

SEGMENTAL MSE WALL AT RETAIL DEVELOPMENT

HAMILTON, OH, USA

SOIL REINFORCEMENT RETAINING WALL

Product: Lock and Load™, MacGrid™

Problem

One of the fastest growing areas in northern Cincinnati is Fairfield Township. Premier Properties Inc, a specialist property developer, realized that retail areas have not grown in proportion to residential developments. They proposed developing "Bridgewater Falls", a 66 acre master-planned retail park attracting premium retailers to the area.

The vast areas of impermeable surface created by these developments, requires complex drainage systems and Bridgewater Falls is no exception. The site drainage is collected by perimeter ditches and retention ponds. To maximize the available land area available for development, the ponds had to be as steep sided as possible. Also, a causeway across the main retention pond created an impressive main vehicle entrance to the park. Accordingly, any solution had to have an architectural 'wow factor' as well as being structurally engineered.

Solution

Walltek Inc. and Lock and Load Ltd. offered a new engineered segmental mechanically stabilized earth (MSE) wall system; Lock and Load™. This consists of a two piece fascia unit made from pre-cast reinforced concrete; a 3.5ft² facing 'stone' and a 'counter fort' which locks into the fascia unit.

The concrete is wet cast, and is reinforced with polymer fibers as well as stainless steel bar. This produces a truly engineered product, giving exceptional strength and durability, particularly freeze-thaw durability; essential in this retention pond setting, where the wall is in constant contact with water.



Attaching Lock and Load™ face 'stone' to counterfort



Backfill compacted onto soil reinforcement geogrids

Client:

PREMIER PROPERTIES INC.

Main contractor:

LATHROP CONSTRUCTION INC.

Specialist MSE wall sub-contractor:

WALLTEK INC.

Designer:

WALLTEK INC. & LOCK AND LOAD

Products used:

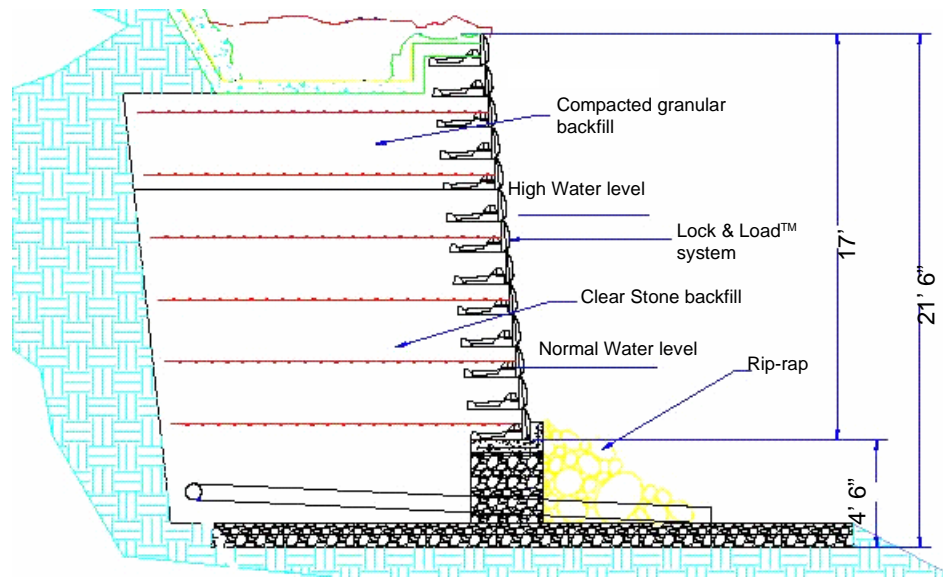
31,000FT² LOCK AND LOAD™, MACGRID™ WG

Date of construction

OCTOBER 2004



Corners and returns within Lock and Load™ wall



Typical section through Lock and Load™ wall

The Lock and Load™ walls on the Bridgewater Falls development are on average, 24 ft high and a maximum of 30ft. The wall geometry was complex with many radii and corners of various angles. Complicating the design is that the Lock and Load™ wall will ultimately support a series of ornamental ponds.

Once a Lock and Load™ wall exceeds 4ft in height, it requires geogrid reinforcement of the structural backfill. The walls on this project are reinforced with Maccaferri MacGrid™ woven polyester geogrids (40, 60 and 120kN).

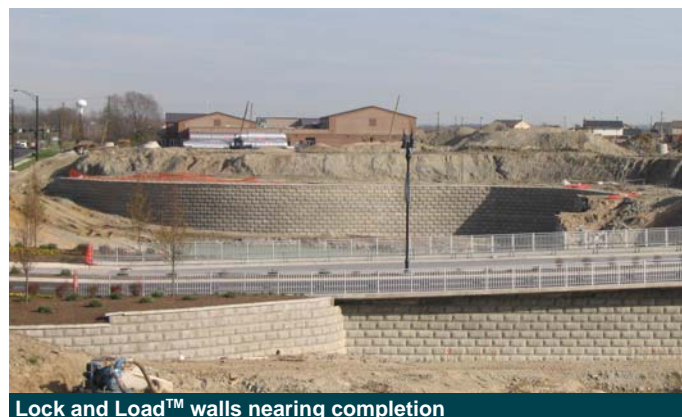
Around the retention pond, care was taken with wall drainage. Free draining gravel backfill was used from 2ft above the water line, down to the wall foundation. This limits the build up of pore water pressures on the wall. Above the waterline and in non-water course areas, a 2ft thick gravel drain was installed immediately behind the face of the wall. Sand backfill was used for the remainder of the MSE structure.

Due to the size of the Lock and Load™ units, these MSE walls are installed more rapidly than traditional non-engineered SRW blockwork walls. The appearance of a 'massive stone' wall offers distinction within a market crowded with the very common 'split face' block appearance.

Lock and Load Ltd is based in Vancouver, with licensed manufacturing operations across North America. Maccaferri Inc. is a Master Distributor for C.J.Pink Ltd, a Lock and Load license holder based in London, ON.



The retention pond wall reaching full-height



Lock and Load™ walls nearing completion

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