

**JACOBS****Site Technical Query - Form**

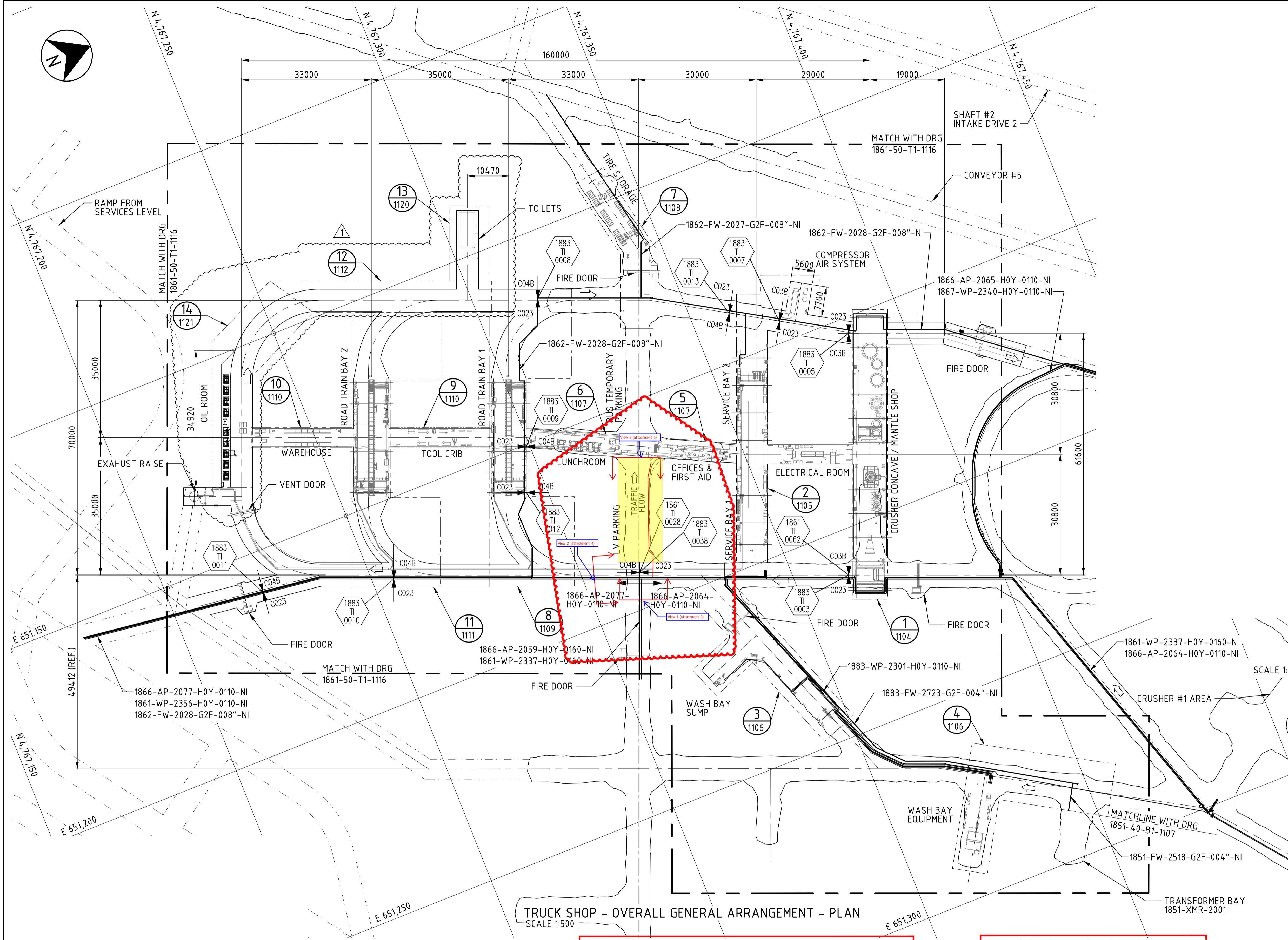
SN1809-0000/XE.FRM/0001 Rev 4 03/02/2021

TQ Number:		Project:	
CW2148472	-A010- 0127	Oyu Tolgoi Underground Project	
A. To be completed by or on behalf of the Contractor			
Contractor/Sub-Contractor Name:	MCS International	Date Response	07/10/2022
Contract Title:	Haulage Truck Workshop /C-004D/	Plant Area &	1883
Contract No.	CW2148472	Contractor TQ Number:	TWS-0415-TQ-0127
Discipline Codes (Mandatory) D1 (CSA) - <input type="checkbox"/> D2 (MP) - <input checked="" type="checkbox"/> D3 (E&I) - <input type="checkbox"/> D4 (Other) - <input type="checkbox"/>			
<i>Description of Technical Query (List affected drawings and specifications):</i> LV parking: Pipe clashed with existing cables			
<p>Electrical cables are installed in LV parking area. Also, 1693ICT2001-F02 cable will be installed on this area as per 1883-05-TQS-8219 _0. 1883-AP-2019-C1A-001", 1883-WP-2207-C1A-002" and 1883-WP-2336-C1A-002" pipes are clashed with existing cables.</p>			
<input type="checkbox"/> Routine		<input checked="" type="checkbox"/> Urgent	Refer Technical Query instructions
<i>Proposed Action (List all attachments)</i>			
<p>Therefore, the contractor proposes following actions.</p> <ol style="list-style-type: none">1. Change the 1883-AP-2019-C1A-001", 1883-WP-2207-C1A-002" and 1883-WP-2336-C1A-002" pipes route as attachment 2. Attached the field photos (attachment 3, 4, 5).2. Change the support SD-101 to SD-103, Pipes are supported on wall by SD-103 (attachment 2).3. Change the rock bolt of only one marked orange support (SD-101) in attachment 4 to M24 anchor rod. Pull test shall be conducted with 50kN.			
Effect on cost (USD):	NO		
Effect on schedule (Days):	NO		
Effect on quality:	NO		
Requested by (Name):	Delgersuren N.	Position:	SMP Field Engineer
Signature:		Date: (dd/mm/yyyy)	04/10/2022

B. To be completed by Jacobs Field Engineer*Comments/recommendations by Engineering****Disclaimer:****Acceptance or rejection of this TQ is only related with technical aspects.**If Cost or Schedule Impact are associated with this TQ, it must be discussed separately with Jacobs Contract team.*

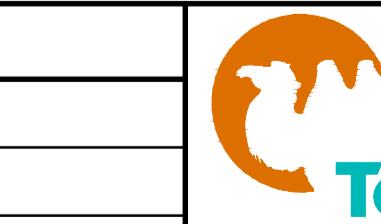
C. Engineering Decision		D. Information		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accept with comments	Reject	Design Change Distribute to: Design Author DA	Cost Impact Distribute to: Contracts, Proj. Controls & Construction Manager	Schedule Impact Distribute to: Proj. Controls & Construction Manager

REVIEWER		APPROVER		CONSTRUCTION MANAGER	
Field Engineer OR Lead Engineer		Lead Engineer OR Chief of Engineering		(If Cost and/or Schedule Impact)	
Date: (dd/mm/yyyy)		Date: (dd/mm/yyyy)		Date: (dd/mm/yyyy)	



CAUTION - PROJECT DRAWING - NOT AS BUILT

CONSTRUCTION ISS



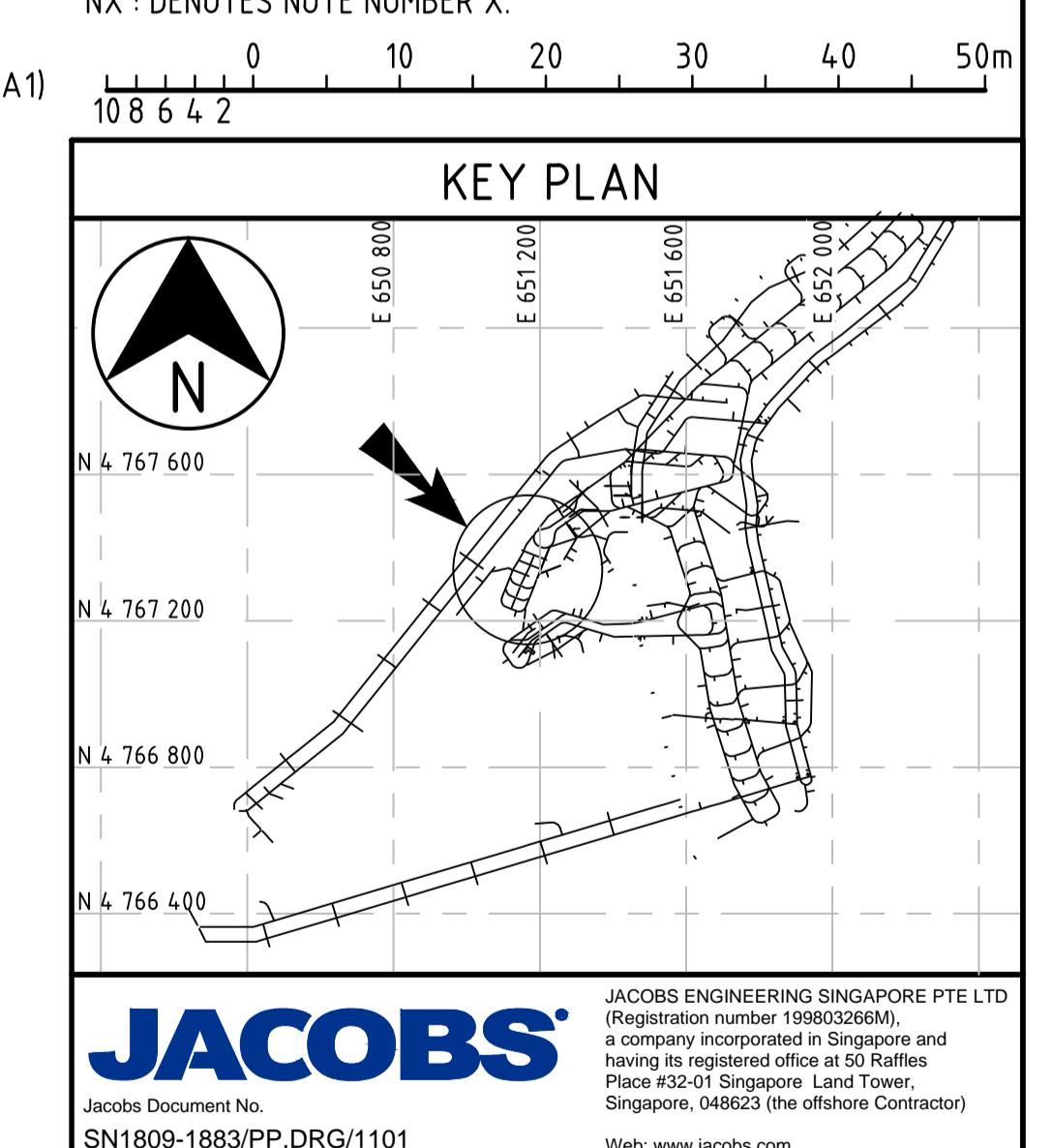
Oyu Tolgoi LLC

REV.	DATE	REVISION DESCRIPTION	DES.	APPROVED	REV.	DATE	REVISION DESCRIPTION
			CHK.				
C	29.06.18	ISSUED FOR APPROVAL	MO	CC			
			BM	CC			
0	09.07.18	ISSUED FOR CONSTRUCTION	MO	CC			
			BM	EM			
1	14.09.20	ISSUED FOR CONSTRUCTION	TM	BM			
			AK	SM			

NOTES:

1. DIMENSIONS ARE IN MILLIMETERS, U.N.O.
2. ALL COORDINATES AND LEVELS IN METERS TO OYU TOLGOI GRID (OTG) SYSTEM.
3. HDPE MINIMUM RADIUS 15D FOR SDR 11 (H0Y); 12D FOR SDR 9 (H0Z).
4. FOR NON-STANDARD DIRECTION CHANGES (45 ° AND 90 °) IN STEEL PIPES, THE FOLLOWING TWO SYSTEMS CAN BE USED:
 - A. TRIM STANDARD ELBOW (ELL 90 DEG LR OR ELL 45 DEG) AND ADD TWO NIPPLES ADAPTERS VICTAULIC NUMBER 42 (GRV. X BEV.).
 - B. COLD (FIELD) BENDING PIPE, ACCORDING TO STANDARD ASME B31.4 (406.2.1 BENDS MADE FROM PIPE). ALLOWABLE FIELD BENDING MINIMUM RADIUS IS 18D AND MINIMUM STRAIGHT EXTREMITIES IS 1D TO PERFORM VICTAULIC SLOT SPECIFICATION 25.01.
- FOR GALVANIZED STEEL:
FOR REPAIRING DAMAGED GALVANIZED COATINGS REFER TO DOCUMENT NO. 0000-00-SPE-0002
5. USE RIGID VICTAULIC COUPLING (STYLE 07) EVERY 6000 mm. FOR STEEL PIPING.
6. USE FLEXIBLE VICTAULIC COUPLING (STYLE 77) FOR BENDS AND ELBOWS.
7. USE RIGID VICTAULIC COUPLING (STYLE 07) FOR VALVES.
8. MOUNT PIPE PARALLEL TO TUNNEL GRADIENT LINE.
9. PIPE SUPPORT, SEE SPECIFICATION FLUOR N° SP-50-017 REV.2 AND DRG. 0000-50-N1-1110.
10. REFER PIPE SPECIFICATION N° 0000-50-SPE-0001.
11. HIGH POINT VENTS AND LOW POINT DRAINS TO BE ADDED BY CONTRACTOR IN THE FIELD WITH ALLOWABLE SPACE FOR MAINTENANCE.
12. ALL ROCK SUPPORTED PIPING MUST BE ACCOMMODATED TO THE FINAL EXCAVATION SURFACE BY THE CONTRACTOR.
13. DIMENSIONS IN PLAN VIEW ARE REFERENTIAL.
14. PIPING SUPPORTS FOR PIPES LESS THAN 3" BY CONTRACTOR.
15. FOR SPRINKLER HEAD TYPE REFER TO DRG 1883-40-B1-1111 FOR FOAM DELUGE SKID REFER TO DRG 1811-40-B1-1112.
16. FOR VESDA SYSTEM REFER TO DRG 1883-40-B1-1120
17. EQUIPMENT WHICH IS POSITIONED ON OR SUPPORTED BY THE DRIFT WALL IS TO BE ACCOMODATED ACCORDING TO FINAL EXCAVATION BY THE CONTRACTOR.
18. TRUCK SHOP DESIGN MUST BE REVISED IN ACCORDANCE WITH FINAL MINING EXCAVATION

LEGEND:



JACOBS
Jacobs Document No. SN1809-1883/PP.DRG/1101
JACOBS ENGINEERING SINGAPORE PTE LTD
(Registration number 199803266M),
a company incorporated in Singapore and
having its registered office at 50 Raffles
Place #32-01 Singapore Land Tower,
Singapore, 048623 (the offshore Contractor)
Web: www.jacobs.com

Web: www.jacobbs.com

OYU TOLGOI UNDERGROUND PROJECT

UNDERGROUND WORKSHOPS

UNDERGROUND WORKSHOPS TRUCK SHOP HALL, AGE LEVEL

TRUCK SHOP HAULAGE LEVEL GENERAL ARRANGEMENT PLAN

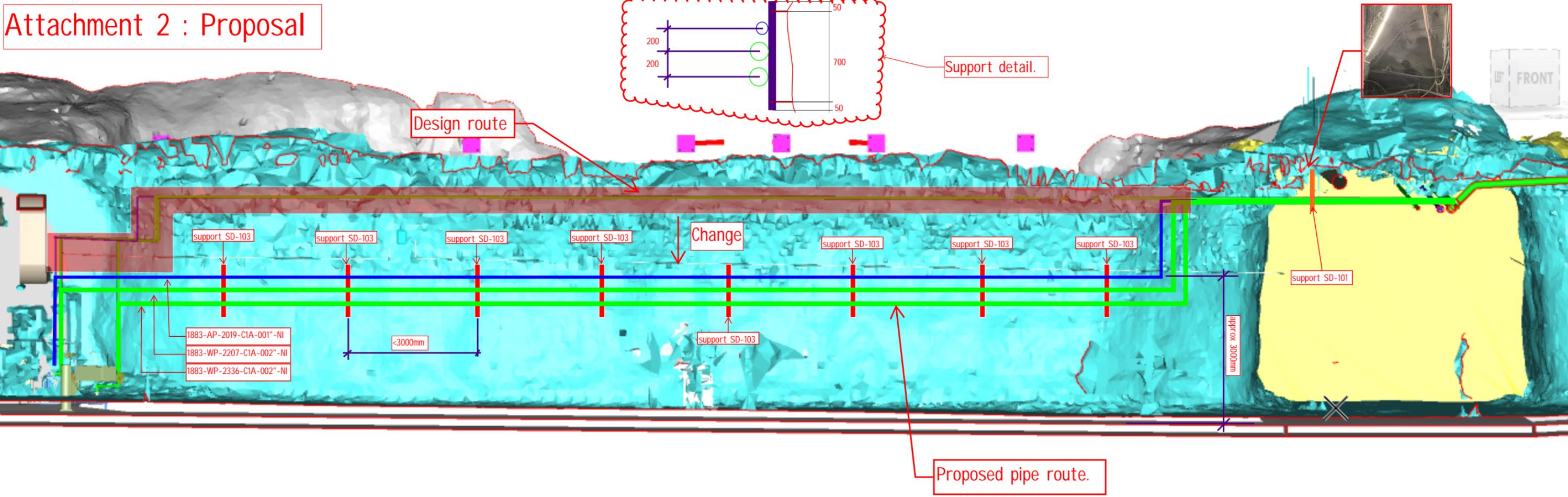
GENERAL ARRANGEMENT - PLAN

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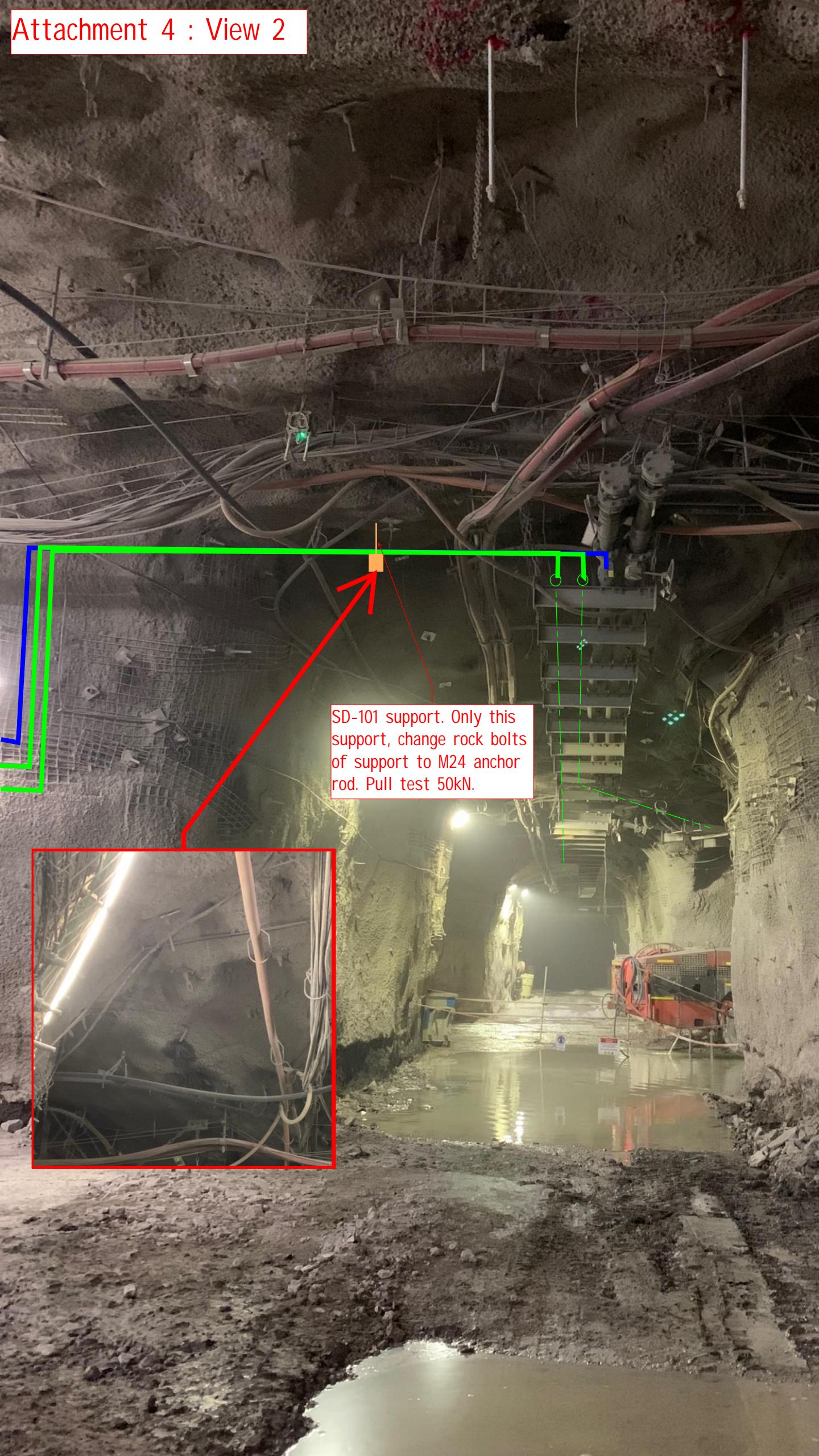
Attachment 2 : Proposal



Attachment 3 : View 1



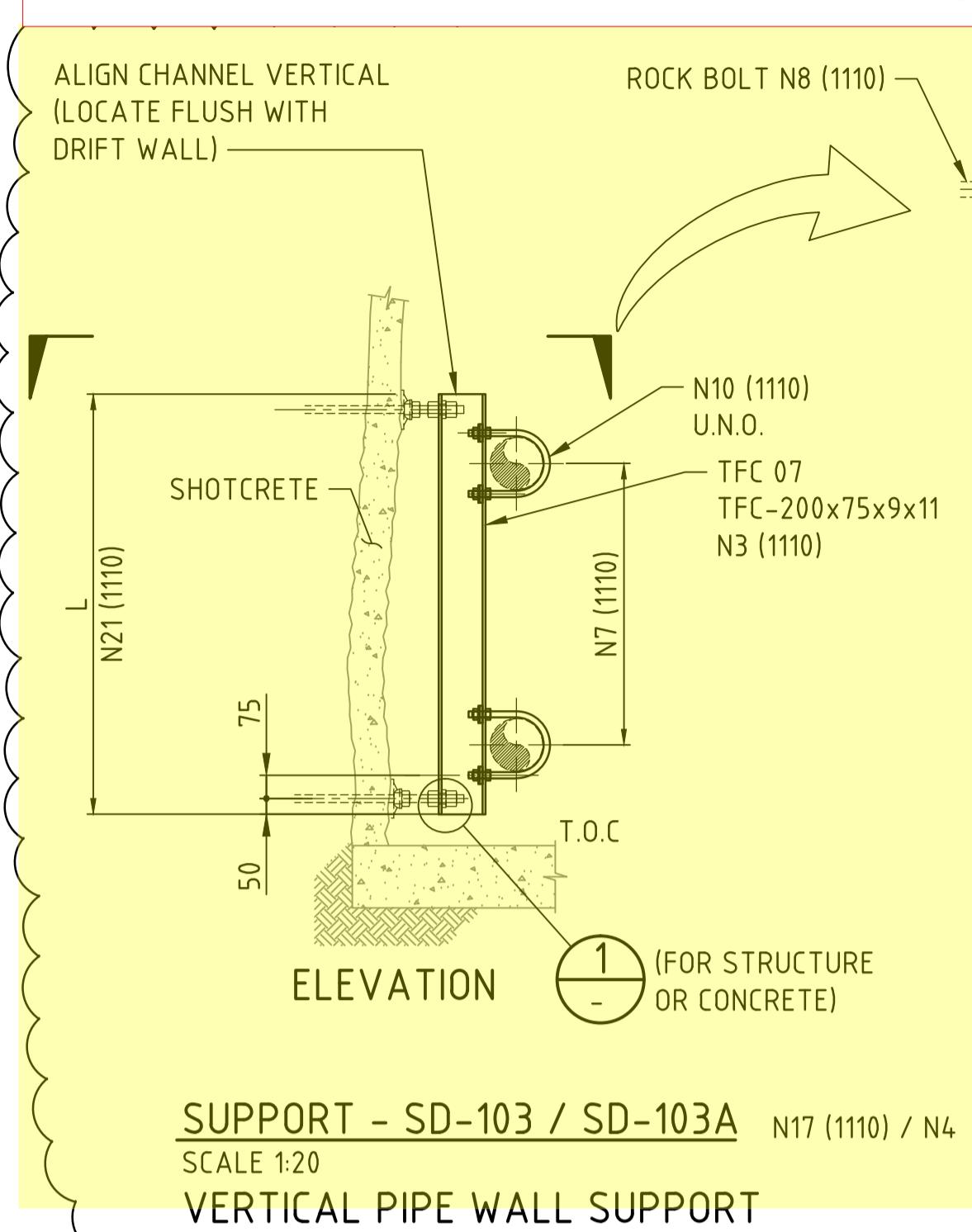
Attachment 4 : View 2



Attachment 5 : View 3



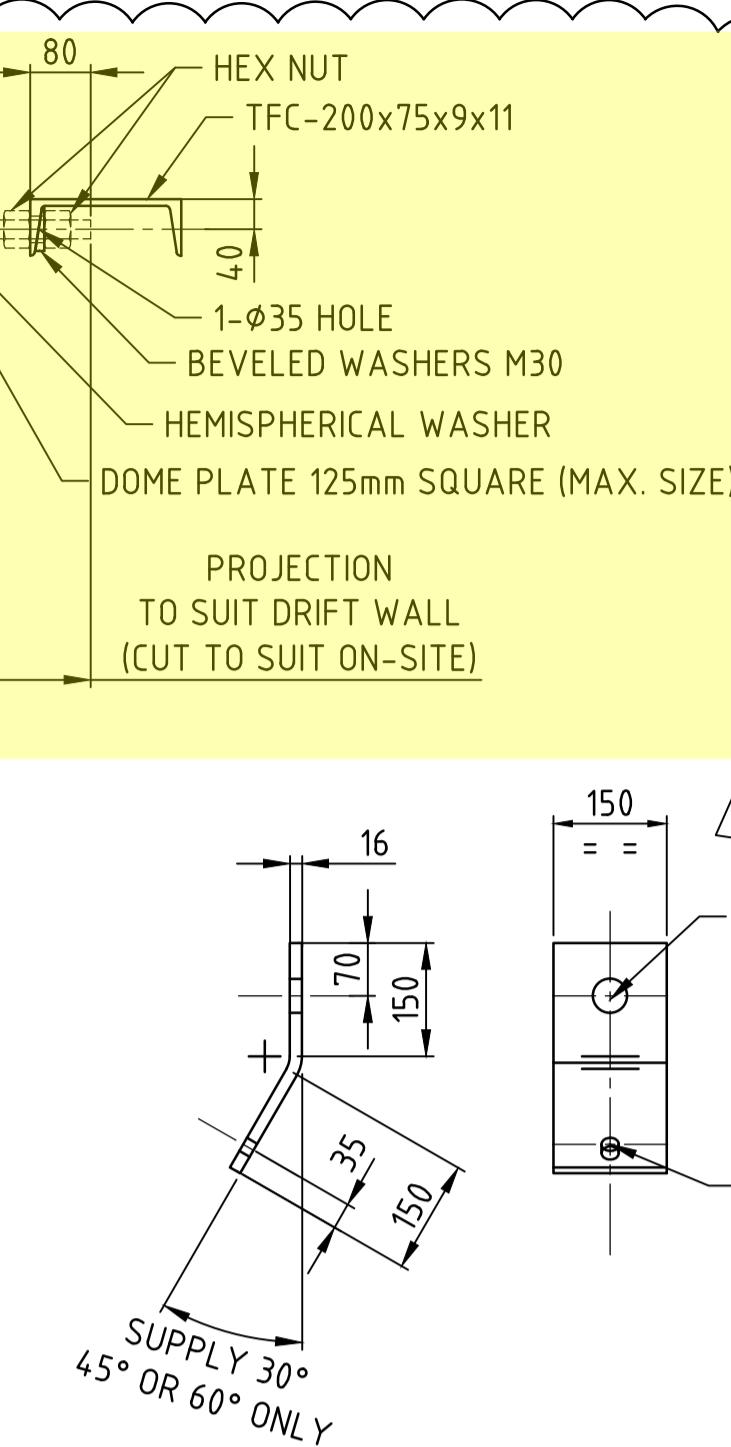
Attachment 6 : Proposed support type



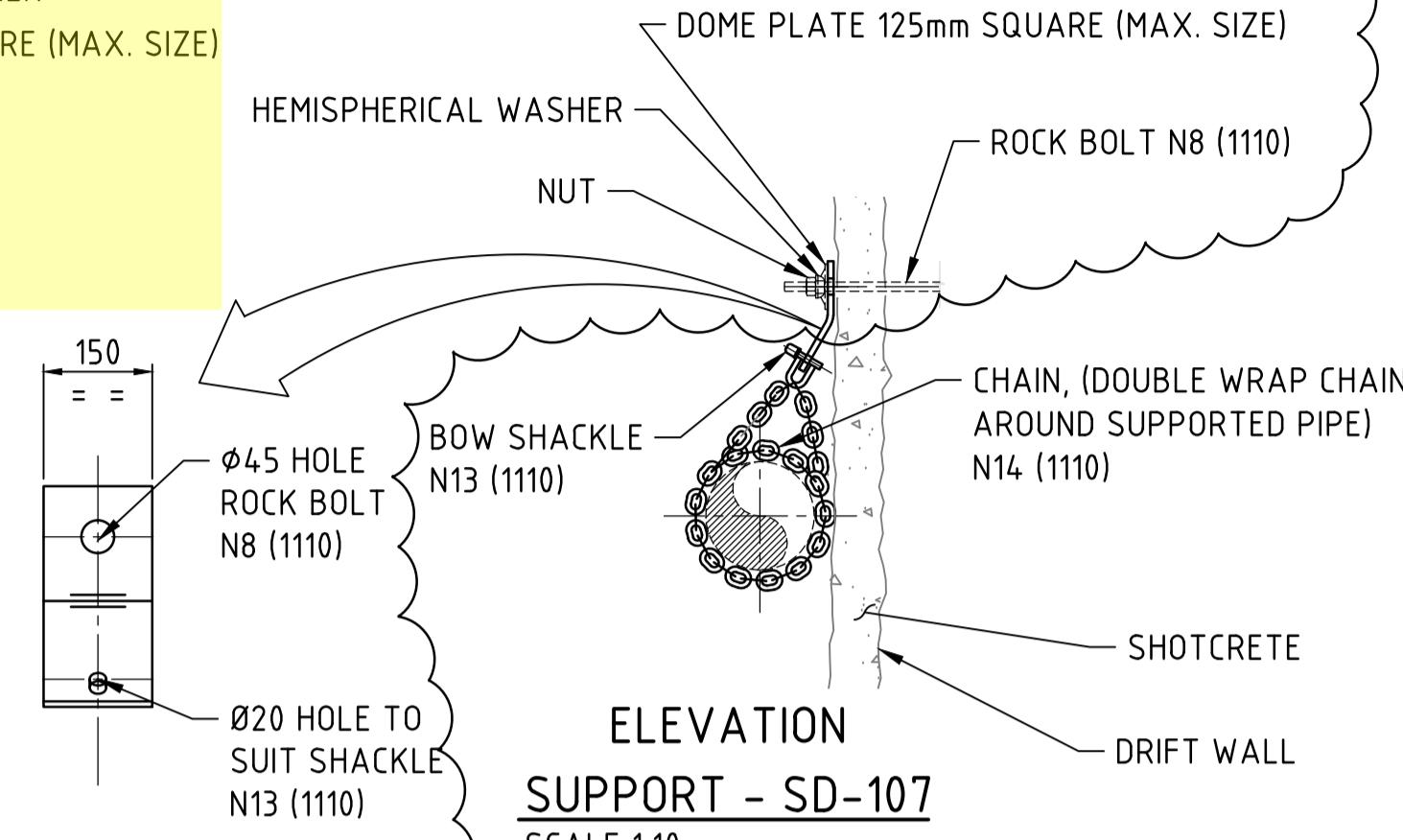
SUPPORT - SD-103 / SD-103A N17 (1110) / N4
SCALE 1:20

SCALE 1:20

**VERTICAL PIPE WALL SUPPORT
USE IN ROCK/CONCRETE/STRUCTURE**



ONLY

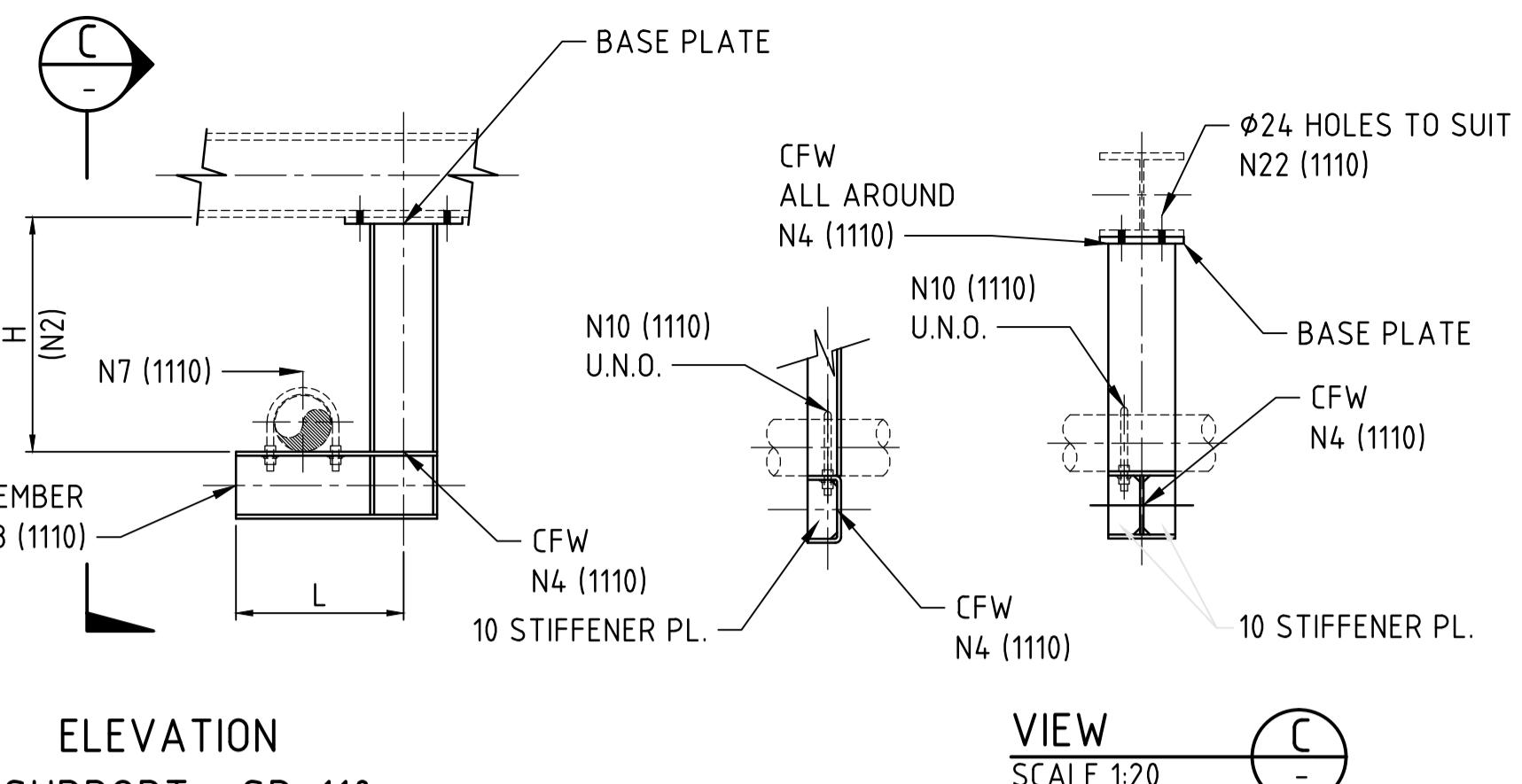


ELEVATION

SUPPORT - SD-107

SCALE 1:10

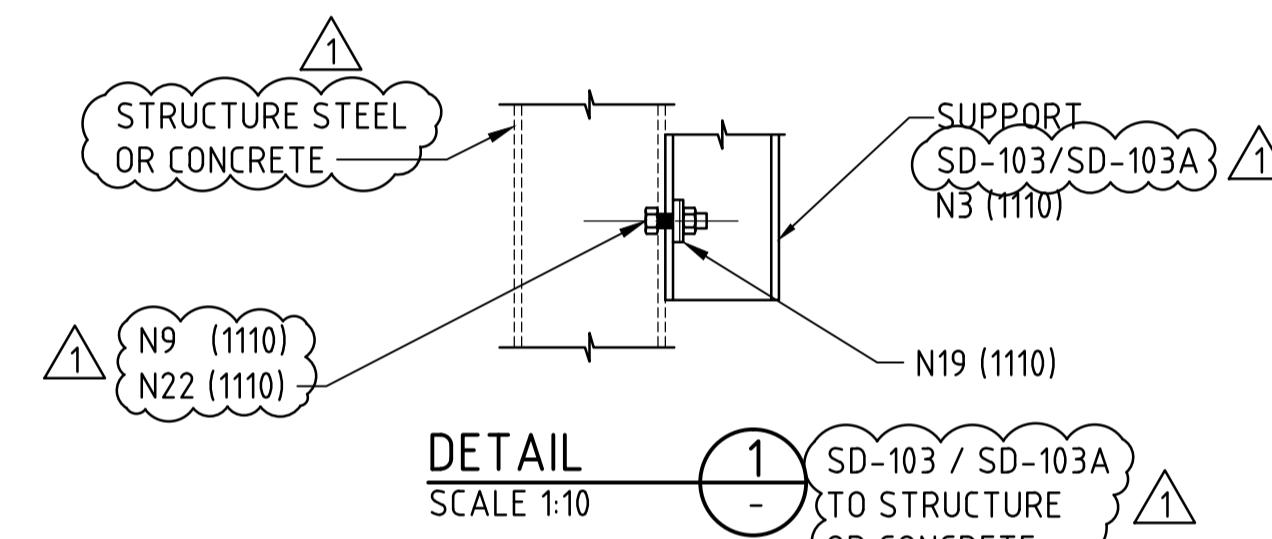
PIPE CHAIN SUPPORT - WAL



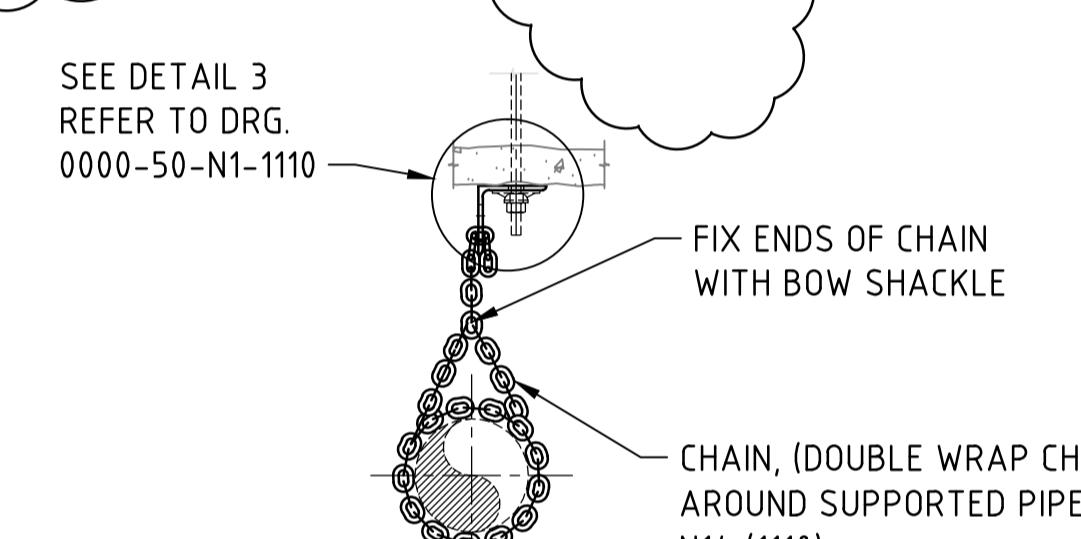
ELEVATION
SUPPORT - SD-110 N16 (1110)
SCALE 1:20
"L" TYPE SUPPORT (TABLE

TYPE	MEMBER N3 (1110)	MAX HEIGHT H	BASE PLATE (N3) 	MAX LOAD (Kgs.)			
				01 (L=500)	02 (L=600)	03 (L=700)	04 (L=800)
A	TFC 07	2200	SEE DETAIL 4	400	390	380	365
B	HN 06	2850	SEE DETAIL 1	820	800	770	750
C	L 08	1250	SEE DETAIL 8	140	130	125	120
D	L 11	1650	SEE DETAIL 8	240	225	215	205
E	L 13	1800	SEE DETAIL 8	240	230	220	210

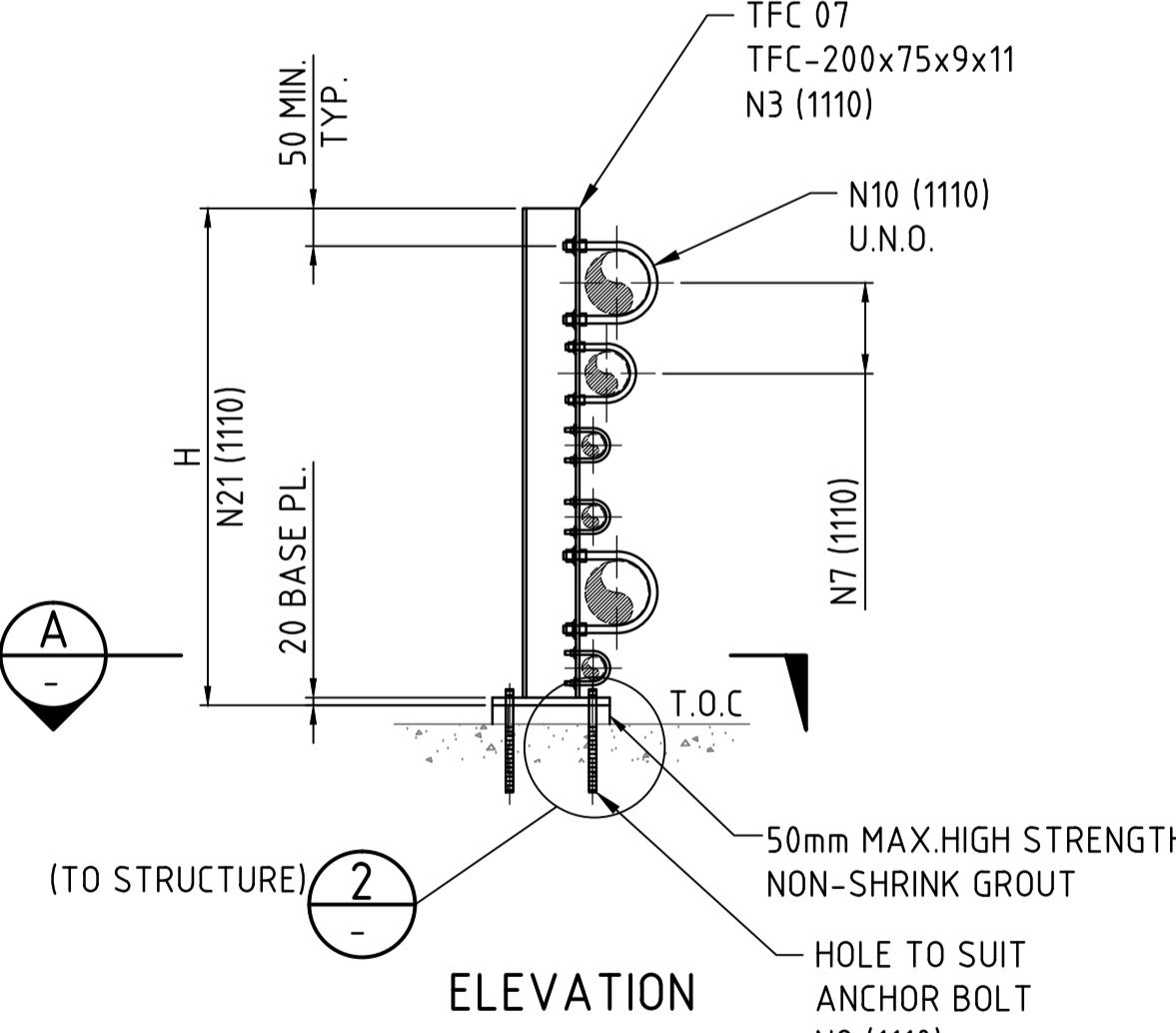
SUPPORT IDENTIFICATION : SD-110 - A - 01
(NAME - TYPE - MAX. LOAD)



DETAIL 1 SD-103 / SD-103A
SCALE 1:10 - TO STRUCTURE



ELEVATION
SUPPORT - SD-106
SCALE 1:10
PIPE CHAIN SUPPORT D00

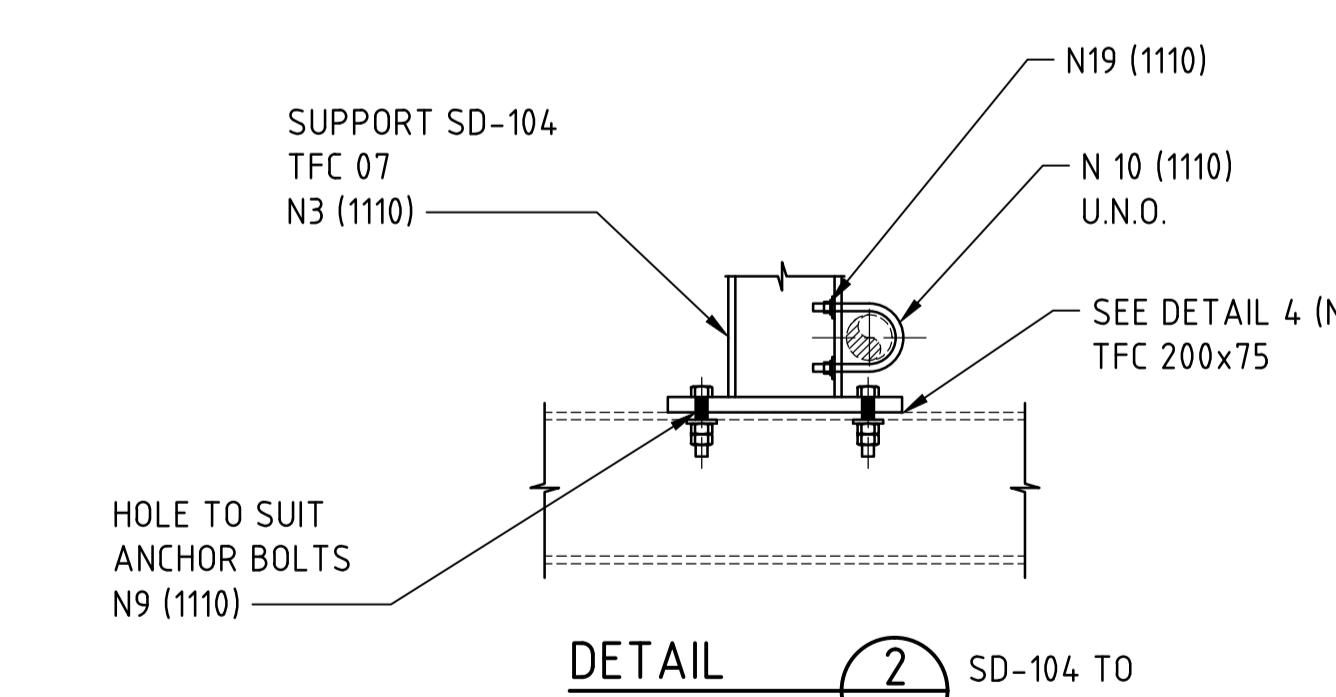


ELEVATION

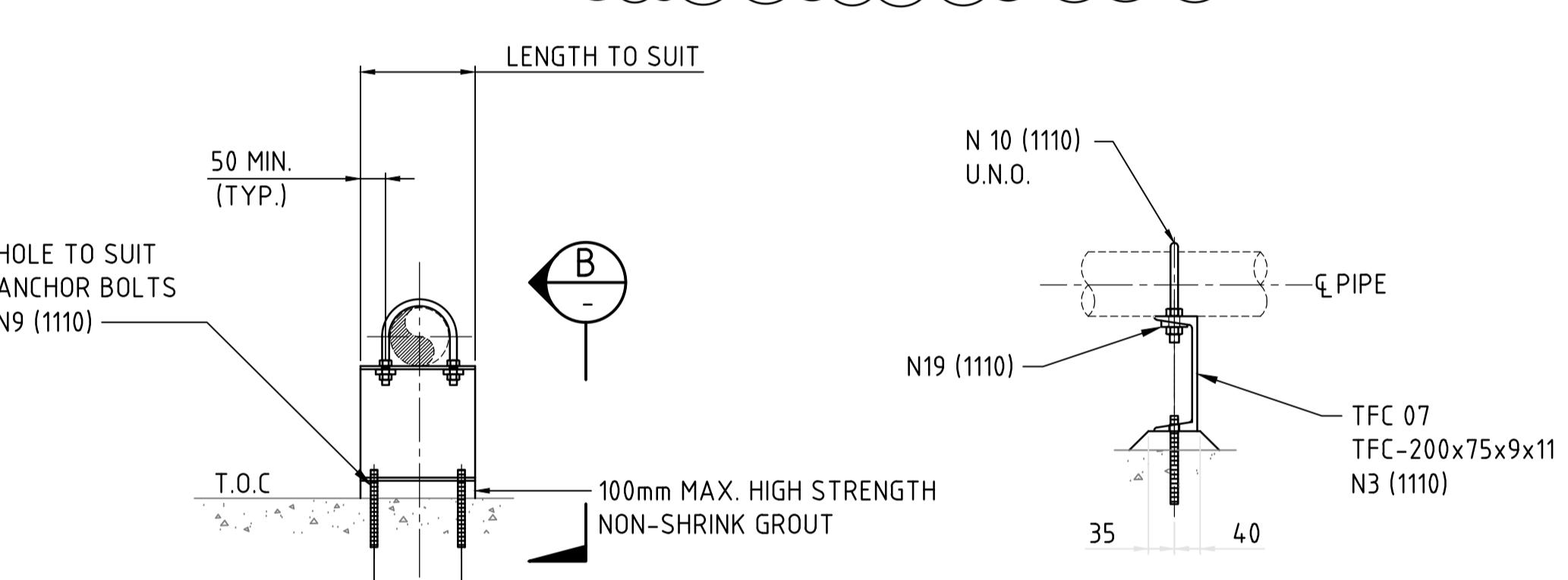
SUPPORT - SD-104

SCALE 1:20

SCALE 1:20
VERTICAL PIPE GROUND SUPPORT



DETAIL SD-104 T
SCALE 1:10 STRUCTURE

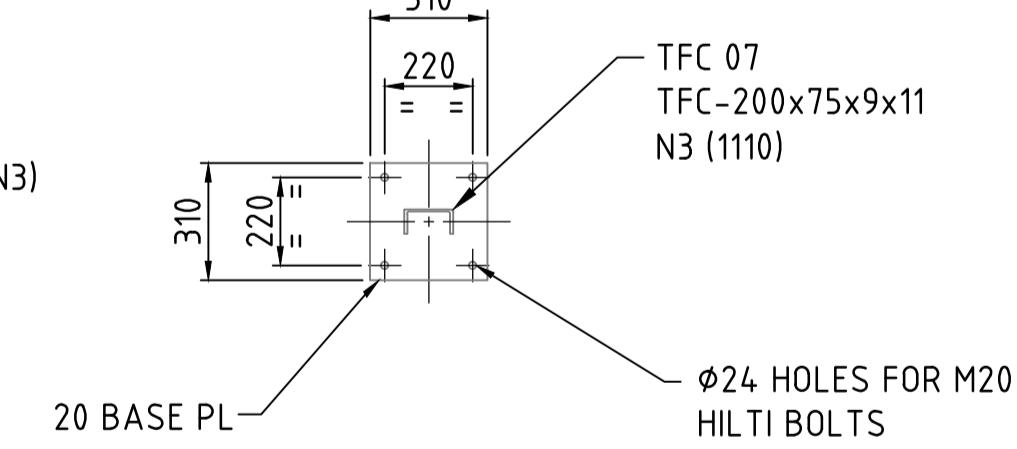


(MIN)

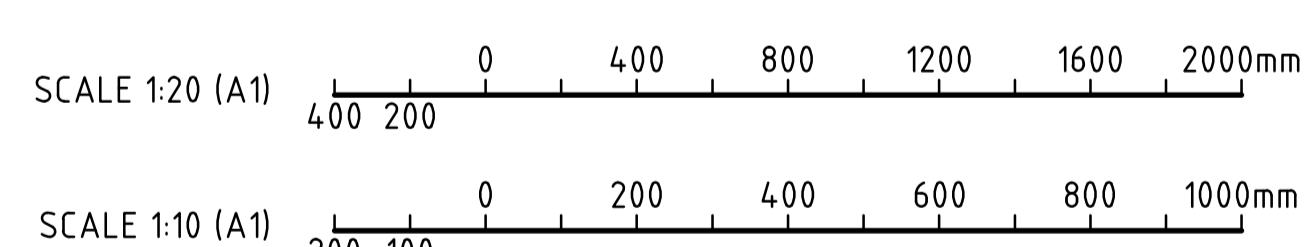
SUPPORT - SD-105

SCALE 1:20

HORIZONTAL PIPE GROUND SUPPORT



SECTION
SCALE 1:20



CONSTRUCTION ISSUE

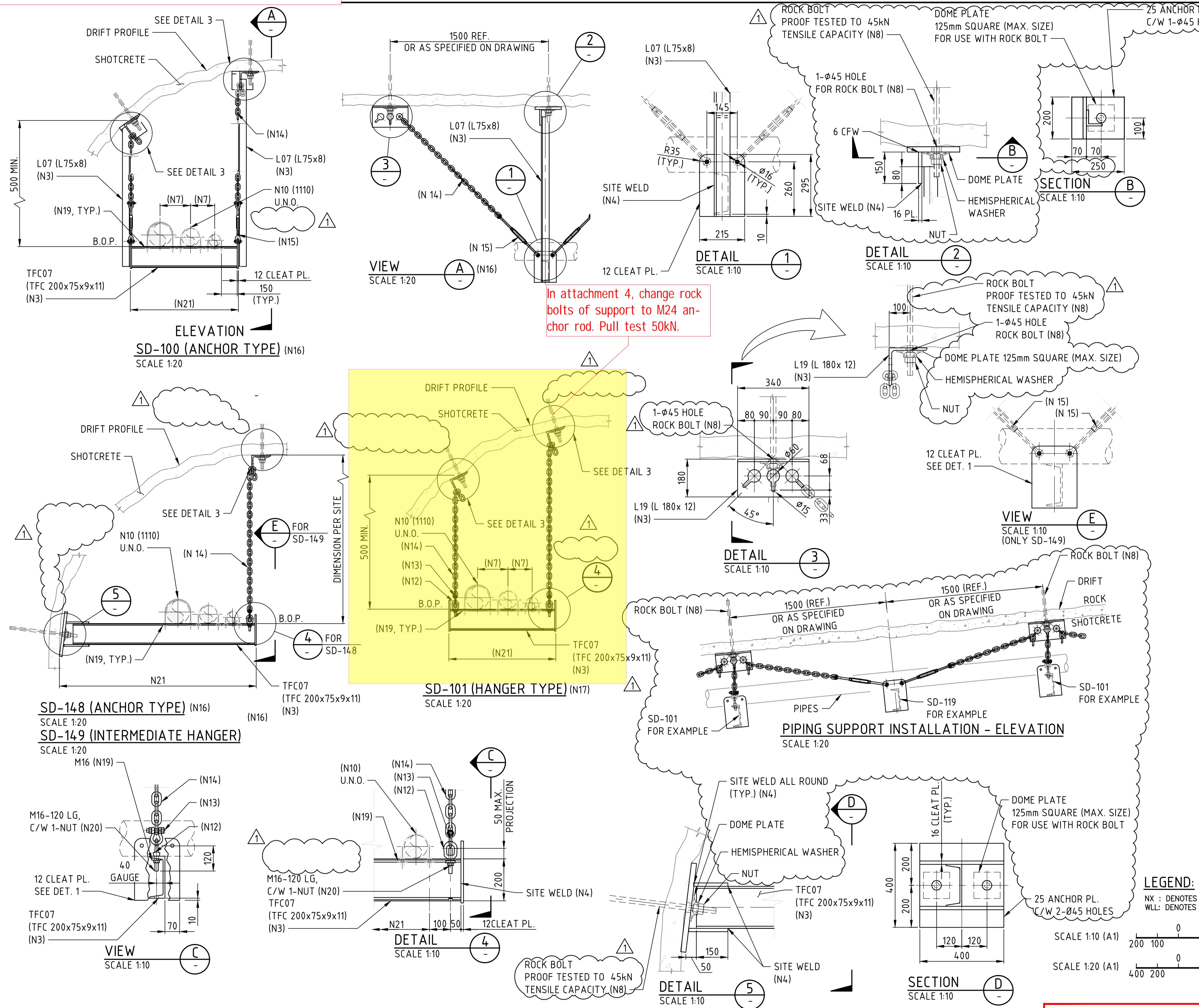


OYU TOLGOI LLC
ОЮУ ТӨЛГОЙ ХХК

ОЮУ ТОЛГОЙ ХХК

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DRAWING SIZE A1	AREA PROJECT ENGINEER	ENGINEERING MANAGER E. MARIN	PLOT SCALE AS SHOWN	APPROVAL DATE 30.08.18	
CAD FILE NAME 0000-50-N1-1112.DWG	CLIENT	APPROVAL DATE	SCALE AS SHOWN	DRAWING NUMBER 0000-50-N1-1112	REV. 1

Attachment 6 : Proposed support type



CAUTION - PROJECT DRAWING - NOT AS BUILT



OYU TOLGOI LLC

Disclaimer: Drawings, plans, models, designs or any other document (or its part or attachment) is owned by Oyu Tolgoi LLC only. Making a copy or internal use of Oyu Tolgoi LLC only. Making a copy or internal use of Oyu Tolgoi LLC's written consent or permission and prohibitions shall be subject legal liabilities and Oyu Tolgoi LLC's rights.

PRODUCED BY	DESIGNED BY J. RODRIGUEZ	DRAWN BY J. RODRIGUEZ	OYU TOLGOI UNDERGROUND PROJECT SITE WIDE SPECIAL PIPE SUPPORTS DETAILS
PROJECT NO SN1809	CHECK DESIGN B. MAUREIRA	CHECK DRAWING B. MAUREIRA	
CONTRACT NO	LEAD ENGINEER C. CID	APPROVAL DATE 30.08.18	
DRAWING SIZE A1	AREA PROJECT ENGINEER	ENGINEERING MANAGER E. MARIN	
PLOT SCALE AS SHOWN	PROJECT MANAGER	APPROVAL DATE 30.08.18	
CAD FILE NAME 0000-50-N1-1110.DWG	CLIENT	APPROVAL DATE	SCALE AS SHOWN
			DRAWING NUMBER 0000-50-N1-1110
			REV. 1R


JACOBS

Site Technical Query - Form

SN1809-0000/XE.FRM/0001 Rev 4 03/02/2021

TQ Number:		Project:		
CW2148472	-A010- 0044	Oyu Tolgoi Underground Project		
A. To be completed by or on behalf of the Contractor				
Contractor/Sub-Contractor Name:	MCS International	Date Response	16/06/2022	
Contract Title:	Haulage Truck Workshop /C-004D/	Plant Area &	1883	
Contract No.	CW2148472	Contractor TQ Number:	TWS-0415-TQ-0044	
Discipline Codes (Mandatory) D1 (CSA) - <input type="checkbox"/> D2 (MP) - <input checked="" type="checkbox"/> D3 (E&I) - <input type="checkbox"/> D4 (Other) - <input type="checkbox"/>				
<i>Description of Technical Query (List affected drawings and specifications):</i> Design proposal for 1883-WP-2336-C1A-002"-NI, 1883-WP-2207-C1A-002"-NI, and 1883-AP-2019-C1A-001"-NI lines				
<ol style="list-style-type: none"> The 1883-WP-2207-C1A-002"-NI, 1883-WP-2336-C1A-002"-NI and 1883-AP-2019-C1A-001"-NI pipelines marked on the P&ID drawings of 1883-25-J1-1113_4, 1883-25-J1-1115_2BL, and 1883-25-J1-1121_0. According to the scope, the plan drawings and layout for piping sizes less than 3" are detailed by contractor. Therefore, contractor has checked pipe route and clash from sections of 1 to 6, including pipe support design for LV parking area. 				
<input type="checkbox"/> Routine		<input checked="" type="checkbox"/> Urgent	Refer Technical Query instructions	
Proposed Action (List all attachments) <ol style="list-style-type: none"> The contractor proposes to design SD-101 pipe supports for 1883-WP-2207-C1A-002"-NI, 1883-WP-2336-C1A-002"-NI and 1883-AP-2019-C1A-001"-NI pipelines. Also, the pipe routes were planned by 3D model as shown in attachments of 2,3 and 4. 				
Attachments: <ol style="list-style-type: none"> Appendix 1. Appendix 2. Appendix 3. Appendix 4. 				
Effect on cost (USD):	NO			
Effect on schedule (Days):	NO			
Effect on quality:	NO			
Requested by (Name):	Zoljargal N.	Position:	MP Field Engineer	
Signature:	Zoljargal Narankhishig	<small>Digital signature by Zoljargal Narankhishig DN: Oyu-MCSI_O=TWG, CN=Zoljargal Narankhishig, E=zoljargal.narankhishig@mcsi.mn Request ID: 1883-05-TQS-8144_0 Location: your signing location here Date: 2022-06-13 14:29:43 Foxit PhantomPDF Version: 10.0.1</small>	Date: <i>(dd/mm/yyyy)</i>	06/13/2022

Attachment 7

B. To be completed by Jacobs Field Engineer

Comments/recommendations by Engineering

Proposed action is accepted with following comments:

1. The contractor shall keep pipe clearances in between pipelines(specially on section#6)
2. The contractor shall include field photos of existing services and supports for further submission.
3. Selected option(supports & pipe arrangements) shall be captured in relevant redline drawings.

Disclaimer:

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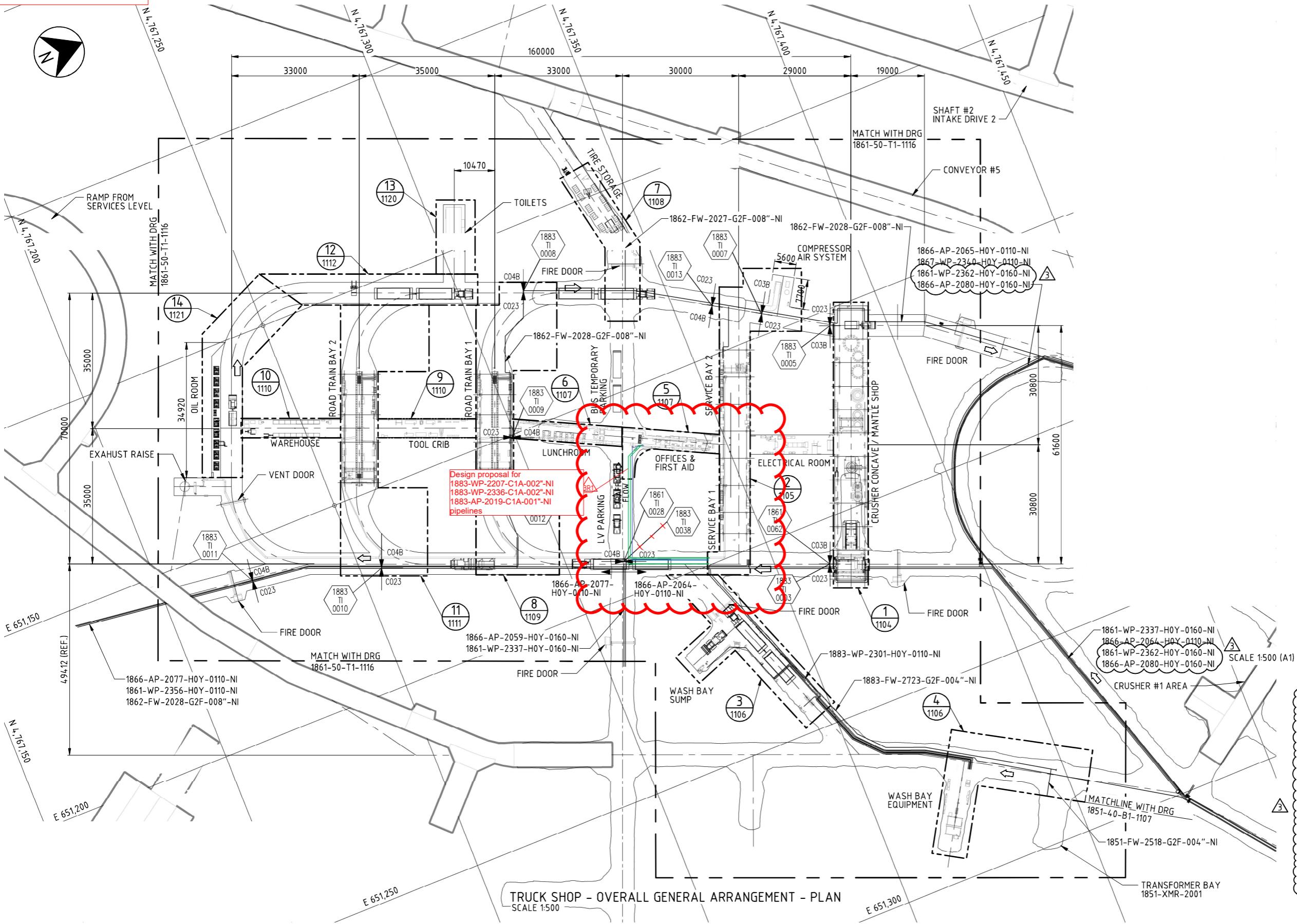
If Cost or Schedule Impact are associated with this TQ, it must be discussed separately with Jacobs Contract team.

C. Engineering Decision		D. Information		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accept with comments	Reject	Design Change Distribute to: Design Author DA	Cost Impact Distribute to: Contracts, Proj. Controls & Construction Manager	Schedule Impact Distribute to: Proj. Controls & Construction Manager

REVIEWER		APPROVER		CONSTRUCTION MANAGER (If Cost and/or Schedule Impact)	
Field Engineer OR Lead Engineer	Lead Engineer OR Chief of Engineering				
Enerel  Date: Olonbayar (dd/mm/yyyy)	<i>On-Bayarbat B.</i> <small>On-Bayarbat B., c=MV, o=Worley, ou=Engineering, email=Bayarbat.Bolbaatar@worley.com Jun 16, 2022</small> Date: Olonbayar <small>Reason: I have reviewed this Date: 2022.06.16 12:14:37 +0800</small>				
	Date: (dd/mm/yyyy)		Date: (dd/mm/yyyy)		

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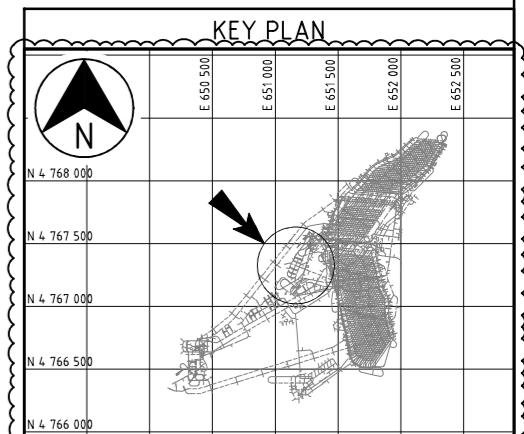
Attachment 7



NOTES:

- . DIMENSIONS ARE IN MILLIMETERS, U.N.O.
- . ALL COORDINATES AND LEVELS IN METERS TO OYU TOLGOI GRID (OTG) SYSTEM.
- . HDPE MINIMUM RADIUS 15D FOR SDR 11 (H0Y); 12D FOR SDR 9 (H0Z).
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 - a. TRIM STANDARD ELBOW (ELL 90 DEG LR OR ELL 45 DEG) AND ADD TWO NIPPLES ADAPTERS VICTAULIC NUMBER 42 (GRV. X BEV.).
 - b. COLD (FIELD) BENDING PIPE, ACCORDING TO STANDARD ASME B31.4 (406.2.1 BENDS MADE FROM PIPE). ALLOWABLE FIELD BENDING MINIMUM RADIUS IS 18D AND MINIMUM STRAIGHT EXTREMITIES IS 1D TO PERFORM VICTAULIC SLOT SPECIFICATION 25.01.
- . FOR GALVANIZED STEEL:
FOR REPAIRING DAMAGED GALVANIZED COATINGS REFER TO DOCUMENT NO. 0000-00-SPE-0002
- . USE RIGID VICTAULIC COUPLING (STYLE 07) EVERY 6000 mm. FOR STEEL PIPING.
- . DELETED.
- . USE RIGID VICTAULIC COUPLING (STYLE 07) FOR VALVES.
- . MOUNT PIPE PARALLEL TO TUNNEL GRADIENT LINE.
- . PIPE SUPPORT, SEE SPECIFICATION FLUOR N° SP-50-017 REV.2 AND DRG. 0000-50-N1-1110.
- . REFER PIPE SPECIFICATION N° 0000-50-SPE-0001.
- . HIGH POINT VENTS AND LOW POINT DRAINS TO BE ADDED BY CONTRACTOR IN THE FIELD WITH ALLOWABLE SPACE FOR MAINTENANCE.
- . ALL ROCK SUPPORTED PIPING MUST BE ACCOMMODATED TO THE FINAL EXCAVATION SURFACE BY THE CONTRACTOR.
- . DIMENSIONS IN PLAN VIEW ARE REFERENTIAL.
- . 4. PIPING SUPPORTS FOR PIPES LESS THAN 3" BY CONTRACTOR.
- . 5. FOR SPRINKLER HEAD TYPE REFER TO DRG 1883-40-B1-1111 FOR FOAM DELUGE SKID REFER TO DRG 1811-40-B1-112.
- . 6. FOR VESDA SYSTEM REFER TO DRG 1883-40-B1-1120
- . 7. EQUIPMENT WHICH IS POSITIONED ON OR SUPPORTED BY THE DRIFT WALL IS TO BE ACCOMODATED ACCORDING TO FINAL EXCAVATION BY THE CONTRACTOR.
- . 8. TRUCK SHOP DESIGN MUST BE REVISED IN ACCORDANCE WITH FINAL MINING EXCAVATION.
- . 9. USE FLEXIBLE COUPLING (STYLE 77) WHERE REQUIRED TO COMPENSATE FOR EXPANSION AT LONG LENGTHS (40m+) ON ELBOW AND 5m FROM ELBOW ON PERPENDICULAR LEG AS PER VICTAULIC DESIGN GUIDE 26.01 EXAMPLE 6.
- . 0. INSTALLATION CONTRACTOR TO ASSESS SUPPORT TYPE AND THE USE OF FLEXIBLE COUPLING TO ENSURE MINIMAL LOAD ON EQUIPMENT. INSTALL FLEXIBLE COUPLINGS WHERE REQUIRED FOR MISALIGNMENT.

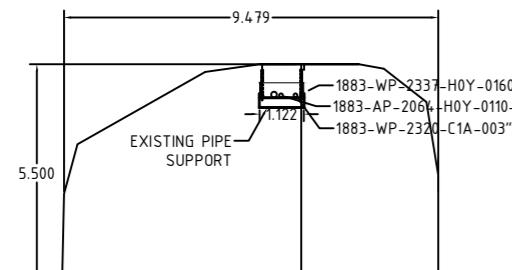
LEGEND:
NX : DENOTES NOTE NUMBER X.



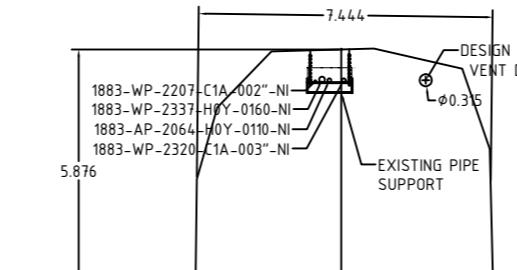
JACOBS
Jacobs Document No.
SN1809-1883/PP.DRG/1101
JACOBS ENGINEERING GROUP SINGAPORE PTE LTD
(Registration No. 1972000020)
a company incorporated in Singapore and
having its registered office at 50 Raffles
Place #32-01 Singapore Land Tower,
Singapore, 048623 (the offshore Contractor)
Web: www.jacobs.com

Attachment 7

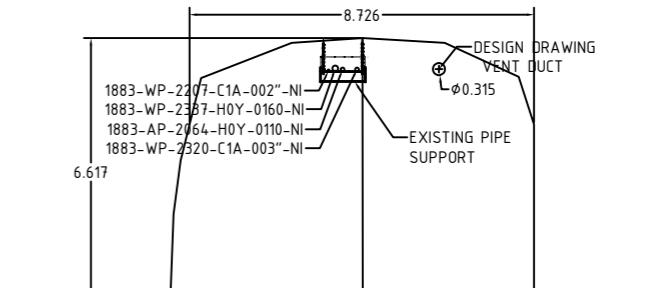




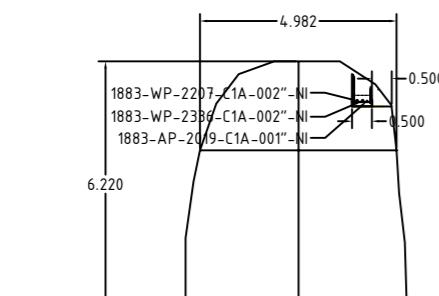
SECTION 6-6



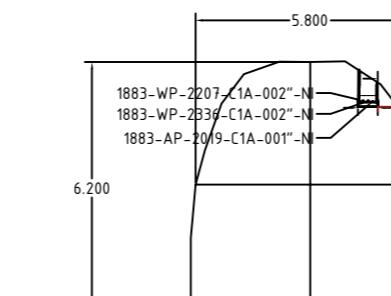
SECTION 5-5



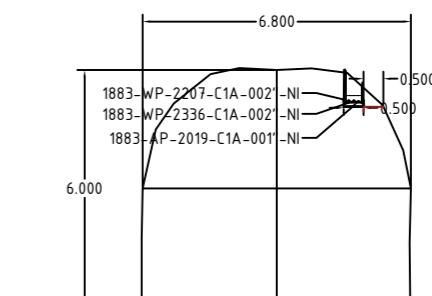
SECTION 4-4



SECTION 3-3



SECTION 2-2



SECTION 1-1

