2.4.2 OTHER STRUCTURES

2.4.2.3 REINFORCED-SOIL RETAINING WALLS

GENERAL DESCRIPTION

Reinforced-soil retaining walls (RSW) are composite structures formed by the interaction of earth backfill with reinforcement of steel ladders/strips or geosynthetics. The earth mass behind the facing panels tends to act as a cohesive monolithic body, supporting its own weight as well as the external loads for which it has been designed.

Reinforced-soil retaining walls are typically faced with precast concrete panels which have connections at the rear to distribute the location of the soil reinforcement within the earth backfill. The panels themselves do not hold up the 'wall' but act as architectural facing, which protects the wall from environmental effects.

The precast panel configuration is designed to allow for rotation and settlement, providing a flexible structure able to accommodate significant displacements without catastrophic failure resulting from seismic activity.

PRODUCT APPLICATION

RSW applications are typically vertical retaining walls greater than 3 m in height, in situations of fill. They are associated with infrastructure works where an engineered retaining wall is required to provide long-term durability and security. Reinforced-soil structures are used predominantly in approach or fly-over ramps for bridges and raised abutments (see *Typical Arrangement*), and road and rail widening where limited space is available for spill batters.

RSW can be designed to support bridge abutment loads as well as large dump-truck structures in materials handling and mining industries.

COMPONENT DETAILS

Larger rectangular and square panels have supplemented the original cruciform shape; with plain or coloured concrete finishes. Greater scope to urban designers is provided by the availability of embossed or relief patterns, natural sandstone and mural depictions.

Precast facing panels are typically 140–150 mm thick and the amount of reinforcement is dependent on road/rail authority's specifications, height of the structure and loads.

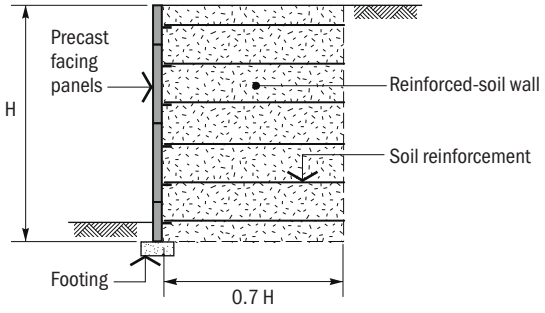
As the facing panels are not the primary structural element, the standard facing panel can be used on walls of varying height, promoting repetition and reducing costs.

The soil reinforcement devices come in a variety of materials and forms from steel ladders, steel strips, and geosynthetic materials including polyester, polyethylene and polypropylene.

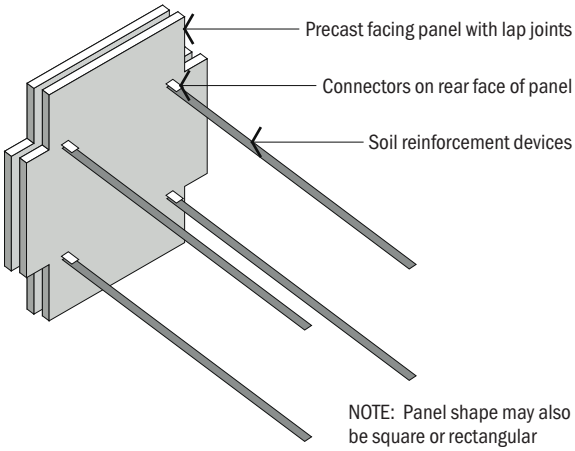
DESIGN PHILOSOPHY

Reinforced-soil retaining walls are designed as coherent gravity structures in accordance with AS 4678 *Earth retaining structures*. Generally they have a height (H) to reinforced-soil block length ratio of 0.7, to maintain the external stability of the structure (see *Typical Wall Section*).

TYPICAL WALL SECTION



BASIC COMPONENTS



TYPICAL ARRANGEMENT