 20 feet away from any structure, property line or sensitive area buffer.
- \_\_\_\_\_ All ponds shall be a minimum of 50 feet from any steep slope (40%). A geotechnical report shall accompany any pond within 200 feet of a steep slope.
- \_\_\_\_\_ Interior side slopes less than 3:1 unless fenced at max. water surface or higher.
- \_\_\_\_\_ Exterior side slopes less than 2:1 unless analyzed by geotechnical engineer.
- \_\_\_\_\_ Pond retaining walls designed and stamped by a structural engineer. Constructed of reinforced, 3000 psi concrete, with a fence along the top. At least 25% of pond perimeter is vegetated with less than 3:1 side slopes.
- \_\_\_\_\_ Overflow provided that directs flow directly to downstream conveyance system. No part of the pond may overtop or exceed the capacity of the emergency spillway. Designed to accommodate the 100-year/24 hour design storm.
- \_\_\_\_\_ Emergency spillway provided that directs flow towards downstream conveyance system. Rip rapped to the toe of each slope. Designed to accommodate the 100-year/24-hour design storm.
- \_\_\_\_\_ Access road provided to each cell. Twelve percent max grade, 12' wide along tangent sections, 15' wide along curved sections with 40' outside radius.
- \_\_\_\_\_ Berm embankment/slope stabilization. Berm width six-foot min. for design depth < three feet. Berm width is 15' for design depths > to three feet (3').
- \_\_\_\_\_ Fencing, if applicable.

### Biofiltration Swales

1. \_\_\_\_\_ Swale length 200 lf or equivalent design surface area. Minimum length 50'.
2. \_\_\_\_\_ Maximum swale width 50'.
3. \_\_\_\_\_ Swale profile 0.5 to 6%.

4. \_\_\_\_\_ Side slopes no steeper than 3:1 below 100-year design depth.
5. \_\_\_\_\_ Oil/water separator provided upstream of inlet.
6. \_\_\_\_\_ Level spreader provided on swales > 5.0' wide.
7. \_\_\_\_\_ Check dams provided on profiles > 4.0%.
8. \_\_\_\_\_ Trees planted with > 20' spacing and not shading bioswale.
9. \_\_\_\_\_ Minimum 0.5' freeboard for 25-year design storm.
10. \_\_\_\_\_ Conveys 100-year design storm without overtopping at < 5 fps.
11. \_\_\_\_\_ Access road provided along entire length of swale or equivalent. 12% max grade, 12' wide along tangent sections, 15' wide along curved sections with 40' outside radius.
12. \_\_\_\_\_ Approved seed mix/specification shown.
13. \_\_\_\_\_ Calculation Sheet(s) in S.D.R.

#### Bioretention (Rain Gardens)

1. \_\_\_\_\_ Soil Loamy Sand
2. \_\_\_\_\_ Soil 1.0 in/hr minimum long term hydraulic conductivity per ASTM D 2434
3. \_\_\_\_\_ Soil 10% minimum organic matter content per ASTM D 2974 (approx 60-65% Loamy Sand at 35-40% compost.)
4. \_\_\_\_\_ Soil pH between 5.5 and 7.0.
5. \_\_\_\_\_ Soil depth 18-24 inches.
6. \_\_\_\_\_ Mulch – compost best for bottom of ponding area – bark or chips tend to float.
7. \_\_\_\_\_ Dense groundcover beneficial.
8. \_\_\_\_\_ Ponding depth 12-inch maximum.
9. \_\_\_\_\_ Ponding surface pool shall drawdown in 24 hours.
10. \_\_\_\_\_ Flow entrances dispersed low velocity sheet flow through landscaped area or filter strip.
11. \_\_\_\_\_ Concentrated flow entrances should have flow dissipation and erosion protection.
12. \_\_\_\_\_ Settling or pre-treatment areas and catch basins.
13. \_\_\_\_\_ Spill protection (Frop-T or other) when possible.
14. \_\_\_\_\_ No under-drains unless near sensitive infrastructure which may flood, filtering flows from high-pollution generation areas (impermeable liner required), or soil infiltration rates are not adequate to meet maximum pool and system dewater rates. (overflow)
15. \_\_\_\_\_ Under-drains 4-8" Ø.
16. \_\_\_\_\_ Under-drains slotted schedule 40 PVC with pea-gravel aggregate filter blanket best.
17. \_\_\_\_\_ Perforated PVC or slotted HDPE can be used with 1-½" – ½" washed drain rock. Pea gravel filter blanket between drain rock and planting soil mix.

18. \_\_\_\_\_ If filter fabric used, only non-woven geotextile for separation.
19. \_\_\_\_\_ No compaction of underlying soils. – Note to take care.
20. \_\_\_\_\_ Avoid excavation during wet or saturated conditions.
21. \_\_\_\_\_ No heavy equipment allowed on subgrade. Rip soil with small equipment if compacted.
22. \_\_\_\_\_ Sidewalls above grade 3:1 max.
23. \_\_\_\_\_ Soil placed in 12" max lifts.
24. \_\_\_\_\_ Allow soil to settle naturally – wet each lift until just saturated or boot pack.
25. \_\_\_\_\_ Stabilize contributing areas to avoid sediment transport to bioretention facility during and after construction.
26. \_\_\_\_\_ Infiltration rate: Underlying soil – 2001 SMMWW Volume V, Chapter 7. Use 1 as infiltration factor of safety.
27. \_\_\_\_\_ Infiltration rate: Planting soil mix – use ASTM D 2434 at 80% compaction per ASTM D 1557. If contributing area < 5000 SF of PGIS; and <10,000 SF TIA; and < ¾ acre landscaping then use factor of safety of 2. If over thresholds, use factor of safety of 4.
28. \_\_\_\_\_ Determine limiting value – planting soil mix or underlying soils.
29. \_\_\_\_\_ Depth to groundwater 1 foot minimum if contributing area has < 5000 SF PGIS; and <10,000 SF TIA; and < ¾ acre landscaping – otherwise minimum 3 feet.

#### Soil Amendments

1. \_\_\_\_\_ Minimum organic matter 10% by dry weight for planting beds and other landscaped areas.
2. \_\_\_\_\_ Minimum organic matter 5% by dry weight for turf areas.
3. \_\_\_\_\_ pH between 5.5 and 7.0 or appropriate for specific plants installed.
4. \_\_\_\_\_ Minimum depth of 8 inches. (except in tree root protection areas)
5. \_\_\_\_\_ Planting beds shall be mulched with 2-3 inches (maximum) of organic material.
6. \_\_\_\_\_ Subsoils below topsoil shall be scarified to a depth of 4 inches with topsoil incorporated to prevent stratification.
7. \_\_\_\_\_ Stripped topsoil from site stockpiled for use in landscaping, and amended as needed.
8. \_\_\_\_\_ Imported topsoil shall meet organic matter content standards.

#### Permeable Pavements \*\*\* Incomplete \*\*\*

1. \_\_\_\_\_ Approved mix design submitted.
2. \_\_\_\_\_ Porous top course.
3. \_\_\_\_\_ Choker course – 1-1/2 - #8 crushed washed stone for asphalt – ASTM No. 8 for interlocking concrete pavers.
4. \_\_\_\_\_ Coarse aggregate base – AASHTO No. 3 for asphalt – ASTM No. 57 crushed aggregate base for interlocking concrete pavers or porous concrete.

5. \_\_\_\_\_ Non-woven geotextile for separation underlying base layer.
6. \_\_\_\_\_ Uncompacted and/or scarified subgrade – necessary strength from structural layers.

Sewer \*\*\*\*\*INCOMPLETE\*\*\*\*\*

1. \_\_\_\_\_ Side sewers serve 2 or less buildings. (1 per lot for every lot that has frontage facing sewer)
2. \_\_\_\_\_ Side sewers  $\frac{1}{4}$ " per foot (2%) grade or steeper.
3. \_\_\_\_\_ Side sewer 6"  $\varnothing$ .
4. \_\_\_\_\_ Cleanouts at bends  $1/8$  ( $45^\circ$ ) or greater, at ROW line, and every 100 feet.
5. \_\_\_\_\_ Side sewer 8"  $\varnothing$  or greater with manholes at angle points. (Only if prior approval for private sewer is granted by Public Works Department.)
6. \_\_\_\_\_ Manhole spacing 300' max.
7. \_\_\_\_\_ Sewer Lateral from main with 6"  $\varnothing$  cleanout at property / ROW / Easement line.

# EROSION/SEDIMENTATION CONTROL PLAN

## General

1. \_\_\_\_\_ Use the same Engineering Plan information as the base for the erosion/sedimentation control plan.
2. \_\_\_\_\_ Show all limits of clearing for flagging in the field.
3. \_\_\_\_\_ Provide perimeter control of runoff on all necessary property boundaries.
4. \_\_\_\_\_ Locate the construction entrance and detail. Specify length, width, thickness and rock size of the entrance.
5. \_\_\_\_\_ Identify drainage features such as streams, wetlands, roads, bogs, depressions, springs, seeps, swales, ditches, existing pipes and seasonal water locations.
6. \_\_\_\_\_ Specify the construction sequence.
7. \_\_\_\_\_ Identify all utility corridor locations other than roadways, associated clearing limits and erosion/sedimentation control measures for all on-site utility construction.
8. \_\_\_\_\_ Provide erosion/sedimentation control plan standard notes.
9. \_\_\_\_\_ Provide off-site, downstream CB protection and detail. Filter fabric placed over or under grate is not an acceptable alternative.
10. \_\_\_\_\_ Provide on-site, interim CB protection and details. Filter fabric placed over or under grate is not an acceptable alternative.
11. \_\_\_\_\_ Specify areas to receive special treatment such as jute netting, rock lining or sod.
12. \_\_\_\_\_ Show clearing limits around significant trees to remain. Limits shall be no closer than the drip line of the trees and shall be designated by a temporary five-foot chain link fence or a line of five-foot high, orange colored 2"x4" stakes placed no more than ten feet apart connected by highly visible surveyor's ribbon. (Coordinate with Planner for confirmation on which trees are to be saved and the landscape plan reflects same.)
13. \_\_\_\_\_ Show orange construction fence placed around all sensitive areas, native growth protection areas, and any other areas where construction traffic is prohibited. A minimum 8" strip of orange construction fencing may be added to the top of silt fence where the two are used in conjunction with one another. Include details.

## Conveyance

1. \_\_\_\_\_ Show all drainage pipes and ditches associated with erosion/sedimentation control.
2. \_\_\_\_\_ Provide all temporary pipe lengths, inverts and slopes and minimum pipe cover if less than two-feet.
3. \_\_\_\_\_ Show grades, dimensions, locations and direction of flow in all ditches and swales. Sufficient dimensioning shall be provided to eliminate the need for scaling a drawing.
4. \_\_\_\_\_ Provide details of bypassing off-site runoff around the clearing limits/disturbed areas and sediment pond/trap.
5. \_\_\_\_\_ Indicate locations and outlets of dewatering systems.

## Sedimentation Facilities

1. \_\_\_\_\_ Show the locations of sediment trap/ponds and all associated pipes and structures.
2. \_\_\_\_\_ Dimension sediment trap/pond berm widths and all slopes.
3. \_\_\_\_\_ Indicate the trap/pond storage required and the depth, length and width dimensions.
4. \_\_\_\_\_ Provide typical section views throughout pond and outlet structure. A minimum of two sections cut at 90° to one another are required.
5. \_\_\_\_\_ Provide typical details of gravel cone and standpipe and/or other filtering devices.
6. \_\_\_\_\_ Detail stabilization techniques for outlets/inlets.
7. \_\_\_\_\_ Detail control/restrictor device location and details.
8. \_\_\_\_\_ Provide rock specifications and details for rock check dams, if used.
9. \_\_\_\_\_ Specify spacing for rock check dams as required for actual slopes on-site.
10. \_\_\_\_\_ Provide front and side sections of typical rock check dams.
11. \_\_\_\_\_ Indicate locations and provide details and specification for silt fabric fence. Include installation detail and standard notes. Maximum upstream travel path is 100 feet.

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