Muscle Wall

resilient stormwater and erosion control management

ENGEO CASE STUDY

ENGEO performed a case study into the use of Muscle Wall (MW) on steep slopes for a project site in Northern California.

Nine temporary Muscle Wall basins were placed along a steep unvegetated hillside with grades up to 50%.

The goal was to detain as much rainfall runoff as possible to reduce the volume of stormwater leaving the project site.

DEPLOYMENT

4,000 linear feet of 4' tall MW was ordered for the project, which arrived on 7 truck trailers (95 pieces per trailer).

Each 8'x6' pallet contained 12 pieces.

Time to deploy 500' of MW:

- 9 hours (if grading was needed to level the surface)
- 5 hours (without grading)

RESULTS

MW basins were successful at detaining large volumes of stormwater and sediment while remaining stable for varying slope steepnesses, surface types, and barrier configurations.

Water would eventually overtop or seep under the barrier pieces, but at a low discharge rate that could be managed downstream.

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Muscle Wall proven resilient

DISCUSSION

Barrier pieces can be left unfilled when placed across a haul road to allow contractor access during dry weather.

The ratio of water filled to unfilled barrier pieces should increase as slope steepness increases.

Combining a MW barrier with an excavated sediment basin and lining with plastic held back large volumes of water without seepage occurring.

A discharge port can be used to control outflow. A hose can be connected and fitted with a bag filter system to reduce turbidity before discharge offsite.

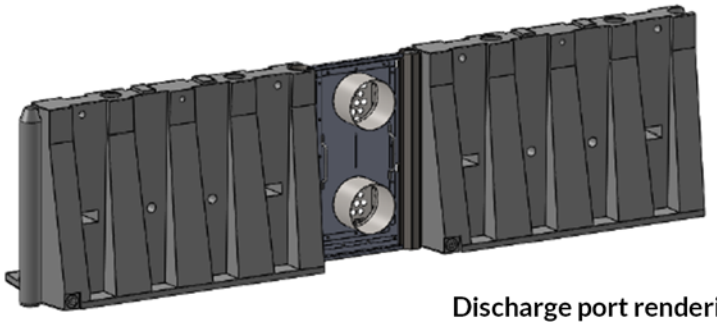
MW was also used as a robust perimeter control, stockpile berm, retaining wall, and diversion channel.

CONCLUSION

MW proved to be a resilient stormwater and erosion control management option.

MW is expected to withstand multiple storm seasons of continued use due to its durable polyethylene material. It can be used year after year for longer duration projects. For shorter duration projects, it can be moved from one project site to the next.

MW placed across haul road

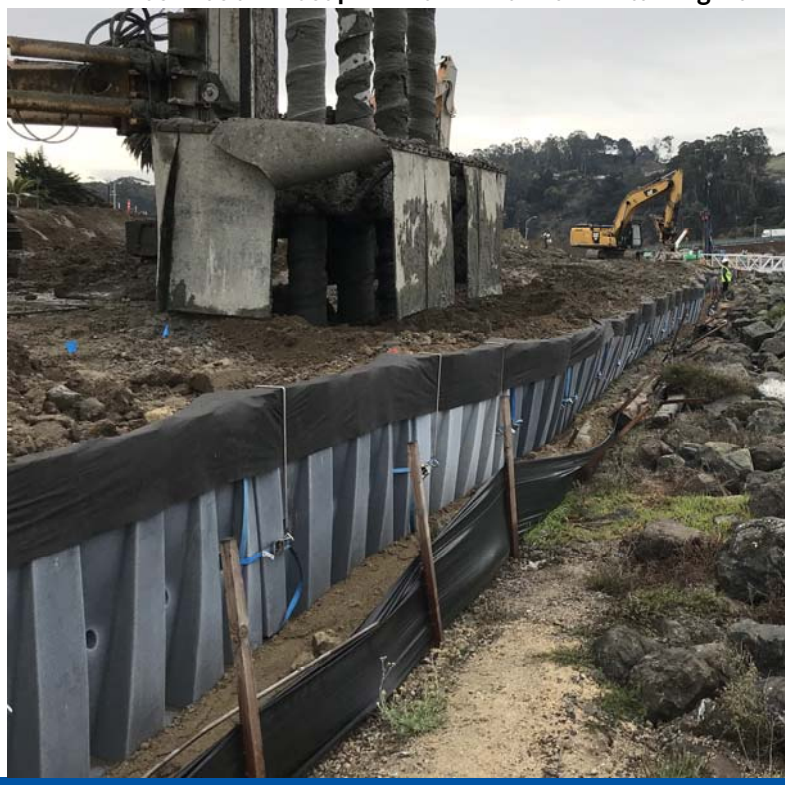


Discharge port rendering

MUSCLE WALL EXCELS FOR SITES WITH THE FOLLOWING CONDITIONS

- ✓ Earthwork occurring throughout rainy season
- ✓ Highly erodible soils
- ✓ Consequences for offsite sediment discharge
- ✓ Steep terrain

MW used as a robust perimeter control and retaining wall



MW used as a diversion channel

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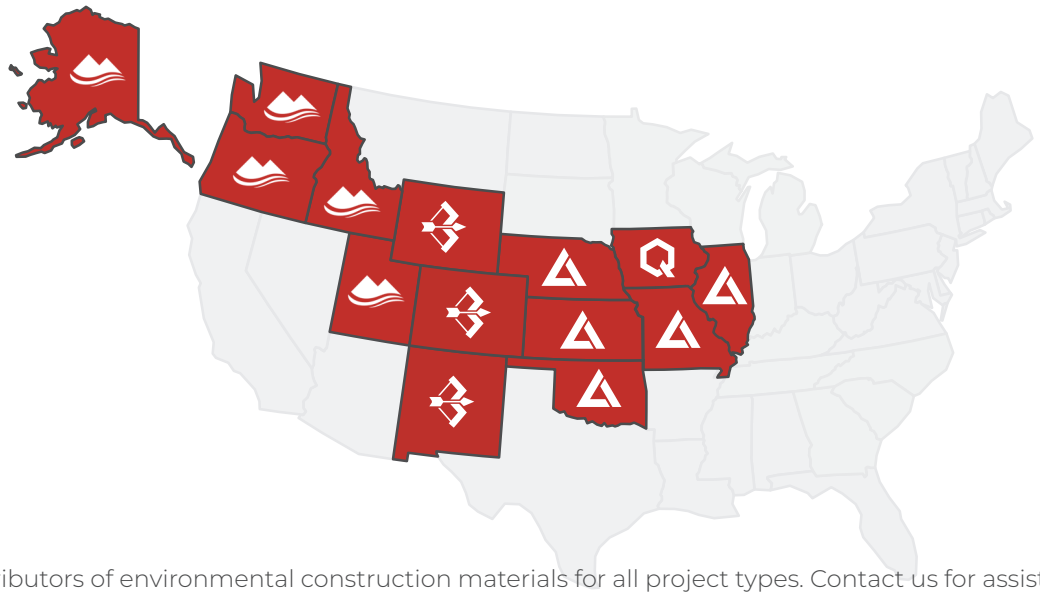

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