1. Detail intended as an example. Detail must match design report.

2. For all applications, pavement designs must be prepared by a registered professional engineer.

3. Inspections: Call BDS NR inspection line, (503) 823-7000. Request 487.3 inspections required.

CONSTRUCTION REQUIREMENTS

Protect subgrade from over-compaction during construction; do not construct or compact the subgrade in wet conditions. Sequence the work to avoid traffic on the subgrade and protect the finished pavement from construction traffic and sediment accumulation. A permeable pavement protection plan may be required.
1. Detail intended as an example. Detail must match PAC assumptions and/or design report.

2. Setbacks: 10' from building foundations; 5' along property lines except next to right-of-way. Walls can't exceed 30' height above grade if within 5' of property lines including right-of-way.

3. Planter Walls: Material must be concrete, unless otherwise approved. Walls must be included on foundation plans.

4. Rock Gallery/Storage Layer, as required: Size per PAC calculations. Construct rock galleries of 3/4” washed drain rock overlain by a 3-4” filter layer of 3/8”-No. 10 washed angular aggregate. Alternative materials such as filter fabric, cellular storage systems, and non-standard aggregates may be used under the Performance Approach, with BES approval.

5. Overflow (if needed): Overflow elevation must allow for 2” of freeboard, minimum. Protect from debris and sediment with strainer or grate.

6. Blended Soil: Use BES standard soil blend for stormwater facilities (SWMM Section 6.3) unless otherwise approved. Install minimum of 12” on native soil. Install minimum of 24” if there’s a drainage layer or storage layer below the imported soil.

7. Vegetation: Refer to plant list in SWMM Section 3.5. Minimum container size is 1 gal. Number of plantings per 100sf of facility area: 80 herbaceous plants OR 72 herbaceous plants and 4 small shrubs.

8. Entrance Erosion Control: Install river rock, flagstone, or similar to dissipate the energy of incoming water at entrances and ends of downspout extensions.

9. Check Dams: Spacing per the PAC. Check dam length must equal the full width of the planter.

10. Inspections: Call BDS NR Inspection Line, (503) 823-7000, request 487. 3 inspections required.

--- CONSTRUCTION REQUIREMENTS ---

Mark the location of future facilities, and fence or cover facility locations after excavation. Do not allow vehicular traffic, foot traffic, material storage, or heavy equipment within 10 feet of the infiltration area except as needed to excavate, grade, and construct the facility. Do not allow entry of runoff or sediment during construction.

--- DRAWING NOT TO SCALE ---
1. Detail intended as an example. Detail must match PAC assumptions and/or design report.

2. Setbacks: No setback is required for lined planters. For infiltration planters the setbacks are 5' from property lines except next to right-of-way, and 10' from building foundations. The planter wall height must be less than 30’ above finished grade if within 5' of property line.

3. Planter Structure: A single pour, monolithic concrete shell without cold joints is required unless otherwise approved.

4. Waterproofing: No additional waterproofing is needed if the structure is a single pour, monolithic concrete shell.

5. Blended Soil: Use BES standard soil blend for stormwater facilities (SWMM Section 6.3) unless otherwise approved. Install minimum of 24” of blended soil.

6. Underdrain System: Sizing is per the PAC. The underdrain must be 4” slotted schedule 40 PVC well casing pipe manufactured with .050” slots, 6 slots per row. Embed the underdrain in 3” No.10 washed angular aggregate. See SW-243 for longitudinal section and SW-244 for office examples. Conform with Oregon Plumbing Specialty Code (OPSC) requirements. Alternative configurations and materials such as cellular storage systems, drainage mats, and non-standard aggregates may be used under the Performance Approach, with BES approval.

7. Overflow: Overflow elevation must allow for 2” of freeboard, minimum. Protect from debris and sediment with strainer or grate.

8. Vegetation: Refer to plant list in SWMM Section 3.5. Minimum container size is 1 gal. Number of plantings per 100sf of facility area: 80 herbaceous plants OR 72 herbaceous plants and 4 small shrubs.

9. Entrance Erosion Control: Install river rock, flagstone, or similar to dissipate the energy of incoming water at entrances and ends of downspout extensions.

10. Check Dams: Spacing per the PAC. Check dam length must equal the full width of the planter.

11. Inspections: Call BDS IVR Inspection Line, (503) 823-7000, request 487. 3 inspections required.

--- CONSTRUCTION REQUIREMENTS ---

Do not allow temporary storage of construction waste or materials in the facilities. Do not allow entry of runoff or sediment during construction.

--- DRAWING NOT TO SCALE ---

Bureau of Environmental Services

STORMWATER MANAGEMENT TYPICAL DETAILS FOR PRIVATE PROPERTY

PLANTER WITH UNDERDRAIN

SW-231

9-8-20
1. Detail intended as an example. Detail must match PAC assumptions and/or design report.

2. Setbacks: 5' from property lines except next to right-of-way; 10' from building foundations.

3. Rock Gallery/Storage Layer, as required: Size per the PAC. Construct rock galleries of \( \frac{3}{4} \)" washed drain rock overlain by a 3-4" filter layer of \( \frac{3}{4} \)" No.10 washed angular aggregate. Alternative configurations and materials such as cellular storage systems, drainage mats, and non-standard aggregates may be used under the Performance Approach, with BES approval.

4. Overflow: Overflow elevation must allow for 2" of freeboard, minimum. Protect from debris and sediment with strainer or grate.

5. Blended Soil: Use BES standard soil blend for stormwater facilities (SWMM Section 6.3) unless otherwise approved. Install minimum of 12" on native soil. Install minimum of 24" if there's a drainage layer or storage layer below the imported soil.

6. Vegetation: Refer to plant list in SWMM Section 3.5. Minimum container size is 1 gal. Number of plantings per 100sf of facility area:
   - Zone A (wet): 80 herbaceous plants OR 72 herbaceous plants and 4 small shrubs.
   - Zone B (moderate to dry): 7 large or small shrubs AND 70 groundcover plants.
   The delineation between Zone A and B shall be either at the outlet elevation or the check dam elevation, whichever is lowest. If project area is over 200sf consider adding a tree.

7. Entrance Erosion Control: Install river rock, flagstone, or similar to dissipate the energy of incoming water at entrances and ends of downspout extensions.

8. Check Dams: Spacing per the PAC. Check dam ends must be keyed into the native soil a minimum of 12".

9. Inspections: Call BDS Inspector, (503) 823-7000, request 487. 3 inspections required.

CONSTRUCTION REQUIREMENTS

Mark the location of future facilities, and fence or cover facility locations after excavation. Do not allow vehicular traffic, foot traffic, material storage, or heavy equipment within 10 feet of the infiltration area except as needed to excavate, grade, and construct the facility. Do not allow entry of runoff or sediment during construction.

- DRAWING NOT TO SCALE -
1. Detail intended as an example. Detail must match PAC assumptions and/or design report.

2. Setbacks: None required.

3. Overflow: Overflow elevation must allow for 2" of freeboard, minimum. Protect from debris and sediment with strainer or grate.

4. Underdrain System: Sizing is per the PAC. The underdrain must be 4" slotted schedule 40 PVC well casing pipe manufactured with 0.030" slots, 6 slots per row. See SW–243 for longitudinal section and SW–244 for orifice examples. Conform with Oregon Plumbing Specialty Code (OPSC) requirements. Alternative configurations and materials such as cellular storage systems, drainage mats, and non-standard aggregates may be used under the Performance Approach, with BES approval.

5. Vegetation: Refer to plant list in SWMM Section 3.5. Minimum container size is 1 gal. Number of plantings per 100sf of facility area:
   - Zone A (wet): 80 herbaceous plants OR 72 herbaceous plants and 4 small shrubs.
   - Zone B (moderate to dry): 7 large or small shrubs AND 70 groundcover plants.

   The delineation between Zone A and B shall be either at the outlet elevation or the check dam elevation, whichever is lowest. If project area is over 200sf consider adding a tree.

6. Blended Soil: Use BES standard soil blend for stormwater facilities (SWMM Section 6.3) unless otherwise approved. Install minimum of 24" of blended soil. Waterproof Liner: 30 mil EPDM, HDPE or approved equivalent.

7. Entrance Erosion Control: Install river rock, flagstone, or similar to dissipate the energy of incoming water at entrances and ends of downspout extensions.

8. Check Dams: Spacing per the PAC. Check dam ends must be keyed into the native soil a minimum of 12".

9. Inspections: Call BOS IVR Inspection Line, (503) 823–7000, request 487. 3 inspections required.

CONSTRUCTION REQUIREMENTS

Do not allow temporary storage of construction waste or materials in the facilities. Do not allow entry of runoff or sediment during construction.
FULL INFILTRATION - LEVEL 1

BLENDED SOIL
EXISTING SUBGRADE

INfiltrATION
PAC CONFIGURATION A, B

INfiltrATION W/ ROCK GALLERY
PAC CONFIGURATION A, B

OVERFLOW
PERFORATED COLLECTION PIPE TO RUN THE LENGTH OF FACILITY

BLENDED SOIL
FILTER AGGREGATE
DRAIN ROCK/STORAGE
EXISTING SUBGRADE

HYBRID
OVERFLOW DIRECTED TO DRAIN ROCK. PAC CONFIGURATION E, F. SEE SW-291 OR SW-292 FOR MORE INFORMATION

Hybrid facility must be registered as a UIC.

OFFSITE DISPOSAL - LEVEL 2 & 3

OUTLET TO APPROVED DISCHARGE POINT PER SWMM SECTION 1.3

SLOTTED PIPE

FILTER AGGREGATE

IMPERMEABLE LINER, IF REQUIRED

EXISTING SUBGRADE

PARTIAL INFILTRATION OR LINED
OVERFLOW AND UNDERDRAIN REQUIRED. SET UNDERDRAIN WITHIN DRAIN ROCK.
PAC CONFIGURATION C AND D
SEE SW-243 FOR PLAN AND LONGITUDINAL SECTION

— DRAWINGS NOT TO SCALE —
TO APPROVED DISCHARGE POINT

1 1/2 MIN. SLOPE

BEEHIVE INTENDED ONLY AS AN EXAMPLE. OVERFLOW AND ACCESSIBLE ORIFICE TO BE DESIGNATED BY DESIGNER.

EXTSNS OF 1/4-NO.10 ANGULAR AGGREGATE MOUNDING

EXTEND 6" BEYOND

A

2.5" - 3.3"

FACILITY WITH UNDERDRAIN
PLAN VIEW

BEEHIVE INTENDED ONLY AS AN EXAMPLE. OVERFLOW AND ACCESSIBLE ORIFICE TO BE DESIGNATED BY DESIGNER. SEE SW-244 FOR EXAMPLES.

TOP-OF-CURB (TOC)

PONDING DEPTH

1/4" - NO.10 WASHED ANGULAR AGGREGATE MOUNTED OVER PIPE.

SLOTTED PVC UNDERDRAIN, RUN 1/4 OF FACILITY LENGTH. MATCH FACILITY GRADE

BLENDED SOIL

6"

12" TYP.

6 TYP.

24" TYP.

LINER (IF REQUIRED)

FACILITY WITH UNDERDRAIN
LONITUDINAL SECTION A-A

DRAWINGS NOT TO SCALE

STORMWATER MANAGEMENT
TYPICAL DETAILS FOR
PRIVATE PROPERTY

UNDERDRAIN
CONFIGURATION SW-243

Bureau of Environmental Services

9-8-20
1. The minimum diameter for orifices taking only filtered flow is 3/8". This applies to examples A, B, C. The minimum diameter for orifices taking some unfiltered flow is 1", with additional measures required to prevent clogging. See example D.

2. Material: For orifices <3" in diameter, the orifice plate must be a strong, thin material such as stainless steel, HDPE, or PVC. The thickness of the orifice plate must be less than the orifice diameter.
1. Entrance Erosion Control: Install river rock, flagstone, or similar to dissipate the energy of incoming water at entrances and ends of downspout extensions.

2. Materials: Check dams can be constructed of other resistant materials such as cedar and juniper. Treated lumber is not acceptable.
1. Detail intended as an example. Detail must match design report.

2. Siting Criteria: The base of the soakage trench must be at least 5’ above seasonal high groundwater, unless otherwise approved.

3. Sizing: Per design report.

4. Setbacks: Measured from the edge, the soakage trench must be 10’ from foundations and 5’ from property lines. The exception to the property setback is next to the right-of-way, where no setback is required.

5. Pre-treatment: A trapped silt basin such as a sumped catch basin is optional only for roof runoff and pedestrian—only paved areas.

6. Piping: Conform with Oregon Plumbing Specialty Code (OPSC) requirements.

7. Inspections: Call BDS IVR inspection line, (503) 823-7000. Request 487.3 inspections required.

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**CONSTRUCTION REQUIREMENTS**

The outline of the facility must be clearly marked before site work begins to avoid soil disturbance. Use of heavy equipment should be minimized within 10 feet of soakage trench areas. The bottom of the soakage trench and the perforated pipe must be level. Smearing the soil surface during excavation can potentially limit infiltration rates; if smooth excavation tools are used, roughen the sides and bottom of the excavation with a sharp pointed tool. Remove loose material from the bottom of the excavation.
1. Detail intended as an example. Detail must match design report.

2. Siting Criteria: The base of the drywell must be at least 5' above seasonal high groundwater, unless otherwise approved. See SWMM Section 2.2 for additional criteria that may restrict infiltration.


4. Setbacks: Measured from the center, the drywell must be 10' from foundations and 5' from property lines. The exception to the property line setback is next to the right-of-way, where no setback is required between the edge of the drywell drain rock and the property line. Measure all setbacks from the edge of the drain rock if the thickness of the rock layer exceeds 12".

5. Piping: Conform with Oregon Plumbing Specialty Code (OPSC) requirements.

6. Access Maintenance Hole: A maintenance hole is required in commercial and industrial settings and for drywells that don’t meet setback requirements. Access is highly recommended in residential settings, but not required.

7. Pre-Treatment: A trapped silt basin such as a sump catch basin is optional only for roof runoff and pedestrian-only paved areas.

8. Inspections: Call BDS IVR inspection line, (503) 823-7000. Request 487.3 inspections required.

**CONSTRUCTION REQUIREMENTS**

Smearing the soil surface during excavation can limit infiltration rates. If smooth excavation tools are used, roughen the sides and bottom of the excavation with a sharp pointed tool. Remove loose material from the bottom of the excavation.
1. Provide protection from all vehicle traffic, equipment staging, and foot traffic in proposed infiltration areas prior to and during construction.

2. Setbacks: Setbacks aren’t required for lined facilities. Setbacks for infiltration facilities, measured from the facility edge, are 10’ from foundations and 5’ from property lines except next to the right-of-way.

3. Trapped silt basin required prior to inlet to subsurface sand filter.

4. Overflow: Perforated collection pipe within top gravel layer.

5. Piping: Conform with Oregon Plumbing Specialty Code (OPSC) requirements.

6. Drain Rock and Filter Sand:
   a. 8” of 3/4” washed drain rock as base.
   b. 30” of washed filter sand per SWMM Section 3.2.4.4.
   c. 8” top layer of 3/4” washed drain rock over sand.
   Separation between drain rock and sand: Use filter fabric or a gravel lens (3/4” - 1/4 inch washed, crushed rock 2 to 3 inches deep) or approved equivalent.

7. Waterproof Liner: Must be 30 mil EPDM, HDPE or equivalent for facilities when lining is required.

8. Inspections: Call BDS MR Inspection Line, (503) 823-7000. Request 497.3 inspections required.

CONSTRUCTION REQUIREMENTS

The location of the infiltration sand filter must not be compacted prior to, during, and after the construction of the facility.

--- DRAWINGS NOT TO SCALE ---

Bureau of Environmental Services

STORMWATER MANAGEMENT TYPICAL DETAILS FOR PRIVATE PROPERTY

SUBSURFACE SAND FILTER SW-280

9-6-20
1. Grating and frame must be galvanized steel medium duty.

2. 8" dia. outlet pipe with upturned elbow.

3. Secure outlet pipe with s/s band embedded 2" in wall.
1. Grating and frame must be galvanized steel medium duty.

2. 8" dia. outlet pipe with upturned elbow.

3. Secure outlet pipe with s/s band embedded 2" in wall.