MR 1-5 Stormwater Review Checklist

Objective: Provide a simplified checklist / cursory level review to show competency in the provided design to avoid labor intensive review for Small SFR Stormwater project subject to MR 1-5 plans (2,000-5,000 sf of new or replaced impervious surface) If it meets that level and is prepared by a licensed Engineer, it can be assumed to be adequate. The level of review should be proportional to the associated risk which is less for Single Family Residence.

Stormwater review flowchart:

Note: If the existing impervious areas are proven to exist before April 2009 they will not need to be included with the design and are exempt. In rural areas impervious areas proven to exist before April 2009 were exempt.
Note: If impervious surfaces are not exempt, they will need to be included in the new design to bring it up to code.

1. **Is it under 2,000 SF of new impervious surface or included in an existing subdivision plan? If under 2000 sf, a storm plan is not required, review Erosion Control Plan only. If included in a previously approved storm plan, a new storm plan is not required. Follow the design guidance in the approved design.**

2. **If over 5,000 SF of new impervious surface, project will trigger MR1-9 and need Engineering review. Project to be engineered per most recent version of the stormwater code and be submitted to Development Engineering for review.**

3. **Does the Stormwater Plan match the site Plan and other materials submitted with the building permit? If not, ascertain which portion is accurate per owner, and return nonmatching plan to be updated within second review. If plan is to be returned, ensure there are no other portions that need to be updated (Ex. Missing SWPPP, Missing Disturbed Area Map, Etc.)**

4. **Is the required SWPPP (Storm Water Pollution Prevention Plan) included? If not, please request update before review. If plan is to be returned, ensure there are no other portions that need to be updated (Ex. Missing SWPPP, Missing Disturbed Area Map, Etc.)**

5. **Has the contractor/designer included or made reference to the following General site BMP's (These may be included as a general note on the plan or included in the report):**
    a. BMPT5.13- Amend disturbed area after construction with 8" of compost.

b. MR 3- Source Control of Pollution: Control dust on roads, prevent damage to water routes.
c. MR 4-, Match the existing flow patterns to the best of construction capabilities. (May be in the design)

6. **Soil Evaluation: Is infiltration a feasible BMP, is a soil assessment required?**
    a. Is there high groundwater? If so, no soil assessment is needed.
    b. If full dispersion is being used, no soil study is needed. (Full dispersion does not require soil study but does require Native Vegetation preservation)
    c. Soils have been analyzed by a qualified professional (Geotech, Septic Designer, or Design Engineer) and determined-
        i. Soil is designated as type 4 or 5, and low rates were observed by a qualified professional.
        ii. Soil evaluation or test confirms site conditions are not suitable for infiltrating (Conduct in accordance with CCSM)
        iii. A full infiltration test (Section 2.3.4, Book 1, CCSM) confirms site conditions are not suitable for infiltration.

7. **Is one of the following BMP's being proposed to handle roof runoff.**
    a. Infiltration trenches BMP T5.10B or BMP T5.10A (See Design Criteria Below)
    b. Dispersion trenches BMP T5.10C (See Design Criteria Below.)
    c. Dispersion splash blocks BMP T5.10C (See Design Criteria Below)
    d. Rain Garden or Bioretention BMP T5.14A or BMP T5.14B (See Design Criteria Below)
    e. If other BMP's are not feasible (List Method) then use Perforated Stub-out connection BMP T5.10D
    f. Engineered retention / detention system (Pond, CMP, infiltrating basin ect) (Designed by an engineer)

8. **Is one of the following BMP's being proposed to handle impervious surface runoff. (Follow hyperlink for additional guidance on each BMP to ensure BMP is applicable)**
    g. Sheet dispersion BMP T5.12 (See Design Criteria Below)
    h. Concentrated flow dispersion BMP T5.11 (See Design Criteria Below.)
    i. Dispersion Trench BMP T5.30A, BMP T5.30B (See Design Criteria Below)
    j. Rain Garden BMP T5.14A (See Design Criteria Below)
    k. Basic Filter Strip BMP T9.40
    l. Engineered Compost Amended Vegetated Filter Strip BMP T7.40 (CAVFS)
    - Designed by a engineer.
    m. Engineered Bioretention System BMP T5.14B
    - Designed by an engineer.
    n. Engineered Permeable Pavement BMP T5.15
    - Designed by an engineer.

If the proposal utilizes an appropriate BMP listed above, The BMP appears to meet the design requirements, the design is prepared by a licensed Engineer, it can be assumed to be adequate.

THIS SECTION IS STILL IN THE WORKS WE MAY WANT TO USE A MORE COMPREHENSIVE BMP GUIDANCE DOC OR JUST REFERENCE THE MANUAL

a. INFILTRATION TRENCH:

Items that make roof downspout Infiltraiton infeasible include:

- Less than three feet of permeable soil exists from the proposed finished ground elevation above the drywell to the seasonal high groundwater table.
- Less than one foot of clearance exists between the proposed bottom of the drywell and the seasonal high groundwater table.

Setbacks

- 100 feet from closed or active landfills.
- 10 feet from any sewage disposal drain field, including reserve areas and grey water reuse systems.
- 100 feet up gradient from any septic system unless site topography clearly prohibits subsurface flows from intersecting the drain field.
- 10 feet from an underground storage tank and its connecting pipes that is used to store petroleum products, chemical, or liquid hazardous wastes in which 10% or more of the storage

volume of the tank and connecting pipes is beneath the ground.

- 10 feet from any structure, property line, or sensitive area (except slopes over 40%). However, if the roof downspout infiltration system is a common system shared by two or more adjacent residential lots and contained within an easement for maintenance given to owners of all residential properties draining to the system, then the setback from the property line(s) shared by the adjacent lots may be waived.

b/c. DISPERSION TRENCH/ DISPERSION SPLASHBLOCKS:

Dispersion Trenches Design Critera:

- A vegetated flow path of at least 25 feet shall be maintained between the outlet of the trench and any property line, structure, stream, wetland, or impervious surface.
- A vegetated flow path of at least 50 feet in length shall be maintained between the outlet of the trench and any slope steeper than 15%. Sensitive area buffers may count towards flow path lengths.
- Trenches serving up to 700 square feet of roof area shall be at least 10 feet long by 2 feet wide.
- For roof areas larger than 700 square feet, a dispersion trench with notched grade board or alternative material approved by Clark County may be used. The total length of this design shall not exceed 50 feet and shall provide at least 10 feet of trench length per 700 square feet of roof area. (Note: DEV ENG has said that up to 100' is accepted provided that the area drain for cleaning is placed in the middle IE 50' to a side)
- No erosion or flooding of downstream properties may result

Splashblocks Design Criteria:

- A vegetated flow path of at least 50 feet shall be maintained between the discharge point and any property line, structure, slope steeper than 15%, stream, wetland, lake, or other impervious surface. Sensitive area buffers may count toward flow path lengths.

- Each splashblock shall drain a maximum area of 700 square feet.
- For purposes of maintaining adequate separation of flows discharged from adjacent dispersion devices, the vegetated flow path segment for the splashblock shall not overlap with other flow path segments, except those associated with sheet flow from a constructed pervious surface.

Splashblock/Dispersion Setbacks:

- 10 feet from any sewage disposal drainfield, including reserve areas and grey water reuse systems.
- 100 feet upgradient from any septic system unless site topography clearly indicates that subsurface flows will not intersect the drainfield.
- 10 feet from any structure, property line, or sensitive area.
- 50 feet from the top of any slope over 15%. This setback may be reduced to 15 feet based on a geotechnical evaluation.

d. RAINGARDEN:

Rain Garden Setbacks

- 50 feet from the top of slopes greater than 20% or with more than 10 feet of vertical relief.
- 100 feet from a landfill (active or closed).
- 100 feet from a drinking water well or a spring used for drinking water.
- 10 feet from any small on-site sewage disposal drain field, including reserve areas, and grey water reuse systems. For setbacks from a "large on-site sewage disposal system," see Chapter 246-272B WAC.
- From an underground storage tank and its connecting pipes that is used to store petroleum products, chemicals, or liquid hazardous waste in which 10% or more of the storage volume of the tank and connecting pipes is beneath the ground:
  - o 10 feet when the system capacity is 1100 gallons or less.
  - o 100 feet when the system capacity is greater than 1100 gallons.
- 100 feet from an area with known deep soil contamination.
- 10 feet from any property line or structure unless a qualified professional provides a written document stating that the structure will not be affected by the proposed location.

Because rain gardens can add phosphorus to stormwater from soil amendments and/or plant material:

- Imported compost shall not be used if the site is within 1/4 mile of a phosphorous-sensitive water body.
- An underdrain shall not be used if drainage would be routed to a phosphorous-sensitive waterbody.