DRAINAGE

Drainage is defined as the collection and transportation of rainwater, groundwater or other fluids such as leachates and gases. Geosynthetic drainage systems are being increasingly used as a more effective and economic alternative to traditional granular based solutions.

Geosynthetics are used extensively in critical structural drainage applications such as basements, bridge abutments and retaining walls, replacing porous concrete blocks, no-fines concrete and other conventional materials.

Typical applications include:

- Parking Lots
- Landfill Gas Drainage
- Bridge Abutments
- Retention
- Paved Grass Areas

Design Considerations:

- Soil conditions
- Hydrology
- Hydrogeology
- Surfacing

EROSION CONTROL

Climate change is one of the primary causes of progressive erosion problems on a global scale. The hydraulic and filtration properties of geosynthetics allow them to be used highly effectively in place of traditional filter layers. Typically, a single layer of geotextile fabric can replace a succession of stone filter layers.

Typical applications include:

- Coastal Protection
- Dams and Flood Defense Bunds
- River and Canal Bank Protection
- River Revetments
- Culvert Head Walls
- Structured Causeways
- Cliff Protection
- Bridge abutments
- Submerged breakwaters
- Artificial Islands

Design Considerations:

- Soil conditions
- Hydrology
- Hydrogeology

Natural vegetation can provide a certain level of erosion protection, it is often inadequate on steep slopes or areas prone to wave run-up or intermittent high velocity flows. This can occur in coastal areas, rivers, lakes, reservoirs, drainage ditches, flood bunds and overspill ponds. River and canal banks are subject to wave action creating reverse flow conditions, it is this dynamic erosive force that undermines bank stability and affects channel flow and navigability.

FILTRATION

Increasingly there is a risk of flooding affecting millions of people worldwide. This global occurrence of major coastal and river flooding events requires geosynthetics to play an increasingly important role in creating solutions in the attempt to provide enhanced protection of our fragile environment. A primary benefit of geosynthetics is their proven performance in terms of hydrocarbon entrapment and treatment.

Typical applications include:

- Permeable Pavements
- Wrapping Infiltration Structures
- Coastal Erosion Protection
- Scour Control
- Paved Grass Areas
- Road Edge drainage
- Permeable Pavements
- Frost protection
- Saline groundwater protection
- Capillary breaks
- Contamination isolation
- Stabilized Drainage layer
- Parking Lots
- Process Water Channels
- Dams

Design Considerations

- Soil conditions
- Hydrology
- Hydrogeology
- Load conditions
- Particle size

GROUND STABILIZATION

Geosynthetics are extremely effective in reinforcing unbound granular layers in roads and other trafficked areas such as parking lots, railways, airports and docks. The use of geosynthetics in ground stabilization allows the overall construction depth to be reduced. This saving on materials and excavation also provides safe working platforms which meet economic and environmental constraints.

Typical applications include:

- Highways
- Railways
- Car parks
- Access roads
- Cycle ways and footpaths
- Site compounds
- Pile cap reinforcement
- Stabilized drainage layer
- No dig tree root protection
- Permeable load supporting surfaces
- Permanent Way ballast stabilization
- Sub-base stabilization for block paved areas
- Green access roads and temporary green occasional car parks
- Permanent and temporary access roads, footpaths and cycle paths.

Design Considerations:

- Sub grade material properties
- Soil conditions
- Hydrology
- Hydrogeology
- Load conditions
- Infill quality/properties
- Sub grade strengths
- Traffic conditions

PROTECTION

Waste management is a demanding environment for geocomposite drainage systems. Besides the standard waste management drainage requirements, the drainage system must be capable of draining aggressive liquids. Needle punched Geotextiles are used extensively in landfill construction. The primary application is when used above and below the geomembrane liner as a protection layer preventing damage occurring during stone placement and filling operations.

Typical applications include:

- Basal liner protection
- Cap liner protection
- Settlement lagoon liner protection
- Landfill cap drainage
- Liner protection
- Landfill gas venting
- Leak detection
- Groundwater control
- Contamination isolation
- Swales and drainage ditches
- Storm water containment lagoons
- Process water channels
- Culvert outfalls
- Intermittent drainage channels
- Dams

Design Considerations:

- Embankment slope angle
- Length
- Hydrology
- Drainage
- Substrate conditions
- Flow
- Depth of fill (waste)
- Type of fill (waste)
- Leachate/gas volumes
- Soil conditions
- Water table

SOIL REINFORCEMENT

With climate change having a major impact on the magnitude and frequency of cutting and embankment slope failures, soil reinforcement is one of the fastest growing traditional applications for geosynthetics.

Typical applications include:

- Steepened Embankments
- Dams and Flood Defense Bunds
- Retention Bunds
- Green Walls
- Culvert Head Walls
- Sound Barriers

Design Considerations:

- Soil conditions
- Hydrology
- Hydrogeology
- Load conditions
- Wall Height
- Fascia Angle
- Surcharge load on the top of the wall
- Overturning Stability
- Sliding Stability
- Foundation Bearing Capacity