Demonstrative slope restoration with soil & water bioengineering techniques in Catterline, Scotland

LOCATION AND DESCRIPTION OF THE PROJECT

Catterline bay lies adjacent to the Fowlsheugh coastal nature reserve, known for its high cliff formations and habitat supporting prolific seabird nesting colonies.

The project area is in the village of Catterline, Aberdeenshire, approximately 7 miles south of Stonehaven.

The Glasgow Caledonian University (GCU) is involved in OPERANDUM project like Naturalea and is responsible of the Open-Air-Laboratory (OAL) from UK.

ACTUAL PROBLEMATIC

The erosion of the slopes toe is leading to the downward movement of the slope forming materials. The early successional plant communities (i.e. herbs and grasses) are influenced by recreation causing risk of landslides and coastal erosion.

The main problem of the study section is the landslides of argillaceous soil on top of a conglomerate base caused by:

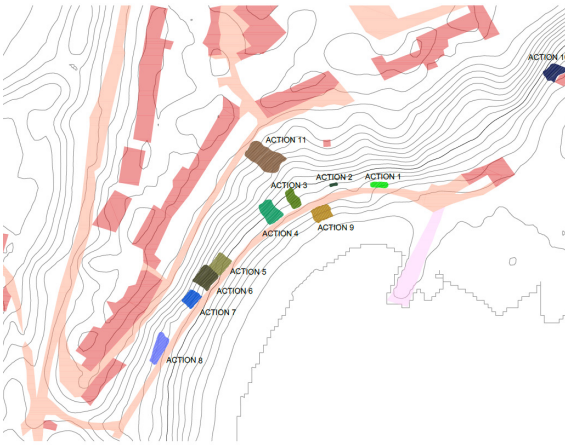
- Phreatic waters.
- Additional action of rain.
- Incidence of an overpopulation of rabbits.
- Incidences due to movements of old lands damaged in the urbanization.

OBJECTIVES OF THE PROJECT

The key objective of this project is to show the capacity of NBS (Nature Based Solutions) to manage the problems of slope stability using techniques based in the use of plants, especially shrubs and create the initial conditions with soil & water bioengineering techniques. The main objective is to use natural materials and proximity materials. Materials that are more plastic and also that can evolve adapting to change conditions. Always is need maintenance but less costly and more easily to handle.

ACTIONS

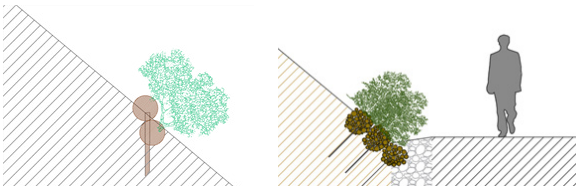
Definition of different actions depending on the topography, the inclination, and the necessary high to protect the slopes.



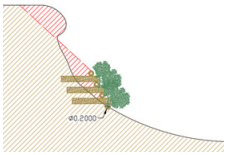
Actions:

1. Fascine with brushlayer (Ribalta) and live drainage fascine
2. Vegetated simple cribwall
3. Live slope grid
4. Wooden vegetated palisade and vesubian slope grid
5. Brush layer
6. Hydramatrix Cx mulch
7. Cribwall Krainer and internal wooden palisade
8. Vegetated simple cribwall, live slope grid and wooden vegetated palisade
9. Brush layer
10. Loricata cribwall
11. Live slope grid

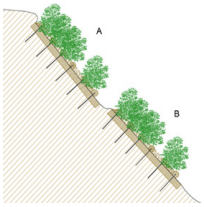
ACTION 1 – FASCINE WITH BRUSHLAYER (RIBALTA) AND LIVE DRAINAGE FASCINE



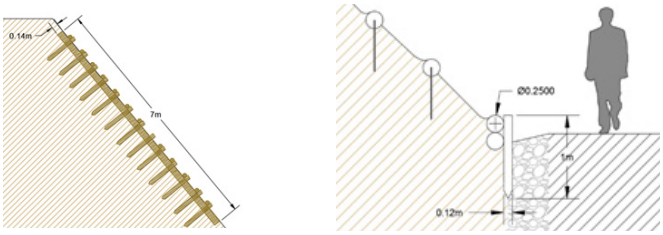
ACTION 2 – VEGETATED SIMPLE CRIBWALL



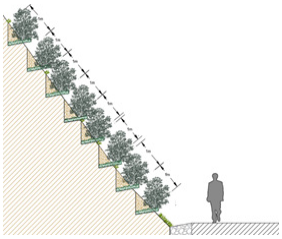
ACTION 3 – LIVE SLOPE GRID



ACTION 4 – WOODEN VEGETATED PALISADE AND VESUBIAN LIVE SLOPE GRID

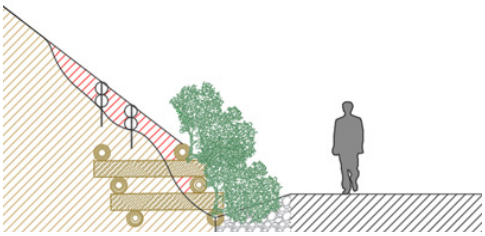


ACTION 5 – BRUSH LAYER

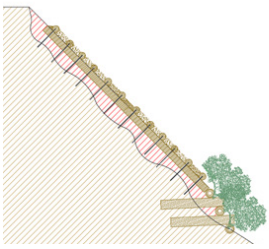


ACTION 6 – HYDRAMATRIX CX MULCH

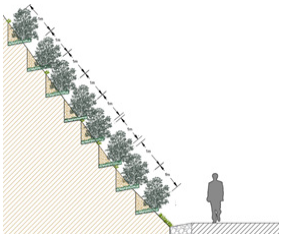
ACTION 7 – CRIBWALL KRAINER AND INTERNAL WOODEN PALISADE



ACTION 8 – VEGETATED SIMPLE CRIBWALL, LIVE SLOPE GRID AND WOODEN VEGETATED PALISADE



ACTION 9 – BRUSH LAYER



ACTION 10 – LORICATA CRIBWALL