APPENDIX F:

Design-Build Plans for High Priority Stormwater Mitigation Sites

Project LI-1: Lyndon Institute Maintenance Building Swale

Site Description

Project LI-1 is located at the campus maintenance building where a flow path carrying clean water from two large metal rooftops spills on to the gravel parking area. Rill erosion is visible along the flow path including a small gully at the catch basin inlet.

Design-Build Plan

The project plan included installation of a grass lined swale to provide a stable flow path for the rooftop runoff to the catch basin, and provide an opportunity for some infiltration. A foundation drain pipe ran parallel to the proposed swale and was incorporated into the design (Figure 1).

Figure 1: Design-build plan produced by FEA for the LI-1 project site.

Project Comments

The project was completed in July 2017 by the NorthWoods Stewardship Center crew (Figure 2). The drain pipe was a significant design constraint requiring the final swale to be defined primarily by a berm, instead of through an excavated flow path. Rock was added to stabilize the drop to the catch basin and the swale was seeded and mulched.

Figure 2: A small swale created to convey clean water from the rooftops to the existing catch basin.

Project LI-3a: Gravel Parking Area Sediment Trap

Site Description

Project LI-3a is located at the outlet of a stormwater pipe carrying runoff from Matty House Circle and portions of Back Center Road. The stormwater pipe emptied on to a dirt parking area that is primarily used for tour buses from visiting athletic programs. Stormwater runoff was causing significant erosion along the parking area and the runoff was spilling over the bank directly into a small stream.

Design-Build Plan

The project plan included installation of a grass lined sediment trap/infiltration basin to detain and treat the WQv storm. The basin included a rock lined splash apron to dissipate high velocity flow at the pipe outlet and a grass lined swale extending south along the edge of the parking area (Figure 3). FEA visited the site with the NorthWoods project manager and the crew leader to layout the construction extents (Figure 4).

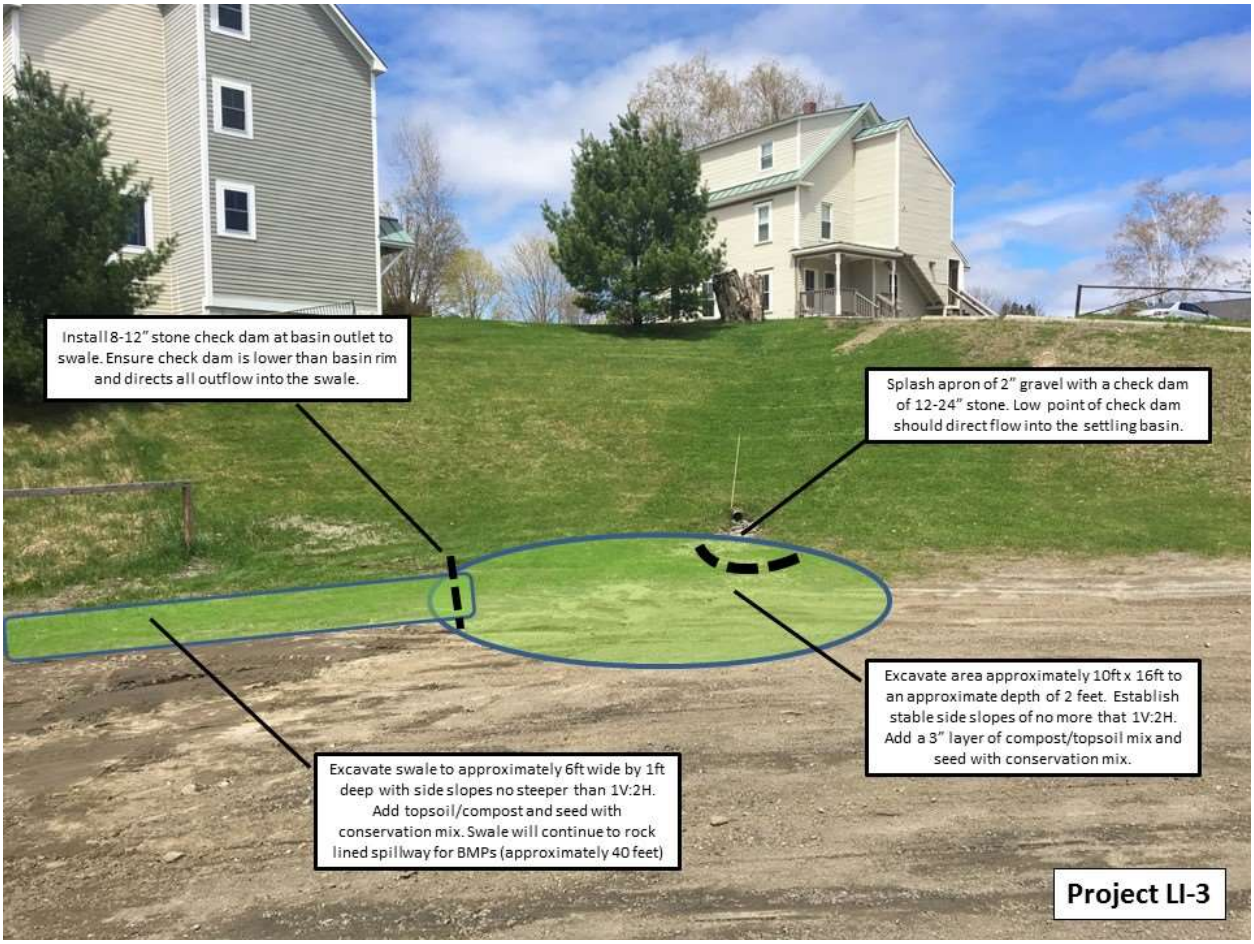

Figure 3: Design-build plan produced by FEA for the LI-1 project site.

Project Comments

The project was completed in July 2017 by the NorthWoods Stewardship Center crew (Figure 5). FEA and CCNRCD conducted a follow-up visit on 8/31/2017 and noted additional improvements required to stabilize the sediment basin. The splash apron stone lining was not thick enough and was causing erosion

of the underlying soil around and under the rock. Additional rock was recommended for the edge of the basin near the inlet. Northwoods completed the site improvements in November 2017.

Figure 4: Pre-construction site layout

Figure 5: Constructed sediment basin

Project LSC-3: Stonehenge Parking Lot Footpath

Site Description

Project LSC-3 is located on a footpath connecting the Stonehenge complex dormitory buildings to the large parking lot. Pedestrian traffic has created a path through the grassed areas and through a swale near the inlet of a large stormwater treatment feature. Soil compaction and erosion along the footpath were increasing sediment loading to the treatment feature.

Design-Build Plan

The site was visited with representatives from FEA, CCNRCD, LSC, NorthWoods, and VTDEC. Several options to stabilize the footpath were discussed and ultimately the construction of a low bridge and infiltration steps was selected. Ben Copans from VTDEC sketched a site plan for the Northwoods crew leaders (Figure 6).

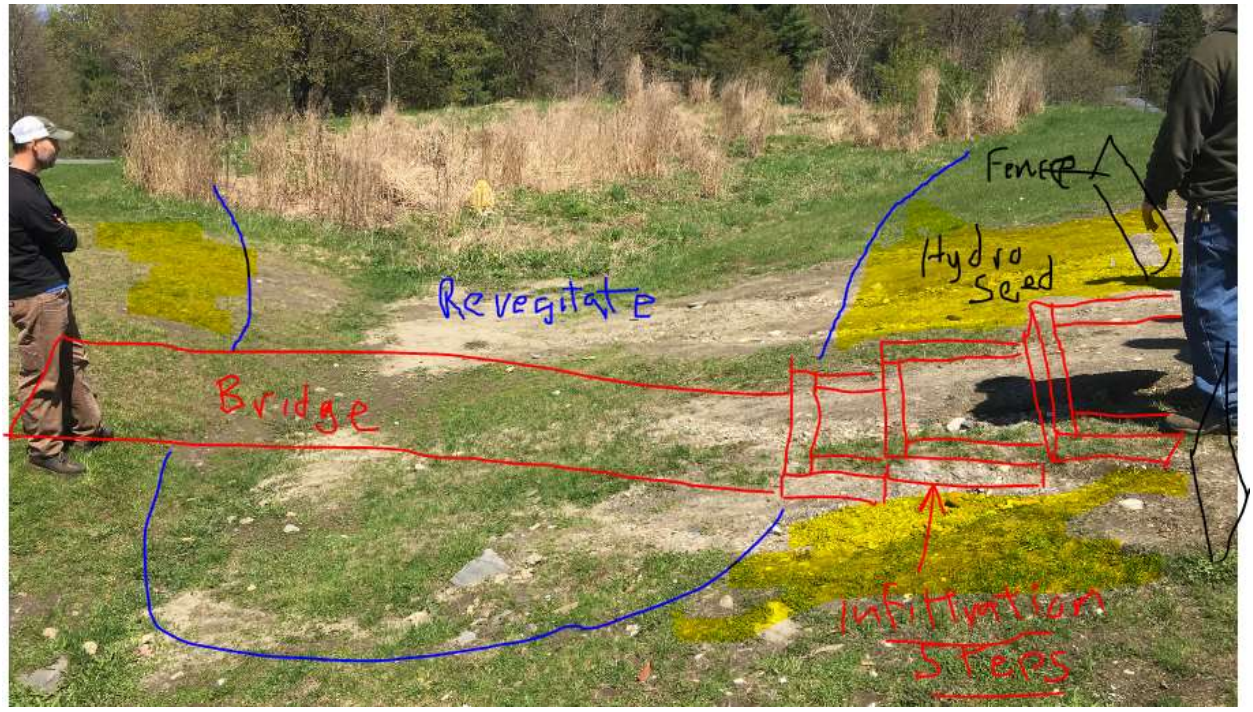

Figure 6: Design-build plan produced by Ben Copans of VTDEC for the LSC-3 project site.

Project Comments

The project was completed in July 2017 by the NorthWoods Stewardship Center crew (Figures 7 and 8). FEA and CCNRCD conducted a follow-up visit on 8/31/2017 and noted minor areas of exposed soil. LSC agreed to hydroseed the site as needed.

Figure 7: Footpath bridge over the stormwater swale

Figure 8: Infiltration steps between the bridge and parking lot

Project LSC-6: Baseball Fields Rain Garden

Site Description

Project LSC-6 is located in the grassed area between the two baseball fields. An existing flow path concentrates runoff at the top of a stone lined swale down the steep slope. Standing water was observed during the 5/3/2017 field visit. Fertilizer application to the baseball fields likely increases nutrient loads through this site.

Design-Build Plan

The site was visited with representatives from FEA, CCNRCD, LSC, NorthWoods, and VTDEC. The raingarden dimensions were confirmed in the field prior to construction (Figure 9). The plans included removal of the concrete and rock debris at the outlet of the rain garden and construction of a stable conveyance to the existing stone-lined swale down the steep bank.

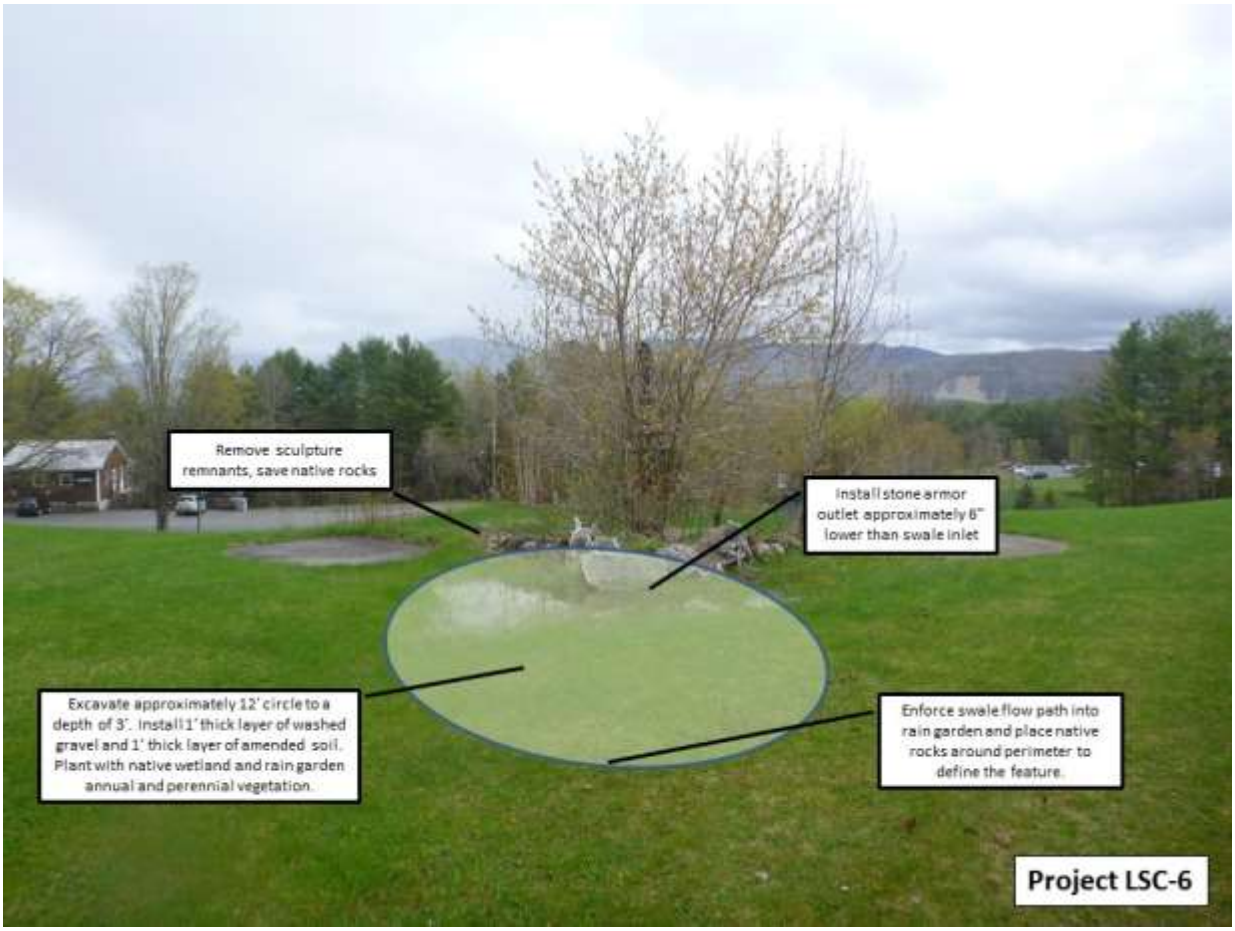

Figure 9: Design-build plan produced by VTDEC for the LSC-3 project site.

Project Comments

The project was completed in July 2017 by the NorthWoods Stewardship Center crew. The basin was hand dug by the crew and the finished depth was approximately 2.5ft, limited by a layer of hardpan clay underlaying the site. The NorthWoods crew uncovered a concrete ring located at the BMP outlet. An existing notch in the ring provided an ideal outlet structure for the rain garden (Figure 10). FEA and CCNRCD conducted a follow-up visit on 8/31/2017 and noted minor areas of exposed soil (Figure 11). LSC agreed to hydroseed the site as needed.

Figure 10: Concrete ring uncovered during excavation

Figure 11: Completed rain garden with some exposed soil from construction disturbance