April 6, 2023

LCRA Highland Lakes Watershed Ordinance Technical Manual – BMP Details

This bulletin provides additional guidance regarding the LCRA Highland Lakes Watershed Ordinance Technical Manual (5th Edition, 2007) requirements for gabions, revetment mattresses, level spreaders, extended detention/sand filter pond outlets and trash racks. These requirements should be added to plan notes and details.

Gabions/revetment mattresses

- All gabions and revetment mattresses used for water quality best management practices (BMPs), erosion control or slope support/stabilization must be metallic-coated or PVC-coated steel meeting either TXDOT Specification 459 or City of Austin Specification 594S.
  - Use minimum 11-gauge (0.120 inch or 3.05 mm) wire for metallic-coated gabions.
  - Use minimum 12-gauge (0.106 inch or 2.7 mm) wire for PVC-coated gabions.
  - Use minimum 13.5-gauge (0.087 inch or 2.2 mm) wire for revetment mattresses.

Level spreaders and permanent rock berms

- Permanent rock berms and level spreaders constructed per the “Rock Berm” lip option in Figure 3-7 of the LCRA Technical Manual must use metallic-coated or PVC-coated steel with a minimum wire size of 14 gauge (0.080 inch or 2.0 mm diameter).

- Prior to construction of level spreaders, the level spreaders must be staked in the field and inspected by LCRA. The owner or his authorized representative is responsible for contacting LCRA for an inspection. We recommend the design engineer be present at the inspection.

- Level spreaders must be turned up gradient at the ends as necessary to prevent flow from spilling around the ends.

Trash racks for pond outlets

- Trash racks must be constructed of welded wire that is PVC-coated or galvanized steel with a minimum wire size of 13.5 gauge (0.087 inch or 2.2 mm diameter). See Figure 4-4 of the LCRA Technical Manual for trash rack details.

- Filter fabric is required around the trash rack until the pond and contributing drainage areas are stabilized. We recommend placing the fabric to a height of approximately one-half of the water quality elevation or 12 inches, whichever is greater. Filter fabric should not be wrapped directly around the riser pipe.

Extended detention/sand filter pond outlets into secondary BMP

- We recommend incorporating a minimum 2-inch drop from the riser pipe outlet flowline to the adjacent surface to promote positive drainage. The drop should be protected with rip rap over geotextile or a splash block.

Flow Spreading Device Alternative - Extended detention, sand filter, batch pond, bioretention, biofiltration outlets

Outfall location: As an alternative to Technical Manual Section 4.2.1 (8) (iii) (flow spreading device), the water quality outfall (6-inch PVC pipe or appropriately sized pipe) may discharge across the buffer zone to the receiving waterway, creek, channel per the following conditions:

- Follow the guidance for Utility Crossings in Section 2.4.1 and 3.3.16 of the Technical Manual.

- Orient the outfall to discharge perpendicular to the buffer zone or angled slightly downstream.

- The outfall system can be a swale or pipe provided that the design minimizes disturbance to the buffer zone, does not result in erosion and restoration is accomplished with native vegetation or other approved means.

- If a swale is used to convey flow across the buffer zone, a vegetated swale with sod, erosion control blankets/matting and/or appropriately sized rock rip rap or hard armor shall be used to enhance filtration and prevent erosion as follows:

Shear stress, psf	Native seed or sod	Native seed or sod with erosion control blankets/matting	Rip rap, articulated concrete mats or equivalent hard armor
0-3	S	S	S
3-6	US	S	S
>6	US	US	S
	S – Suitable US- Unsuitable		

- Erosion control blankets/matting installed in buffer zones or in frequently inundated locations must be designed to minimize wildlife entrapment. The receiving channel bank should be lined with rock rip rap and sized per the technical manual including a toe and apron in the channel bottom.

- Restoration practices must be shown on the erosion control plans and restoration plans.

- If a water quality outlet pipe discharges directly into the channel, the following shall apply:

- The flowline of the pipe shall be set at a point located 1/3 of the bank height above the channel flowline. For example, if the channel is six feet deep, the outlet flowline will be two feet above the channel flowline.

- The last 20 feet of the 6” pipe should have a slope of 2.0% or greater.

- Storm drain-pipes discharging to the creek should enter at a 45-degree angle to direct runoff in the same direction as the creek flow.

- The outlet shall be set in a headwall or rock rip rap outfall as per Section 3.2.5 of the Technical Manual. Alternative outfall designs per following standard details may be used where appropriate.

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