

SLOPE STABILISATION WITH

ANCHORED GABION FASCIA WALL



PROJECT:

GATEWAY OFFICE PARKS SEZ – PHASE IV
SLOPE STABILISATION

LOCATION:

PERUNGALATHUR, CHENNAI,
TAMIL NADU, INDIA

CLIENT:

GATEWAY OFFICE PARKS PRIVATE LIMITED

COMPLETED:

2023

INTRODUCTION

Gateway Office Parks SEZ at Perungalathur, on GST Road at the southern edge of Chennai, is a Special Economic Zone campus developed as Shriram The Gateway. Expansion of the campus into its A-Zone required permanent cut slopes to be formed and held immediately behind new buildings, internal roads and the site compound wall. Gateway Office Parks Private Limited engaged Gabion Technologies India Pvt. Ltd. as specialist designer and installer for the Phase IV slope stabilisation works.

PROBLEM

The A-Zone excavation left a high cut slope running the full length of the new development, from chainage 2 m to 148 m. The slope had to be stabilised permanently and immediately, with no scope for regrading back to a flatter, naturally stable profile.

The working corridor was extremely tight. A service road, storm drain and compound wall were being constructed at the toe while the slope works were live, and existing boundary structures sat at the crest. A conventional gravity retaining structure would have demanded a base width the site simply could not surrender.

The face also had to look right. It forms the permanent visible backdrop to the office park's internal road – not a hidden slope behind a fence.

PROJECT CHALLENGES:

- Holding a cut slope up to 12 m high with almost no room for a gravity structure at the toe.
- Building above and alongside a live commercial campus, with the toe road, drain and compound wall under construction simultaneously.
- Delivering a uniform, presentable dressed-stone face across the full 146 m alignment while wall heights varied continuously.
- Satisfying independent third-party design vetting before construction could begin.

SOLUTION

GTI designed a passive anchored gabion system – a gabion fascia wall tied back into the slope with grouted anchors, so that the mesh-and-stone face carries the slope rather than merely dressing it. Sections were designed individually along the alignment for wall heights from 5.50 m to 12.00 m, designed against in-situ soil taken at cohesion 25 kN/m², friction angle 34° and unit weight 21 kN/m³, with backfill at cohesion 0, friction angle 30° and unit weight 18 kN/m³.

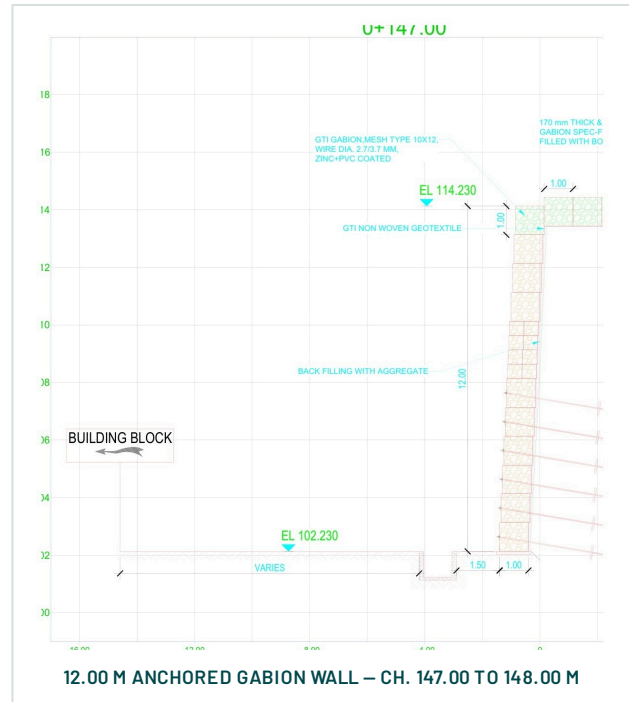
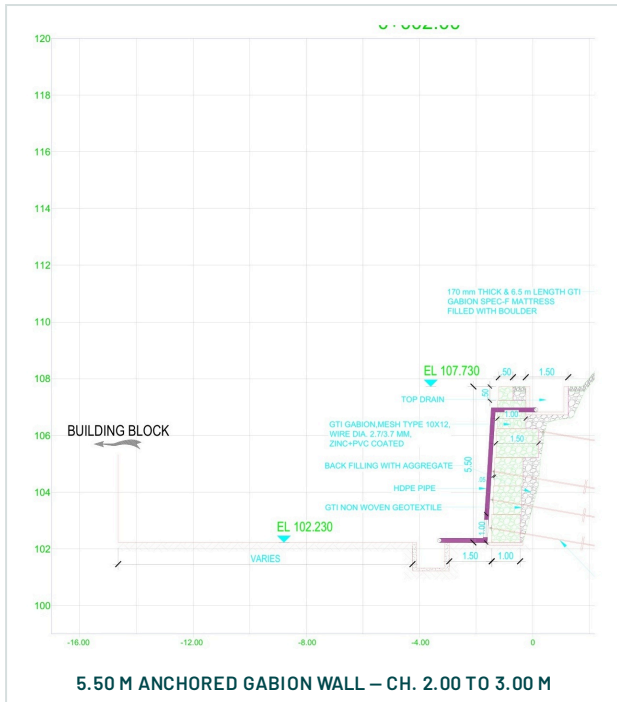
The anchors are 12.0 m long, 32 mm dia. Fe-450 self-drilling grouted bars set at 1.000 m and 1.500 m centres, carrying load back beyond the potential failure surface into stable ground and distributing it through bearing plates at the gabion face. Gabion units are GTI mechanically woven, double-twisted hexagonal mesh, type 10×12, wire dia. 2.7/3.7 mm, Zn+PVC coated, with diaphragms at 1.0 m and a 3° batter held true using MS framework.

Drainage was treated as a primary design element rather than an afterthought: non-woven geotextile behind the face, free-draining aggregate backfill, 200 mm HDPE outlets and a top drain at the crest. Above the top drain the inclined crest was armoured with 170 mm GTI Spec-F gabion mattress, carrying the treatment over the slope shoulder.

The design was independently vetted by an IIT team before construction commenced.



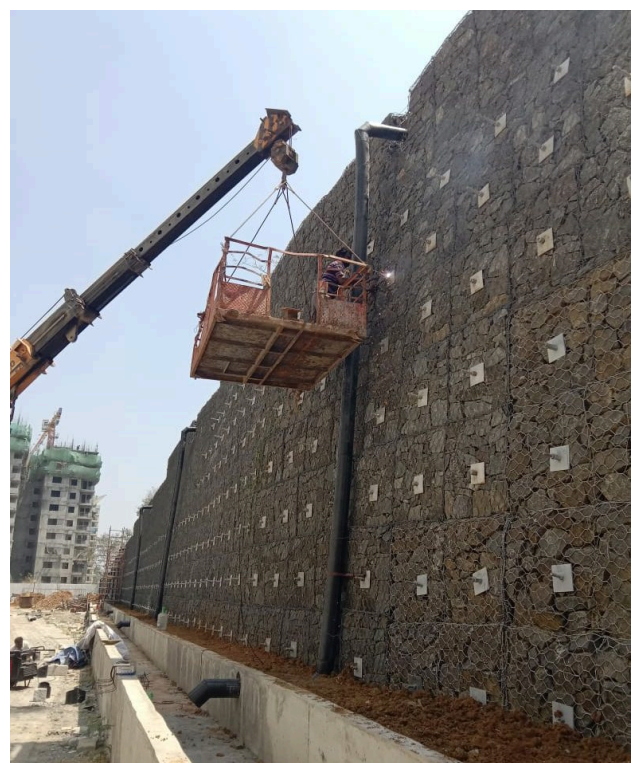
GTI typical cross-section drawings are as follows



The works were executed in two phases along the alignment – chainage 142 to 73, then chainage 72 to 2 – so that the toe road and drainage could be released back to the main development progressively rather than in one handover at the end.

Access governed the method. With no working platform available at the face, gabion assembly, stone filling, anchor installation and plate fixing were all carried out from crane-suspended baskets, working the face lift by lift. Every box was hand-packed with 150–250 mm hard angular stone of crushing strength above 300 kg/cm², placed in three layers with single and double loop lacing at 100 mm spacing, and the exposed stone was dressed by hand so the finished face reads as coursed stonework rather than a wire basket.

Because the wall height changes continuously along the alignment, anchor length, spacing and gabion arrangement were set section by section against 85 as-built cross-sections rather than applied as a single typical detail – the approach that allowed a 12 m face to be held within the base width available.



CONCLUSION

Phase IV of the Gateway Office Parks SEZ slope stabilisation was completed and handed over with full as-built documentation in 2023, under a 24-month defects liability period. The anchored gabion fascia wall holds the cut slope along the entire 146 m alignment while presenting a natural dressed-stone face to the campus.

The project shows GTI delivering a fully engineered, independently vetted anchored gabion solution – design, supply and installation under one accountability – inside a live commercial development.



PROJECT AT A GLANCE

146 m

CUT SLOPE
STABILISED

5.5–12 m

DESIGN WALL
HEIGHTS

12 m

SDA GROUTED
ANCHORS
32 mm dia.
Fe-450

512 nos

GABION UNITS
277 m³

709 m²

GABION
MATTRESS

24 mth

DEFECTS
LIABILITY

Wall heights, anchor details and section geometry per GTI as-built drawing GTI-SH-2016-1825-RF-CSS/14. Gabion, mattress and drainage quantities per Work Order GOPPL/014/2022-23 (top drain fascia and inclined crest portion, Ch. 2-142).



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