

REF-A16

BASEPLATE CONNECTION FOR TUNNEL E&M, S&T APPLICATION

PROJECT

Udhampur Srinagar
Baramulla Rail link
E&M, S&T baseplate
application

LOCATION

Jammu & kashmir, India

CLIENT

Konkan Railway / IRCON

DESIGNER

Amberg, Geodata, Lombard

INSTALLATION

2023



Application

E&M, S&T baseplate for tunnel

Design std.

EN 1992-4, ETAG Annex C

Hardware

HST3-R, HST4-R, HY 200, HIT-RE 500 V4,
SIW 6-AT

Software

PROFIS Engineering (anchor to concrete)

Services

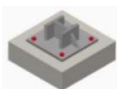
Application training at jobsite

CHALLENGES

- NATM guidelines
- ROCS application
- Seismic C2, fire R120 approval
- Limited time for completion
- Full support from beginning for civil work
- Material Availability at far flung areas

HILTI TOTAL SOLUTION

- ✓ Approved and premium stainless steel anchors
- ✓ Optimised design in PROFIS
- ✓ Efficient supply and service
- ✓ Collaboration with designer and submission of seismic, fire reports



LOAD/ CONDITIONS

Static / Seismic / Fire /
ROCS tunneling

PROJECT HIGHLIGHT



Seismic, fire R120 ETA approval, strong engagement from beginning

APPLICATION AND REQUIREMENT



Application Details: Cable tray fixing, ROCS

Several E&M / S&T (Electrical & Mechanical) / (Signaling & Transmission) works in the civil works, tunnels have been executed according to NATM guidelines. Hence, there was requirement of electric tools and accessories (ET&A) for tunneling activity. In addition to that for the E&M and S&T works, there were multiple applications of baseplate connections.

Special approvals for seismic, fire

Designer's requirement was for approved anchors against seismic C2 category and fire with criteria of R120 (resistant for fire exposure duration of 120 mins). Considering the criticality and multiple vibrations loads due to heavy movements due to passage of train inside the tunnel which brings very high amount of reverse thrust on the equipment that were hanged. So, keeping this as well as the high seismicity zone into consideration, the need of seismic design and relevance to fire was clearly established with the specifiers and the client.

APPROACH TOWARDS SOLUTION

All fixtures, screws etc. inside and outside the tunnel shall be made of stainless-steel material no. 1.4401 as per IS 4367 and according to DIN EN 10088, IS-6911-1992.

Inside the tunnel plastic fixing clips are not allowed and steel clips to be used approx. at 10 m and if required, additional brackets made of stainless-steel material no. 1.4401 as per IS 4367 and according to DIN EN 10088, IS-6911-1992 shall be provided to prevent the cables of falling down on the escaping persons in case of fire.

Depending on the used cable tray, expansion joints shall be required. These expansion joints shall be included in the price of cable tray. The fastening for mounting the substructure on the tunnel wall also shall be made of stainless steel, material no. 1.4571.

Logistics / weather challenges

They have only 8-9 months in a year to execute the project and show the progress. Therefore, the material planning as well as time-to-time testing of lots were done at the site as well as the ware-house location as compliance was the major issue in the project as it was the first of its kind in North-India. The technical, design, compliance and geographical challenges were addressed by the team very swiftly. Looking at the time bound nature of the project, the need of SIW-6AT was proposed by the team and establishing our End-to-End solution portfolio

Post-installed anchors and other tools

- Post-installed mechanical anchors- **HST3-R** of size **M8x75mm, M10x110mm and M12x125mm (Grade 1.4401/1.4404 and 1.4571)**
- Post-installed chemical anchors- **HIT-RE500 V4 for ROCS** (Rigid catenary overhead conductor system) application
- Installation was done with **Hilti SIW 6-AT** module

THE FINAL OUTCOME



Baseplate application and Hilti anchors at jobsite

