

ALTO MAIPO**OWNER'S INSTRUCTION**
Section 2.29
PHAM-PLN12-INS-0003Contract: ☐ AM-CO610/620B ☒ AM-CO630/620A SI 63401 N° 01071Scope Segment Description: *Preproctoring* Scope Segment ID: 3.4Location: *V64.2 0+092.0* 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 preproctoring at TM 0+092.0 following the guide lines of general SI 1073 and 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: *Eduardo Henriquez Jara*Sign: *[Signature]*

Designation:

Date: *18-09-16* Time: *17:50***Received by Contractor**Name: *Eduardo Henriquez Jara*Sign: *[Signature]*Designation: *Geologist*Date: *19/09/2016* Time: *02:00*

Imp.San Pedro - F. 2 2556 6665 - (4077)

(original): Contractor

Grouting Instruction VL4A-2 FIRST GROUT FAN

Tunnel	VL4A-2 (W=6,9 - H=6,9 m)
Instruction N°	General instruction 1073

Instructed by:	Ernesto Henriquez Jara
Instruction date:	18/09/2016

Chainage	0+092,0
Total Inflow face (L/s)	
Total Inflow Probe holes (L/s)	3,45
Water pressure measured (Bar)	2

HOLES	
N° of Grout holes	15
Grout holes length (m)	27
Grout hole angle ref Tunnel axis	10°-15°

Position of Grout holes 1st grout round:

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.

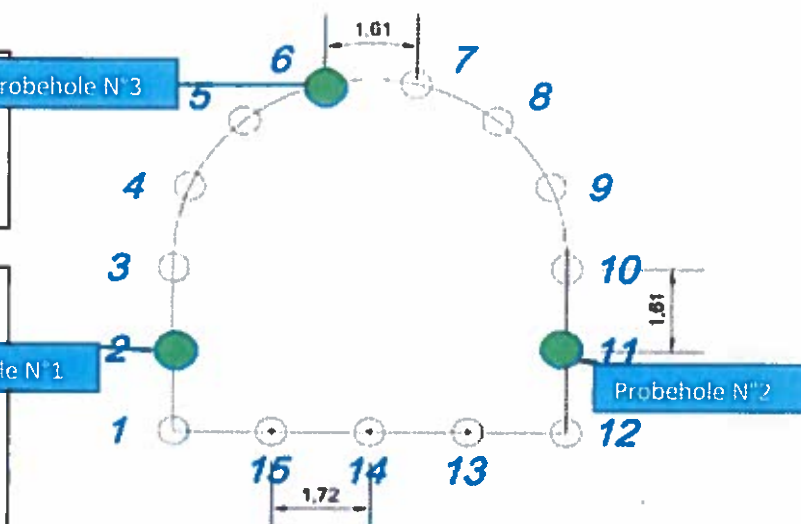
Probehole N° 3

2- DRILL HOLES UNDER COMPLETE THE COMPLETE CURTAIN (15 HOLES) 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.

Probehole N° 1

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



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.

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

A

WCR	0.45 if water inflow > 2.5 L/s
	0.65 if water inflow < 2.5 L/s

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

STRABAG

Ernesto Henriquez Jara

18/09/2016

Name

Signature

SAM

Ernesto Henriquez Jara

Name

Signature