



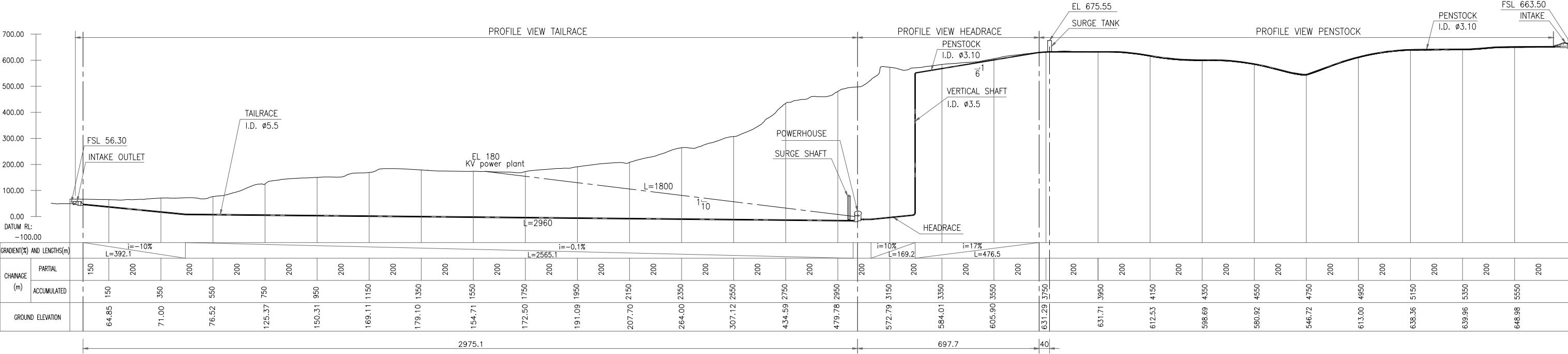
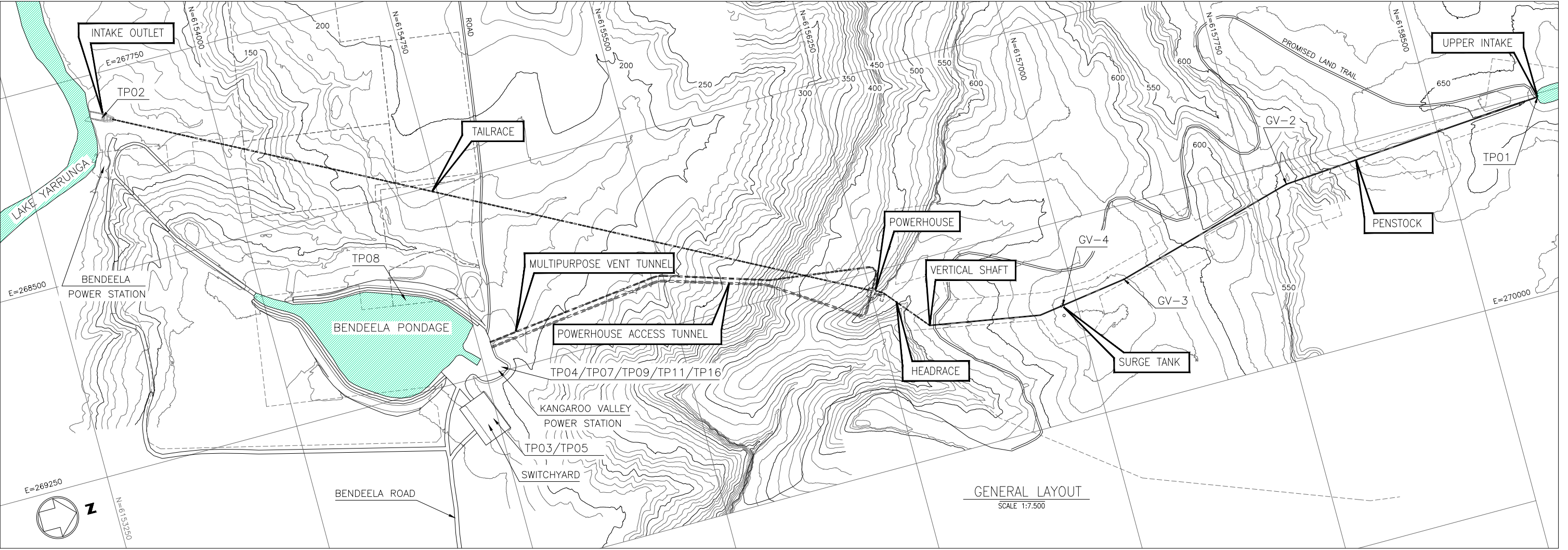
Appendix B. Indicative concept design

Shoalhaven Hydro Expansion Project - Main Works Environmental Impact Statement

SSI-10033

Origin Energy Eraring Pty Ltd

November 2022



LONGITUDINAL PROFILE
SCALE 1:7,500

NOTES:
1.- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN METERS.

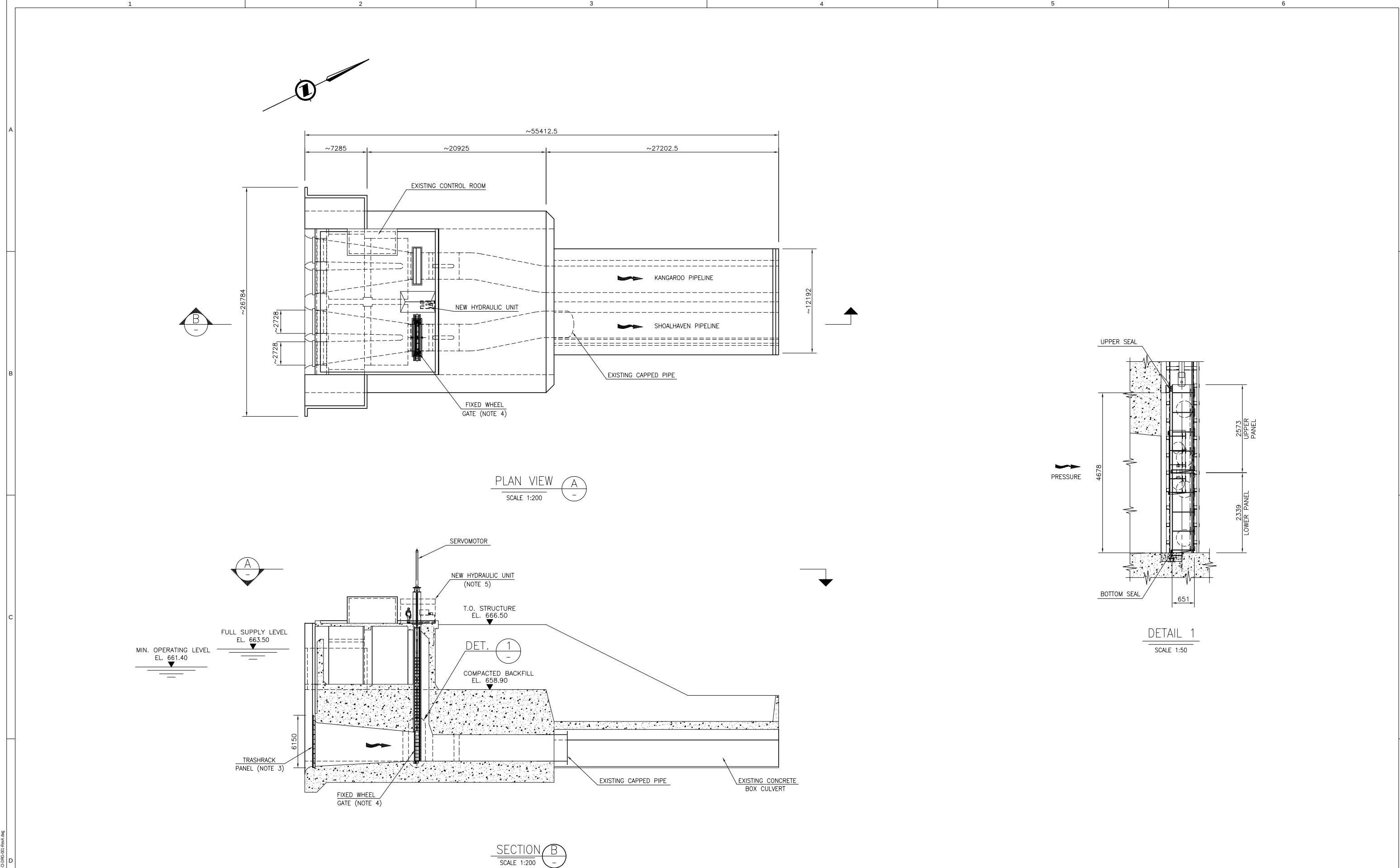
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C	OCT.-2021	A.G.L.	A.G.L.	I.B.	UPDATED CONCEPT - FOR INFORMATION ONLY
B	FEB.-2019	F.C.S.	J.A.B.	J.A.B.	FOR CLIENT REVIEW
A	JAN.-2019	F.C.S.	J.A.B.	J.A.B.	FOR CLIENT REVIEW

JACOBS

CLIENT ORIGIN			
PROJECT SHOALHAVEN EXPANSION			
DRAWN F.C.S.	DRAWING CHECK J.A.B.	REVIEWED	APPROVED
DESIGNED J.A.B.	DESIGN REVIEW	DATE	DATE OCT.-2021

TITLE		
GENERAL LAYOUT SITE LOCATION		
SCALE AS SHOW	DRAWING No IA193700-0100-GN-DRG-001	REV C

FOR INFORMATION ONLY



- NOTES:
- 1.- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS AND ELEVATIONS IN METERS.
 - 2.- ALL DIMENSION SHOWN IN THIS DRAWING HAS BEEN OBTAINED FROM THE AS BUILT DRAWING No. K75-5-4051, K75-5-4052 AND K75-6-8041 AND ARE INDICATIVE. EPC CONTRACTOR TO CONFIRM DIMENSIONS OF EXISTING STRUCTURE.
 - 3.- REMOVABLE TRASHRACK PANEL TO BE INSTALLED IN EXISTING STOPLOGS GUIDES.
 - 4.- FIXED WHEEL GATE TO BE INSTALLED IN EXITING GATE TRACKS.
 - 5.- REFER TO MFS.

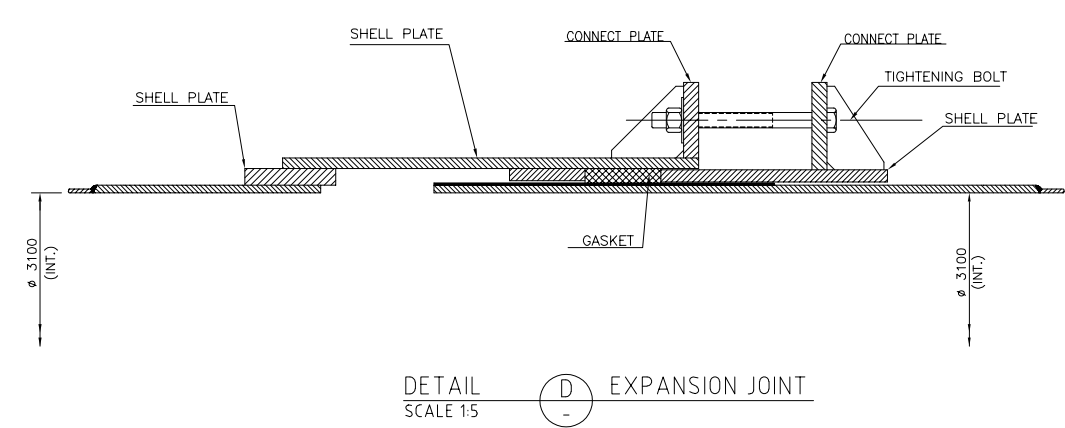
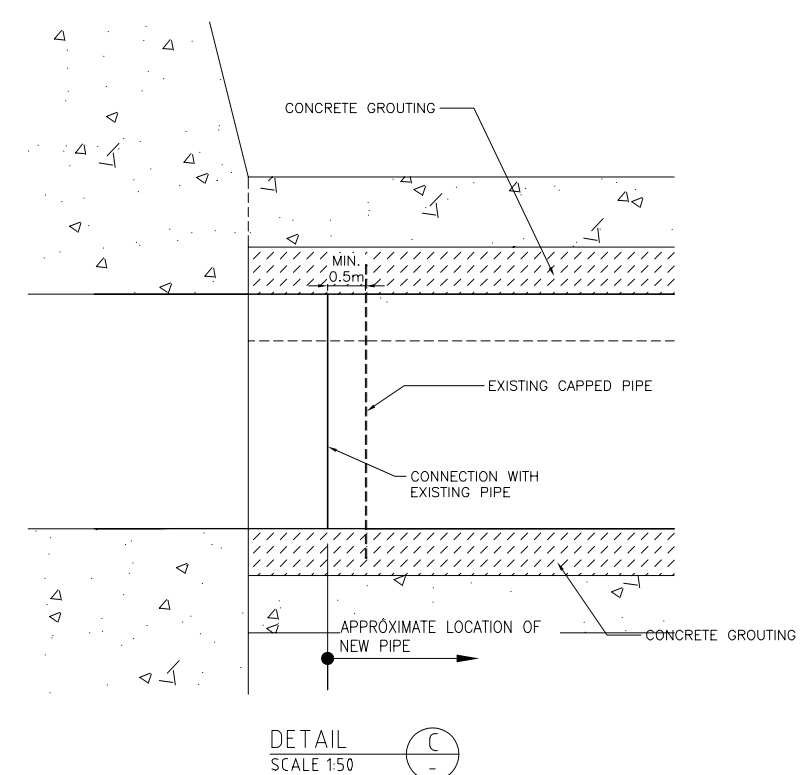
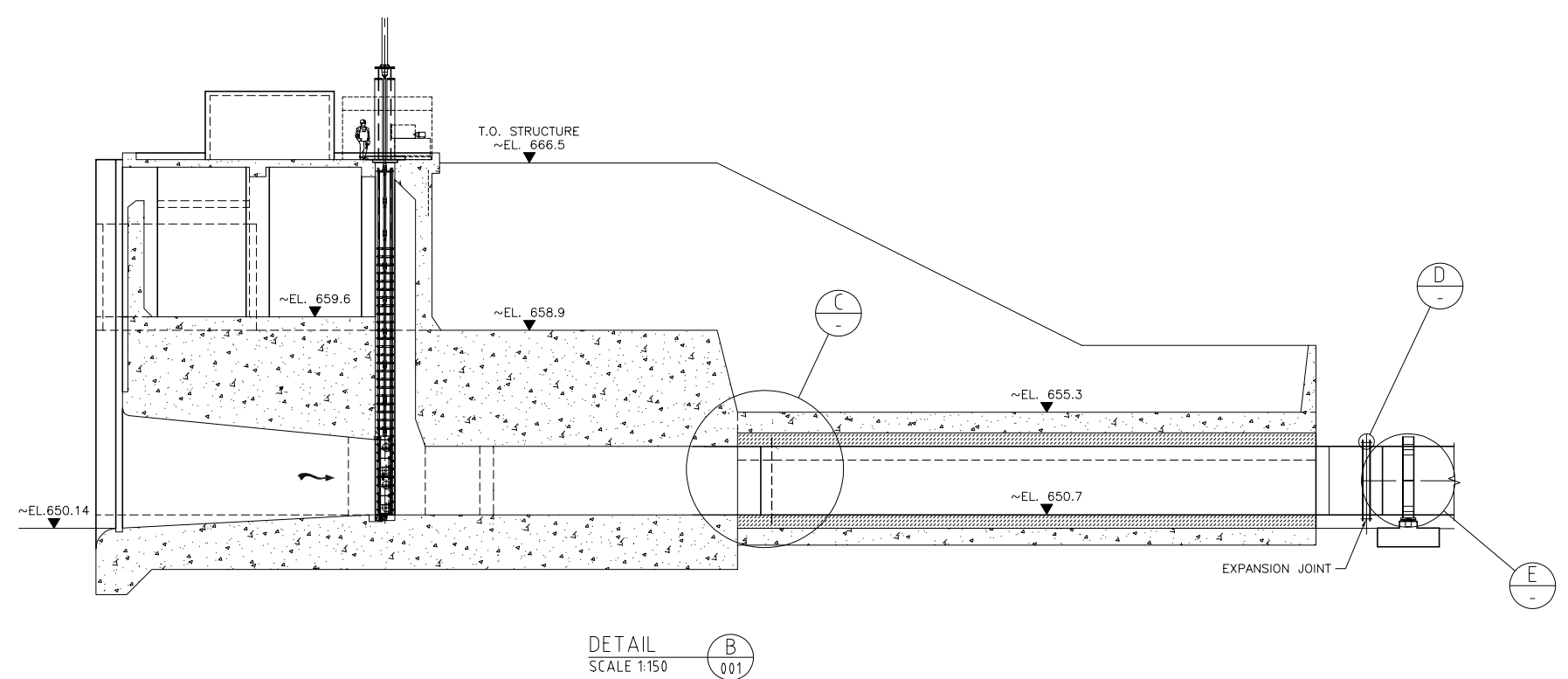
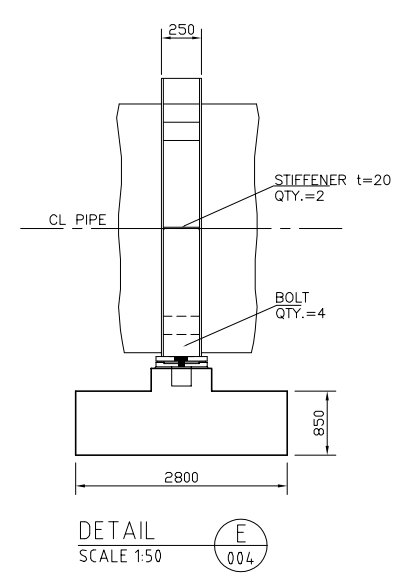
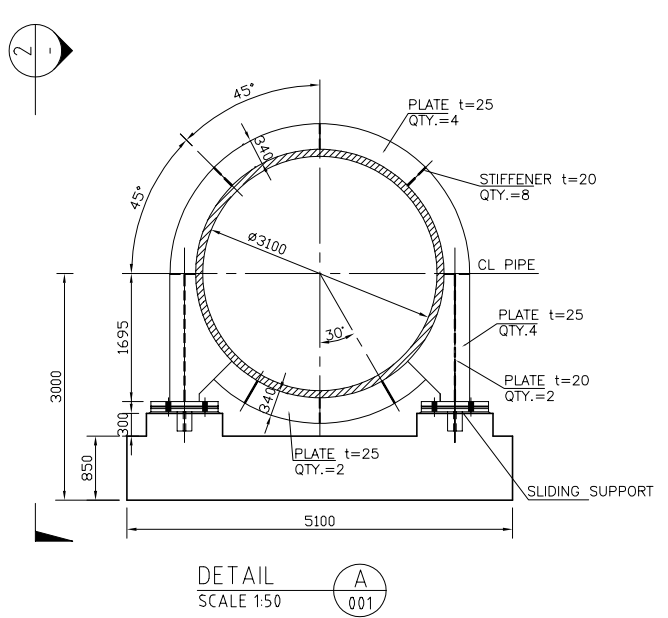
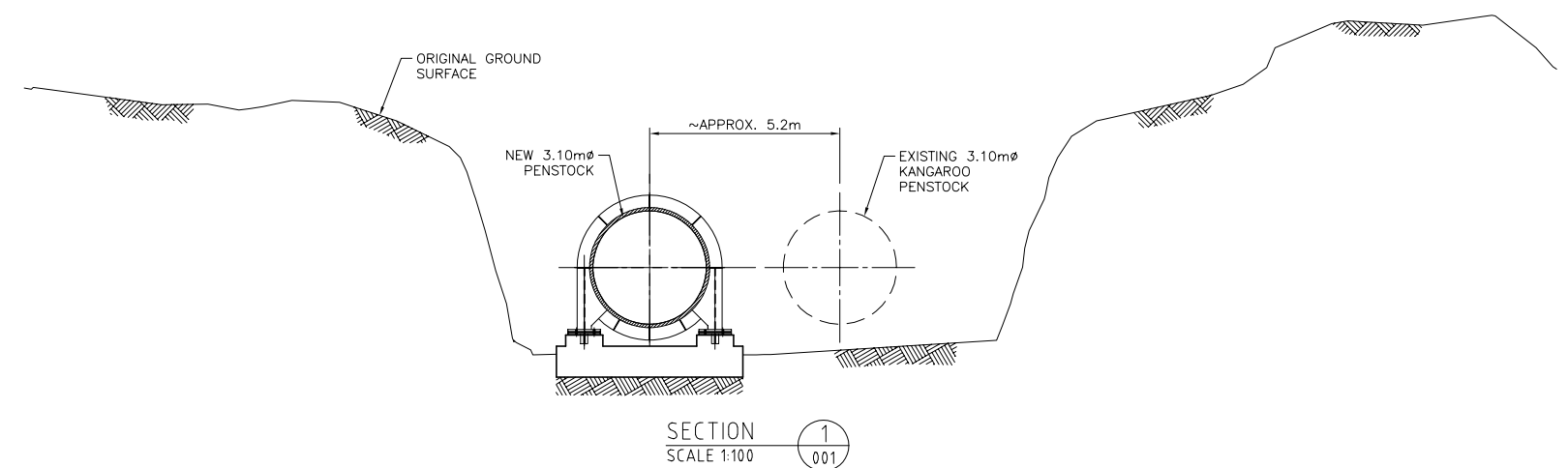
REV	DATE	DRAWN	REV'D	APP'D	REVISION
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A	FEB-2019	F.C.S.	J.A.B.	J.A.B.	FOR INTERNAL REVIEW

JACOBS

CLIENT ORIGIN			
PROJECT SHOALHAVEN EXPANSION			
DRAWN F.C.S.	DRAWING CHECK J.A.B.	REVIEWED	APPROVED
DESIGNED C.B.G.	DESIGN REVIEW	DATE	DATE FEB.-2019

TITLE UPPER INTAKE GATE AND TRASHRACK		
SCALE AS SHOWN	DRAWING No IA193700-0200-CI-DRG-001	REV B

FOR INFORMATION ONLY



NOTES:

1. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN METERS.

2. ALL ELEVATION LEVELS SHOWN ARE APPROXIMATE AND TO BE CONFIRMED ON SITE.

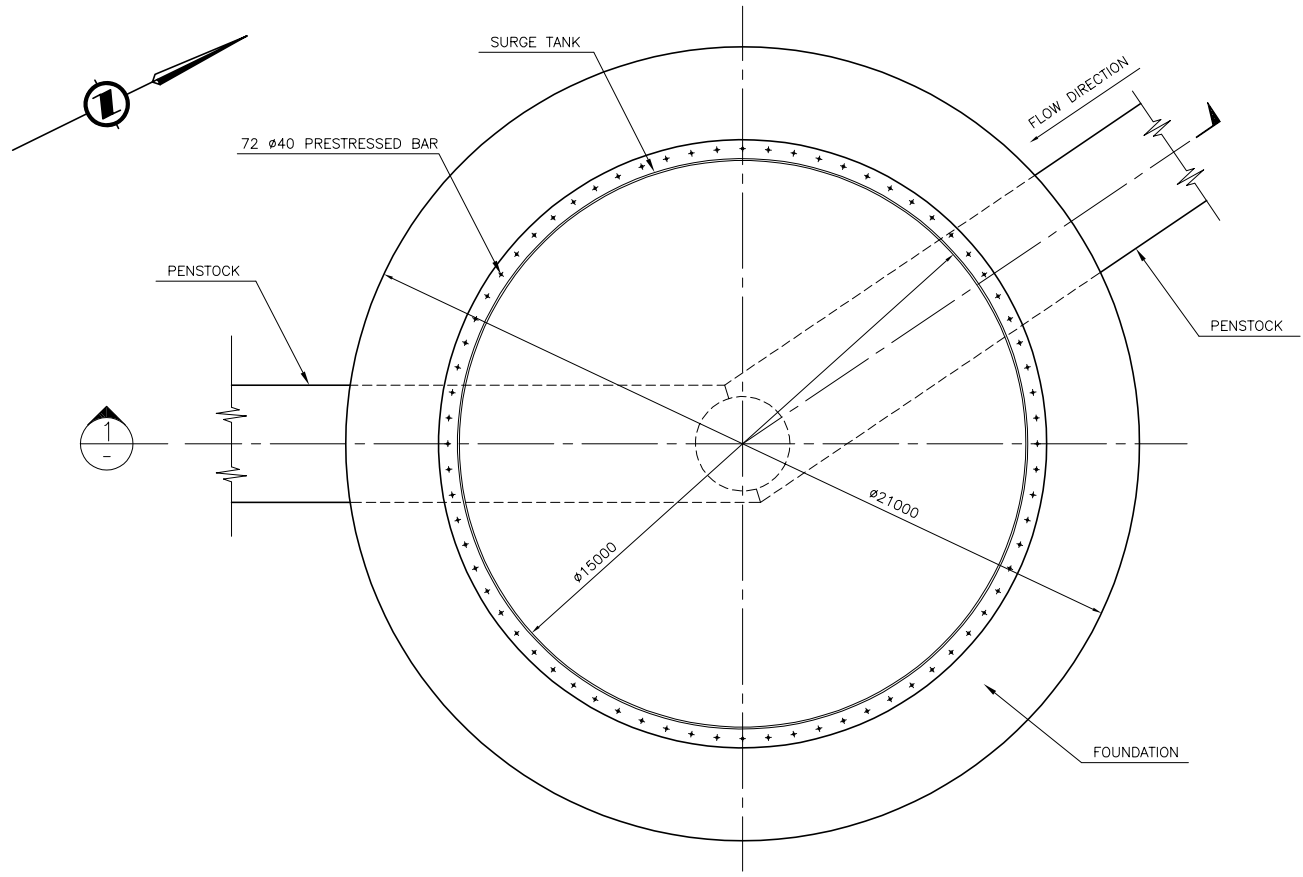
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B	FEB-2019	F.C.S.	J.A.B.	J.A.B.	FOR CLIENT REVIEW
A	JAN-2019	F.C.S.	Z.T.	J.A.B.	FOR INTERNAL REVIEW



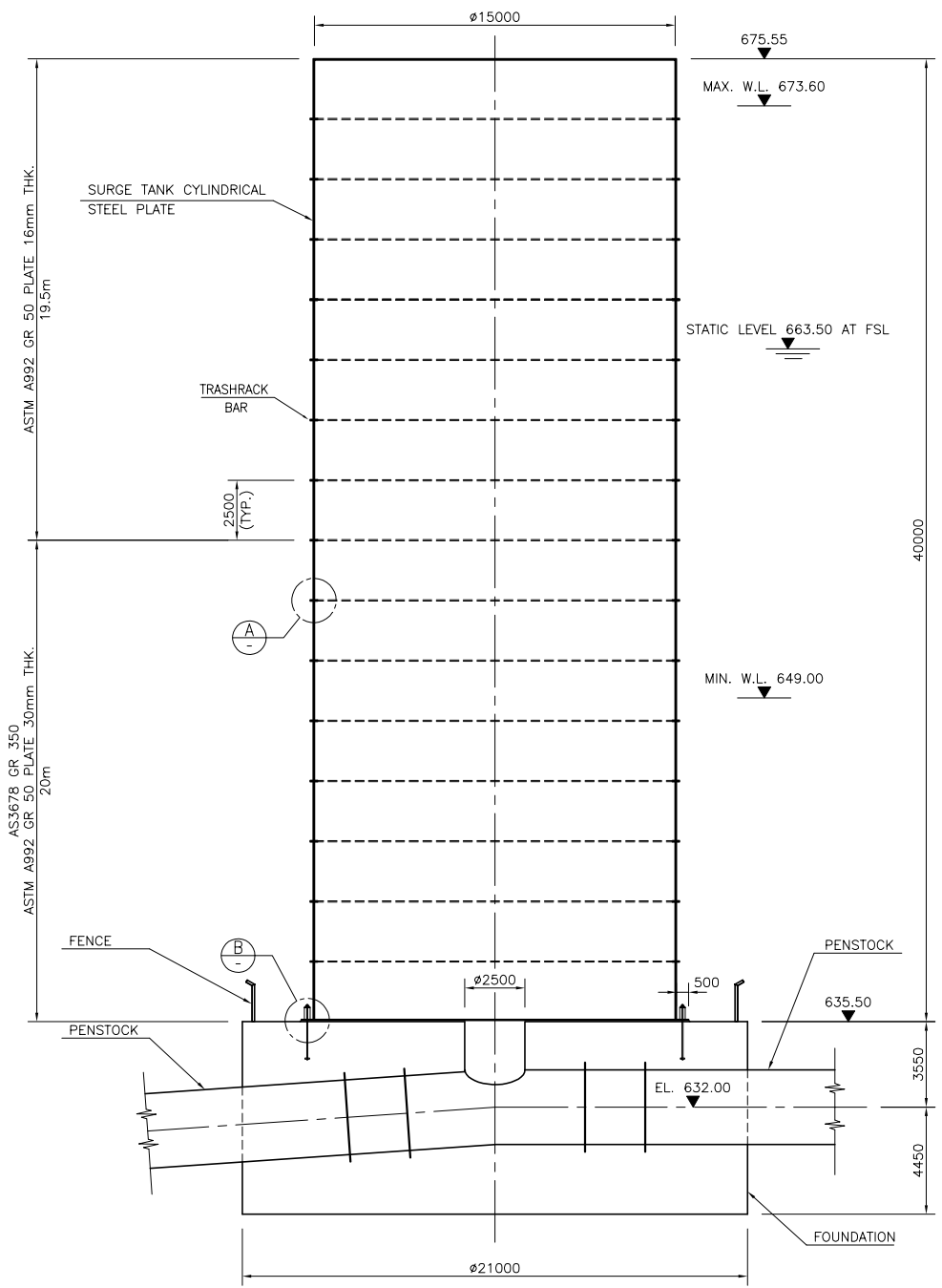
CLIENT			
PROJECT			
DRAWN	DRAWING CHECK	REVIEWED	APPROVED
F.C.S.	J.A.B.		
DESIGNED	DESIGN REVIEW	DATE	DATE JAN-2019
Z.T.			

TITLE		
PENSTOCK CROSS SECTIONS AND DETAILS		
SCALE	DRAWING No	REV
AS SHOWN	IA193700-0300-GN-DRG-004	B

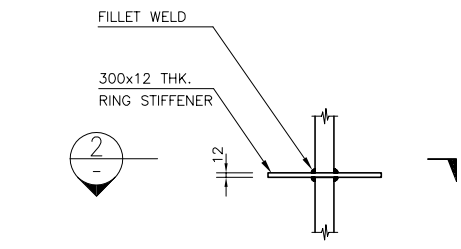
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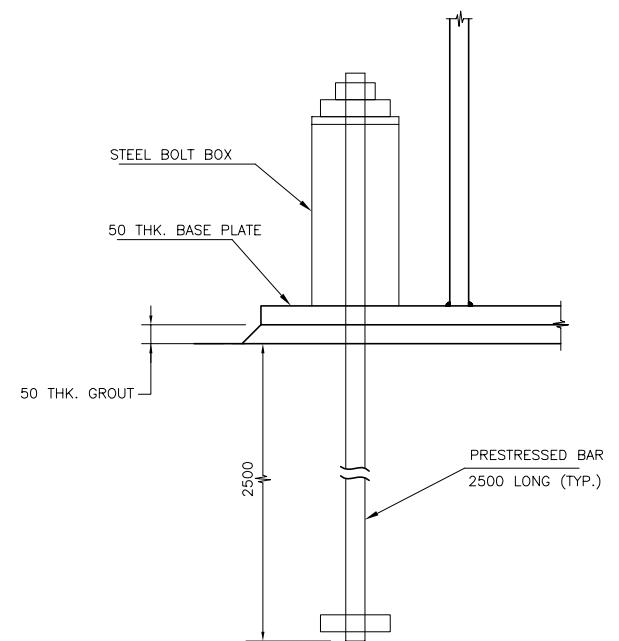
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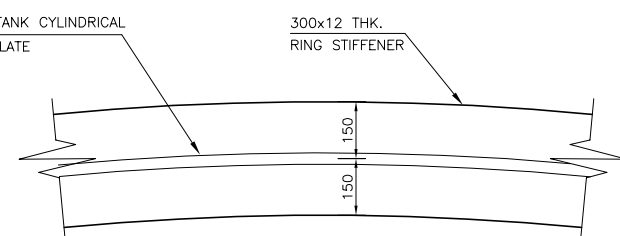
SECTION 1
SCALE 1:100



DETAIL A
SCALE 1:10



DETAIL B
SCALE 1:10



SECTION 2
SCALE 1:10

NOTES:
1.- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS.

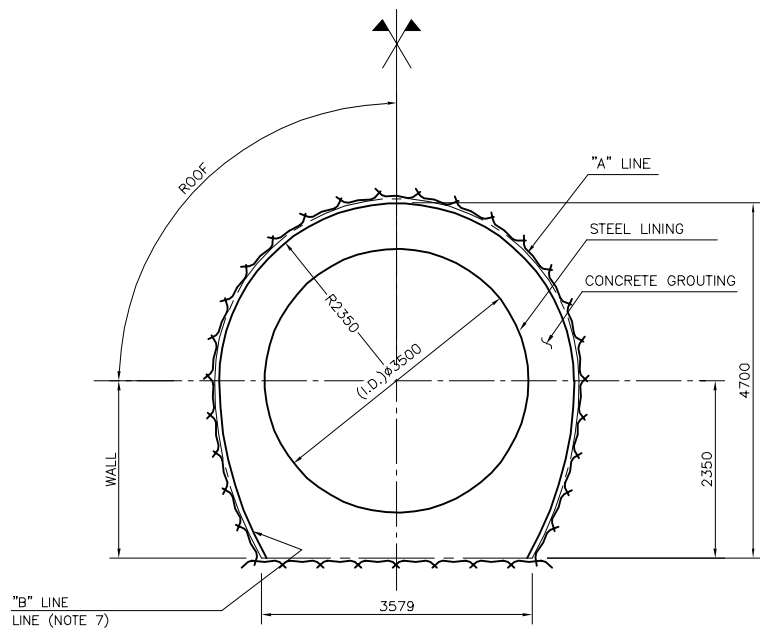
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A	JAN-2019	F.C.S.	Z.T.	J.A.B.	FOR INTERNAL REVIEW
REV	DATE	DRAWN	REV'D	APP'D	REVISION

JACOBS

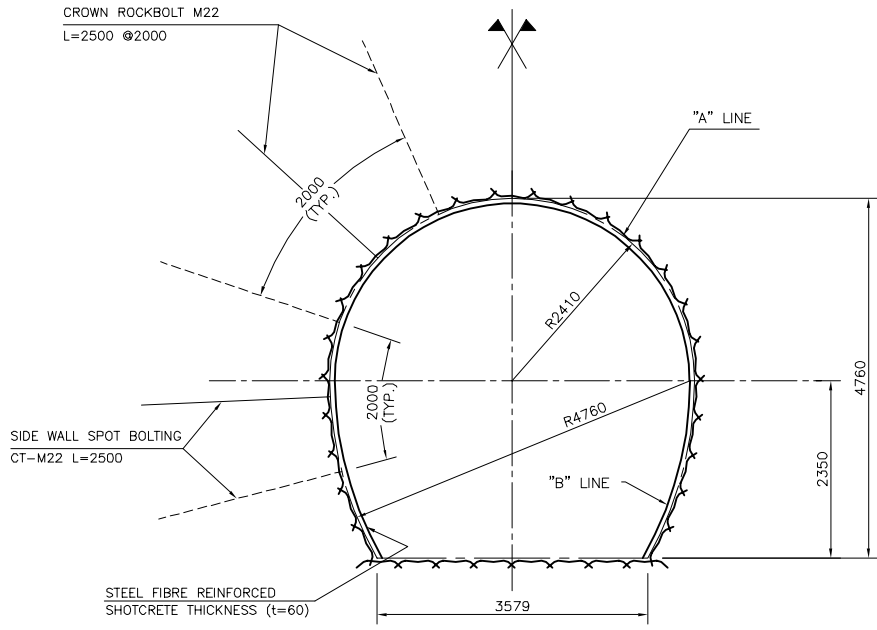
CLIENT ORIGIN			
PROJECT SHOALHAVEN EXPANSION			
DRAWN F.C.S.	DRAWING CHECK J.A.B.	REVIEWED	APPROVED
DESIGNED J.D.	DESIGN REVIEW	DATE	DATE JAN-2019

TITLE SURGE TANK PLAN VIEW AND PROFILE DETAILS			REV B
SCALE AS SHOWN	DRAWING No IA193700-0400-CI-DRG-001		

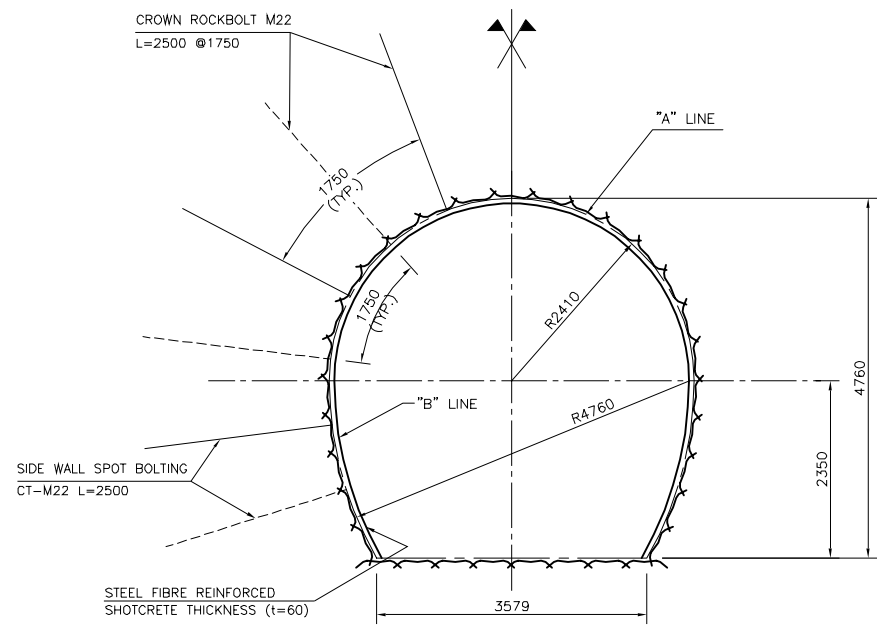
FOR INFORMATION ONLY



TYPICAL SECTION
SCALE 1:50



GT-1
SCALE 1:50
HEADRACE TUNNEL



GT-2
SCALE 1:50

NOTES:

- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETRES.
- SUPPORTING SYSTEM SHALL BE SELECTED ACCORDING THE ACTUAL GEOLOGICAL CONDITIONS.
- FIBRE REINFORCED SHOTCRETE (SFR): ASSUMING 35-40 Kg/m³ OF STEEL FIBRES, ACHIEVING AN ESTIMATED EFNARC TOUGHNESS OF t=700 JOULES, ROUGHLY EQUIVALENT TO 280 JOULES ASTM C1550, AND A FLEXURAL BEAM FR4=2.5MPA.
- BOLTS: DSI CT-BOLT (CEMENT GROUTED) BAR CORE DIAMETER 21.7mm DIAMETER FOR PERMANENT SUPPORT OR M22 GALVANISED BAR FOR TEMPORARY SUPPORT, 600 MPa YIELD STRENGTH, 840 MPa TENSILE STRENGTH, 2.92 Kg/m, PRETENSIONED TO 50kN.
- STRIP DRAINS TO BE PROVIDED AS REQUIRED TO CONTROL WATER INGRESS DURING CONSTRUCTION.
- "A" LINE DEFINES THE THEORETICAL EXCAVATION LINE WITHIN NO UNEXCAVATED MATERIAL SHALL ENCROACH.
- "B" LINE IS THE LINE INTO WHICH THE PRIMARY SUPPORT MUST NOT ENCROACH AFTER ALLOWING FOR CONVERGENCE AND CONSTRUCTION TOLERANCES.

B	FEB.-2019	C.B.M.	J.A.B.	A.H.	FOR CLIENT REVIEW
A	FEB.-2019	F.C.S.	J.A.B.	A.H.	FOR INTERNAL REVIEW
REV	DATE	DRAWN	REV'D	APP'D	REVISION

JACOBS

CLIENT ORIGIN			
PROJECT SHOALHAVEN EXPANSION			
DRAWN F.C.S.	DRAWING CHECK J.A.B.	REVIEWED	APPROVED
DESIGNED Z.T.	DESIGN REVIEW S.R.	DATE	DATE FEB.-2019

TITLE HEADRACE TUNNEL TYPICAL SECTION EXCAVATION AND SUPPORT CLASSES		
SCALE AS SHOWN	DRAWING No IA193700-0500-CI-DRG-002-1	REV B

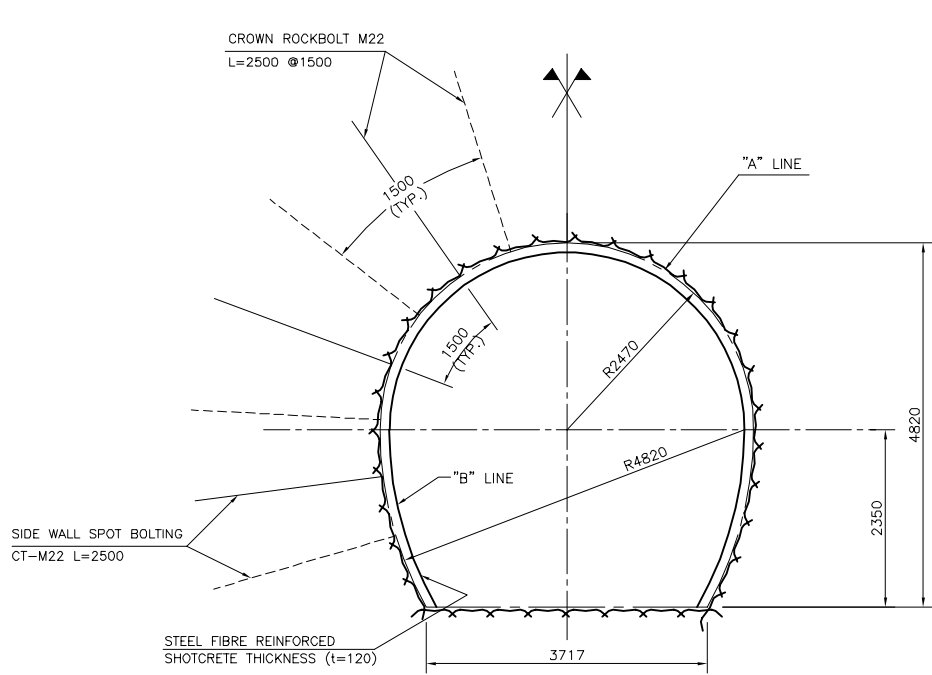
FOR INFORMATION ONLY

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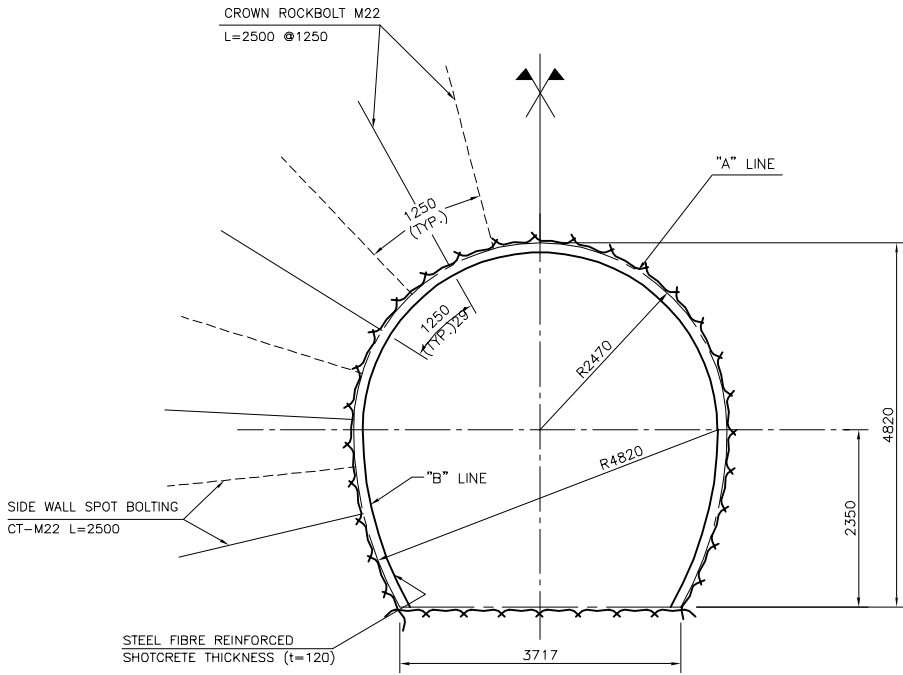
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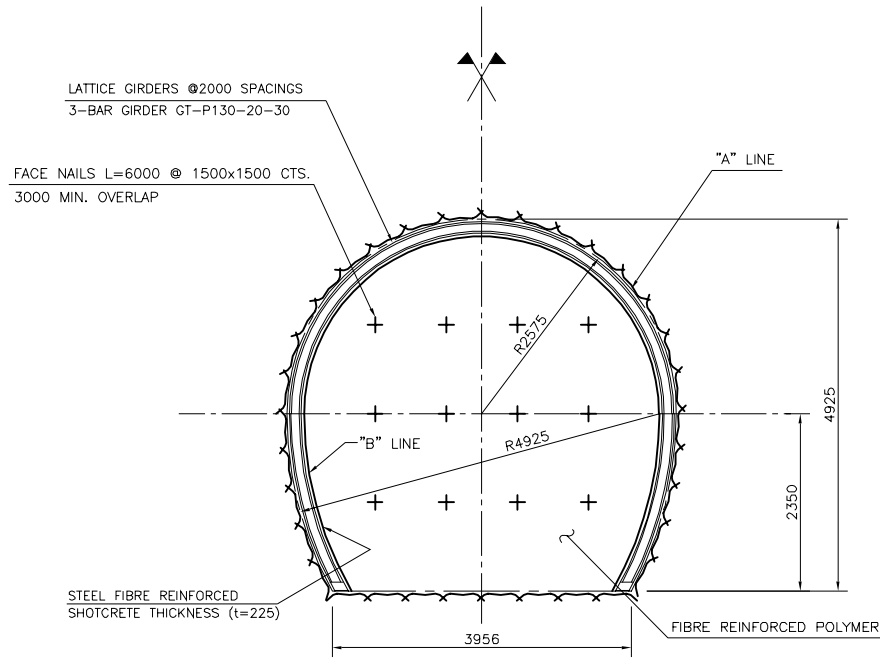
D



GT-3
SCALE 1:50



GT-4
SCALE 1:50
HEADRACE TUNNEL



GT-5
SCALE 1:50

NOTES:

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- FIBRE REINFORCED SHOTCRETE (SFR): ASSUMING 35-40 Kg/m³ OF STEEL FIBRES, ACHIEVING AN ESTIMATED EFNARC TOUGHNESS OF t=700 JOULES, ROUGHLY EQUIVALENT TO 280 JOULES ASTM C1550, AND A FLEXURAL BEAM FR4=2.5MPa.
- BOLTS: DSI CT-BOLT (CEMENT GROUTED) BAR CORE DIAMETER 21.7mm DIAMETER FOR PERMANENT SUPPORT OR M22 GALVANISED BAR FOR TEMPORARY SUPPORT, 600 MPa YIELD STRENGTH, 840 MPa TENSILE STRENGTH, 2.92 Kg/m, PRETENSIONED TO 50kN.
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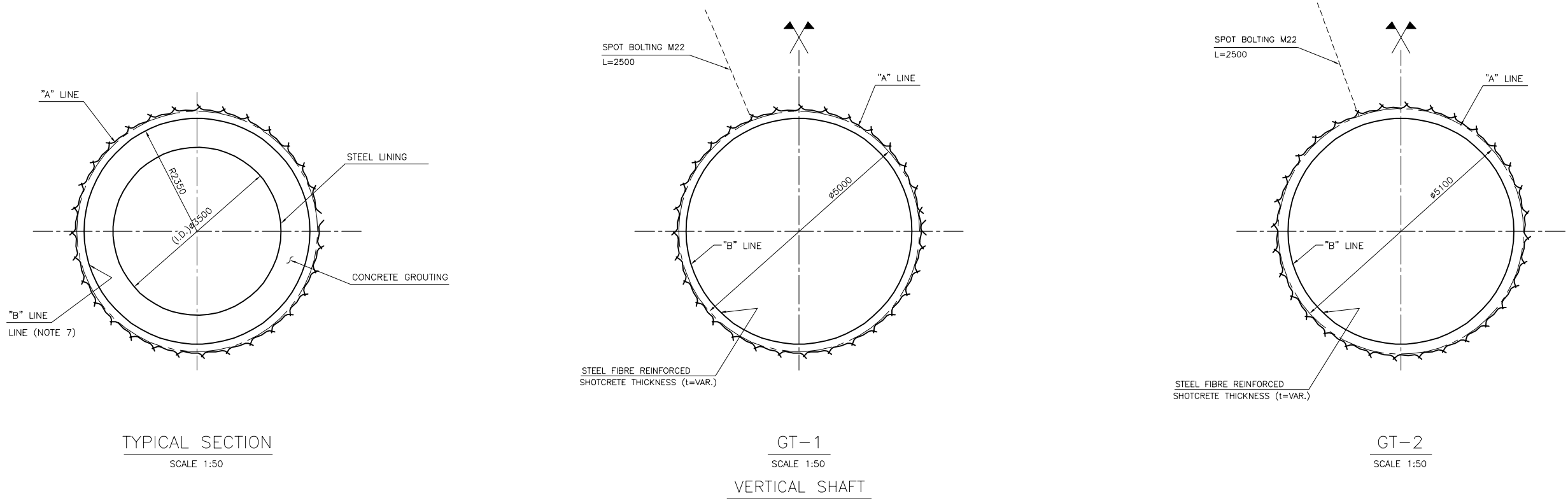
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B	FEB.-2019	F.C.S.	C.B.M.	A.H.	FOR CLIENT REVIEW
A	FEB.-2019	F.C.S.	J.A.B.	A.H.	FOR INTERNAL REVIEW

JACOBS

CLIENT ORIGIN			
PROJECT SHOALHAVEN EXPANSION			
DRAWN F.C.S.	DRAWING CHECK J.A.B.	REVIEWED	APPROVED
DESIGNED Z.T.	DESIGN REVIEW S.R.	DATE	DATE FEB.-2019

TITLE HEADRACE TUNNEL TYPICAL SECTION EXCAVATION AND SUPPORT CLASSES		
SCALE AS SHOWN	DRAWING No IA193700-0500-CI-DRG-002-2	REV B

FOR INFORMATION ONLY



TYPICAL SECTION
SCALE 1:50

GT-1
SCALE 1:50
VERTICAL SHAFT

GT-2
SCALE 1:50

PRIMARY SHAFT WALLS SUPPORT					
GROUND TYPE	SUPPORT	STEEL FIBRE REINFORCED SHOTCRETE THICKNESS VS SHAFT DEPTH (mm)			
		DEPTH < 100 m	100 < DEPTH < 200 m	200 < DEPTH < 300 m	300 < DEPTH < 420 m
GT-1	SPOT BOLTING AS REQUIRED	150	150	200	250
GT-2	SPOT BOLTING AS REQUIRED	150	200	250	300

- NOTES:
- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETRES.
 - SUPPORTING SYSTEM SHALL BE SELECTED ACCORDING THE ACTUAL GEOLOGICAL CONDITIONS.
 - FIBRE REINFORCED SHOTCRETE (SFR): ASSUMING 35-40 Kg/m³ OF STEEL FIBRES, ACHIEVING AN ESTIMATED EFNARC TOUGHNESS OF t=700 JOULES, ROUGHLY EQUIVALENT TO 280 JOULES ASTM C1550, AND A FLEXURAL BEAM FR4=2.5MPa.
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 - "B" LINE IS THE LINE INTO WHICH THE PRIMARY SUPPORT MUST NOT ENCR OACH AFTER ALLOWING FOR CONVERGENCE AND CONSTRUCTION TOLERANCES.

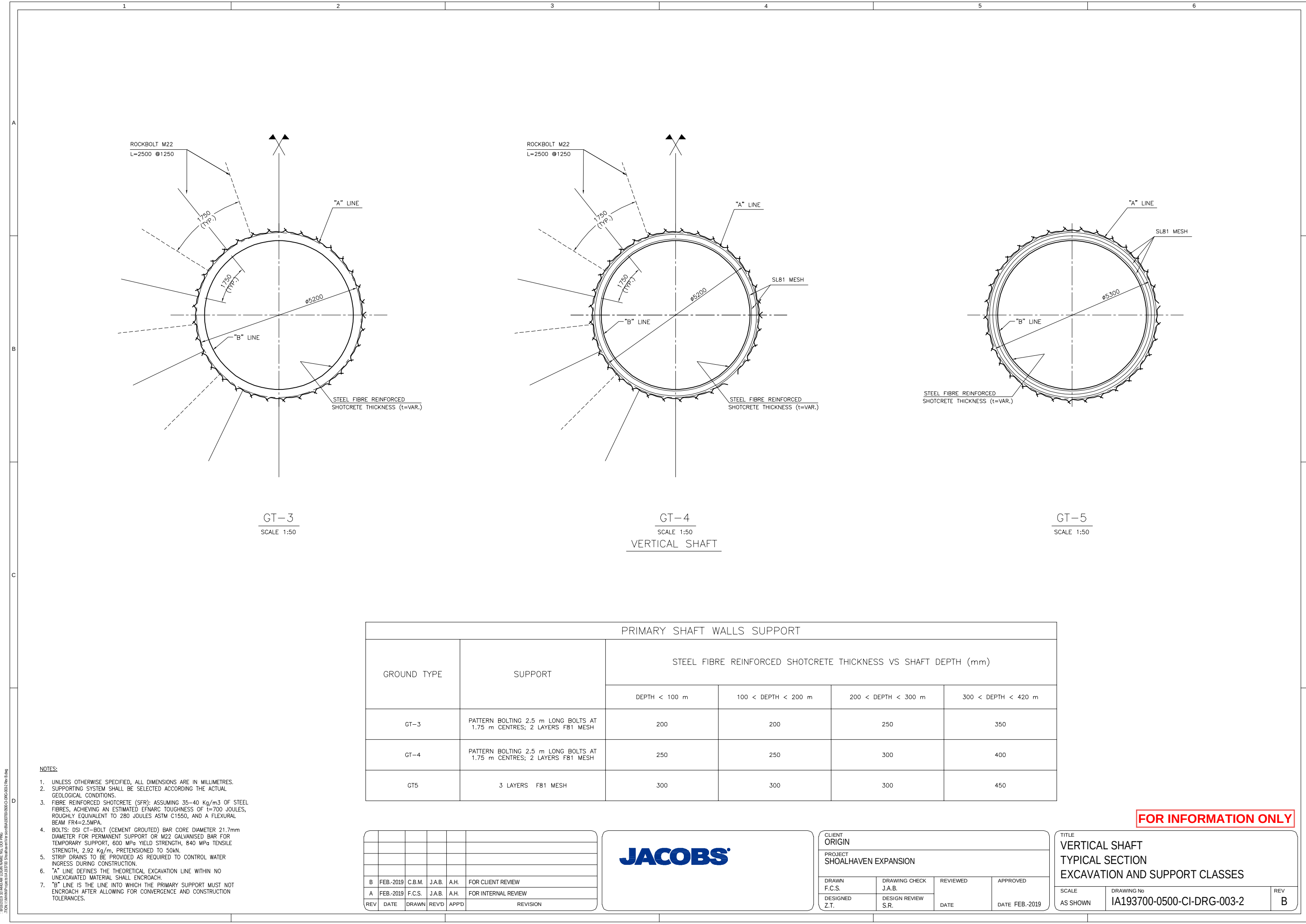
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A	FEB.-2019	F.C.S.	J.A.B.	A.H.	FOR INTERNAL REVIEW
REV	DATE	DRAWN	REV'D	APP'D	REVISION

JACOBS

CLIENT ORIGIN			
PROJECT SHOALHAVEN EXPANSION			
DRAWN F.C.S.	DRAWING CHECK J.A.B.	REVIEWED	APPROVED
DESIGNED Z.T.	DESIGN REVIEW S.R.	DATE	DATE FEB.-2019

TITLE VERTICAL SHAFT TYPICAL SECTION EXCAVATION AND SUPPORT CLASSES		
SCALE AS SHOWN	DRAWING No IA193700-0500-CI-DRG-003-1	REV B

FOR INFORMATION ONLY



GT-3
SCALE 1:50

GT-4
SCALE 1:50
VERTICAL SHAFT

GT-5
SCALE 1:50

PRIMARY SHAFT WALLS SUPPORT					
GROUND TYPE	SUPPORT	STEEL FIBRE REINFORCED SHOTCRETE THICKNESS VS SHAFT DEPTH (mm)			
		DEPTH < 100 m	100 < DEPTH < 200 m	200 < DEPTH < 300 m	300 < DEPTH < 420 m
GT-3	PATTERN BOLTING 2.5 m LONG BOLTS AT 1.75 m CENTRES; 2 LAYERS F81 MESH	200	200	250	350
GT-4	PATTERN BOLTING 2.5 m LONG BOLTS AT 1.75 m CENTRES; 2 LAYERS F81 MESH	250	250	300	400
GT5	3 LAYERS F81 MESH	300	300	300	450

NOTES:

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- SUPPORTING SYSTEM SHALL BE SELECTED ACCORDING TO THE ACTUAL GEOLOGICAL CONDITIONS.
- FIBRE REINFORCED SHOTCRETE (SFR): ASSUMING 35-40 Kg/m³ OF STEEL FIBRES, ACHIEVING AN ESTIMATED EFNARC TOUGHNESS OF t=700 JOULES, ROUGHLY EQUIVALENT TO 280 JOULES ASTM C1550, AND A FLEXURAL BEAM FR4=2.5MPa.
- BOLTS: DSI CT-BOLT (CEMENT GROUTED) BAR CORE DIAMETER 21.7mm DIAMETER FOR PERMANENT SUPPORT OR M22 GALVANISED BAR FOR TEMPORARY SUPPORT, 600 MPa YIELD STRENGTH, 840 MPa TENSILE STRENGTH, 2.92 Kg/m, PRETENSIONED TO 50kN.
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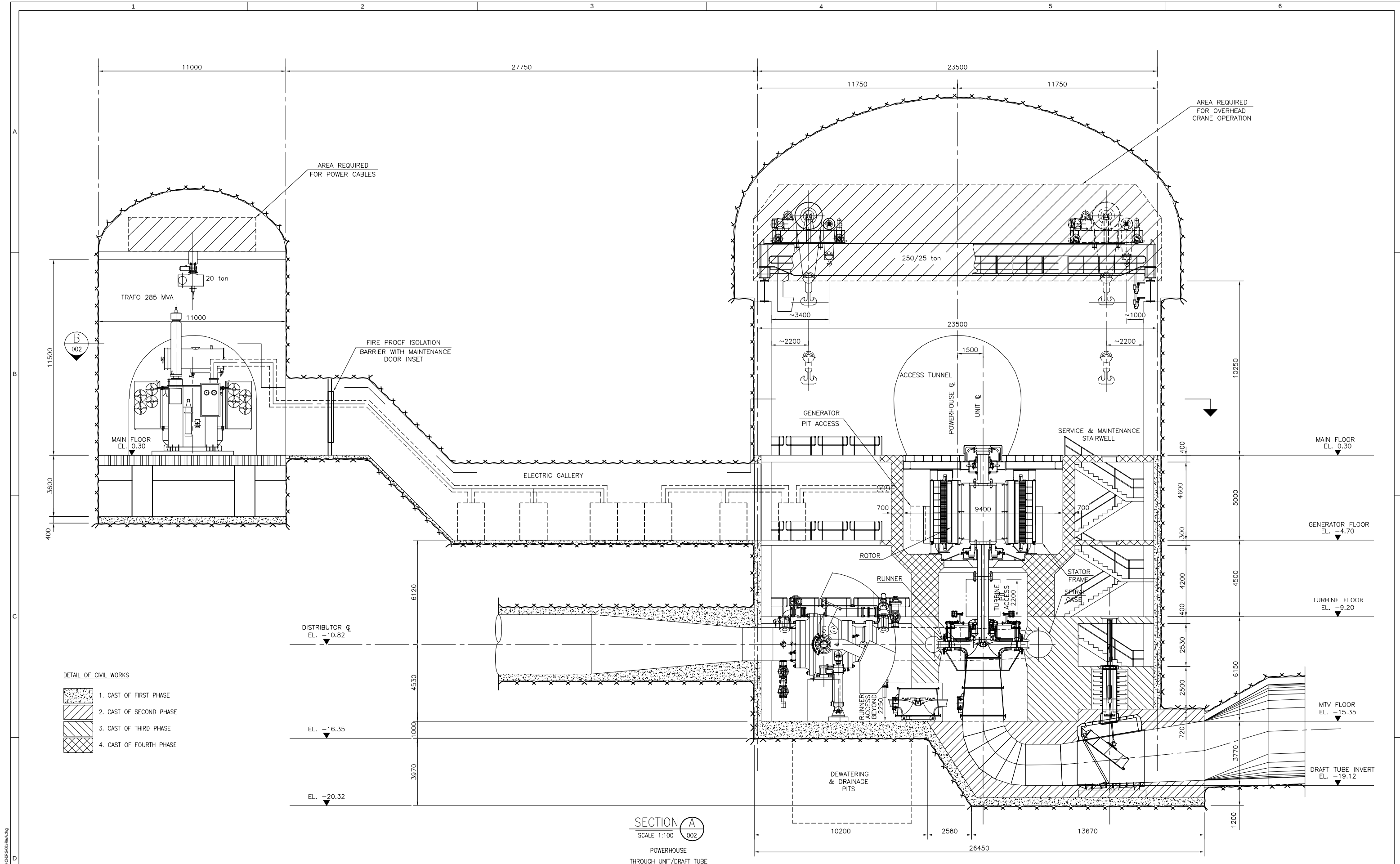
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A	FEB.-2019	F.C.S.	J.A.B.	A.H.	FOR INTERNAL REVIEW
REV	DATE	DRAWN	REV'D	APP'D	REVISION

JACOBS

CLIENT ORIGIN			
PROJECT SHOALHAVEN EXPANSION			
DRAWN F.C.S.	DRAWING CHECK J.A.B.	REVIEWED	APPROVED
DESIGNED Z.T.	DESIGN REVIEW S.R.	DATE	DATE FEB.-2019

TITLE VERTICAL SHAFT TYPICAL SECTION EXCAVATION AND SUPPORT CLASSES		
SCALE AS SHOWN	DRAWING No IA193700-0500-CI-DRG-003-2	REV B

FOR INFORMATION ONLY



- DETAIL OF CIVIL WORKS
- 1. CAST OF FIRST PHASE
 - 2. CAST OF SECOND PHASE
 - 3. CAST OF THIRD PHASE
 - 4. CAST OF FOURTH PHASE

- NOTES:
- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS IN METERS.
 - MTV = MAIN TURBINE VALVE.

A	JAN-2019	F.C.S.	C.B.G.	J.A.B.	FOR CLIENT REVIEW
REV	DATE	DRAWN	REV'D	APP'D	REVISION

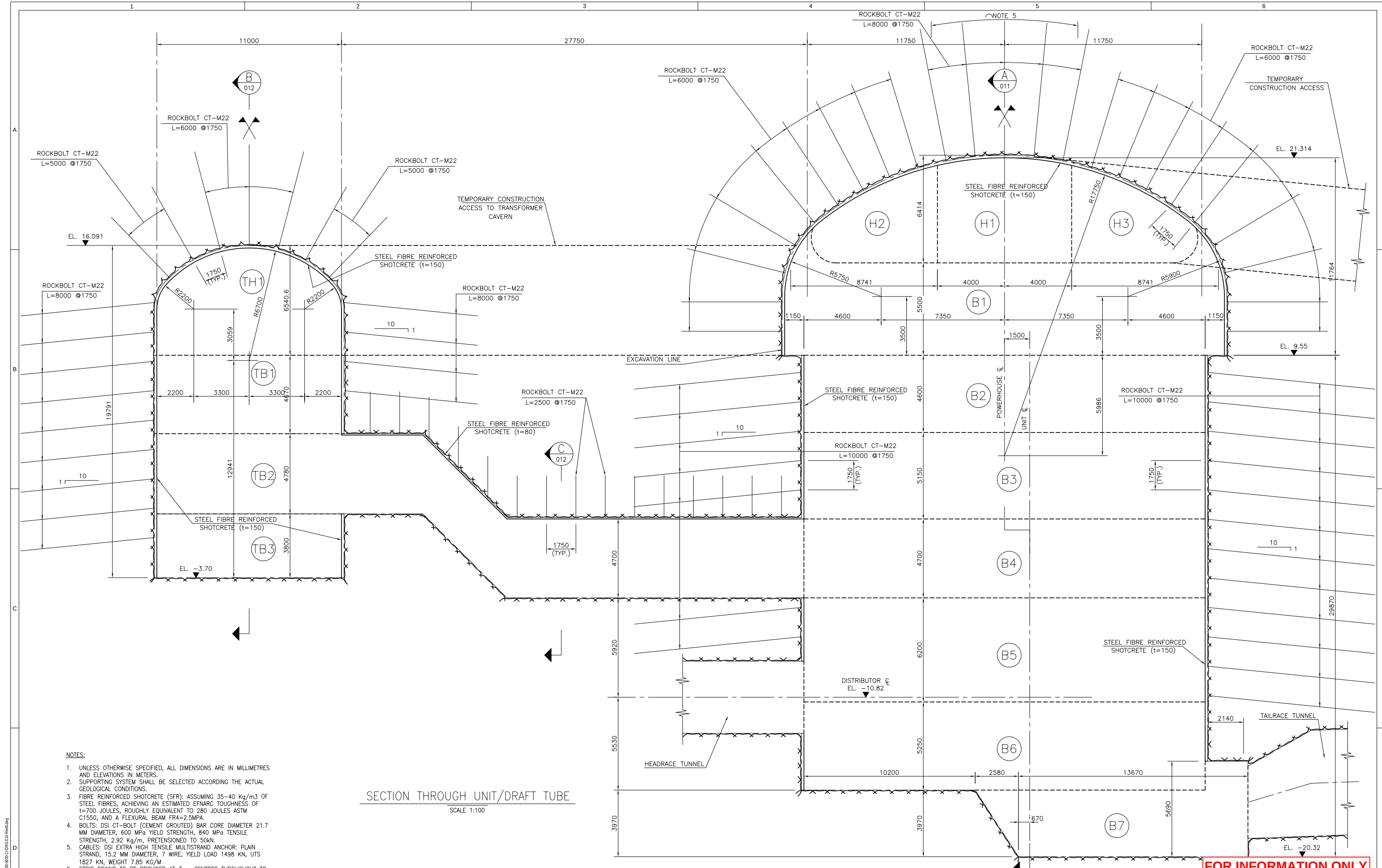
SECTION A
SCALE 1:100
POWERHOUSE
THROUGH UNIT/DRAFT TUBE

JACOBS

CLIENT ORIGIN			
PROJECT SHOALHAVEN EXPANSION			
DRAWN F.C.S.	DRAWING CHECK J.A.B.	REVIEWED	APPROVED
DESIGNED C.B.G.	DESIGN REVIEW J.A.B.	DATE	DATE JAN.-2019

TITLE POWERHOUSE SECTION A		
SCALE AS SHOWN	DRAWING No IA193700-0600-CI-DRG-001	REV A

FOR INFORMATION ONLY



- NOTES:
- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS IN METERS.
 - SUPPORTING SYSTEM SHALL BE SELECTED ACCORDING TO THE ACTUAL GEOLOGICAL CONDITIONS.
 - FIBRE REINFORCED SHOTCRETE (SFR): ASSUMING 35-40 Kg/m³ OF STEEL FIBRES, ACHIEVING AN ESTIMATED ENFARC TOUGHNESS OF t=700 JOULES, ROUGHLY EQUIVALENT TO 280 JOULES ASTM C1550, AND A FLEXURAL BEAM FR4=2.5MPa.
 - BOLTS: DSI CT-BOLT (CEMENT GROUTED) BAR CORE DIAMETER 21.7 MM DIAMETER, 600 MPa YIELD STRENGTH, 840 MPa TENSILE STRENGTH, 2.92 Kg/m, PRETENSIONED TO 50kN.
 - CABLES: DSI EXTRA HIGH TENSILE MULTISTRAND ANCHOR: PLAIN STRAND, 15.2 MM DIAMETER, 7 WIRE, YIELD LOAD 1498 KN, UTS 1827 KN, WEIGHT 7.85 KG/M.
 - STRIP DRAINS TO BE PROVIDED AT 3 m CENTRES THROUGHOUT TO PROVIDE A CONTINUOUS DRAINAGE SYSTEM TO THE SUMP IN THE POWERHOUSE.
 - DRAINAGE RELIEF HOLES FOR POWER HOUSE AND TRANSFORMER HALL, ELECTRIC GALLERY TO BE 46mm AND 4000mm LENGTH AT NOMINAL 4000mm CENTRES TO BE CONNECTED TO STRIP DRAIN SHOTCRETE LINING.
 - FOR POWER HOUSE AND TRANSFORMER HALL PROVIDE SPRAY ON IMPERVIOUS LINING OR MEMBRANE TO SHED SEEPAGE TO SIDE WALL DRAINAGE SYSTEM.

SECTION THROUGH UNIT/DRAFT TUBE
SCALE 1:100

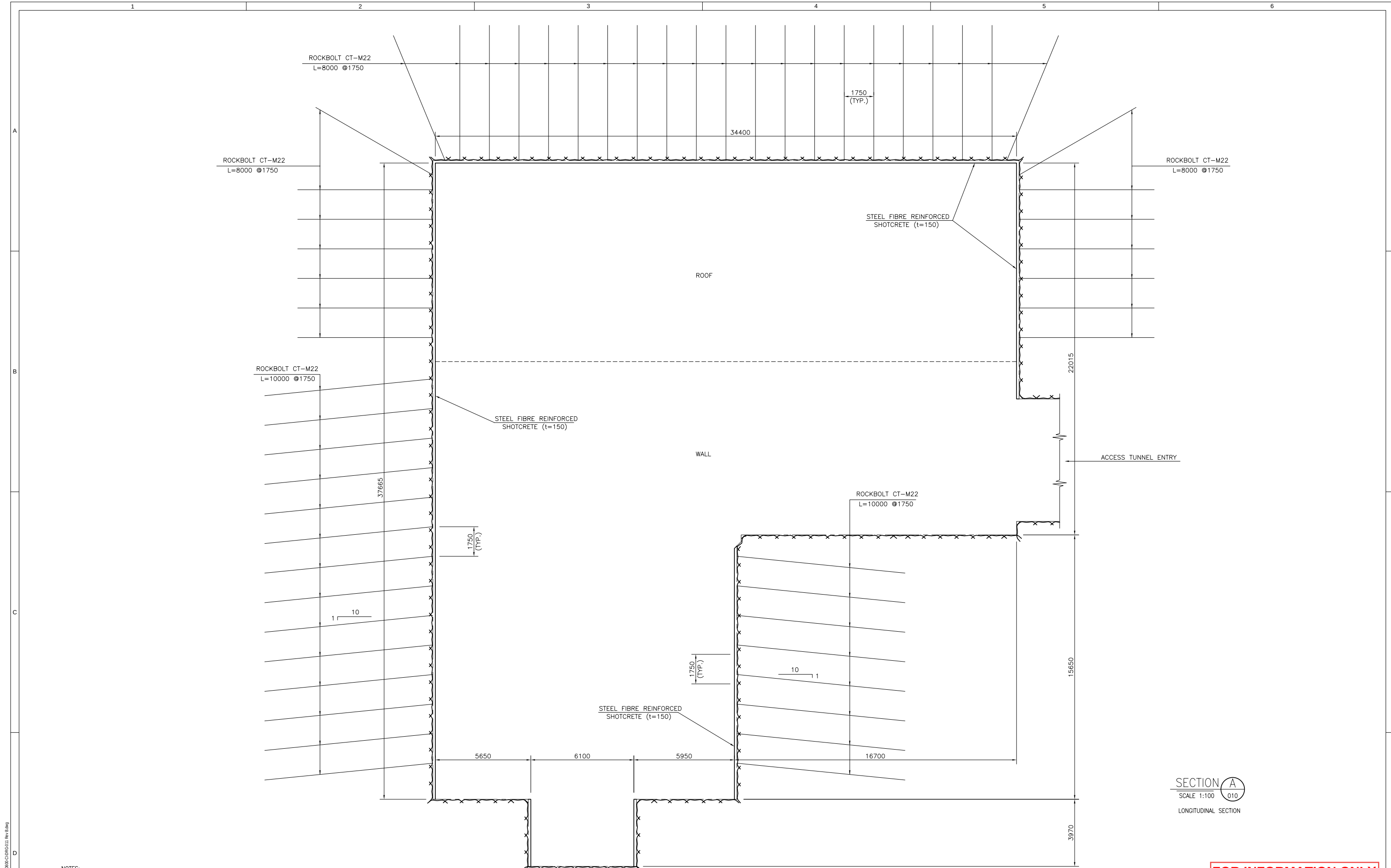
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A	FEB-2019	F.C.S.	J.A.B.	A.H.	FOR INTERNAL REVIEW
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JACOBS

CLIENT ORIGIN			
PROJECT SHOALHAVEN EXPANSION			
DRAWN F.C.S.	DRAWING CHECK J.A.B.	REVIEWED	APPROVED
DESIGNED Z.T.	DESIGN REVIEW S.R.	DATE	DATE FEB-2019

TITLE POWERHOUSE SECTION THROUGH UNIT/DRAFT TUBE EXCAVATION AND SUPPORT			REV B
SCALE AS SHOWN	DRAWING No IA193700-0600-CI-DRG-010		

FOR INFORMATION ONLY



SECTION A
SCALE 1:100 010
LONGITUDINAL SECTION

NOTES:

1. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETRES AND ELEVATIONS IN METERS.
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3. FIBRE REINFORCED SHOTCRETE (SFR): ASSUMING 35-40 Kg/m³ OF STEEL FIBRES, ACHIEVING AN ESTIMATED EFNARC TOUGHNESS OF t=700 JOULES, ROUGHLY EQUIVALENT TO 280 JOULES ASTM C1550, AND A FLEXURAL BEAM FR4=2.5MPA
4. BOLTS: DSI CT-BOLT (CEMENT GROUTED) BAR CORE DIAMETER 21.7 MM DIAMETER, 600 MPa YIELD STRENGTH, 840 MPa TENSILE STRENGTH, 2.92 Kg/m, PRETENSIONED TO 50kN

REV	DATE	DRAWN	REV'D	APP'D	REVISION
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A	FEB-2019	F.C.S.	J.A.B.	A.H.	FOR INTERNAL REVIEW

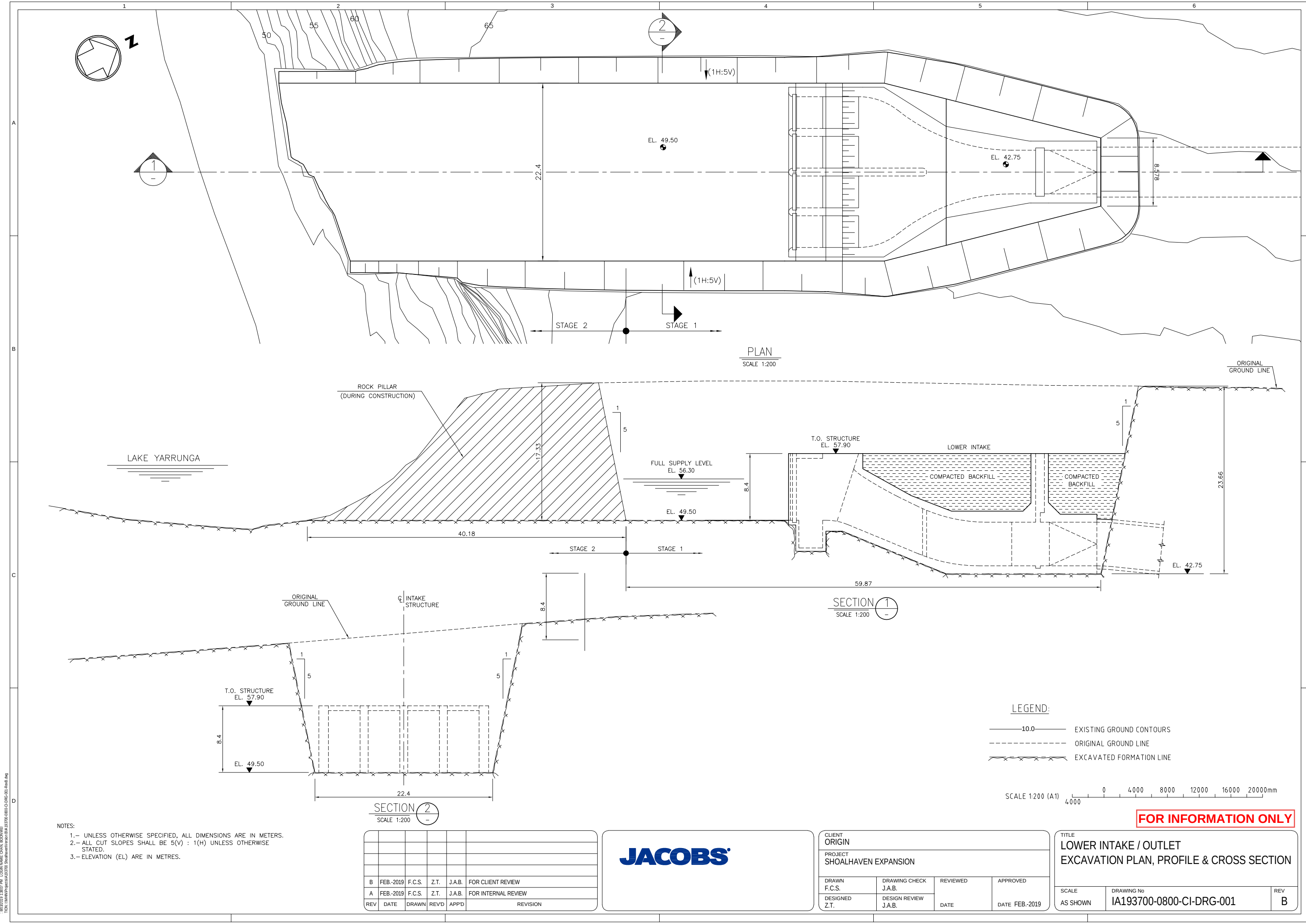
JACOBS

CLIENT ORIGIN			
PROJECT SHOALHAVEN EXPANSION			
DRAWN F.C.S.	DRAWING CHECK J.A.B.	REVIEWED	APPROVED
DESIGNED Z.T.	DESIGN REVIEW S.R.	DATE	DATE FEB.-2019

TITLE POWERHOUSE SECTION A EXCAVATION AND SUPPORT			REV B
SCALE AS SHOWN	DRAWING No IA193700-0600-CI-DRG-011		

FOR INFORMATION ONLY

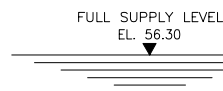
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PLAN @ EL. 60.00

SCALE 1:100



SECTION A
SCALE 1:100

NOTES:
1.- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS.

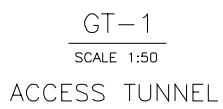
REV	DATE	DRAWN	REV'D	APP'D	REVISION
B	FEB.-2019	F.C.S.	C.B.G.	J.A.B.	FOR CLIENT REVIEW
A	FEB.-2019	F.C.S.	C.B.G.	J.A.B.	FOR INTERNAL REVIEW

JACOBS

CLIENT ORIGIN			
PROJECT SHOALHAVEN EXPANSION			
DRAWN F.C.S.	DRAWING CHECK J.A.B.	REVIEWED	APPROVED
DESIGNED C.B.G.	DESIGN REVIEW J.A.B.	DATE	DATE FEB.-2019

TITLE LOWER INTAKE / OUTLET PLAN VIEW AND PROFILE DETAILS 1/2			REV B
SCALE AS SHOWN	DRAWING No IA193700-0800-CI-DRG-002-1		

FOR INFORMATION ONLY



1. UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETERS.
2. SUPPORTING SYSTEM SHALL BE SELECTED ACCORDING THE ACTUAL GEOLOGICAL CONDITIONS.
3. FIBRE REINFORCED SHOTCRETE (SFR): ASSUMING 35-40 Kg/m³ OF STEEL FIBRES, ACHIEVING AN ESTIMATED EFNARC TOUGHNESS OF 1=700 JOULES, ROUGHLY EQUIVALENT TO 280 JOULES ASTM C1550, AND A FLEXURAL R2=4.5 MPa.
4. BOLTS: DSI CT-BOLT (CEMENT GROUTED) BAR CORE DIAMETER 21.7mm DIAMETER FOR PERMANENT SUPPORT OR M22 GALVANIZED BAR FOR TEMPORARY SUPPORT, 600 MPa YIELD STRENGTH, 840 MPa TENSILE STRENGTH, 2.92 Kg/cm, PRETENSIONED TO 50KN.
5. STRIP DRAINS TO BE PROVIDED AS REQUIRED TO CONTROL WATER INGRESS DURING CONSTRUCTION.
6. "A" LINE DEFINES THE THEORETICAL EXCAVATION LINE WITHIN NO UNEXCAVATED MATERIAL SHALL ENCROACH.
7. "B" LINE IS THE LINE INTO WHICH THE PRIMARY SUPPORT MUST NOT ENCROACH AFTER ALLOWING FOR CONVERGENCE AND CONSTRUCTION TOLERANCES.
8. WEEP HOLES IN THE WALL TO CONNECT TO STRIP DRAINS PLACED AS PART OF PERMANENT LINING.

JACOBS'

TITLE ACCESS TUNNEL TYPICAL SECTION EXCAVATION AND SUPPORT CLASSES		
SCALE	DRAWING No	REV
AS SHOWN	IA193700-1100-CI-DRG-002-1	B

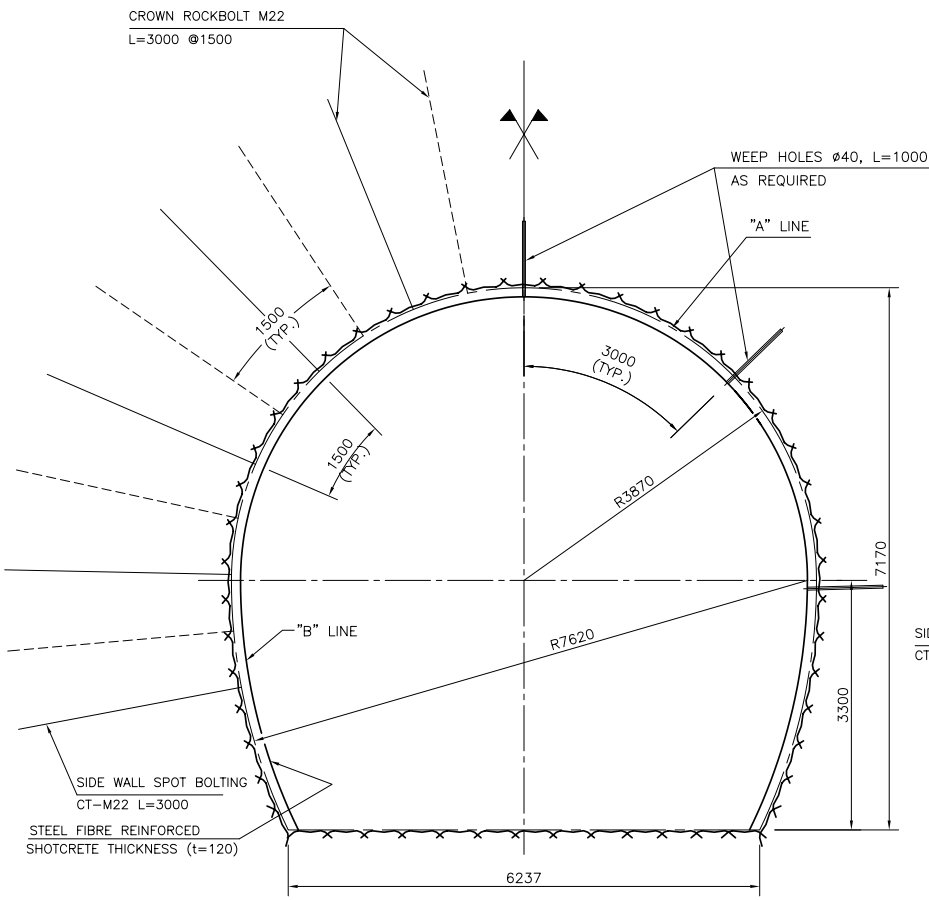
FOR INFORMATION ONLY

A

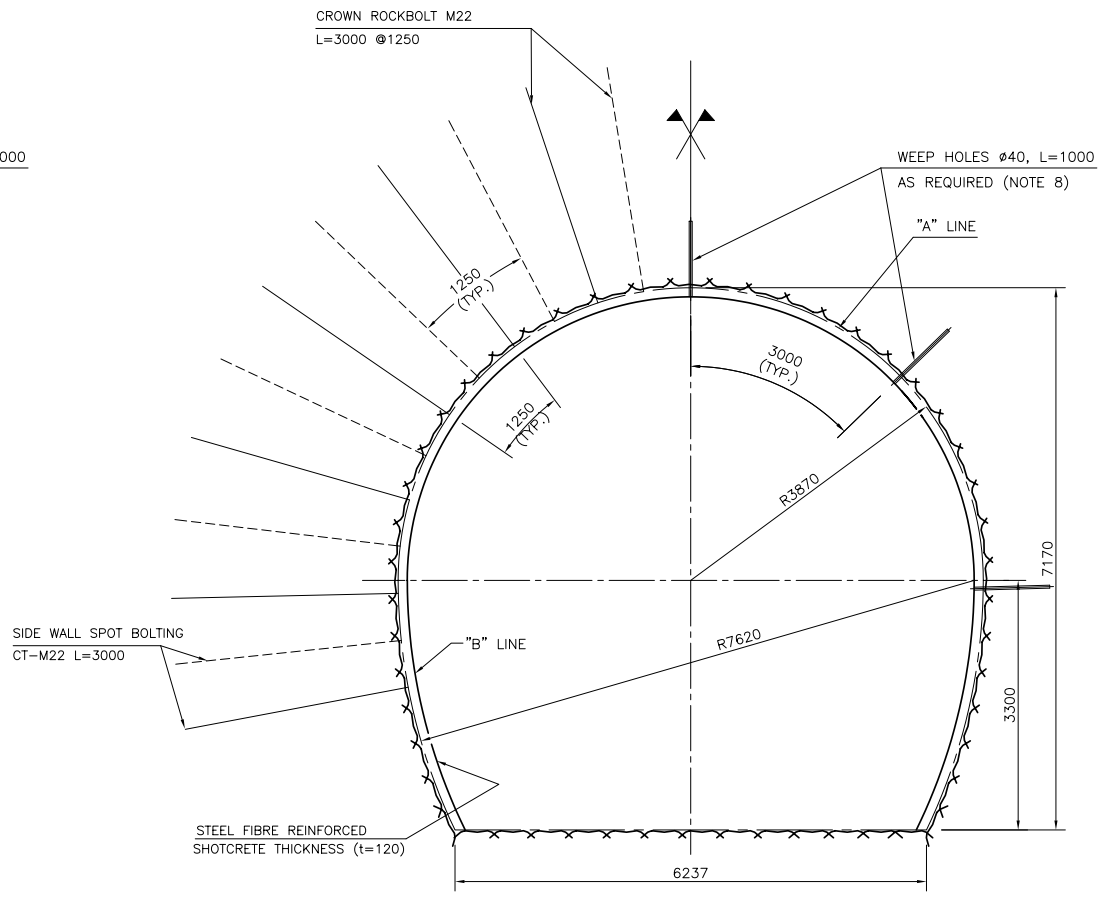
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C

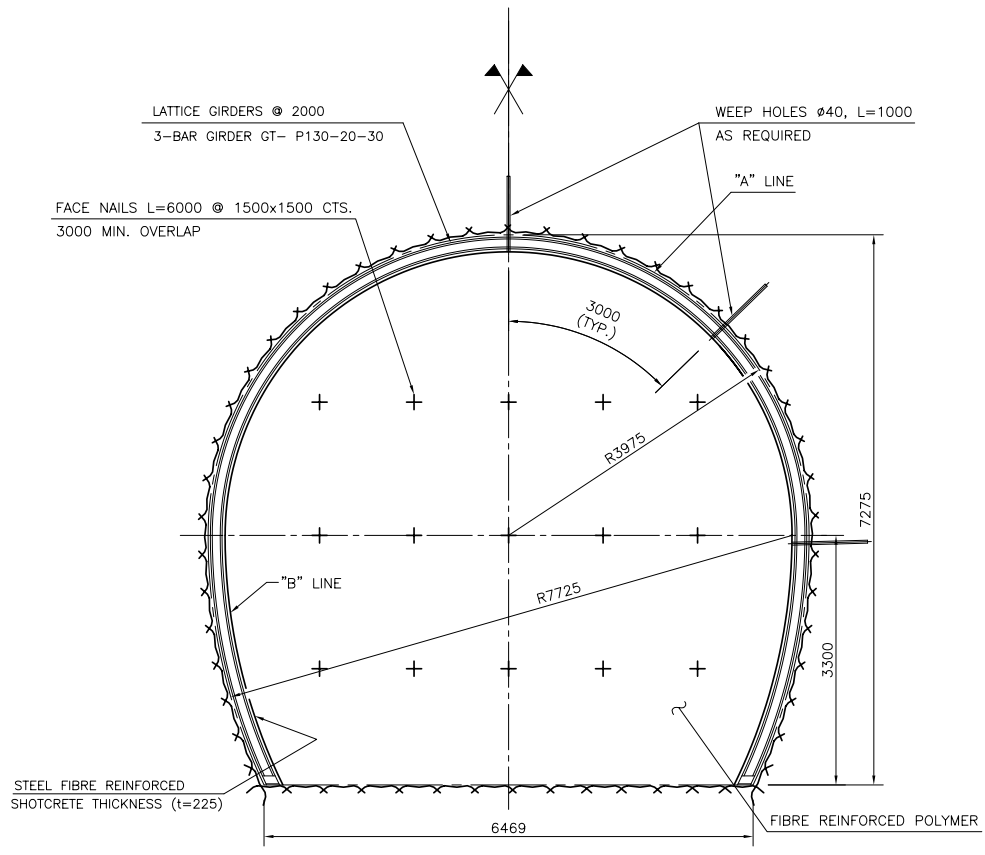
D



GT-3
SCALE 1:50



GT-4
SCALE 1:50



GT-5
SCALE 1:50

ACCESS TUNNEL

ACCESS TUNNEL

NOTES:

- UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN MILLIMETRES.
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- BOLTS: DSI CT-BOLT (CEMENT GROUTED) BAR CORE DIAMETER 21.7mm DIAMETER FOR PERMANENT SUPPORT OR M22 GALVANISED BAR FOR TEMPORARY SUPPORT, 600 MPa YIELD STRENGTH, 840 MPa TENSILE STRENGTH, 2.92 Kg/m, PRETENSIONED TO 50kN.
- STRIP DRAINS TO BE PROVIDED AS REQUIRED TO CONTROL WATER INGRESS DURING CONSTRUCTION.
- "A" LINE DEFINES THE THEORETICAL EXCAVATION LINE WITHIN NO UNEXCAVATED MATERIAL SHALL ENCROACH.
- "B" LINE IS THE LINE INTO WHICH THE PRIMARY SUPPORT MUST NOT ENCROACH AFTER ALLOWING FOR CONVERGENCE AND CONSTRUCTION TOLERANCES.
- WEEP HOLES IN THE WALL TO CONNECT TO STRIP DRAINS PLACED AS PART OF PERMANENT LINING.

B	FEB.-2019	C.B.M.	J.A.B.	A.H.	FOR CLIENT REVIEW
A	FEB.-2019	F.C.S.	J.A.B.	A.H.	FOR INTERNAL REVIEW
REV	DATE	DRAWN	REV'D	APP'D	REVISION

JACOBS

CLIENT ORIGIN			
PROJECT SHOALHAVEN EXPANSION			
DRAWN F.C.S.	DRAWING CHECK J.A.B.	REVIEWED	APPROVED
DESIGNED Z.T.	DESIGN REVIEW S.R.	DATE	DATE FEB.-2019

TITLE ACCESS TUNNEL TYPICAL SECTION EXCAVATION AND SUPPORT CLASSES		
SCALE AS SHOWN	DRAWING No IA193700-1100-CI-DRG-002-2	REV B

FOR INFORMATION ONLY

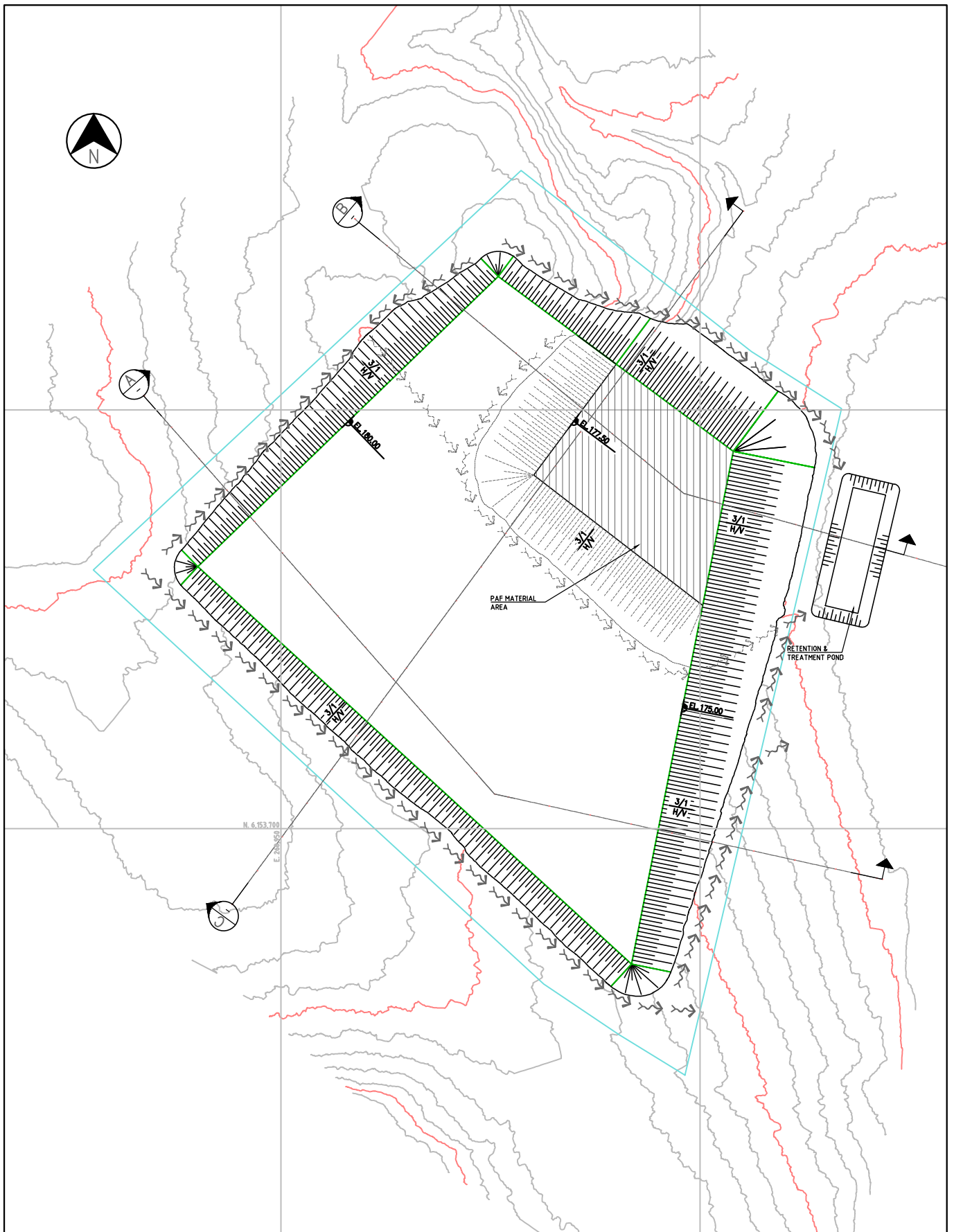
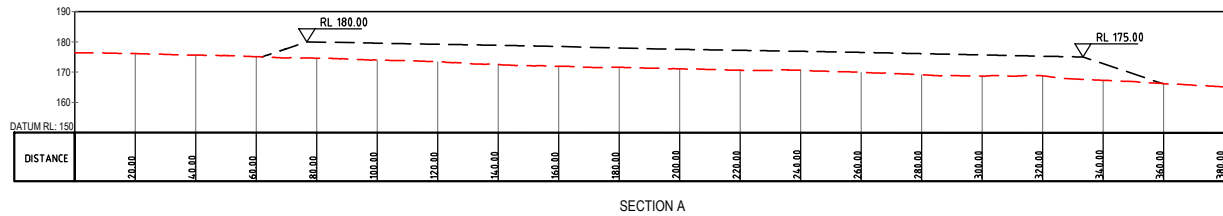


FIGURE 1.3

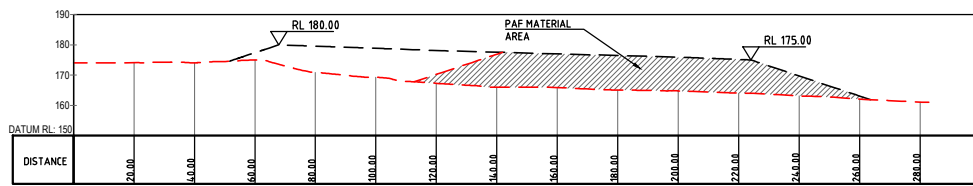
Jacobs

PERMANENT SPOIL AREA CONCEPT - OPTION 2

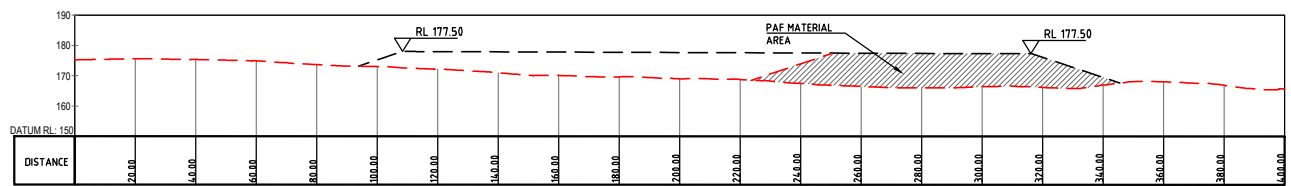
PLAN VIEW



SECTION A



SECTION B



SECTION C

FIGURE 1.4

Jacobs

PERMANENT SPOIL AREA CONCEPT OPTION 2

SECTIONS

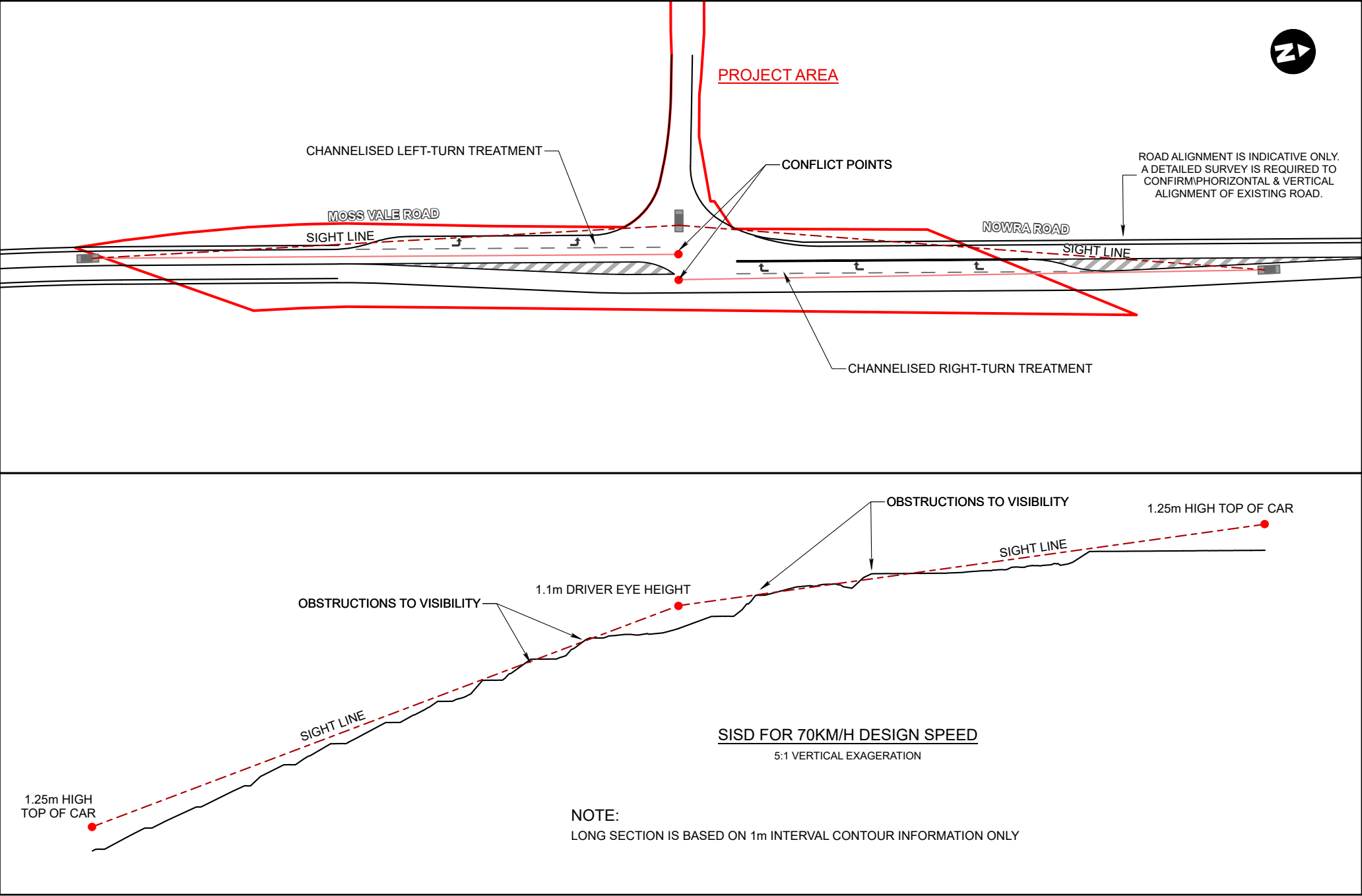


Figure B-1 Indicative intersection upgrade layout