



TECHFAB INDIA

At the Heart of Geosynthetic Activity



ENGINEERED **GROUND** IMPROVEMENT SOLUTIONS

STRONGER GROUND. STRONGER INFRASTRUCTURE.

Geosynthetic Solutions for Stable, Durable
and Constructible Foundations

Geocells | Geogrids | Geotextiles | Prefabricated Vertical Drains | Drainage Composites | Reinforcement Systems

WHY IT MATTERS

WHY GROUND IMPROVEMENT?

Weak or variable soils compromise bearing capacity, deformation control and long-term performance. Ground improvement creates a stable and reliable platform for infrastructure development.



BASAL SEPARATION LAYER PLACEMENT - EMBANKMENT FOUNDATION PREPARATION

GROUND CONDITIONS THAT DEMAND AN ENGINEERED RESPONSE

- ▶ Low bearing capacity
- ▶ Excessive total settlement
- ▶ Differential settlement
- ▶ Poor subgrade performance
- ▶ Lateral spreading
- ▶ Construction instability
- ▶ Long-term deformation
- ▶ Soft & compressible soils

01 HIGHER BEARING CAPACITY
Improves load distribution and supports infrastructure loading.

02 SETTLEMENT CONTROL
Reduces total and differential settlement through appropriate systems.

03 IMPROVED CONSTRUCTABILITY
Creates a stable working platform for construction activities.

04 FASTER CONSTRUCTION
Enables construction over challenging ground conditions.

05 COST OPTIMISATION
Can reduce excavation, replacement and excessive granular fill.

06 LONG-TERM PERFORMANCE
Improves stability and serviceability of completed infrastructure.

SELECTING THE STRATEGY

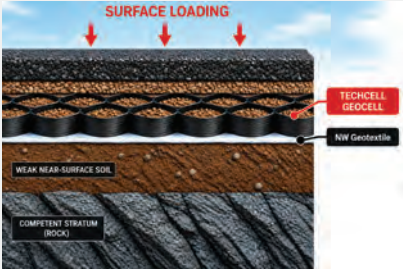
GROUND IMPROVEMENT APPROACHES

Ground improvement is selected according to where the weakness lies in the soil profile. Three broad engineering approaches cover the majority of conditions.

1

SHALLOW GROUND IMPROVEMENT

Improvement concentrated within the near-surface zone using geocell confinement, geogrid reinforcement, geotextile separation and reinforced granular layers.

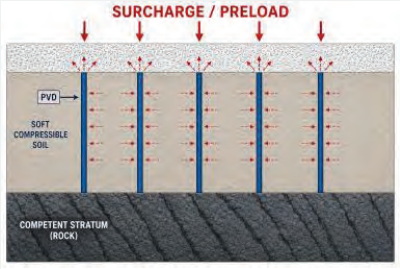


► Techcell, Techgrid, Techgeo

2

DEEP GROUND IMPROVEMENT

Improvement extending into deeper weak and compressible strata using prefabricated vertical drains with preloading or surcharge-assisted consolidation.

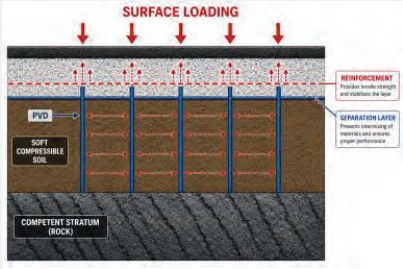


► Techdrain PVD, Preloading, Techgeo

3

COMPOSITE GROUND IMPROVEMENT

Combination of shallow and deep improvement where both near-surface performance and deeper consolidation or stability must be addressed.



► Techcell, Techgrid, Techgeo, Techdrain PVD

SELECTION LOGIC

NEAR-SURFACE PROBLEM • Shallow ground improvement	DEEP COMPRESSIBLE LAYER • Deep ground improvement	BOTH CONDITIONS PRESENT • Composite ground improvement
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NEAR-SURFACE ZONE

SHALLOW GROUND IMPROVEMENT

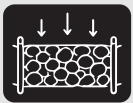
Shallow ground improvement enhances the engineering performance of near - surface weak soils through reinforcement, confinement, separation and improved load distribution - creating a stable, reliable foundation platform without deep excavation or deep foundation systems.



GEOGRID INSTALLATION BENEATH A GRANULAR WORKING PLATFORM

ENGINEERING FUNCTIONS

- ▶ Reinforcement of granular layers
- ▶ Three-dimensional confinement of infill
- ▶ Separation of soil & aggregate
- ▶ Improved load distribution
- ▶ Improved bearing response
- ▶ Reduction in rutting & deformation



AGGREGATE CONFINEMENT

Three-dimensional confinement limits lateral spread of infill.



LOAD DISTRIBUTION

Wheel and plant loads spread over a wider subgrade area.



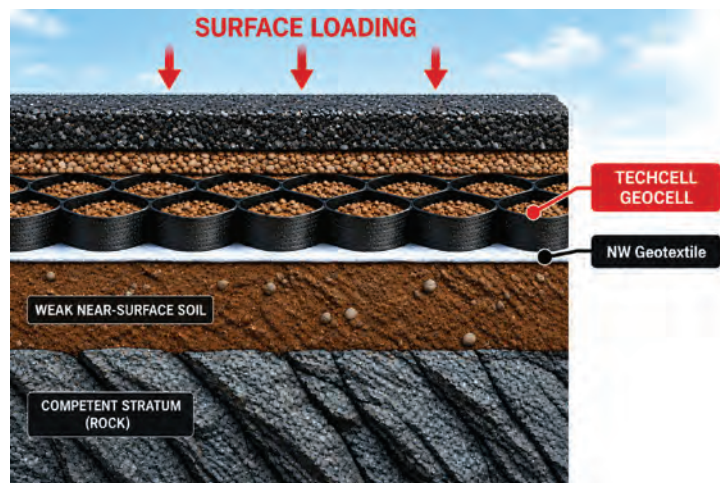
SEPARATION & FILTRATION

Aggregate kept clean of subgrade fines and pumping.



REDUCED RUTTING

Less deformation under repeated construction trafficking.



ON SITE



SHALLOW TREATMENT — GRANULAR PLATFORM WORKS

SOFT & COMPRESSIBLE SUBSOIL —

DEEP GROUND IMPROVEMENT

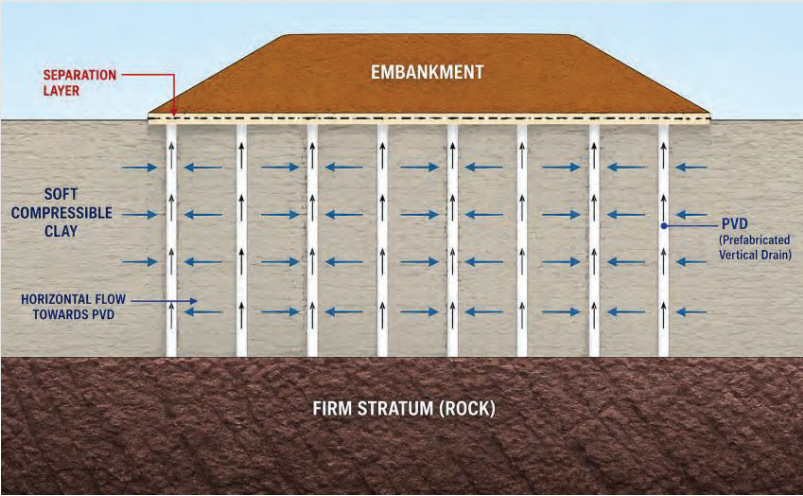
Soft clay and compressible soil can result in excessive consolidation settlement, long construction periods, low undrained strength, stability issues and delayed dissipation of excess pore pressure. Prefabricated vertical drains shorten the drainage path so consolidation is achieved within the construction programme.



PVD INSTALLATION ACROSS A SOFT GROUND TREATMENT AREA

- Excessive consolidation settlement
- Long construction periods
- Low undrained strength
- Stability issues
- Delayed pore pressure dissipation

PRIMARY SYSTEM —TECHDRAIN PVD



- PRELOAD FILL
- DRAINAGE BLANKET
- VERTICAL DRAIN
- PORE WATER FLOW
- SOFT COMPRESSIBLE CLAY

SHORTER DRAINAGE PATH

Drainage distance reduced to the horizontal drain spacing.

ACCELERATED CONSOLIDATION

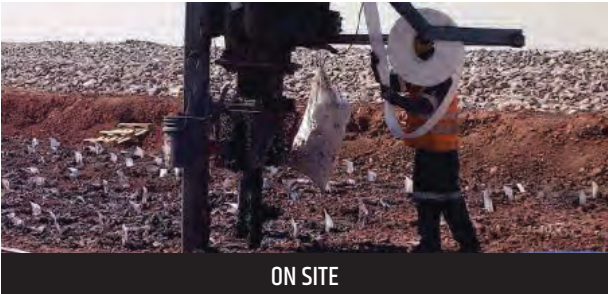
Settlement brought forward into the construction programme.

INCREASED EFFECTIVE STRESS

Pore pressure dissipates and effective stress rises.

IMPROVED SHEAR STRENGTH

Higher stability for subsequent construction stages.



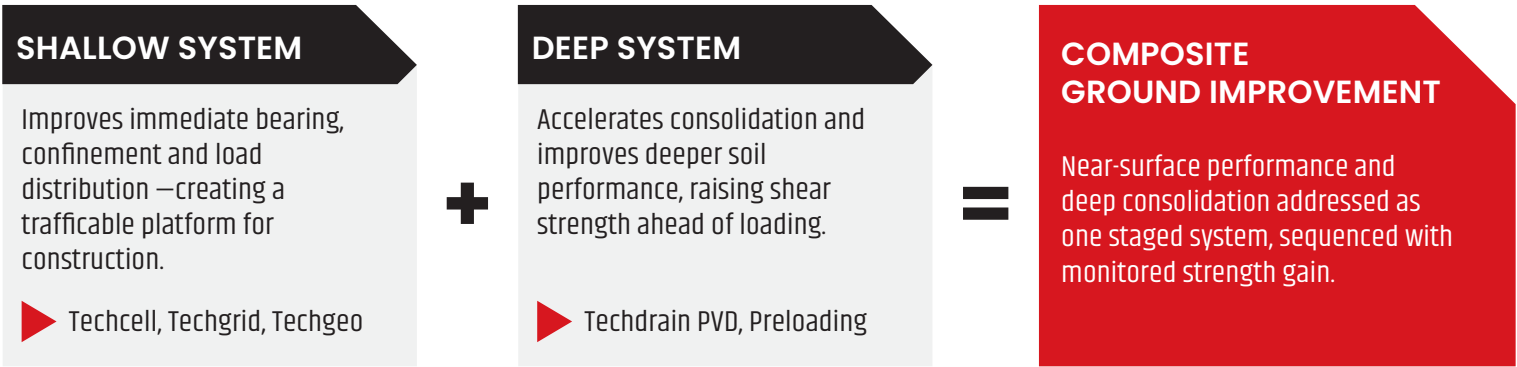
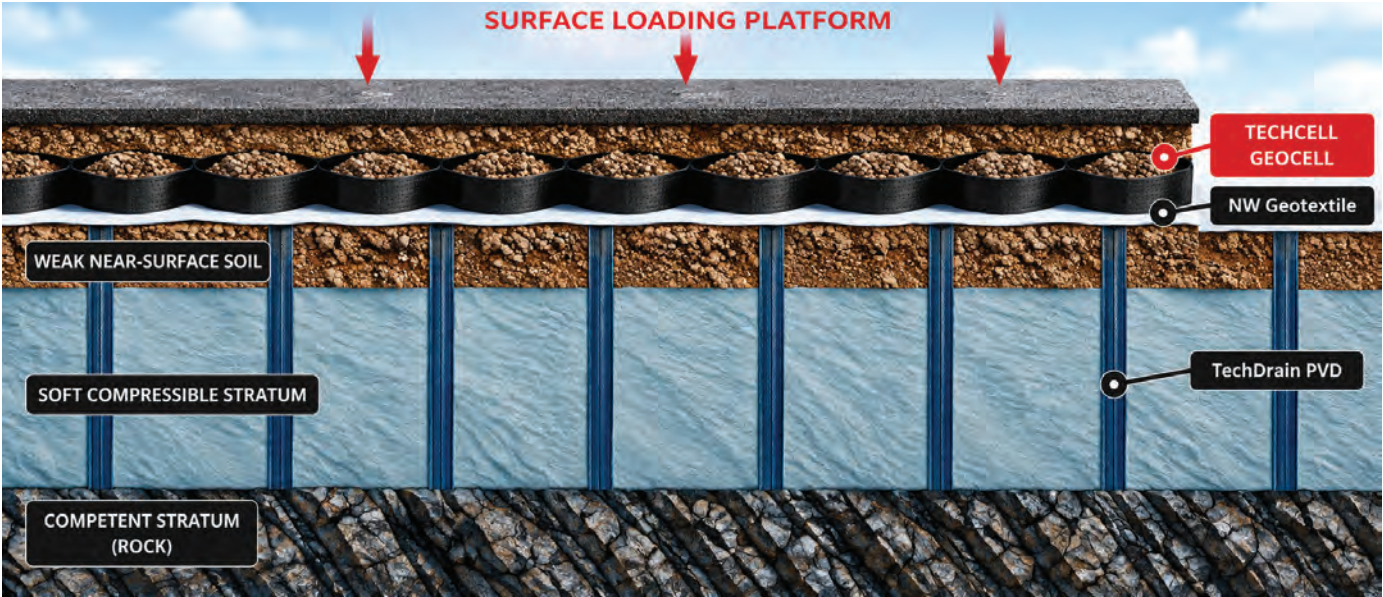
ON SITE



COMBINING SHALLOW REINFORCEMENT WITH DEEP CONSOLIDATION

COMPOSITE GROUND IMPROVEMENT

Where weak near-surface soils coexist with deep compressible strata, a combined ground improvement system may be required —shallow reinforcement for immediate bearing and constructability, deep drainage for long-term settlement.



WHERE COMPOSITE IMPROVEMENT APPLIES

Port & reclamation areas | Highway embankments on soft ground | Industrial platforms over compressible strata
Rail formation on soft foundations | Approach embankments | Large yard developments

CONSTRUCTION SEQUENCE



WORKING PLATFORMS, STACKING YARDS & WAREHOUSES



ENGINEERING CHALLENGES

Heavy static and dynamic loading | Weak subgrade | Rutting under repeated trafficking
Differential deformation | Construction traffic during build-out

APPLICATIONS

- | | | |
|--------------------------------|----------------------------|--------------------------|
| ▶ Heavy-duty working platforms | ▶ Container stacking yards | ▶ Warehouse foundations |
| ▶ Industrial yards | ▶ Internal roads | ▶ Equipment access areas |
| ▶ Load transfer platforms | | |

WORKING PLATFORM

• PROBLEM

Weak subgrade combined with heavy construction traffic and concentrated plant loads

• SYSTEM

TechGeo + TechGrid/TechLink + TechCell

• OUTCOME

Separation + reinforcement + confinement, producing a stable trafficable platform

TECHFAB SOLUTIONS

• TECHCELL

Aggregate confinement and working platform stabilisation

• TECHGRID

Reinforcement and load distribution

• TECHGEO

Reinforcement, Separation and filtration

• TECHLINK

High strength, Reinforcement and load distribution

• TECHDRAIN PVD

Deep soft-soil consolidation where required



ON SITE

MARINE, RECLAMATION & PORTS



KEY GROUND CHALLENGES

Very soft marine clay | High groundwater table | Low bearing capacity
High compressibility | Large consolidation settlement | Construction-stage instability

APPLICATIONS

- | | | |
|------------------------|--------------------------|------------------------|
| ▶ Port infrastructure | ▶ Container terminals | ▶ Reclamation projects |
| ▶ Marine yards | ▶ Coastal infrastructure | ▶ Approach embankments |
| ▶ Heavy-duty pavements | | |

RECLAMATION PLATFORM

• PROBLEM

Very soft, highly compressible marine clay beneath hydraulic fill

• SYSTEM

TechDrain PVD + TFI Woven + TechGrid/ TechLink + TechCell

• OUTCOME

Accelerated consolidation with a separated, reinforced formation

TECHFAB SOLUTIONS

• TECHDRAIN PVD

Accelerated consolidation of soft marine clay

• TFI WOVEN

Basal reinforcement and separation over very soft soil

• TECHGRID

Reinforcement of yard formation and platforms

• TECHLINK

High strength, Reinforcement and load distribution

• TECHCELL

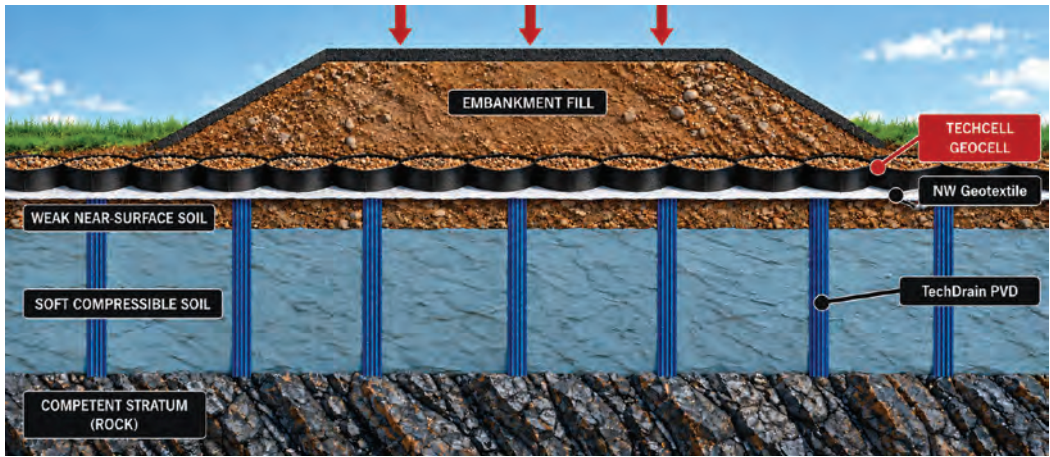
Confinement for heavy-duty pavement areas



ON SITE

APPLICATION —

RS WALL, RS SLOPE & EMBANKMENTS ON SOFT SOILS



STAGED EMBANKMENT AND RS STRUCTURES OVER SOFT GROUND - PVD DRAINAGE AND BASAL REINFORCEMENT

KEY GROUND CHALLENGES

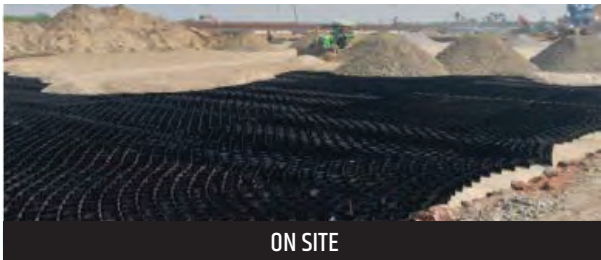
Low foundation bearing strength | Excessive total settlement | Lateral spreading of soft soil
Right-of-way and land-width constraints | Construction-stage instability
Long natural consolidation time

APPLICATIONS —

- | | | |
|-----------------------|------------------------|------------------------|
| ▶ Highway embankments | ▶ Railway formations | ▶ Approach embankments |
| ▶ RS retaining walls | ▶ Bridge abutments | ▶ Flyover ramps |
| ▶ Steepened slopes | ▶ Industrial platforms | ▶ Reclamation fills |
| ▶ Flood bunds | | |

EMBANKMENT & RS STRUCTURE

- **PROBLEM**
Soft compressible foundation with steep grade changes on constrained land
- **SYSTEM**
TechDrain PVD + TFI Woven + TechGrid TGB/TGU/TechLink + TechStrap
- **OUTCOME**
Faster consolidation, controlled settlement and stable retaining structures



ON SITE

TECHFAB SOLUTIONS —

- **TECHDRAIN PVD**
Radial drainage for accelerated consolidation
- **TFI WOVEN**
Basal reinforcement over soft foundation soil
- **TECHGRID TGB**
Tensile reinforcement at embankment base
- **TECHGRID TGU**
Uniaxial reinforcement for RS walls and slopes
- **TECHSTRAP · TECHCORE**
Panel-faced RS walls and connections
- **TECHGEO · TECHDRAIN**
Separation, filtration and back-of-wall drainage
- **TECHLINK**
High strength, Reinforcement and load distribution

APPLICATION LANDSCAPE —

GROUND IMPROVEMENT ACROSS SECTORS

Ground improvement requirements by end-use sector, with the TechFab product systems applied in each. Weak subgrades, soft compressible foundations, settlement control and drainage recur across all eight —the same platform is configured to suit the loading and service life of each sector.

1**HIGHWAYS**

- ▶ Subgrade stabilisation and base reinforcement
- ▶ Embankments on soft foundation soil
- ▶ Steep slopes and RS retaining walls
- ▶ Formation drainage management

TechGrid PP Biaxial · TechCell · TechGeo · TechDrain

5**PORTS & CONTAINER YARDS**

- ▶ Reclamation fill consolidation with PVD
- ▶ Heavy-duty yard formation
- ▶ Access and internal road stabilisation
- ▶ Basal reinforcement over marine clay

TechDrain PVD · TFI Woven · TechCell · TechLink

2**RAILWAYS**

- ▶ Track bed and formation stabilisation
- ▶ Embankment ground improvement
- ▶ Blanket layer separation
- ▶ Slope protection along formation

TechGrid TGB · TechGeo · TechDrain PVD · TechLink

6**WATER MANAGEMENT**

- ▶ Canal and reservoir formation
- ▶ Check dams and bank protection
- ▶ Drain and reservoir lining support
- ▶ Filtration and scour protection

Tech GeoMattress · Metal Gabions · TechGeo

3**LANDFILLS**

- ▶ Basal ground improvement below cells
- ▶ Leachate collection and drainage layers
- ▶ Vertical expansion over old waste
- ▶ Capping system reinforcement

TechDrain Composites · TechGrid TGU · TechGeo

7**ENERGY**

- ▶ Crane pads and load-support platforms
- ▶ Wind farm and solar access roads
- ▶ Pond and reservoir subgrade
- ▶ Erosion control on graded slopes

TechGrid PP Biaxial · TechCell · TechMat · TechLink

4**MINING**

- ▶ Haul road subgrade stabilisation
- ▶ Working platforms on soft ground
- ▶ Tailings dam raise and drainage
- ▶ Overburden dump stability

TechCell · TechGrid PP Biaxial · TFI Woven · TechLink

8**LAND DEVELOPMENT**

- ▶ Site formation over soft fill
- ▶ Preloading and surcharge with PVD
- ▶ Basal reinforcement of engineered fills
- ▶ Settlement control below structures

TechDrain PVD · TechGrid TGU · TFI Woven · TechLink

BEYOND GROUND IMPROVEMENT —

OTHER SOLUTIONS

Ground improvement remains the core focus. Four further verticals extend the same TechFab platform into roads, water infrastructure, hill slopes and earth-retaining structures —all BIS and CE marked, with design support, in-house testing and site supervision from the same team.

1**PAVEMENT**

ASPHALT OVERLAYS · BASE REINFORCEMENT

- ▶ Reflective crack control under overlays
- ▶ Subgrade stabilisation for roads and airports
- ▶ Base and sub-base reinforcement
- ▶ Rural and urban road strengthening
- ▶ Concrete pavement rehabilitation
- ▶ Working platforms over weak subgrade

TechGlass AIC · TGC Reinforced Nonwoven · TechPave · TechGrid PP Biaxial · TechGrid TGB · TechCell

**HYDRAULIC**

CANALS · RIVER TRAINING · COASTAL WORKS

- ▶ River bank revetments and bed protection
- ▶ Scour protection at piers and abutments
- ▶ Groynes, bund walls and seawalls
- ▶ Canal and reservoir lining
- ▶ Beach and shoreline erosion protection
- ▶ Filtration and dewatering works

Metal Gabions · Tech GeoMattress · TechTube · Geotextile Bags · TFI WovenGeotextile

2**3****ROCKFALL & GEOHAZARD**

HILL ROADS · QUARRIES · TUNNEL PORTALS

- ▶ Active and passive rockfall protection
- ▶ Hill highway cut-slope stabilisation
- ▶ Quarry and mine bench protection
- ▶ Tunnel portal and approach protection
- ▶ Landslide and debris flow mitigation
- ▶ Surface erosion protection

TechRhombus · TechSlope Mesh · TechAnchor · Tech Weld Mesh · TechMat

**RS STRUCTURES**

RS WALLS · BRIDGE APPROACHES · SLOPES

- ▶ Reinforced soil and shored MSE walls
- ▶ Bridge abutments and approach ramps
- ▶ Flyover ramps and grade separators
- ▶ Steepened slopes and wrap-around walls
- ▶ Gabion-faced retaining walls
- ▶ Basal reinforcement of embankments

TechGrid TGU · TechStrap · TechCore Connector · TechLink · TechFab Metal Gabions
TechDrain Dimple Board

4

TechFab India was founded in **2003** to provide world-class geosynthetic products and services to Indian infrastructure. From a single woven geotextile facility in Silvassa, it has grown into the country's largest manufacturer of geosynthetics and rockfall protection & geohazard mitigation products.

07

MANUFACTURING SITES

Silvassa · Daman
Bhopal · Haridwar

50+

COUNTRIES SERVED

Including
TechFab USA

50+

ENGINEERS

05

DEDICATED DESIGN TEAM

03

REGIONAL OFFICES

New Delhi
Hyderabad
Vadodara

THE COMPLETE PRODUCT RANGE

GROUND IMPROVEMENT & REINFORCEMENT

TechGrid Polyester Geogrids (TGU / TGB) • TechGrid PP Biaxial Geogrid
• TechLink Polymeric Strip • TechStrap • TechCell Geocell • TechGeo
Nonwoven • TFI Woven Geotextiles

DRAINAGE

TechDrain Prefabricated Vertical Drains • TechDrain Drainage
Composites • TechDrain Dimple Board

HYDRAULIC & COASTAL

TechFab Geotextile Bags • Tech GeoMattress • TechTube Geotextile
Tubes • TechFab Metal Gabions & Mattress • TechPave • TechGlassAIC

GEOHAZARD MITIGATION & SLOPE STABILISATION

TechRhombus • TechSlope Mesh 65/3 & 100/3.4 • TechAnchor
Self-Drilling Anchors • Tech Weld Mesh • TechFab Metal Netting

CERTIFICATIONS & ACCREDITATION



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