Maurice River and Johnson Creek Soil Bioengineering Stabilization and Restoration

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TWO URBAN WATERWAY BANK REMEDIATION PROJECTS IN THE US

Maurice River in Millville, New Jersey.

The Maurice River in this location is a tidal influenced system that had long been neglected and marginally stabilized with asphalt debris and concrete rubble. See Figure 1. In 2004 a new waterfront improvements program for the development of Ware Avenue Park and Marina presented an opportunity for soil bioengineering stabilization and restoration of the riverbank. A vegetated reinforced soil slope (VRSS) system that combined geogrid reinforcement and embedded rooted plant materials was installed. The geogrid soil wrapped upper lifts and vegetation stabilized the riverbank providing enhanced aquatic habitat and an attractive lineal park along the Ware Avenue Waterfront development. See Figures 2, 3 and 4.

Figure 1. Bank conditions 2003

Figure 2. Bank conditions 2019

Figure 3. Post construction 2004

Figure 4. Bank conditions 2019

Johnson Creek in Milwaukee, Oregon.

Johnson Creek flows through a highly urbanized suburban area of Portland. The creek was widened in the 1930's for flood control. In 1993 the creek was realigned, shortened and steepened by ODOT to accommodate a new bridge and off ramp highway construction. The initial proposal was for a trapezoidal riprap channel design. See Figure 5.

Due to environmental concerns and associated required permits for salmonid stream systems, the realignment and stabilization presented an opportunity for the use of ecologically sound soil bioengineering measures including the VRSS system along the outside right descending bank meander. A compound channel design was developed to provide a larger cross-sectional area to accommodate flood events and provide a wildlife corridor. See Figure 6. Beyond bank stabilization and channel stability, aquatic, riparian and waterfowl habitat and aesthetics were addressed to meet the multi-objective goals. See Figures 7 & 8.

Figure 5. Original 1993 design for riprap

Figure 6. 2 weeks post construction 1994

Figure 7. 6 years of development 2000

Figure 8. 25 years of development 2019

CONCLUSION

While both case histories are in different parts of the country with different conditions, they each illustrate the benefits of soil bioengineering synergistic designs to meet long-term structural stability, broad environmental functions and aesthetic benefits. These represent the excellent performance of soil bioengineering VRSS systems over 15 and 25-year periods.