SECTION TWENTY

BEACHING

20.01 DESCRIPTION

This section covers the requirements for the supply and placing of rock, stone or manufactured block beaching for the protection of batter slopes, drainage channels and culvert endwalls as shown on the drawings. Four types of beaching are covered by this section:

Type 1: Ungrouted rock beaching.
Type 2: Grouted rock beaching.
Type 3: Grouted flat stone beaching.
Type 4: Butted paving block beaching.

20.02 CONFORMITY WITH DRAWINGS

The finished surface of the beaching shall conform with the levels, lines and grades as shown on the drawings or as specified.

20.03 MATERIALS

Unless otherwise specified, the Contractor shall supply all materials necessary to construct the beaching as specified, including rock or paving blocks, bedding materials, geotextile, concrete, reinforcement and drainage pipes.

(a) Beaching Material

(i) Type 1 Beaching

Rock for Type 1 beaching shall consist of sound, dense field or quarry rock.

Field or quarry rock shall be resistant to the weathering action of air and water and shall be free from cracks and other structural defects which may reduce its mechanical strength and resistance to weathering.

All rocks, shall have a mass of between 20 and 70kg and at least 60% by number shall be over 40 kg mass. Rocks shall be of such size that the layer of beaching is not less than 225mm thick.

(ii) Type 2 Beaching

Rock for Type 2 beaching shall conform with the same general requirements as for Type 1 beaching except that the rocks shall be of such size that the layers of beaching shall be at least 150mm thick and of mass between 10kg and 40kg with at least 60% by number having a mass of over 25kg. The rocks shall be reasonably uniform in colour.

(iii) Type 3 Beaching

Type 3 beaching shall consist of sound dense flat stone.

Beaching stone shall be free from cracks and other structural defects and be reasonably uniform in size, shape and colour. Each piece shall be not less than 65mm thick and have a face area not less than 0.1m². At least 50% of the pieces by number shall have an area of more than 0.2m².

Samples of beaching material shall be reviewed by the Superintendent prior to placement.

(iv) Type 4 Beaching

Paving blocks shall be of a type, face size, thickness and colour as specified.

(b) Bedding

Type 1 beaching shall not require a granular bedding. However a needle-punched non-woven geotextile, with a mass not less than 250 g/m² and with a robustness (geotextile strength Rating G) of 2000 to 3000, shall be laid over the trimmed surface where beaching is to be placed. The geotextile shall be buried to a depth of 300mm at the edges of beaching and wrapped under the toe wall unless otherwise specified. The geotextile shall be laid evenly with no kinks or folds and joints shall be formed by overlapping the geotextile by not less than 300mm and not more than 500mm.

Type 2 beaching shall not require bedding unless otherwise specified or shown on the drawings.

Bedding for Type 3 beaching shall consist of at least 30mm of mortar, comprising one part Portland Cement, and nine parts sand.

Bedding for Type 4 beaching shall consist of a 50mm minimum layer of bedding sand.

20.04 PREPARATION OF UNDERLYING SURFACE

Areas on which beaching is to be placed shall be trimmed as required to provide a finished surface level of beaching in accordance with the drawings. Any scours or hollows in the surface shall be filled with compacted crushed rock.

Unless otherwise specified trimmed material shall be removed from the site.

20.05 BEACHING PLACEMENT

(a) Beaching materials shall be firmly bedded on the prepared embankment and/or bedding if required and laid in courses commencing from the bottom of any slope. The general surface of the finished beaching shall not vary from a 3 m straight edge laid across the surface of the beaching by more than:

150mm for Type 1 Beaching
75Mm for Type 2 Beaching
30mm for Type 3 Beaching
20mm for Type 4 Beaching

(b) Type 1 Beaching

Gaps between rocks shall be as narrow as practicable. Unless otherwise specified, voids shall be filled to at least mid-height of the rocks with topsoil.

(c) Type 2 Beaching

Width of joints may vary between 10mm and 60mm, with an average not exceeding 40mm. Level difference between edges of adjacent rocks shall not exceed 40mm. The joint pattern shall be random and the joints kept free from debris before grouting.

(d) Type 3 Beaching

Beaching material shall be thoroughly cleaned and saturated with water before being bedded on fresh mortar as specified in Clause 713.03(b).

The joint pattern shall be random and the joints kept free from debris prior to grouting. Width of joints may vary between 10mm and 60mm, with an average not exceeding 40mm. Level difference between edges of adjacent stones shall not exceed 25mm.

(e) Type 4 Beaching

The blocks shall be placed on the specified bedding sand and laid in accordance with the manufacturer's recommendation. Edge blocks shall be neatly cut to establish straight edges. Dry sand shall be broomed into the joints on completion and lightly watered. The sand used in this mixture shall all pass a 1.18mm AS sieve and 10-20% shall pass a 0.075mm AS sieve.

20.06 GROUTING

Grouting with mortar shall be carried out when the air temperature is above 5°C and work shall be kept moist for 3 days after grouting.

Joint mortar shall consist of one part Portland cement, six parts sand by volume, thoroughly mixed with water to produce grout of suitable consistency.

The joints shall be neatly finished by filling with mortar. Care shall be taken to keep the exposed rock face clean. Brooming of mortar across the face of the rocks will not be permitted.

20.07 PERIMETER WALLS

Perimeter and toe walls shall be constructed where shown on the drawings.

For Type 1 Beaching, toe walls 600mm wide by 600mm deep shall be constructed. They shall be lined with geotextile fabric and filled with hand packed rock, the larger voids between rocks being filled with smaller stones.

For Types 2, 3 and 4 Beaching, concrete perimeter walls shall be constructed around exposed edges of the beaching. Concrete used for this purpose shall comply with Section 5 ‘Concrete’.

Toe walls shall be 300mm wide by 400mm deep at the front face and reinforced with 8TM trench mesh top and bottom. The upper surface of the toe wall shall slope upwards at either the slope of the rock beaching or the adjacent verge as shown on the drawings. Side walls and top walls shall be 150mm wide by 250mm deep. The top of the walls shall be continuous with the beaching.

20.08 DRAINAGE

(a) Where specified, or shown on the drawings, a 100mm diameter PVC pipe shall be laid down the batter in a trench beneath the bedding to discharge immediately above the top of the toe wall. The pipe shall be securely bedded within the backfilled compacted crushed rock or natural gravel trench.

(b) Weepholes consisting of 75mm diameter PVC pipes shall be placed through the beaching at 2m centres immediately above the top of the concrete toe wall and cut off flush with the face of beaching.

20.09 CLEANING

On completion of the work, the beaching shall be cleaned to remove all foreign materials and discolouration from the beaching surface. Any joint mortar adhering to the surrounding rock surfaces shall be removed.