

Grouting Instruction VL4 FIRST GROUT FAN

| | |
|----------------|-------------------|
| Tunnel | VL4 (W=6,9-H=6,9) |
| Instruction N° | 572-584 |

| | |
|-------------------|------------------------|
| Instructed by: | ERNESTO HERNANDEZ JARA |
| Instruction date: | 22/02/16 |

| | |
|-------------------------|---------|
| Chainage | 1+261,1 |
| Total Inflow face | |
| Total Inflow Probe hole | |
| Water pressure measured | |

| | HOLES 1-15 | 16-21 |
|----------------------------------|------------|-------|
| N° of Grout holes | 15 | 6 |
| Grout holes length (m) | 24 | 24 |
| Grout hole angle ref Tunnel axis | 15 | 0 |

Position of Grout holes 1st grout round:

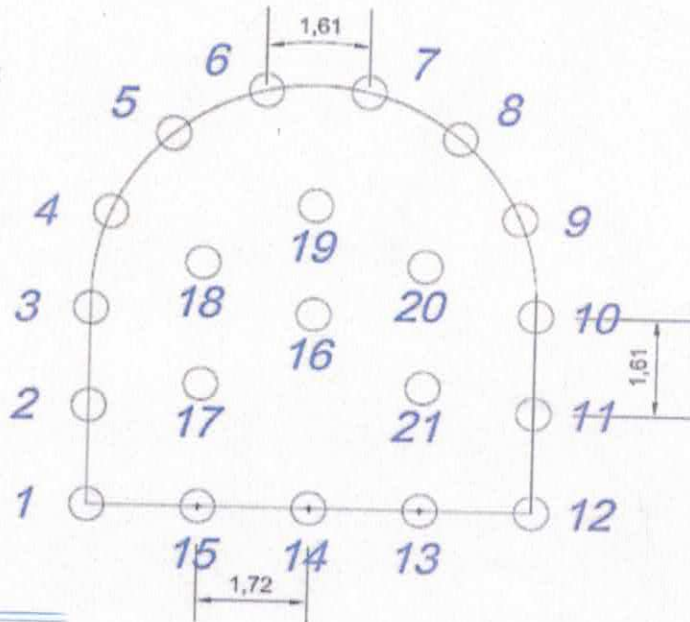
Mark additional holes with x and number

Erase holes not to be used

1-DRILL HOLES 1 TO 15 WITH ANGLE 15° IN ORDER:
6, 7, 5, 8, 4, 9, 3, 10, 2, 11, 1, 12, 15, 13, 14 AND
GROUT

2- DRILL HOLES IN ORDER: 17, 21, 18, 20, 19, 16
PARALLEL TO THE TUNNEL AND GROUT.

THE PACKER SHOULD BE INSTALLED BETWEEN 1,5
AND 3,0 M (DEPENDING OF ROCK MASS
CONDITION, REF LEAKAGE)



| | |
|---------------------------------|---|
| Design Mix (Type A,B,C, D or E) | A |
|---------------------------------|---|

| | |
|-----|------|
| WCR | 0.65 |
|-----|------|

Closure criteria

| | |
|---------------------|------|
| Pmax | 25* |
| Vmax (l/m borehole) | 85 |
| GIN | 1000 |

NOTES:

- 1-DRILL GROUTING HOLES TO THE FULL DEPTH AS INSTRUCTED, EVEN WITH SIGNIFICANT DISCHARGE (>2.5 l/sec)
- 2- THE MAXIMUM INCREASE OF GROUTING PRESSURE SHALL BE NOT MORE THAN 2,5 BAR PER MINUTE.
- 3- DRY HOLE SHALL NOT BE REDRILLED OR REGROUTED.

*IF GROUNDWATER PRESSURE IS
HIGHER THAN 10 BAR THEN APPLY
GROUT PRESSURE OF 2,5 TIMES
GROUNDWATER PRESSURE

STRABAG ANTONIA DEČMAN A. Dečman 22/02/2016
Name Signature 12:50h

SAM ERNESTO HERNANDEZ JARA [Signature]
Name Signature