

ALTO MAIPO**OWNER'S INSTRUCTION**

Section 2.29

PHAM-PLN12-INS-0003

Contract: ☐ AM-CO610/620B ☒ AM-CO630/620A SI 63401 N° 01083Scope Segment Description: *Preproting 2+016.0* Scope Segment ID: *34*Location: *UL4A - 2+016.0* Time for Compliance: *IMMEDIATELY*

Contractor shall immediately proceed with the Work described below, in accordance with the terms and conditions of the Contract. This instruction is limited to maximum of 1000 UF or USD \$ 50,000., and without impact on the lump sums or schedule (except for Equivalent Times in the BOQ).

Instruction:

*The contractor is here instructed to carry out
preproting at Ch. 2+016.0
Details in attachment sheet*

Owner estimate of impact is: Per Units in BOQ ☒ ; or cost ; &/or Time

If Contractor believes that this instruction constitutes a Change, Contractor shall promptly provide Notice according to Section 11 of the Contract.

Contractor comments (if any): *SUBJECT TO FURTHER COMMENTS***Issued by**Name: *Ernesto Rodriguez Jara*Sign: *[Signature]*

Designation:

Date: *29-9-16* Time: *06:45***Received by Contractor**Name: *Esther Guiso*Sign: *[Signature]*Designation: *ABOLVIST*Date: *29/09/16* Time: *10:00*

(original): Contractor

Grouting Instruction VL4A FIRST GROUT FAN

Tunnel	VL4A (W=6,9 - H=6,9 m)
Instruction N°	General instruction 1073

Instructed by:	Andrés Tapia Pardo
Instruction date:	29-09-2016

Chainage	2+016,0
Total Inflow face (L/s)	
Total Inflow Probe holes (L/s)	3.0
Water pressure measured (Bar)	1.5

Mark additional holes with x and number

1-DRILL PROBEHOLES:

DRILL PROBEHOLES IN POSITIONS OF GROUTING CURTAIN FOLLOWING THE GUIDELINES OF GENERAL SI N° 1073. GROUT ALL PROBEHOLES AS STANDARD GROUTING.

2- DRILL HOLES UNDER COMPLETE THE COMPLETE CURTAIN (12 HOLES, NOT DRILL THE INVERT) AND THEN GROUT:

DRILL THE HOLES AND INSTALL THE PACKERS. DRILL TO FULL LENGTH (IF $Q_w < 10 \text{ L/s}$), OTHERWISE DRILL TO END OF RESPECTIVE ROD. MEASURE WATER INFLOW AND PRESSURE IN EVERY DRILLED HOLE.

3- GROUT ALL HOLES AS INDICATED BELOW AND IN "NOTES".

Design Mix (Type A,B,C, D or E)	A
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WCR	0.45 if water inflow > 2.5 L/s 0.65 if water inflow < 2.5 L/s
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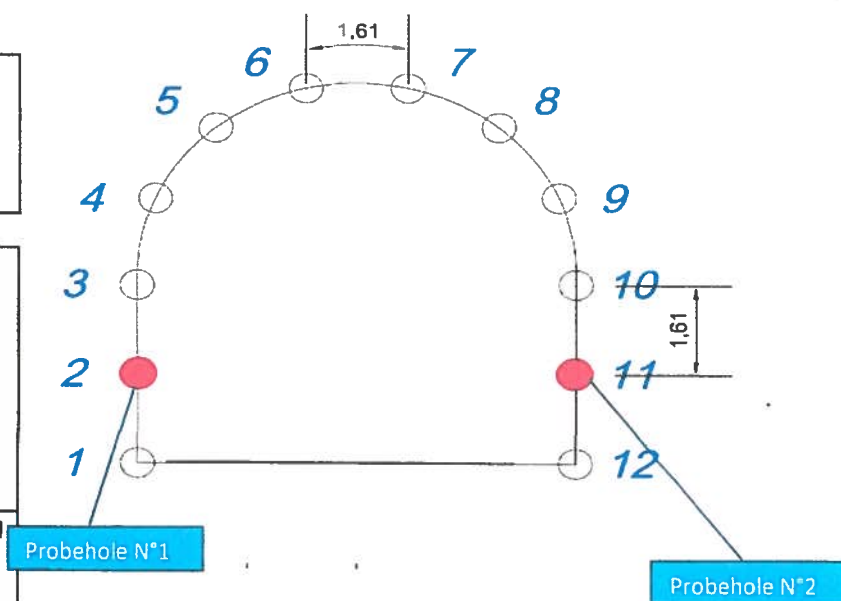
Closure criteria

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

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

HOLES

N° of Grout holes	12
Grout holes length (m)	24
Grout hole angle ref Tunnel axis	10°-15°

Position of Grout holes 1st grout round:**NOTES:**

- 1- The maximum increase of grouting pressure shall be not more than 2,5 Bar per minute.
- 2- Use pump rate of 10 L/min for hole filling (=4 l grout per meter). Increase pump rate afterwards (to 25 L/min).
- 3- The volume closure criteria of 1000 Liters of grout shall apply if not significant pressure increase is observed (i.e. >3Bar).
- 4- Use anti wash-out additive (Sikament 100SC or equivalent).
- 5- After grouting of all holes redrilling can be conducted.

STRABAG

ESTHER GUÍD
29/09/16 Name

Signature

SAM

Andrés Tapia Pardo

Name

Signature