Geosynthetics and Reinforced Soil Structures

Reinforced Soil Walls

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Outline of the Lecture

• Different Types of Reinforced Soil Retaining Walls constructed in India
• Material requirements
Components of reinforced soil retaining walls

- Thin, flexible facing panels - about 180 mm thick
- Levelling pad is usually 150 mm thick and 300-400 mm wide
- Backfill soil is select non-plastic granular fill
- Horizontal reinforcement layers
crash barrier

Typical highway supported by reinforced soil retaining walls
Different Types of RE Walls built in India

- Full-height walls
- Modular block walls
- Panel walls
- Steel mesh reinforcement
- Steel strips with anchor
- Gabion facings
- Geogrid reinforcement
- Reinforced Soil Walls - 2
- Polymeric strip reinforcement
A view of a full-height panel wall under erection
Schematic of construction procedure of full-height panel wall
Bridge approach road with full-height panel walls on both sides
Dry construction without using cement mortar or concrete

RE wall with Modular block facing under construction in front of IIT Madras
Facing blocks and horizontal layer of reinforcement
Close-up view of facing blocks and reinforcement – aggregate layer as drainage block behind the blocks
Bridge approach road in Velachery, Chennai – behind IIT Madras

Reinforced Soil Walls - 2
Differential settlement of approach road in Velachery wall
Close-up view of abutment of Velachery flyover. Some length of the approach road constructed directly on the pile cap below the abutment and the rest on subgrade soil.
View of differential settlement due to part length supported on soil and other part on pile cap
Close-up view of the deformed/cracked facing blocks
Heavier blocks with strong shear key. Can be used for short height walls without reinforcement layers
RE wall near Kanchipuram – facing made up of 180 mm thick facing panels
Overall view of the construction of flyover approach road – maximum height of the reinforced soil wall is 9 m near the bridge abutment
Re walls with 1.5m size facing panels .. Inside view
Details of clevis connection between facing panels and welded wire grid
Details of horizontal joint between two panels – notice the lifting hooks and guide rods
Levelling pad for laying the facing panels
Mould for making the facing panels

Reinforcement for panels

Seating pad between panels
Temporary prop support to facing panels during construction
Reinforcement details at the corner of two walls
Geotextile filter at joints to prevent loss of fines
Light weight compactor for compaction near the facing – up to 3 m distance
Compaction should be along the length of the wall – never into the wall facing
Bulging out of the facing panels due to improper compaction at one construction site
Reinforced Anchored Earth walls near Chennai airport & Kathipara junction
Reinforced soil wall in Jaipur city with aesthetic finish in pink colour
Some Applications of rock filled Gabions at Pune

Reinforced Soil Walls - 2
River training works at Kaleswara Rao market road, Vijayawada
Reinforced Soil Approach road at Trivendrum airport – polymeric strips used along with facing panels – notice the seating pads between the blocks
Reinforced soil wall system with galvanized steel welded bar mat reinforcement and precast concrete discrete panels
RE wall under construction near Coimbatore
Positive connection between facing panels and knitted geogrids
22 m high 2-tier retaining wall at Vijayawada
44 m high 4-tier reinforced soil retaining wall at Vijayawada
Recap

• This lecture has described the different reinforced soil retaining walls built in India
• The construction aspects of these walls has been discussed
Questions ????
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