





<b>ALTO MAIPO</b>	<b>OWNER'S INSTRUCTION</b>	
	Section 2.29 PHAM-PLN12-INS-0003	

Contract:	<input type="checkbox"/> AM-CO610/620B <input checked="" type="checkbox"/> AM-CO630/620A	SI 63401 N° 0570
Scope Segment Description: Access tunnel to 7H Cavern.		Scope Segment ID: 3.4
Location: VLY ch: 1+051		Time for Compliance: before next round

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).

<b>Instruction:</b> The contractor is here with instructed to carry out preprocuting as indicated in the attached sketch.
<b>Notes</b> 1.) Measure the water inflow and water pressure in all holes equally distributed around the tunnel perimeter 2.) Holes N° 2 and 9 shall be logged as exploratory holes
Owner estimate of impact is: Per Units in BOQ <input checked="" type="checkbox"/> ; 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): For safety reasons HSE # 11 (instead of # 9) will be logged.
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<b>Issued by</b> Name: ERASMO HERNANDEZ JARA Sign:  Designation:  Date: 11-12-15 Time: 00:15 hrs	<b>Received by Contractor</b> Name: ESTHER GRISO Sign:  Designation: GEOLGIST Date: 17/11/2015 Time: 08:25
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(original): Contractor



## Grouting Instruction VL4 FIRST GROUT FAN

Tunnel	VL4 (W=6,9-H=6,9)
Instruction N°	0570

Chainage	1+051
Total Inflow face	
Total Inflow Probe hole	
Water pressure measured	

Mark additional holes with x and number

Erase holes not to be used

1- DRILL HOLES: 1 TO 15 WITH ANGLE 15°

PRIMARY ROUND: 2,8,14,6,12,4,10,15 AND GROUT  
 SECONDARY ROUND: 1,7,13,5,11,3,9 AND GROUT

2- DRILL HOLES IN ORDER: 17,19,21,18,20,16  
 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
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WCR	0,65
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Closure criteria

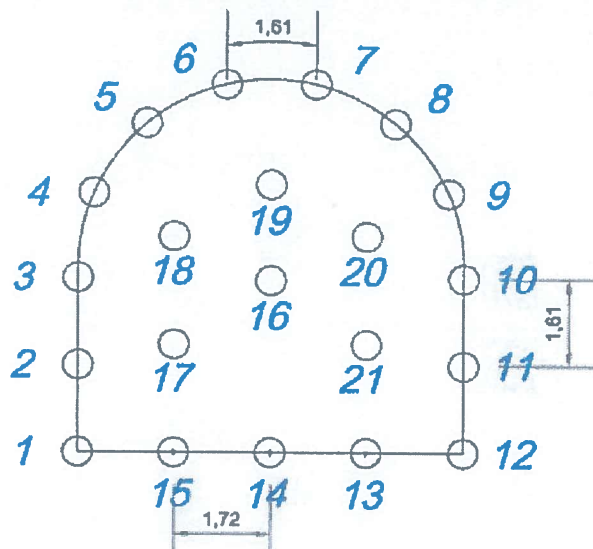
Pmax	25*
Vmax (l/m borehole)	85
GIN	1000

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

Instructed by:	ERNESTO HERNANDEZ JIMENEZ
Instruction date:	12-12-15

	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:



## NOTES:

1-DRILLING OF A HOLE SHALL BE STOPPED AND THE HOLE SHALL BE GROUTED IN CASE SUDDEN HIGH WATER INFLOW (>3L/S) IS ENCOUNTERED GROUTING SHALL BE CONDUCTED WITH THE MINIMUM POSSIBLE TO PUMP W/C RATIO ABOUT 0,4 AND A MAXIMUM OF 500 Kg OF CEMENT. THE GROUT PRESSURE SHALL BE 15 BAR ABOVE THE GROUNDWATER PRESSURE

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.

ERNESTO HERNANDEZ JIMENEZ  
 Name Signature