

HAGAR CREEK SLOPE-A SELF WATERING VEGETATED SLOPE USING PARADRAIN BURLINGTON, ONTARIO, CANADA

Reinforced Soil Walls and Slope Reinforcement

Problem

Vegetated reinforced slopes have become a familiar retaining system in place of traditional reinforced systems. These systems use tiebacks interacting with engineered backfill to create a stable mass to stabilize the retained soil over time. The natural appearance of vegetation growing in the front of a reinforced slope provides an environmentally sound solution. The design of vegetated reinforced slope systems requires an organic soil pocket within the front face and directly behind that, free draining granular backfill. Due to this configuration an inherent problem arises. Wherein any water within this structure drains downwards away from the front face. This lack of water results in stunted growth. For the Hager slope project. A slope failure occurred during the widening of a trail within a ravine setting. To stabilize the failing slope which was adjacent to an existing residence. A natural looking solution was the prerequisite. It would need to be constructed within a forested area, with limited space. Further, due to the slopes location, there would be zero maintenance once built.

Solution

The consultants, Waters Edge Environmental Solutions Team, Soil Engineers Ltd., the geotechnical engineers along with Maccaferri's Technical Department, designed a Green Terramesh Slope 5.6m high using Paradrain 100 as the geogrid reinforcement, with a 3m high 3:1 slope above it. Though typically used with marginal fills to accelerate the dissipation of pore pressures. The ParaDrain in this application would not only act as a reinforcement but also act as a drainage channel. Due to gravity, any water draining through the engineered fill would flow downwards, but with ParaDrain partial amounts of water would also be directed horizontally, thus acting as a self-watering irrigation system. This would ensure the structure would vegetate. The work was performed by Anthony's Excavating Central Inc.. It was their first time installing the Green Terramesh with Paradrain. They found the installation straightforward. The project was completed on time and on budget and was a big "W" (win) for all involved.

Client: CITY OF BURLINGTON

Designer / Consultant: Soil Engineers Ltd.

Contractor: Anthony's Excavating Central Inc.

Products used (Qty.)

- Green Terramesh	294m2
- ParaDrain	3510m2
- MacMat	126m2
- MacDrain W	430m2

Date of construction: 04/2019 - 05/2021



Failed Slope with Temporary Erosion Control Blanket



Start of Construction - Cut Slope with MacDrain Installed



Free Draining Granular Backfill with ParaDrain



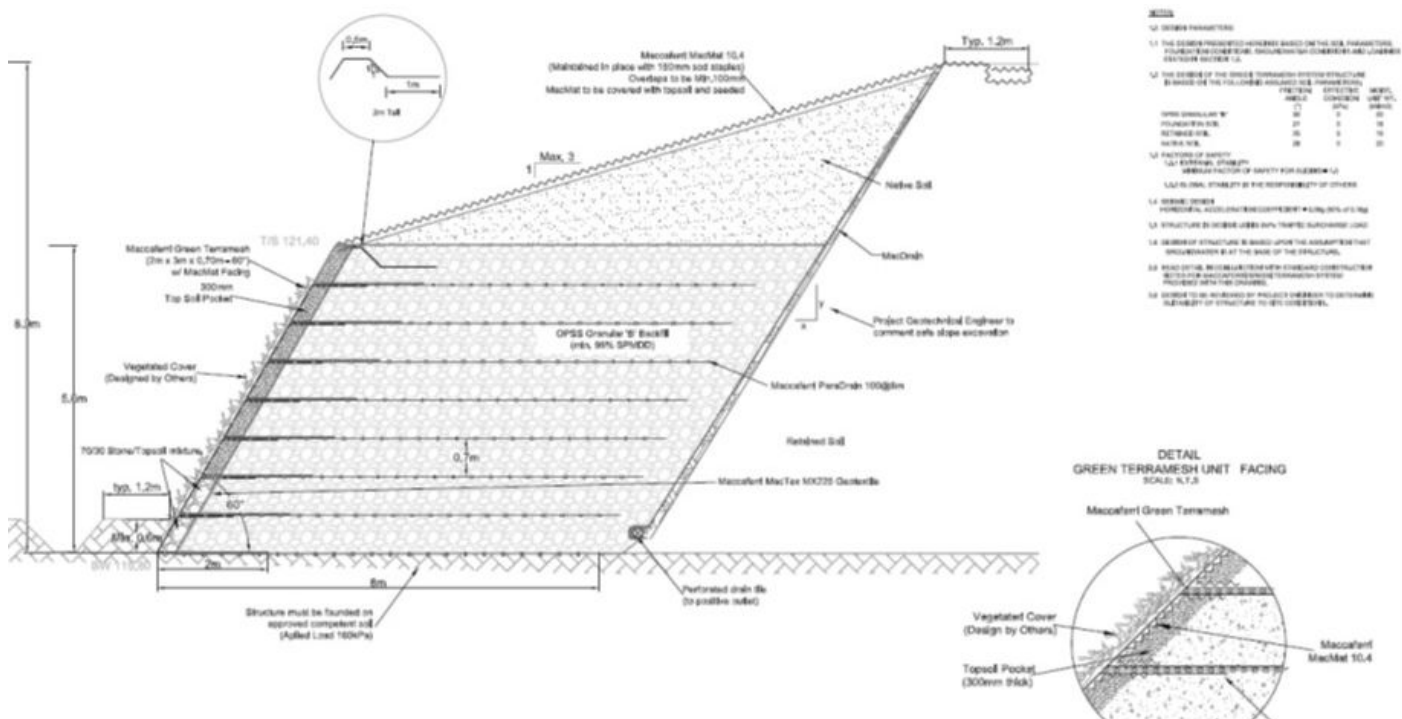
Partial Green Terramesh Installation



Completed Green Terramesh Slope



Green Terramesh Starting to Vegetate



Cross Section of Hagar Creek Reinforced Slope

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