NOTES:

1. Cleanouts recommended at pipe bends and end of trench.

2. Solid lid yard drain or catch basin shall be designed to be traffic bearing in areas subject to traffic.

3. Place non-woven geotextile fabric along walls and top of washed rock. Non-woven geotextile to conform to WSDOT Spec. 9-33.2(1), Tables 1 and 2.

4. All disturbed areas not covered with hard surfaces shall be stabilized by planting or mulching.
NOTES:
1. Sizing per SWMM BMP L602b.
2. Cleanouts recommended at any pipe bends.
3. Solid lid yard drain or catch basin shall be designed to be traffic bearing in areas subject to traffic.
4. For amended soils guidance, see Standard Detail BMP L613 Options 2, 3 or 4 (Std. Plan GSI - 01).
5. All disturbed areas not covered with hard surfaces shall be stabilized by planting or mulching.
6. Place non-woven geotextile fabric along walls and top of washed rock. Non-woven geotextile to conform to WSDOT Spec. 9-33.2(1), Tables 1 & 2.
NOTES:
1. Trench may be placed no closer than 10 feet to another (100 feet along flowpath)
2. Trench must be level. Align to follow contours on site.
3. Trench may serve roof areas up to 700 square feet. For larger roof areas, refer to GSI Figure No. 004 - Dispersion Trench with Notched Grade Board.
4. Refer to SWMM BMP L603.a
5. Trench length not to exceed 10 feet.
6. Place non-woven geotextile fabric along walls and bottom of washed rock. Non-woven geotextile to conform to WSDOT Spec. 9-33.2(1), Tables 1 and 2.
NOTCHED GRADE BOARD 2"X2" NOTCHES
18" O.C. INSTALL U BOLTS ON GRADE 3 FEET ON CENTER TO ATTACH TO STAKES TO SUPPORT GRADE BOARD

PLAN

SECTION A-A

NOTES:
1. Trench may be placed no closer than 10 feet to another (100 feet along flowpath)
2. Trench and grade board must be level. Align to follow contours on site.
3. Trench length not to exceed 50 feet. Trench length minimum 10 feet.
4. 3/4 inch diameter - 24 inch minimum height round steel stakes (concrete form stakes), 3 feet on center.
5. Refer to SWMM BMP L603.a.
NOTES:

1. Per BMP L603.a, sensitive area buffers may count towards flowpath lengths if approved by the City of Tacoma.

2. Vegetative flowpath is measured from the downspout or dispersion system discharge point to the downstream property line, stream, wetland, or other hard surface. The vegetative flowpath shall be measured perpendicular to site contours. A vegetated flow path of at least 50 feet in length must be maintained between the outlet of the trench and any slope 15% or greater.

3. The discharge point shall be at least 10 feet from any building structure and at least 5 feet from any other structure or property line unless approved by Environmental Services. If necessary, setbacks shall be increased from the minimum 10 feet in order to maintain a 1H:1V side slope for future excavation and maintenance.

4. Additional setbacks may be required by other local, state, or federal agencies. Where a conflict between setbacks occurs, the City shall require compliance with the most stringent of the setback requirements from various codes/regulations.
1. Refer to Stormwater Management Manual BMP L603.b and GSI Figure 005 for setbacks.
2. Splash block shall be concrete, plastic, or similar material. Commercially available splash blocks generally meet design criteria.
3. Rock pad shall consist of 4" cobbles per WSDOT 9-03.11(2) or ballast meeting WSDOT 9-03.9(1).
NOTES:
1. Provide 10 feet of perforated pipe per 5,000 square feet of roof area laid in a level, 2-foot wide trench.
2. 3/4" - 1 1/2" washed rock or WSDOT Specification 9-03.12(5).
3. Place non-woven geotextile fabric along walls, bottom, and top of washed rock. Non-woven geotextile to conform to WSDOT Spec. 9-33.2(1), Tables 1 and 2.
4. A minimum one foot of separation is required from the trench bottom to the seasonal high ground water.
5. Perforated stub-out to be sized and located per SWMM BMP L604.
6. Do not build on slopes steeper than 20%.
7. All disturbed areas not covered with hard surfaces shall be stabilized by planting and mulching.
8. Cleanouts recommended at pipe bends and one end of the perforated section.
1. For driveways greater than 20 feet in width, additional flow path is required. See SWMM BMP L612.
2. Transition zone material may be crushed rock, modular pavement, drain rock or other material approved by the City.
3. Dispersion systems shall set back a minimum 10 feet from buildings and a minimum of 5 feet from property line unless approved in writing by the City.
4. Dispersion systems shall be set back a minimum of 50 feet from the top of any steep (greater than 15%) slope.
FIGURE NO. CITY OF TACOMA GREEN STORMWATER INFRASTRUCTURE TYPICAL DETAILS

January 2016

CONCENTRATED FLOW DRIVEWAY DISPERSION

700 S.F. MAX BETWEEN BERMS (SEE BERM DETAIL)

700 S.F. MAX BETWEEN SLOTTED DRAIN (SEE NOTE 4)

1. See SWMM BMP L611 for additional requirements.
2. Rock pad shall be clean crushed rock or 4 inch cobbles per WSDOT 9-03.11(2), 2 feet wide by 3 feet long by 6 inches deep.
3. Dispersion trench shall conform to BMP L603.a and GSI Figure 003.
4. Berms or drains may be used to concentrate flow. Slotted drains shall be modular trench channel units for driveways with a minimum width of 4 inches.
5. Dispersion systems shall be set back a minimum of 10 feet from buildings.
6. Dispersion systems shall be set back a minimum of 50 feet from the top of any steep (greater than 15%) slope.

NOTES:

PLAN
DRIVEWAY WITH DIAGONAL BERMS

PLAN
DRIVEWAY SLOTTED DRAINS

25'

25'

LOCATE BERM 25' FROM ROW IF DRIVEWAY SLOPES TOWARD STREET

LOCATE BERM 25' FROM ROW IF DRIVEWAY SLOPES TOWARD STREET

30'

30'

50 FOOT VEGETATED FLOW PATH

50 FOOT VEGETATED FLOW PATH

ROCK PAD (NOTE 2)

ROCK PAD (NOTE 2)

SLOPE 15% MAX.

SLOPE 15% MAX.

ASPHALT OR CONCRETE BERM DETAIL

6" 2-4"

6" 2-4"
NOTES:

1. This is a conceptual plan for an extensive vegetated rooftop. See SWMM BMP L631 for design requirements.
NOTES:
1. For guidance on plants for each zone and for example planting plans see the 2013 Rain Garden Handbook for Western Washington, available at CityofTacoma.org/raingardens.
2. Choose a minimum 50% evergreen plants.
3. Keep plants clear of inlet, outlet and/or overflows.

LEGEND:
- LOW PERENNIALS / GROUND COVERS
- EMERGENTS
- HERBACEOUS PERENNIALS
- FERNS
- HERBACEOUS PERENNIALS / SMALL SHRUBS
- LARGE SHRUBS / DECIDUOUS TREES
- SHRUBS
1. Rain gardens sized for compliance with MR #5 shall be in accordance with SWMM BMP L601, available at www.cityoftacoma.org/stormwatermanual. Rain gardens not required to comply with SWMM can be sized per the Rain Garden Handbook for Western Washington, available at cityoftacoma.org/raingardens - where sizing is based upon depth of either 6-inches or 12-inches of ponding.

2. Transition zone
   a. 1-inch grade change from edge of sidewalk, curb and/or other hard surface.
   b. 2% max. slope.
   c. Transition shall be amended soils per BMP L613 (Std. Plan GSI-01) if applicable or per note 3.

3. Scarify or till subgrade to 3-inch depth. Place 3-inches of topsoil on surface and till into 5-inches of site soil. Install 3-inches woodchip mulch or as specified on plans.

4. Freeboard shall be a minimum of 2-inches for contributing areas under 1,000 square feet, or 6-inches for contributing areas 1,000 square feet or greater per SWMM.

5. Do not compact the rain garden soil mix.
   a. Do not operate heavy equipment within the the rain garden.
   b. Do not place or amend rain garden soil when the ground is frozen or when the soil is excessively wet.

6. Continue mulch for a minimum of 2-feet past the top of bank elevation or install landscape edging if rain garden is adjacent to turf.

7. Maximum side slope (2:1 or 3:1) varies with size of contributing area. See SWMM BMP L601 or the Rain Garden Handbook for Western Washington, as applicable.
**NOTES:**

1. Gravel or stream bed cobble splash pad minimum depth of 6 inches. Rock splash pad shall be minimum of 1 foot wide and extend beyond the pipe outlet by a minimum of 1 foot.
2. Pipe shall be per SWMM Volume 3.
MINIMUM 10'-0" SETBACK FROM BUILDING FOUNDATION TO TOP OF RAIN GARDEN PONDING SURFACE (SEE NOTE 3).

CONVEYANCE SWALE

GUTTER
EXISTING DOWNSPOUT
DOWNSPOUT SPLASH BLOCK
CONVEYANCE SWALE, SEE DETAILS ON THIS SHEET FOR OPTIONS
MIN SLOPE = 0.5%, IF GREATER THAN 4% SLOPE, PROVIDE EROSION CONTROL OPTIONS SUCH AS A ROCK CHECK DAM.

RAIN GARDEN, SEE DETAIL GSI FIGURE 012

OVERFLOW, SEE GSI FIGURES 015 AND 016 FOR OPTIONS

NOTES:
1. Do not place plants that will restrict or concentrate the flow of water in the bottom of the swale.
3. Use impervious liner instead of geotextile fabric if you have observed flooding issues in your basement or near your building foundation.
OVERFLOW PIPE THROUGH SIDEWALK TO CURB

NOTES:
1. Beehive grate must be made of UV stabilized material.
2. Pipe per the City of Tacoma SWMM Volume 3 for privately maintained pipe to edge of ROW. Pipe within ROW shall be per SU-29 or SU-29a.
RAIN GARDEN WITH SWALE OVERFLOW

OVERFLOW THROUGH CONVEYANCE SWALE TO R.O.W.

NOTES:
1. See GSI Figure 015 for conveyance swale detail.
2. Minimum slope = 0.5%. If greater than 0.4% slope, provide erosion control options such as a rock check dam.
3. Overflow dispersion trench consists of a minimum 6" wide by 6" deep by 24" long drain rock layer lined with geotextile fabric on the sides and bottom for separation.

LEGEND:
- RAIN GARDEN SOIL MIX
- WOOD CHIP MULCH AND/OR PLANTED AREA
- EXISTING NATIVE SOIL
- LAWN OR PLANTED OVERFLOW AREA
- CONVEYANCE SWALE (SEE NOTE 1)

CITY OF TACOMA
GREEN STORMWATER INFRASTRUCTURE
TYPICAL DETAILS

FIGURE NO. 016
January 2016
1. Permeable pavers may be allowed. Cross section shall meet manufacturer's recommendations and include an appropriate reservoir layer and scarification of subgrade per SWMM.

2. Limit run-on to permeable pavement surfaces to the maximum extent practicable. Run-on shall only be allowed from fully stabilized areas.

3. 6-inch minimum treatment layer of sand or media if required per SWMM.

4. Thicker section of ballast may be required to establish sufficient reservoir capacity. Engineer to provide calculations per SWMM.

5. Geotextile may be required between native soils and permeable pavement section, per soils professional recommendation. Geotextile will be required between permeable ballast and sand layer. Geotextile shall be geotextile for separation per WSDOT 9.33.2(1), woven, Table 3 and installed per WSDOT 2-12.3(1).

6. Refer to SWMM BMP L633 for design criteria and soils suitability.

7. Permeable pavement surfacing shall meet APWA GSP 5-06.3(6)A Infiltration Rate of the Placed Pavement for pervious concrete.

8. Geomembrane barrier shall provide an impermeable barrier between standard and permeable section. It shall be installed below finished grade and per Std. Plan GSI-18. Geomembrane barrier seams shall overlap at least 18” or per manufacturer's recommendations. Geomembrane barrier shall extend the length of the permeable section when adjacent to standard pavement.