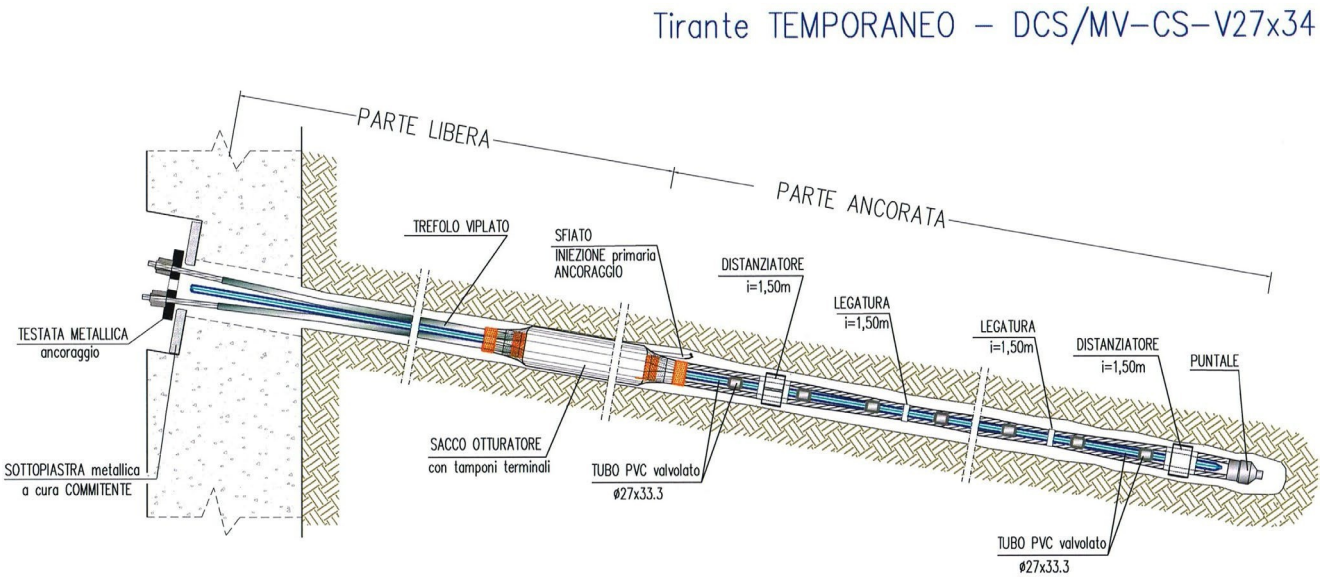
TEMPORARY ANCHOR DCS/MV-CS-V27x34



Encoding, classification, and static function :

Tie rod for geotechnics, **active** type, **temporary**, complying with UNI EN 1537:2013, suitable for installation by **high-pressure cementing** operations (pmax=40bar), **with obturator bag**, particularly suitable for **loose soils**.

Assembly type :

- *Metal reinforcement* → 0.6" strands of stabilized harmonic steel type c.a.p., according to UNI EN10138.
- *strand number* → no. 2-8.
- *maximum operating pull* → 300-1200 kN
- *Cementation mode* → high-pressure (**pmax=40bar**), repeated and selective (**IRS**) injection by double-piston packer
- *anchor stretch protection* → unprotected
- *free tract protection* → unprotected
- single *strand protection* → single plating
- *separation free tract/anchor tract* → separating pad and with TNT obturator bag
- single *locking protection* → single-refractory locking cover (polyolefin-based synthetic polymer)
- *protection tested anchorage* → CAP protection (polyolefin-based synthetic polymer)

Assembly mode :

Protection of the free part is achieved by impregnation of the strands by suitable anti-corrosive product (grease), after opening the individual strands and subsequent monoplating of the strands themselves using ϕ16.5x19.5mm polyethylene pipe.

In order to increase the adhesion of the reinforcement in the cemented anchorage section (foundation portion)

the bundle of strands is configured with the prescribed 'sinusoidal' pattern, alternating sections of 'tying' (by means of metal ties) with the placement of specific spacers, arranged at spacing of no more than
1.50 ml.

The end of the tie rod has a ferrule (polyolefin-based synthetic polymer) to facilitate insertion of the tie rod into the drill hole.

The ferrule is installed, covering the strands, with metal strapping and tape.

The separation between the free part and the foundation part of the tie rod, is achieved by the interposition of an 'obturator bag', having the function of containment and confinement and consisting of an element (diam. 190mm) made of non-woven fabric (from 300 gr/sqm) with a length of about 1.0 ml, installed in the free part of the tie rod.

The two ends of the obturator bag, strapped and taped with adhesive tape, consist of pads made with the use of specific sealing product (called 'z-strip').

To prevent filtering through the obturator bag, even of only the liquid phase of the cement mixture, sealant is inserted between the strand strands immediately after the pad upstream of the bag.

Inside the borehole, in the anchorage section, the correct positioning of the tie rod is ensured through the use of the specific 'spacers/centers' (made of polyolefin-based synthetic polymer) arranged with maximum spacing i=1.50ml, the installation of which ensures the correct minimum overburden expected.

For operational purposes, the obturator bag is put into operation by, first, injecting, at low pressure, 'fat' cement mixture, inside the same bag, operating through a ϕ16x20mm

polyethylene pipe (with outlet at the end, lower, inner part of the bag) and with the help of a similar ϕ12x16mm polyethylene vent pipe (with outlet at the initial, upper, inner part of the bag).

Approximately 12 hours after bag injection, we proceed with the 'primary injection' of the foundation section, using suitable cement mixture, operating at medium-low pressure (p≤10bar), through 'double-piston' packer and using the first valve, downhole, of the ϕ27x33.3mm valved pvc pipe positioned in the center of the strand bundle.

To enable repeated and selective injection (**I.R.S**), under pressure (**pmax=40bar**), of the anchor bulb, the same ϕ27x33.3mm valved pvc tube is used, positioned in the middle of the strand bundle and equipped with 'manchettes' valves and bottom cap.

After a few hours have elapsed since the execution of the primary injection, we proceed with repeated and selective injection (**IRS**) at high pressure **(pmax=40bar),** operating, individually, on all valves, by means of 'double-piston' packers, in order to create sbulbling on the previously made cement liner and improve the bulb-soil adhesion effect.

The pitch of the injection valves (i=33-150cm) is made according to the design and execution requirements provided by the Construction Designer.

The identification of the different injection and vent tubes, according to their operational function, is done by reference to the color of the tubes :

- red color → tube ——— ϕ16x20mminjection - shutter bag
- black color → tube ϕ12x16mm ——— *injection vent - shutter bag*
- black color → pipe ϕ12x16mm ——— *injection vent - anchor section*
- green color → tube ——— ϕ16x20mmoptional // injection - free stretch

Tie rods are complete with metal header plates, of appropriate size and varying according to the number of strands planned, as well as clamping systems (monotrefolo) for stringing them.

At the request of the Client's Technical Representative, all available underplate and/or overplate protection devices suitable for ensuring greater durability and reliability of the installed element, in contact with the ground, with any percolating water in the wall and/or rising from the borehole interface as well as exposed to external weathering, can be provided and arranged as a supplement.

In the present case are available :

- ➔ mooth sheaths for free stretch protection
- ➔ ingle-reflection covers.
- ➔ Variable section centralizers
- ➔ ver-plate protection device → CAP protection.
- ➔ **Underplate protection device → tube Packing**