SCON INFRA PRESTRESS LLP

PT Slab, Rock Anchoring, Rehabilitation, Expansion Joints, Stay Cable, Bridge Bearings

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INTRODUCTION

SCON INFRA PRESTRESS LLP commenced its operation in 2009, with a commitment to provide its services and to share its experience in business of infrastructure sector in India, for its future development, having its registered office in Mumbai and regional office in Thane with factory based in Bhiwandi.

The Key Persons of SCON have 15 to 20 Years of Work Experience in the field of PT, Rehabilitation, Bridge Bearings, Expansion Joints, and was associated with Company like Freyssinet.

Familiar and known to all the leading Consultants e.g. Sritec, STERLING, EPICONS,Mahimtura, SPAN, CES, STUP, TANDONS, Lewis Berger, Scot Wilson etc. and major Contractors EWL, HCC, GAMMON, L&T-ECC, AFCONS, NCC, etc.

Strength of “SCON”

- Strength of any company depends on both fixed & growing assets. SCON is enriched by both.
- In Term of fixed assets we are having land for setting new factory, Location, vast experience in the field, good relations with Government Bodies Like NHAI, MORTH, NPCIL, BHEL & other Infrastructure governing bodies.
- In Term of Growing assets we are having our team of Designers, Project & Production personals guided by the Management. They are the most precious & valuable assets for SCON.

PRESTRESSED ROCK ANCHORS

Rock Anchors are basically devices used to transmit the forces to the soil by means of prestressed tendon to anchor the Structure to the ground or to retain the slopes from collapsing.

TYPE OF ROCK ANCHORS

A) Based on The Nature of Structure

- **Permanent Anchors** – Permanent Rock anchors have to guarantee their function during the lifetime of the structures to be anchored
- **Temporary Anchors** – Prestressed anchors, which have to fulfill their function only for a limited time

TYPE OF ROCK ANCHORS

B) Based on how it is installed

- **Vertical Anchors** – These anchors are provided vertically into the ground.
- **Inclined Anchors** – These anchors are provided at an angle into the ground

TYPE OF ROCK ANCHORS

C) Based on Application

- **Test Anchors** – Test anchors are specially design anchors subject to extensive tests in order to obtain, either comprehensive information on anchor capacity and geo-technical conditions, or to prove the quality and adequacy of design, material and construction
- **Control Anchors** – Control anchors are anchors in or beside the structure used for long-term observation. They are often equipped with devices, which monitor the variation of forces and displacement.

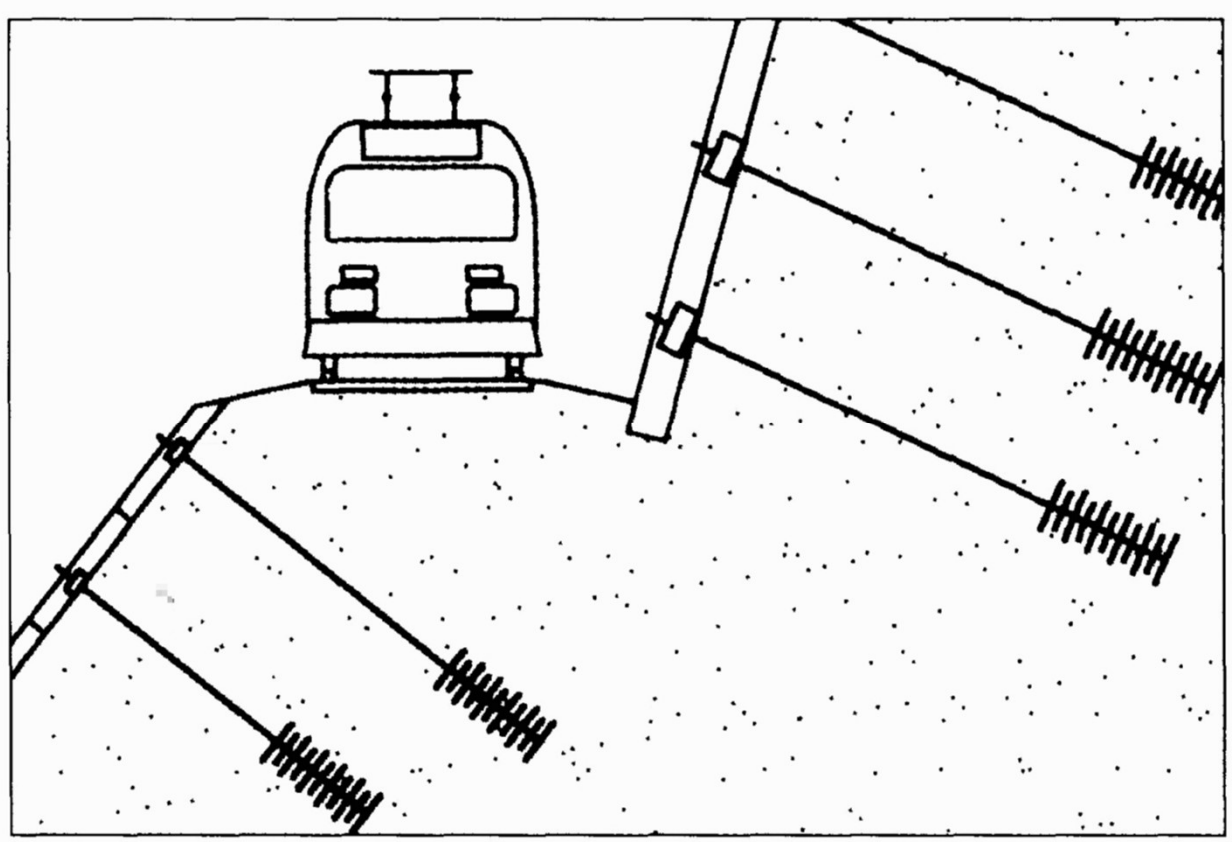
Application of Rock Anchors

Rock anchors mainly found applications in the following structures..

- Inclined anchors in the retaining walls to retain the earth
- Vertical anchors in the raft foundation, to resist the uplift pressure due to high water table.
- In the diaphragm walls.
- To retain embankment slopes of the roads, canals etc.
- Rock anchors are used in pile load testing.

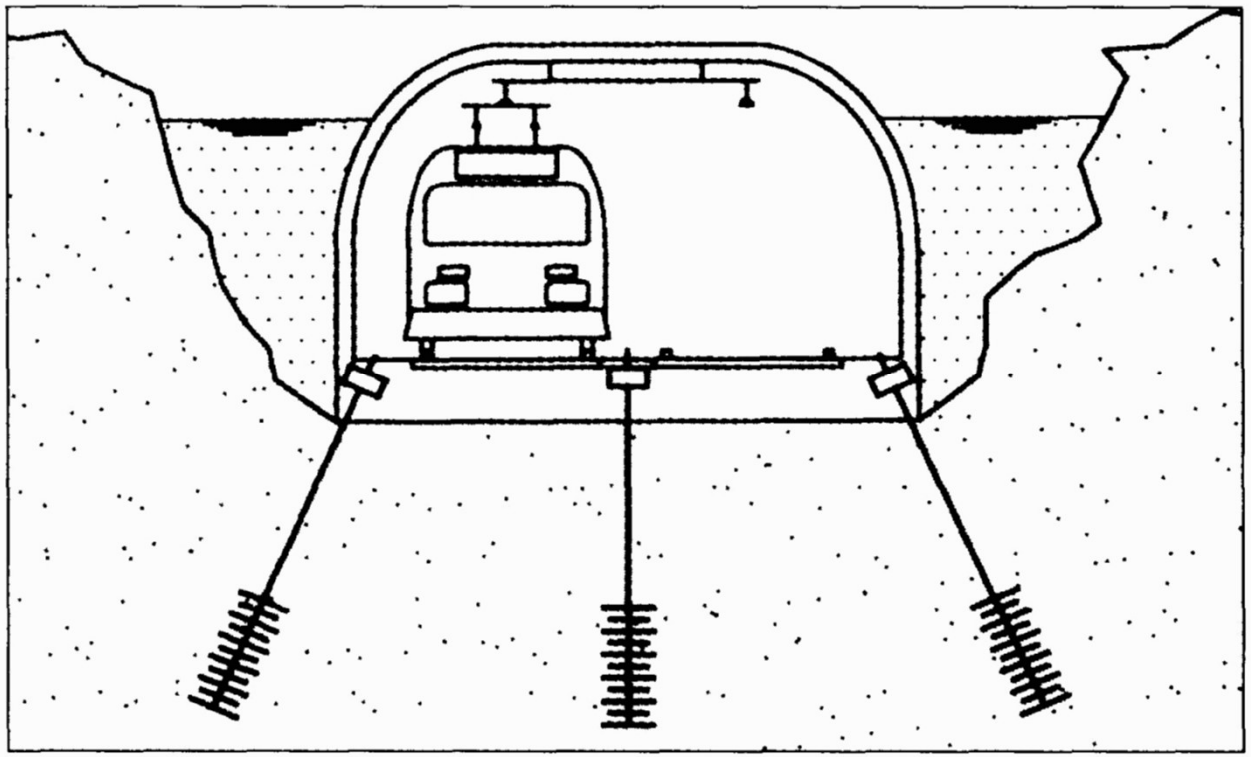
Application of Rock Anchors

1) Stabilization of Unprotected Slopes or man made cuts



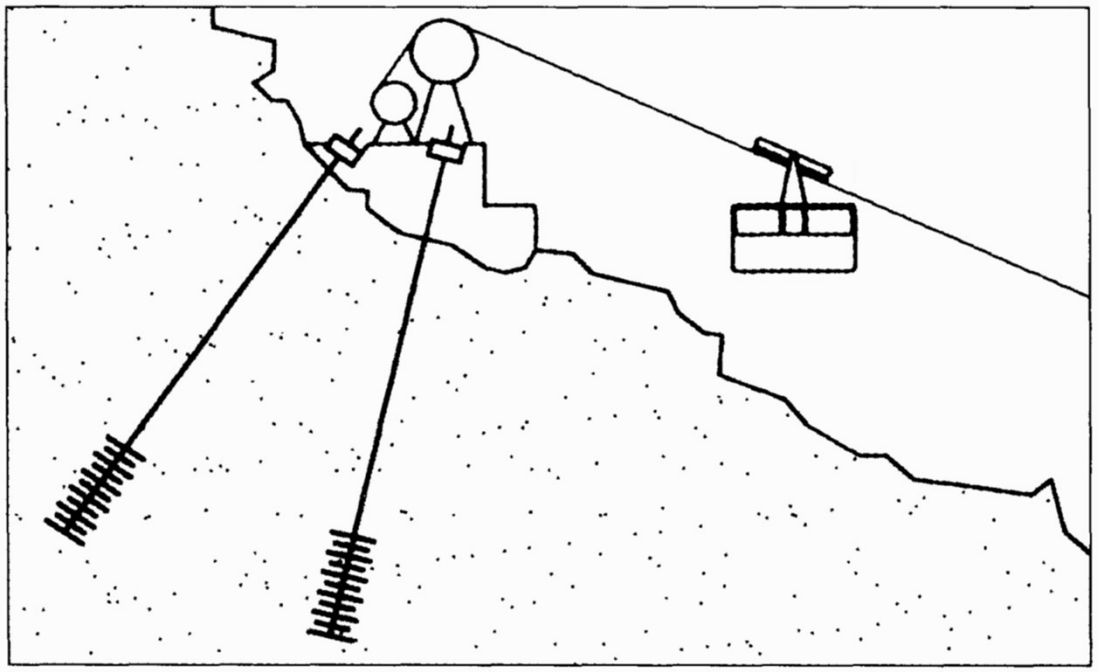
Application of Rock Anchors

2) Securing Structures below Groundwater level against Buoyancy



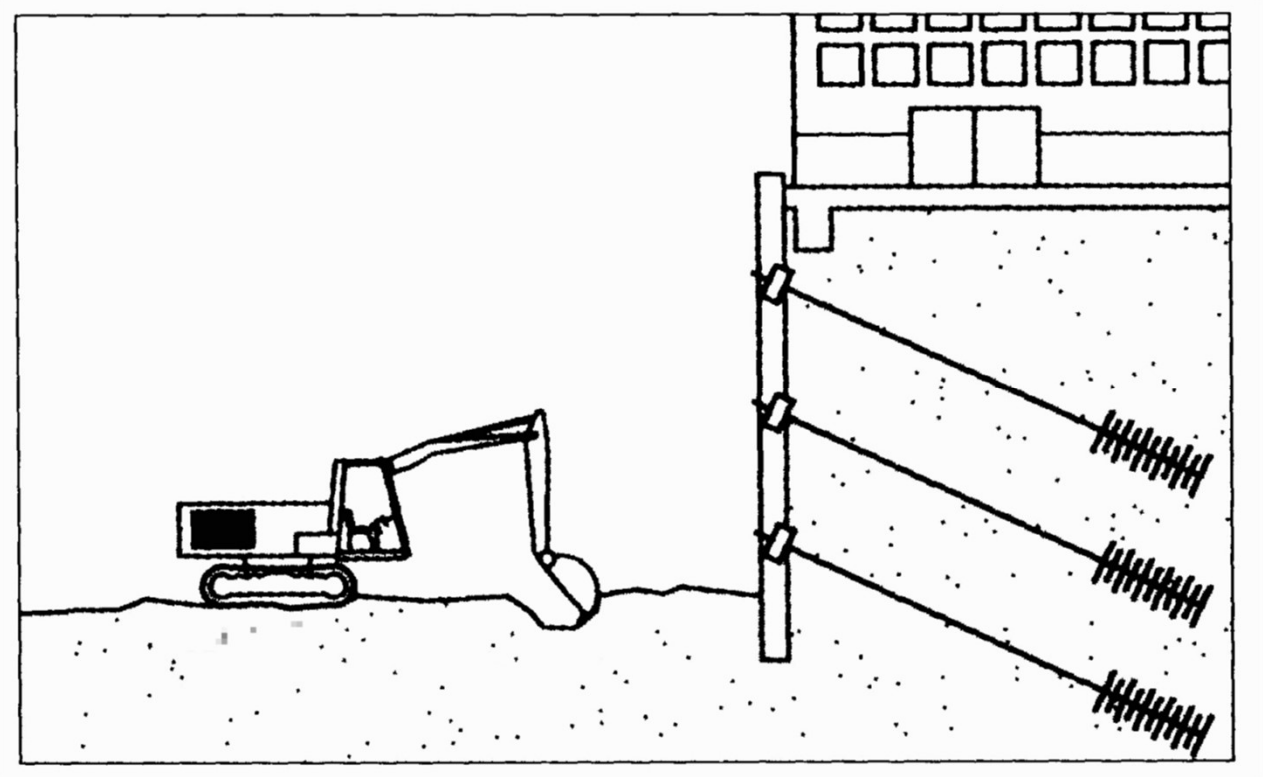
Application of Rock Anchors

3) Anchoring Concentrated tensile Forces as for Cableways or Bridge abutments



Application of Rock Anchors

4) For Retaining Walls Or for Excavation



Prestressed Rock Anchors

The Basic function of rock anchors consists of transmitting tensile forces in to the ground by means of –

- The Anchor Head, holding the tendon under tension and transmitting forces in to the structure
- The Fixed Anchor Length, the part of the tendon over which the force is transmitted in to the ground through the bond between the prestressing steel, the grout and the soil. It is also called the bonded length.
- The Free Anchor Length, the part over which the tendon can elastically elongated and is also called the unbonded length. To graduate a free elongation this length should not be less than 5 m.

Components of the Anchor

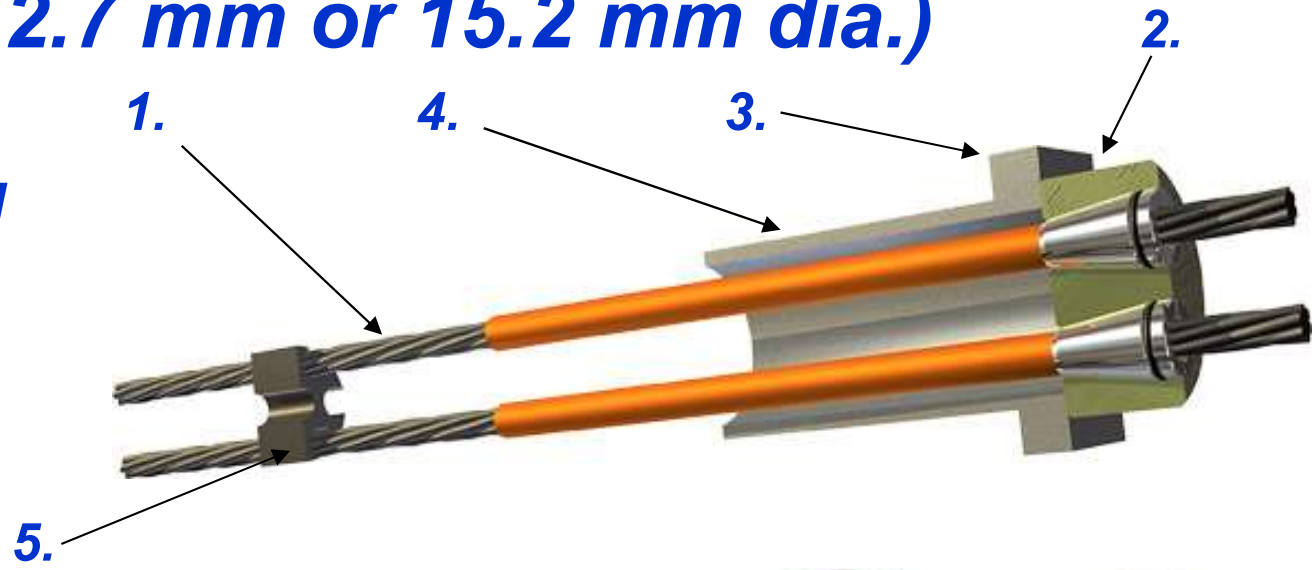
1) H T Strand (12.7 mm or 15.2 mm dia.)

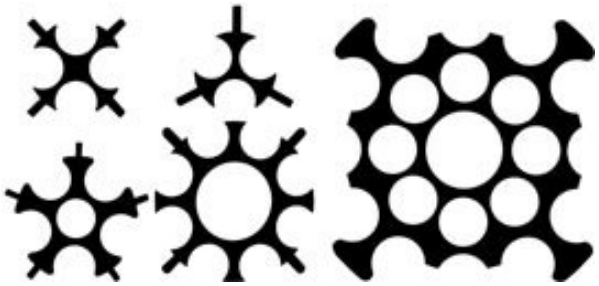
2) Anchor Head

3) Thrust plate

4) MS/HDPE Sleeve

5) Spacers





Spacers

Material for Rock Anchor

1) H T Strand (12.7 mm or 15.2 mm dia.)
2) Anchor Head
3) Thrust plate
4) MS/HDPE Casing Pipe
5) Wedges
6) Spacers
7) Cement
8) Admixture
9) Water

Equipment for Rock Anchor

1) Drilling Machine
2) Stressing pump & Jack
3) Grouting pump & Agitator
4) Tool Box

METHODOLOGY

FOR

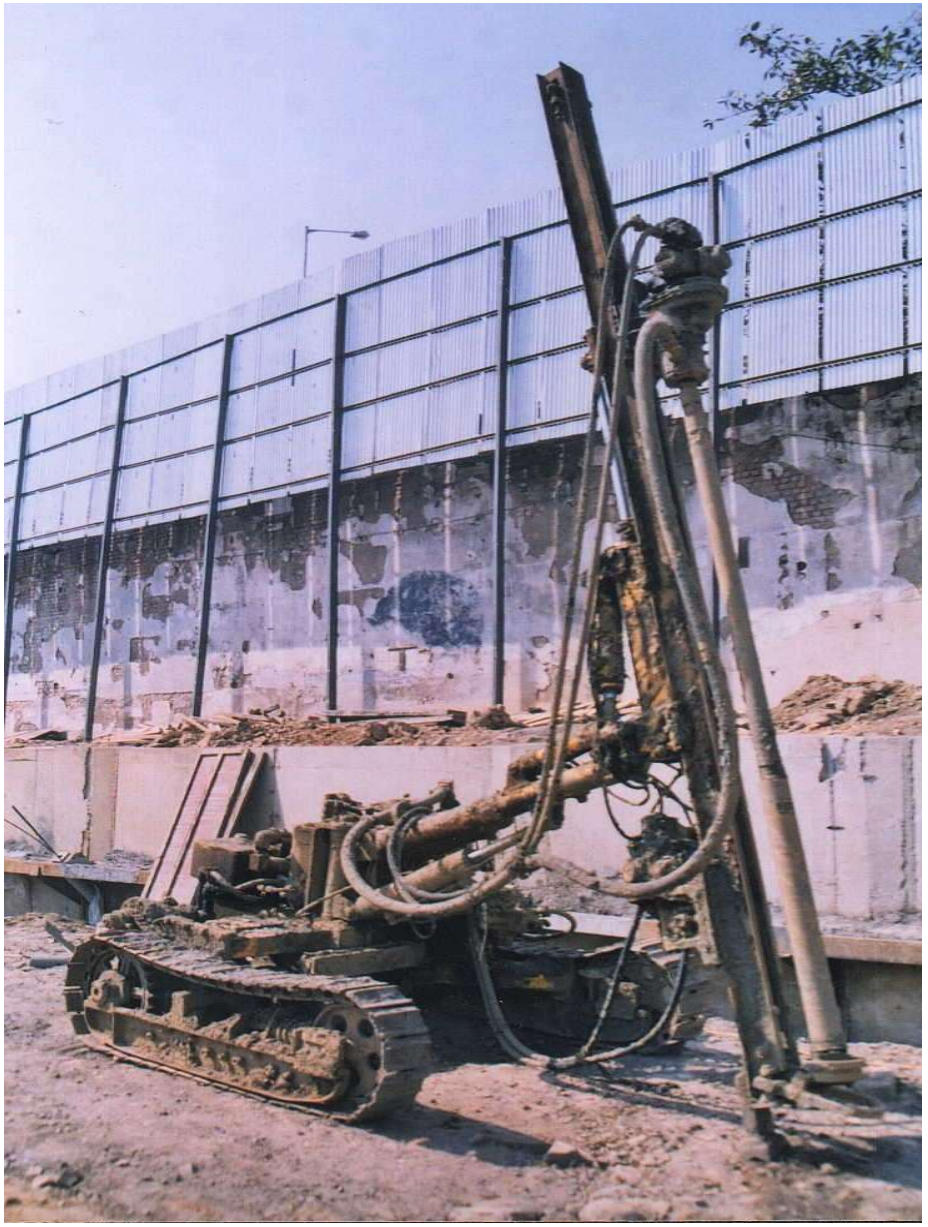
GROUND ANCHORS

Rock anchoring work is carried out in the following steps-

- Drilling
- Homing
- Primary Grouting (Fixed length grouting)
- Stressing
- Secondary Grouting

Drilling

As per the design requirement and the location given on the drawing, drilling of the hole, vertical or inclined, is carried out using percussion DTH type drilling method.
Depth of the drilling shall be free length plus fixed length.
If the wall of the hole is not standing by its own, a MS or PVC casing is inserted in the Free length of the anchor and drilling of the fixed length is then carried out.
Hole should be flushed with clean water and compressed air.



Fabrication of Anchor:-

Strands are cut to the required length. Required length is derived such that fixed length plus free length plus extra 1 meter for jacking purpose. Strands are then cleaned to remove rust, oil, dust if any.

1) Fixed Length :-

fixed length is provided with two coats of epoxy. Epoxy coats are applied with brush. Second coat is applied when first coat is dried for 24 hours.

When still second coat is sticky quartz sand is sprinkled over the fixed length. This will enhance the bond between strand and grout.

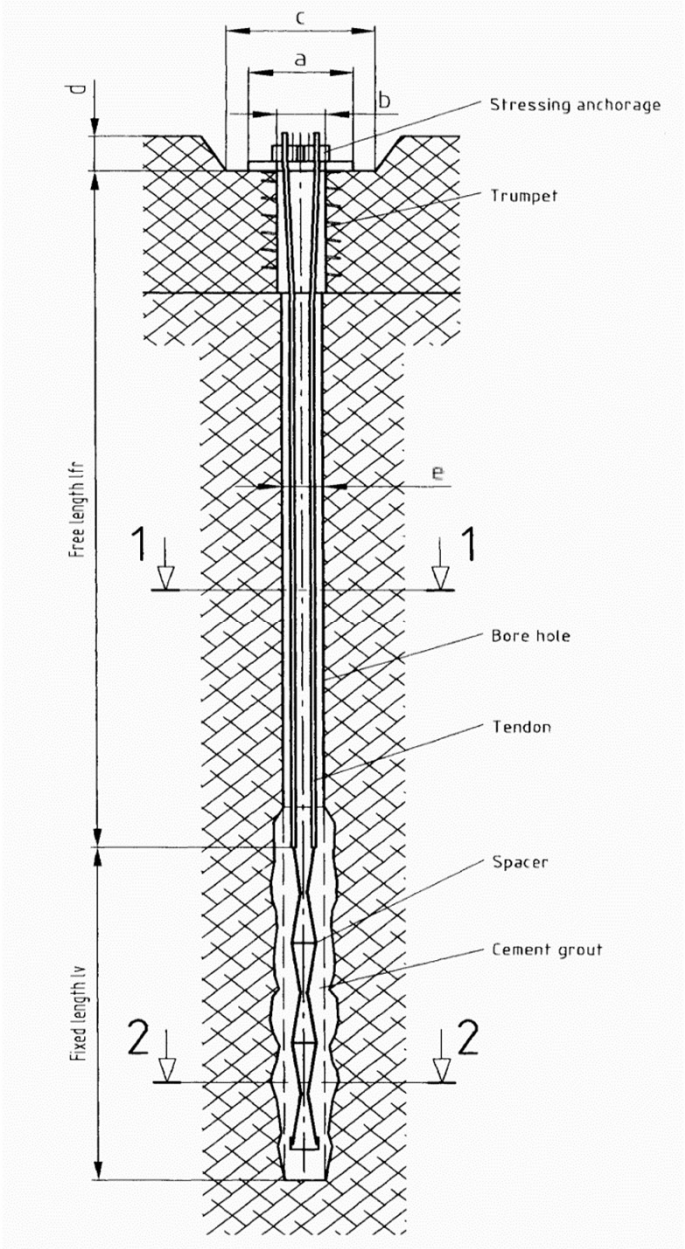
Spacers are provided at 1 m c/c throughout the fixed length to keep sufficient space in between the strands.

Dead end anchorage should be provided at the end of the fixed length of the anchor to guide the anchor in to the hole.

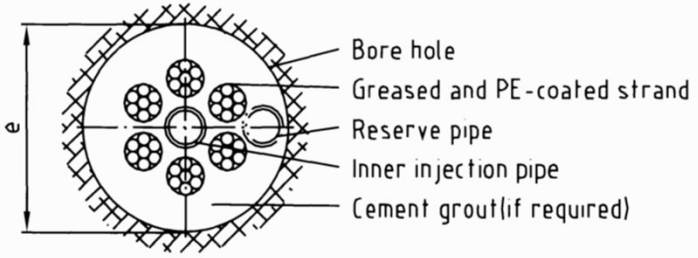
1) Free Length :-

Free length is provided with a single coat of epoxy based red oxide paint.

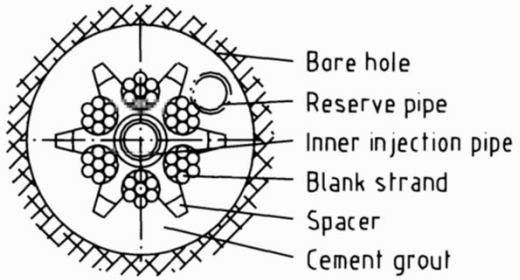
Flexible PVC pipe is then provided over the free length. HDPE dummy pipe is provided through out the anchor length for the grouting work.



Free anchor length lfr (Section 1 - 1)



Fixed anchor length lv (Section 2 - 2)



Rock-Anchor showing fixed & free length:-

Homing:-

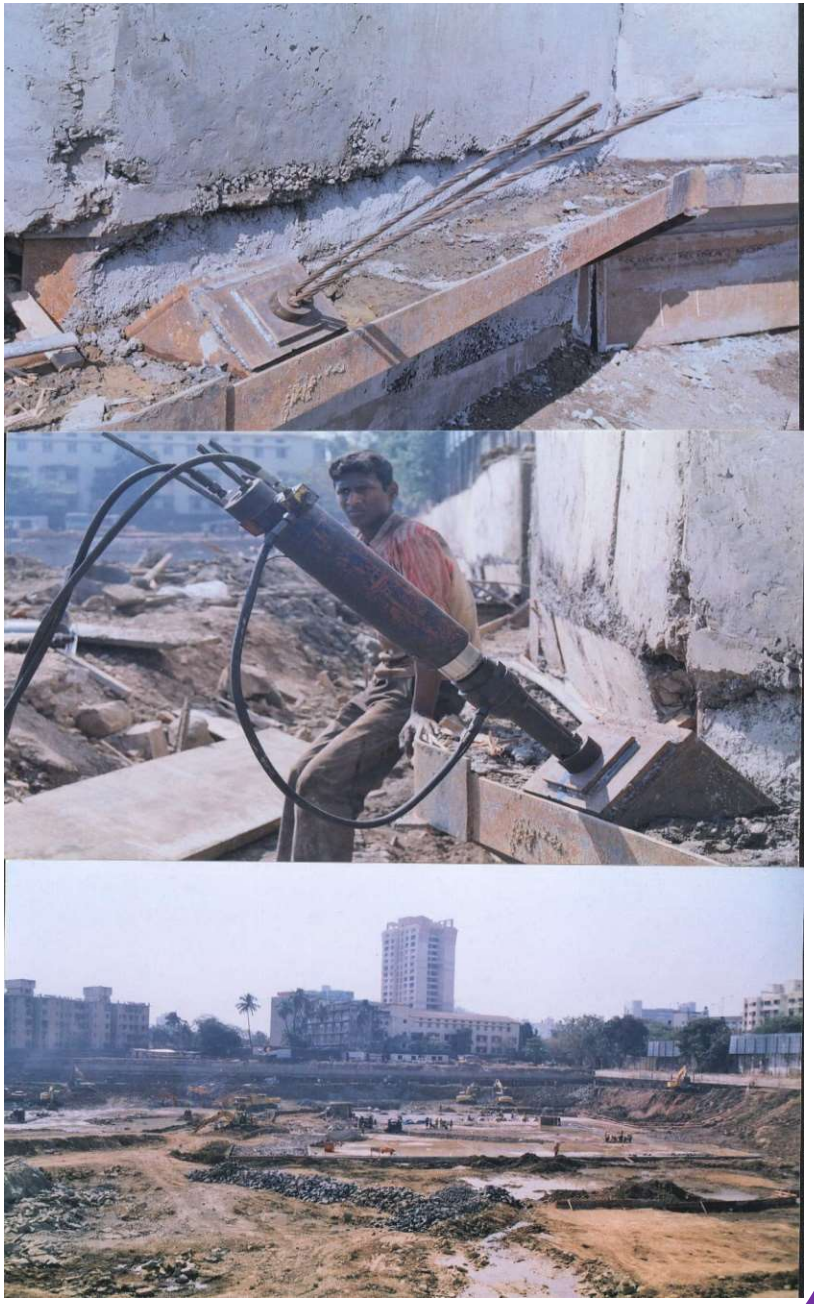
Fabricated anchor is then slowly lowered in to the hole. Precaution should be taken so that anchor should be remain suspended at least 300 mm above the bottom of the hole. Anchor should be firmly secured at ground level with the help of clamp until the fixed length grouting is completed.

Primary Grouting (Fixed length grouting):-

Primary grouting or fixed length grouting is carried out with neat cement using water cement ratio of 0.4. Admixture may be added if client permits. Pre measured quantity is pumped through HDPE dummy pipe with the help of electrically operated grout pump. Dummy pipe is slowly taken out side as the grout quantity pumped inside the anchor hole.

STRESSING:-

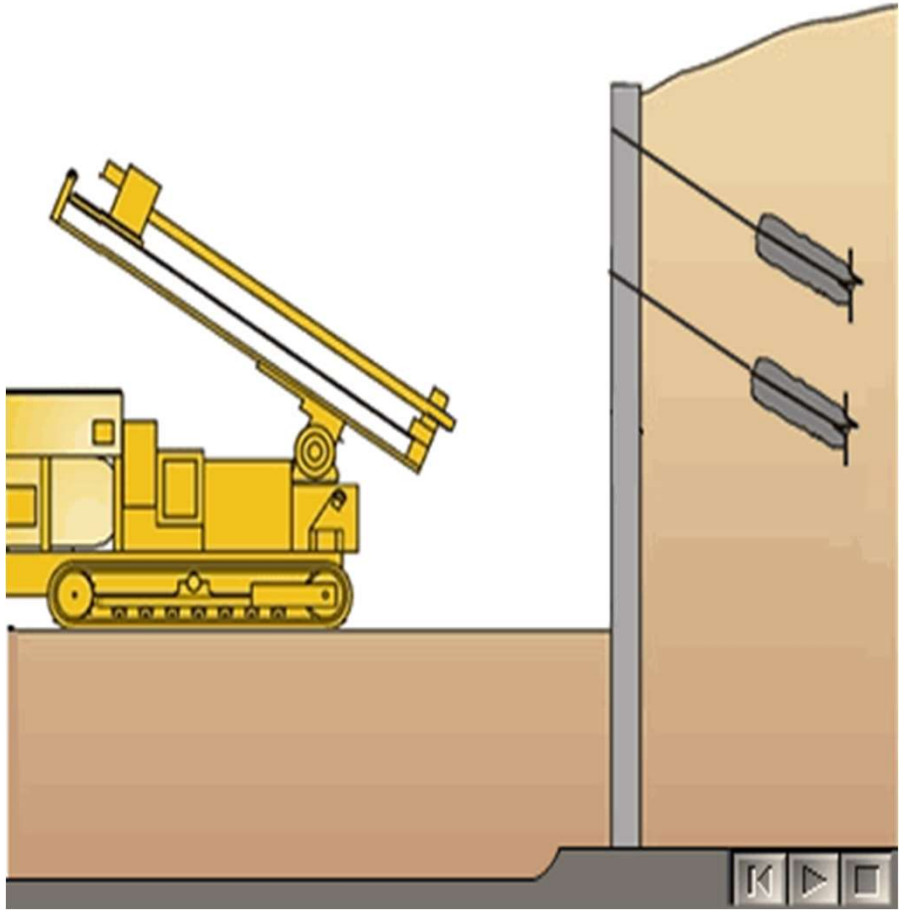
Stressing can be carried out only when grout has attend sufficient strength of 30 Mpa which normally achieved in 21 days. For earlier strength conbextra GP2 can be used.
Extra length of the anchor kept for jacking is cleaned. Anchor plate is fixed on the cable. Anchor is then stressed using hydraulic jack of required capacity and anchor is locked in the anchor plate

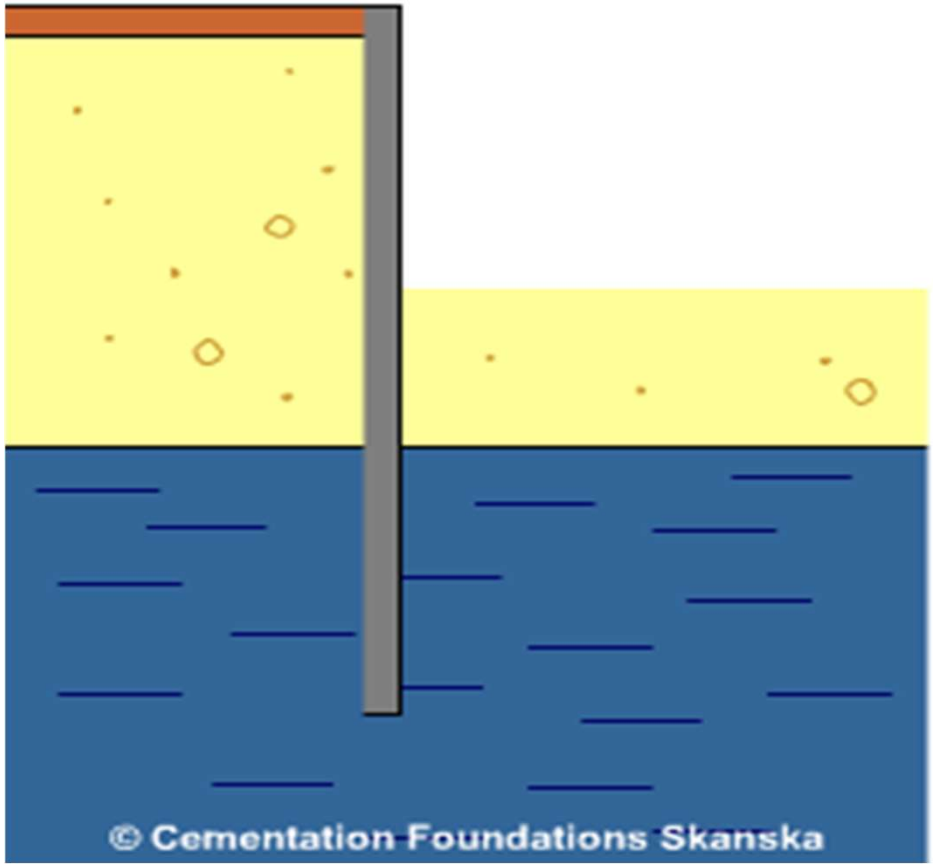


SECONDARY GROUTING:-

The protruding length of H T strands are cut and the annular space of the anchor including the free length portion is then grouted.

ROCK- ANCHORING STEPDWISE:-





ROCK- ANCHORING SITE PHOTOS:-

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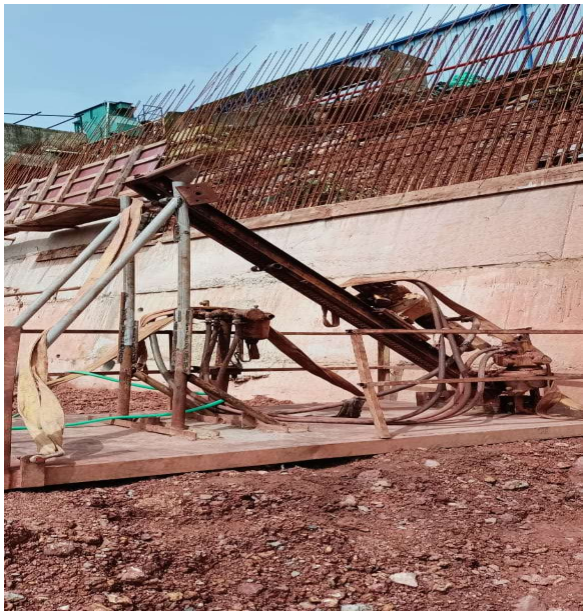
REFERENCES:-

List of important Rock-anchoring work carried out in recent past by the experienced staff of SCON-

1) **Inclined Rock anchors for M/S. Marine Electrical Pvt.ltd. At Verna, Goa.**
   Anchor Capacity – 115 T & 165 T
   Angle of inclination - 45º



REFERENCES:-

List of important Rock-anchoring work carried out in recent past by the experienced staff of SCON—

2) **Inclined Rock anchors at Bhumiraj Construction site, Sanpada, Navi Mumbai.**
Anchor Capacity – 115 T & 165 T
Angle of inclination - 45º & 60º to the horizontal

3) **Inclined Rock anchors for Valecha Engineers for India Bulls Ltd. site, Lower Parel, Navi Mumbai.**
Anchor Capacity – 60 T
Angle of inclination - 45º

REFERENCES:-

List of important Rock-anchoring work carried out in recent past-

4) **Inclined Rock anchors for Marathon-Mafatlal site, Lower Parel, Mumbai.**
   Anchor Capacity – 40 T
   Angle of inclination - 45º

5) **Vertical Rock anchors for Raft foundation for Drive-in theater, Bandra (E), Mumbai**
   Anchor Capacity – 165 T

SCON INFRASTRUCTURE

THANK YOU!