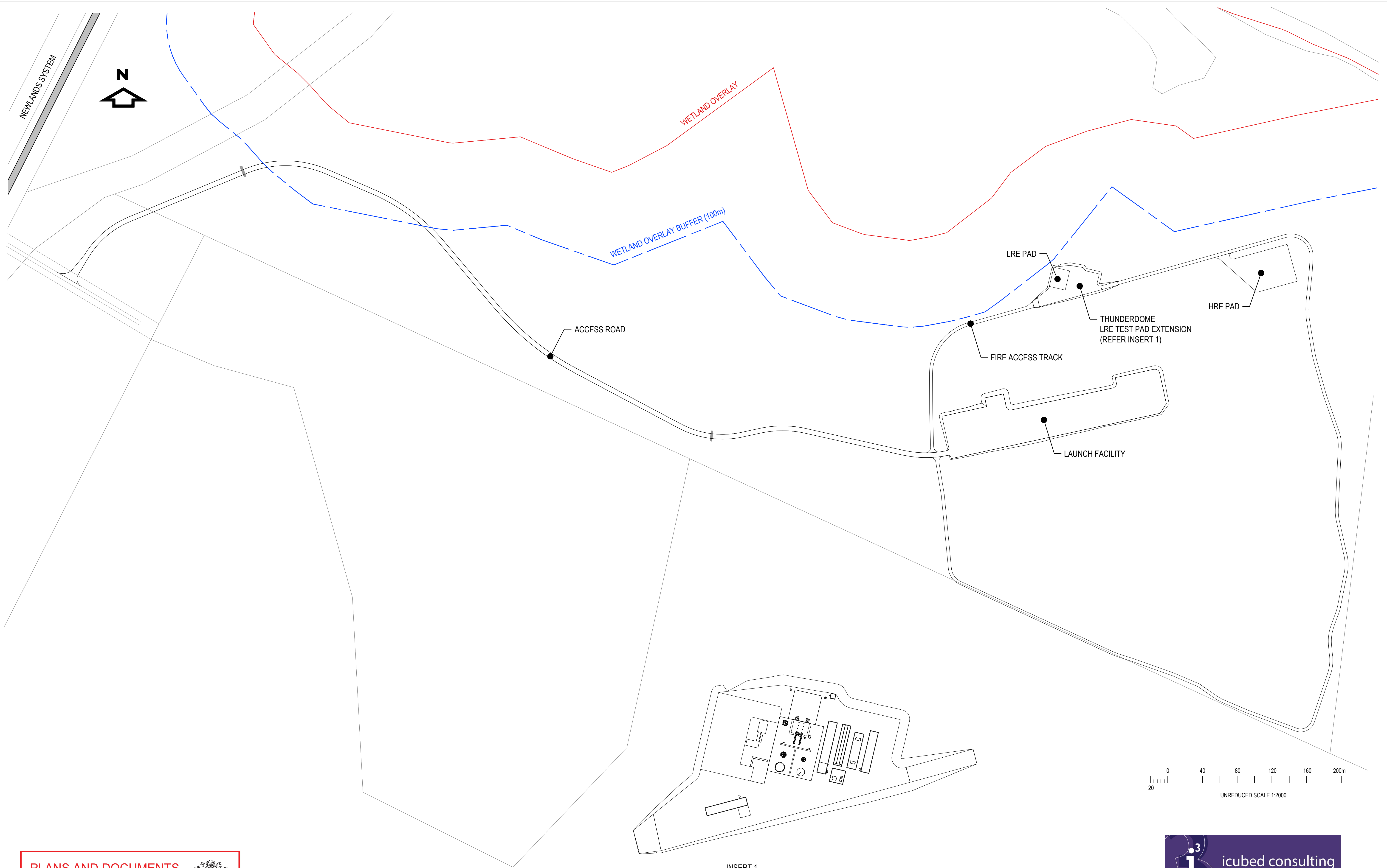




PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006-01

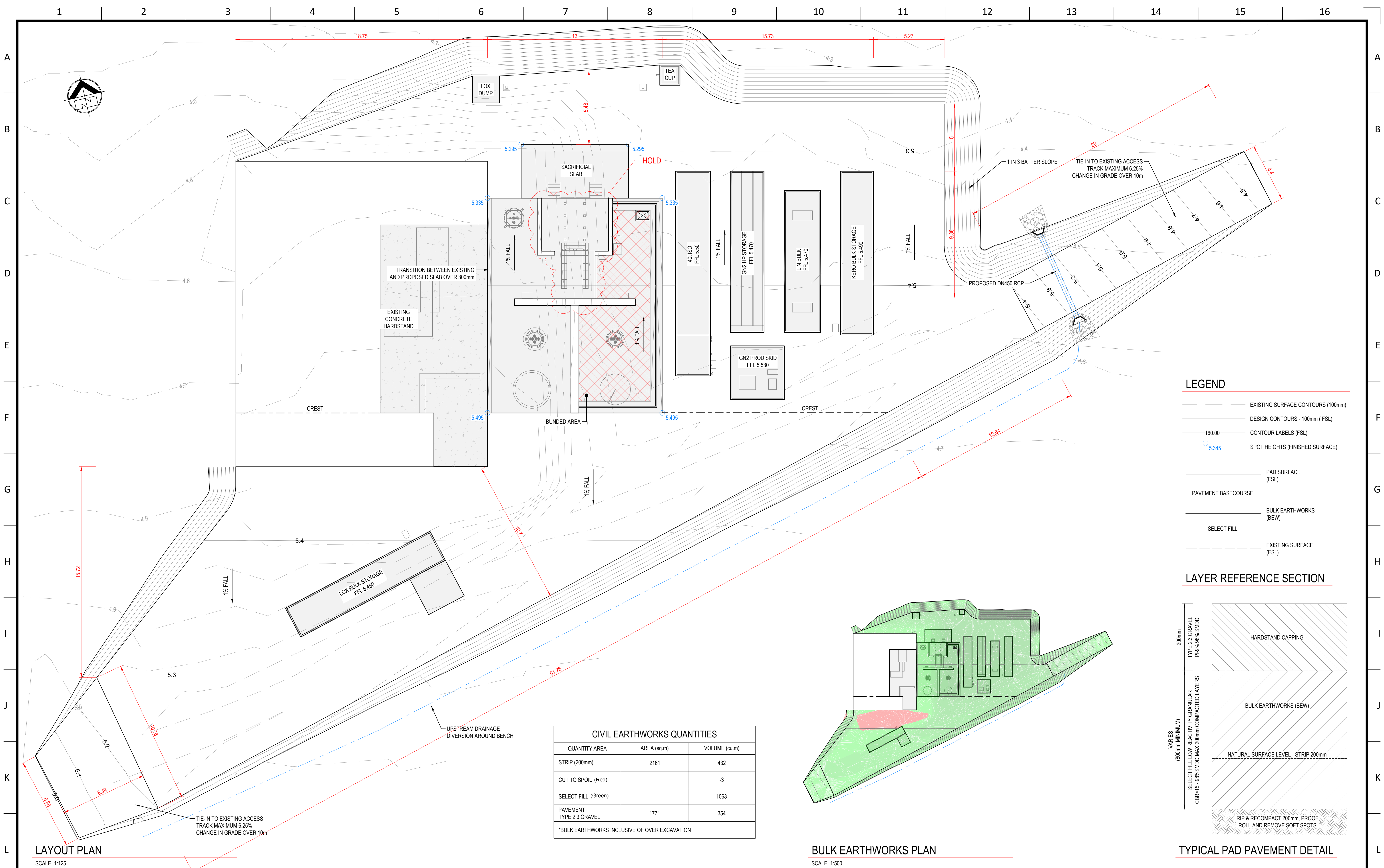
INSERT 1
THUNDERDOME LRE
TEST PAD EXTENSION



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BOWEN ORBITAL SPACEPORT
LAYOUT

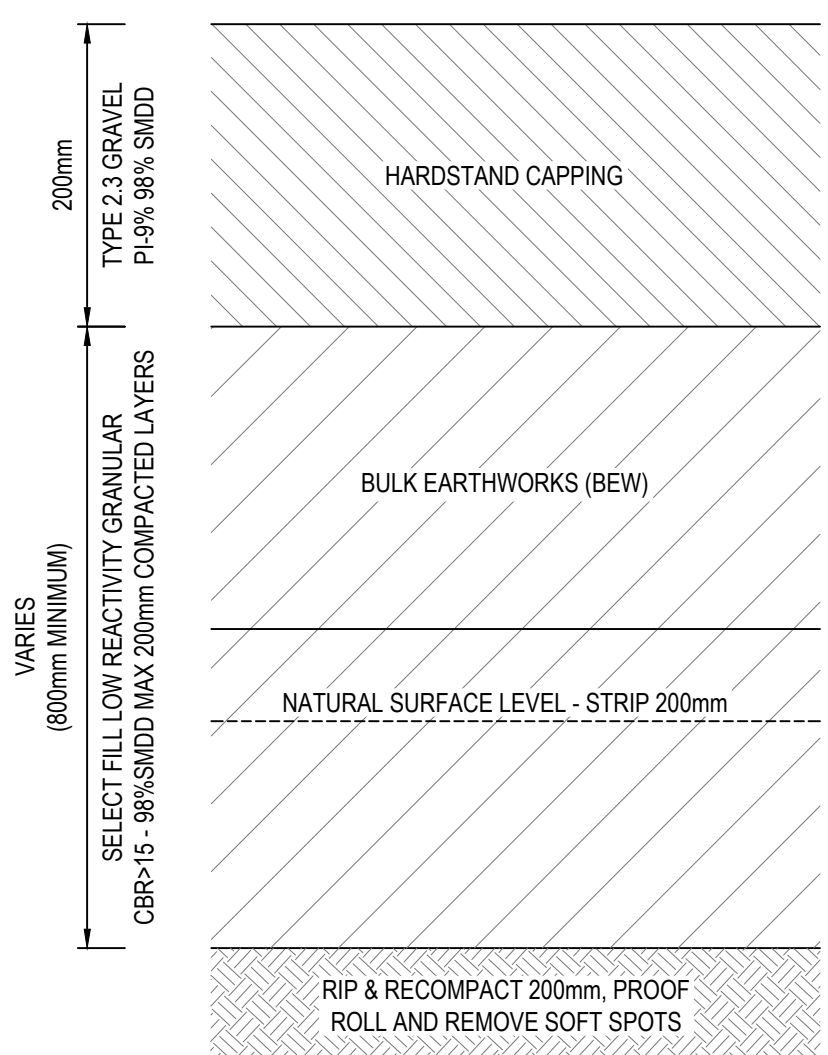
T.J.S. 28/04/2026 21-307-BOS-SK01 A1



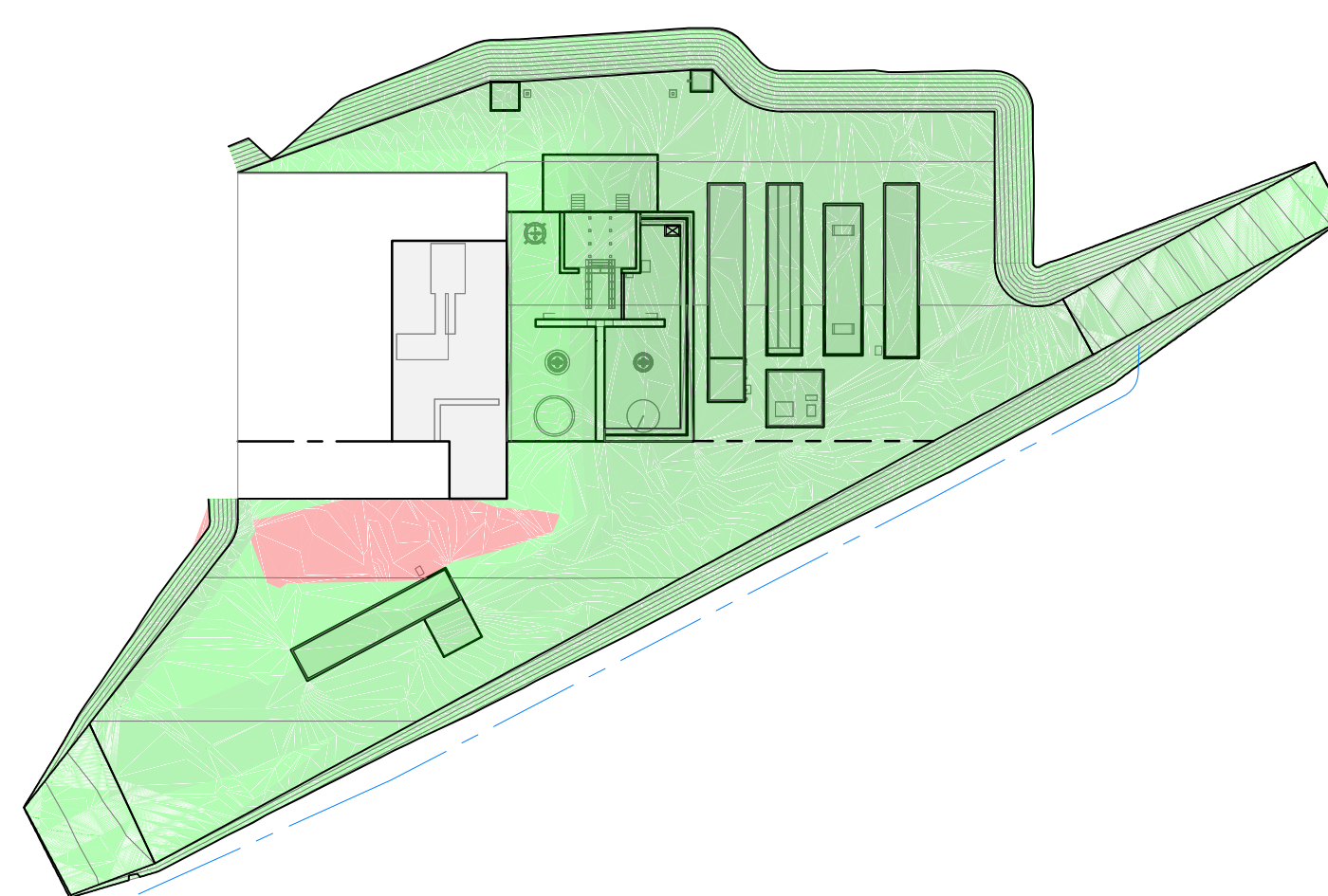
LEGEND	
	EXISTING SURFACE CONTOURS (100mm)
	DESIGN CONTOURS - 100mm (FSL)
	CONTOUR LABELS (FSL)
	SPOT HEIGHTS (FINISHED SURFACE)

	PAD SURFACE (FSL)
	PAVEMENT BASECOURSE
	BULK EARTHWORKS (BEW)
	SELECT FILL
	EXISTING SURFACE (ESL)

LAYER REFERENCE SECTION



CIVIL EARTHWORKS QUANTITIES		
QUANTITY AREA	AREA (sq.m)	VOLUME (cu.m)
STRIP (200mm)	2161	432
CUT TO SPOIL (Red)		-3
SELECT FILL (Green)		1063
PAVEMENT TYPE 2.3 GRAVEL	1771	354
*BULK EARTHWORKS INCLUSIVE OF OVER EXCAVATION		



LAYOUT PLAN

SCALE 1:125

BULK EARTHWORKS PLAN

SCALE 1:500

TYPICAL PAD PAVEMENT DETAIL

REVISION HISTORY		DES	DRN	CHK	APP	DATE
No	DESCRIPTION					
B	BATTER AMENDED	T.J.S.	T.J.S.	P.T.	T.J.S.	21.10.2025
A	FOR REVIEW	T.J.S.	T.J.S.	P.T.	T.J.S.	21.10.2025

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PLANS AND DOCUMENTS referred to in the SDA APPROVAL

SDA approval: APC2024/006-01

STATUS FOR REVIEW

SIZE A1 HEIGHT DATUM AHD

COORDINATE REFERENCE SYSTEM GDA2020 MGA Z55

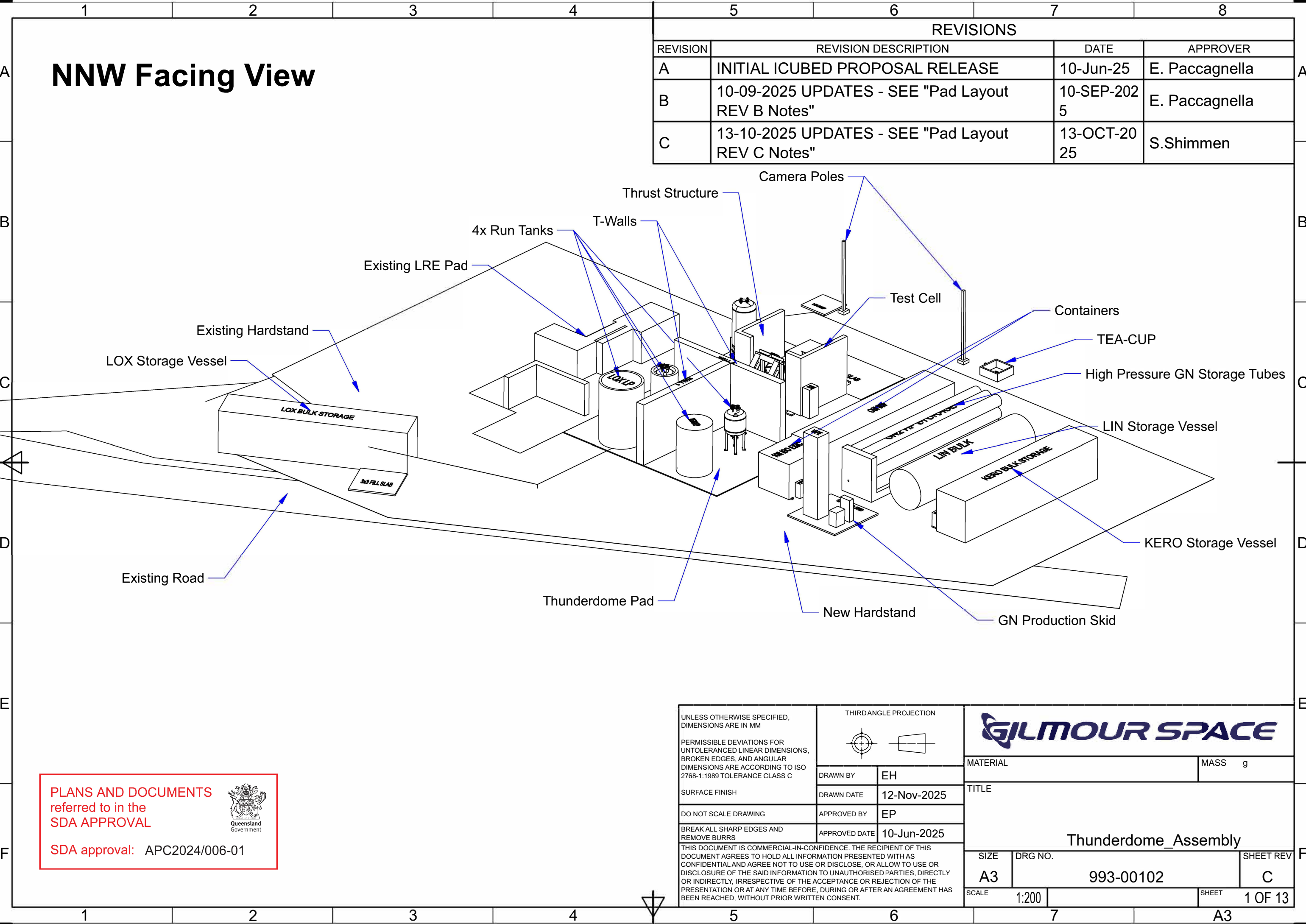
PRINT IN COLOUR

PROJECT BLF THUNDERDOME

TITLE BOWEN ORBITAL SPACE PORT THUNDERDOME LAYOUT PLAN

DRAWING No. GSLE-I3C-CV-DWG-010-01

REV B



REVISIONS			
REVISION	REVISION DESCRIPTION	DATE	APPROVER
A	INITIAL ICUBED PROPOSAL RELEASE	10-Jun-25	E. Paccagnella
B	10-09-2025 UPDATES - SEE "Pad Layout REV B Notes"	10-SEP-2025	E. Paccagnella
C	13-10-2025 UPDATES - SEE "Pad Layout REV C Notes"	13-OCT-2025	S.Shimmen

NNW Facing View

PLANS AND DOCUMENTS referred to in the SDA APPROVAL

SDA approval: APC2024/006-01



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MM

PERMISSIBLE DEVIATIONS FOR UNTOLERANCED LINEAR DIMENSIONS, BROKEN EDGES, AND ANGULAR DIMENSIONS ARE ACCORDING TO ISO 2768-1:1989 TOLERANCE CLASS C

SURFACE FINISH

DO NOT SCALE DRAWING

BREAK ALL SHARP EDGES AND REMOVE BURRS

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THIRD ANGLE PROJECTION

DRAWN BY: EH

DRAWN DATE: 12-Nov-2025

APPROVED BY: EP

APPROVED DATE: 10-Jun-2025

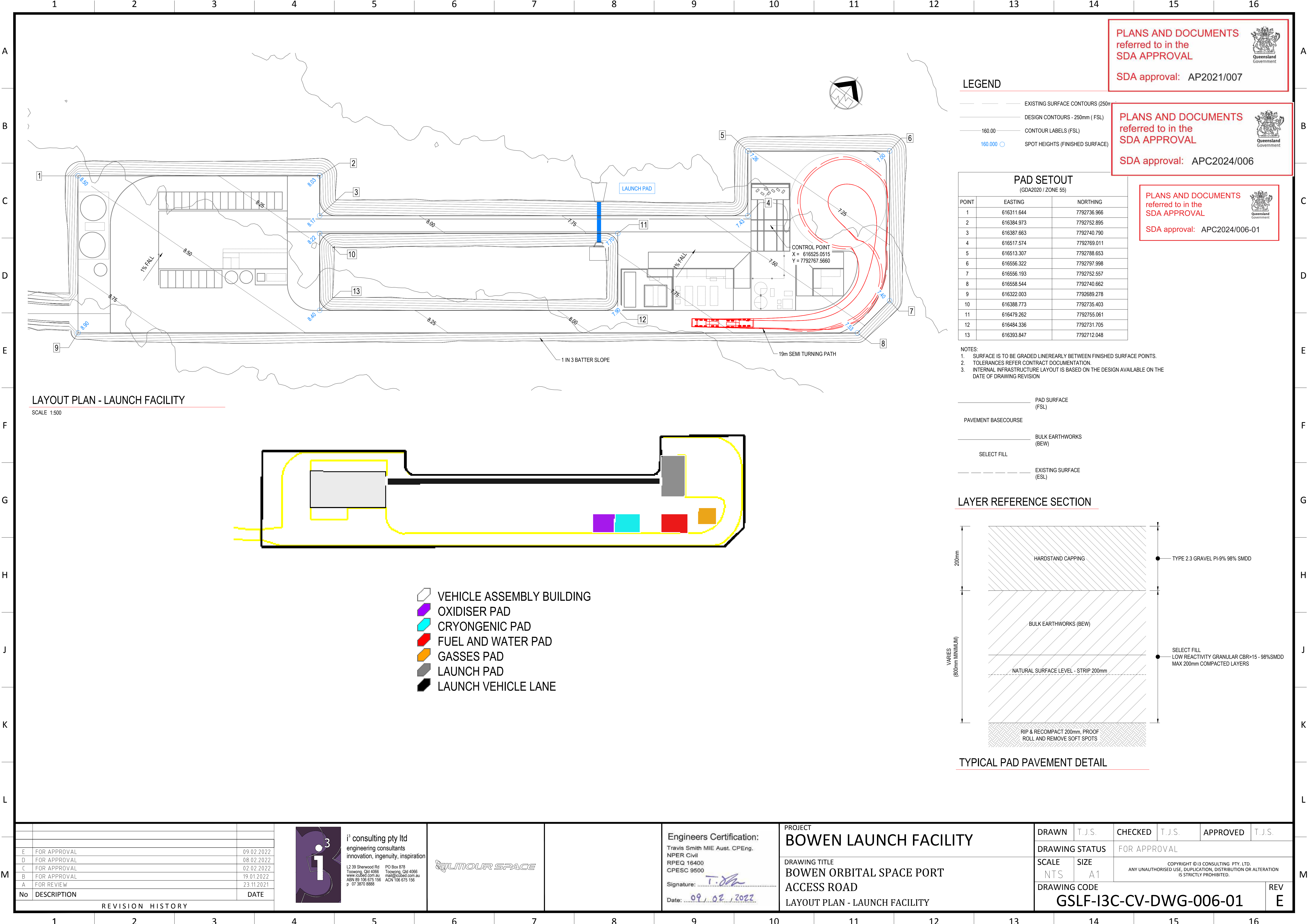
GILMOUR SPACE

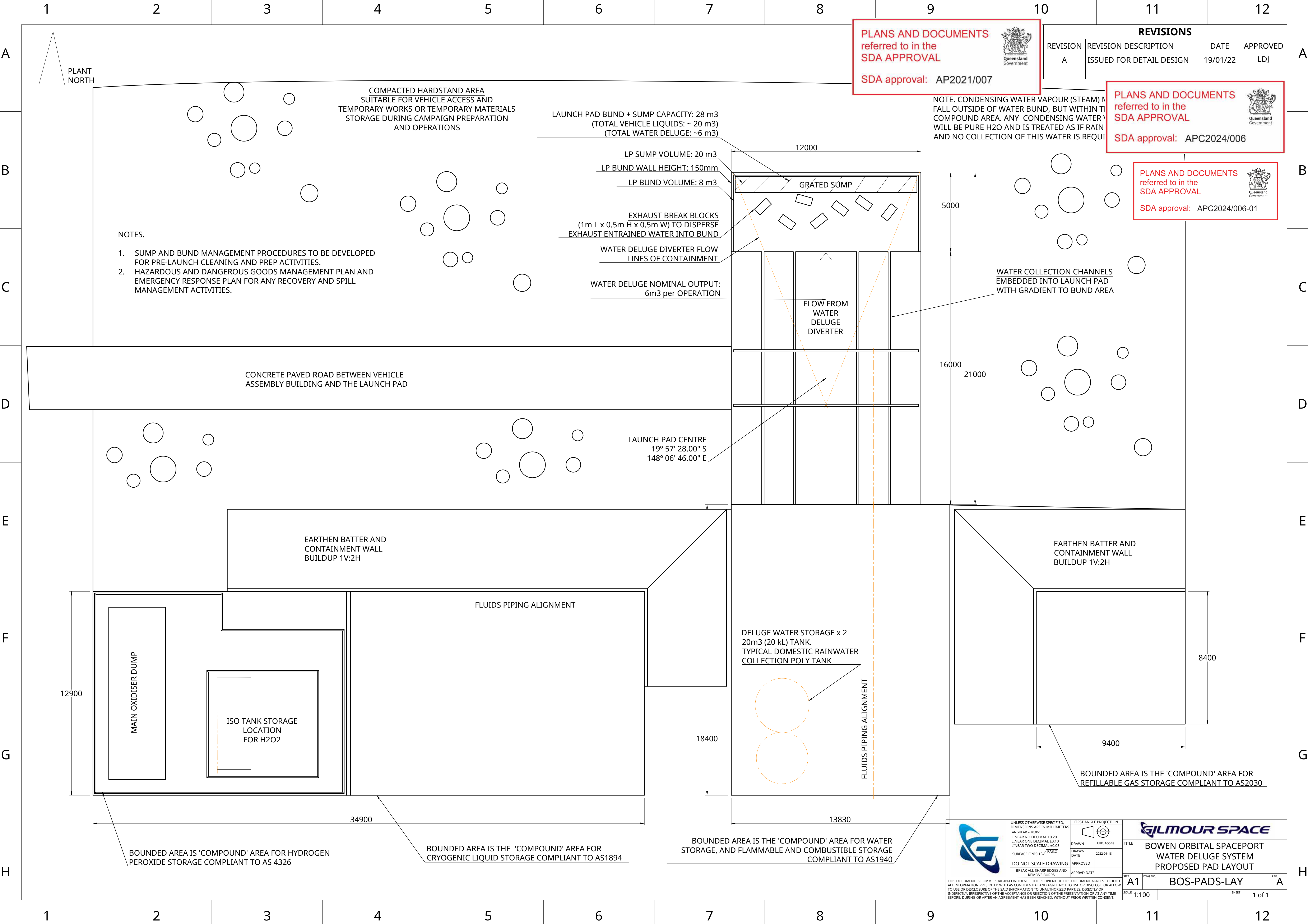
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TITLE: **Thunderdome_Assembly**

SIZE: **A3** DRG NO.: **993-00102** SHEET REV: **C**

SCALE: **1:200** SHEET: **1 OF 13**





PLANS AND DOCUMENTS
referred to in the
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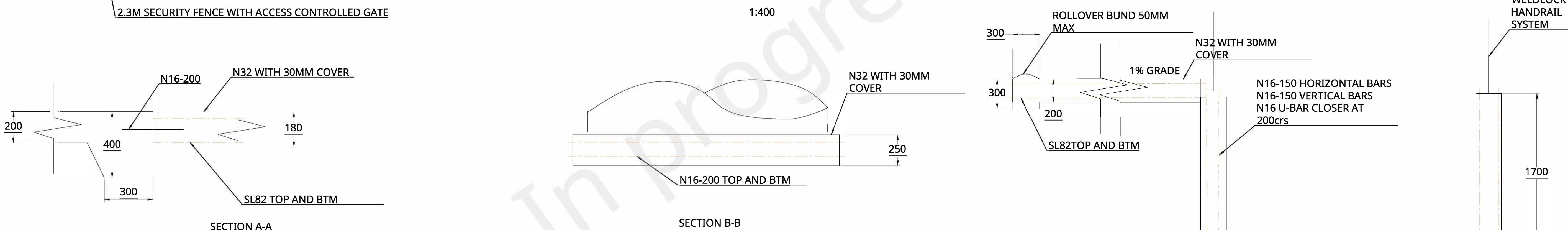
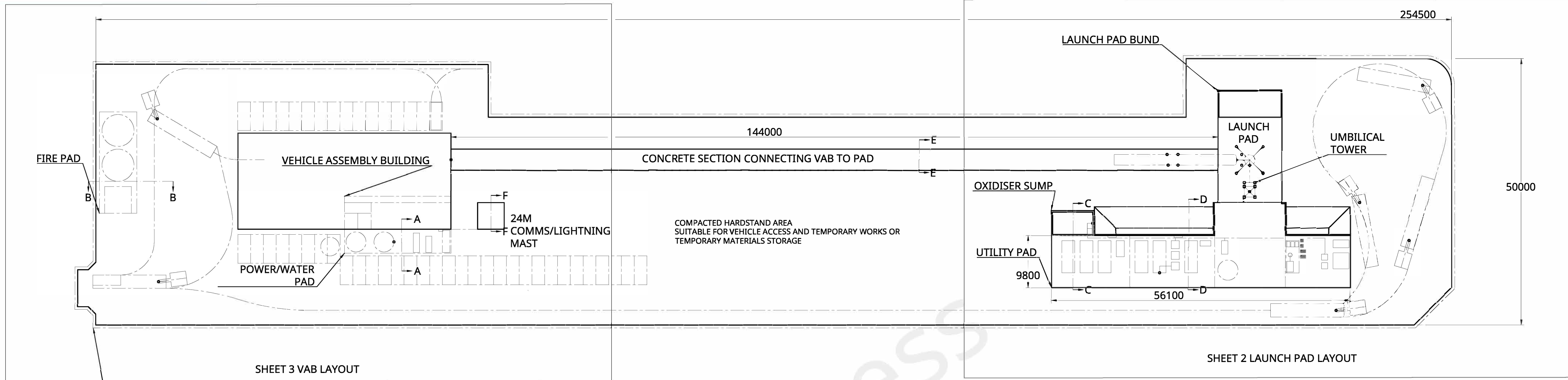

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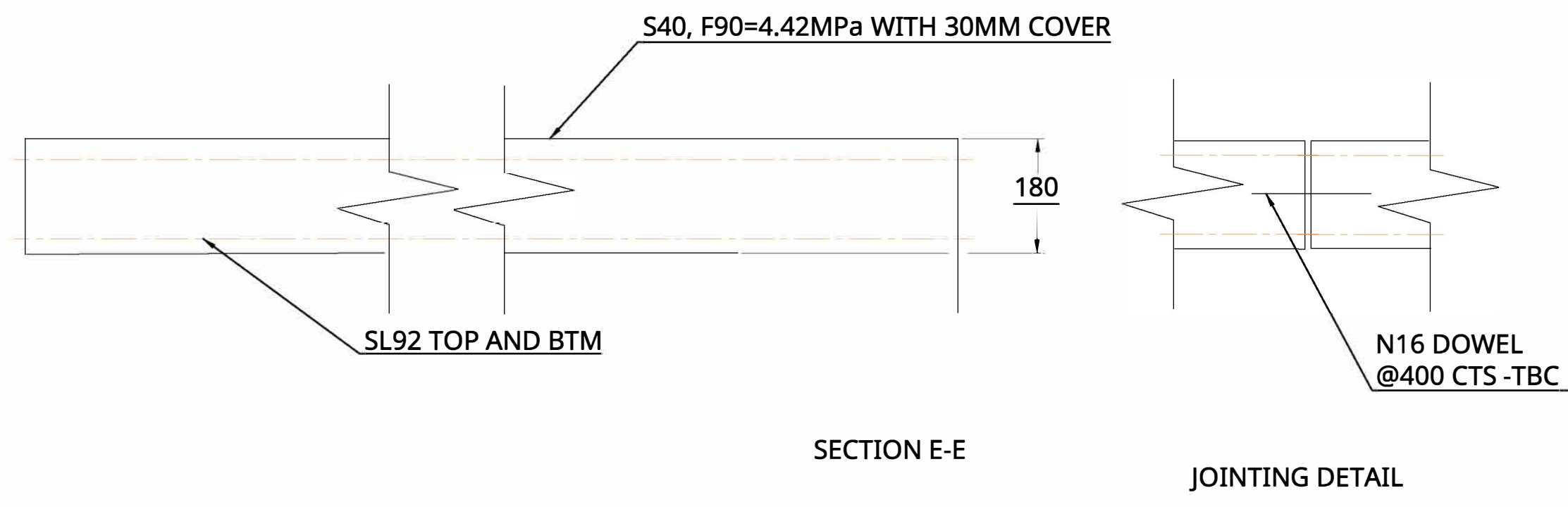
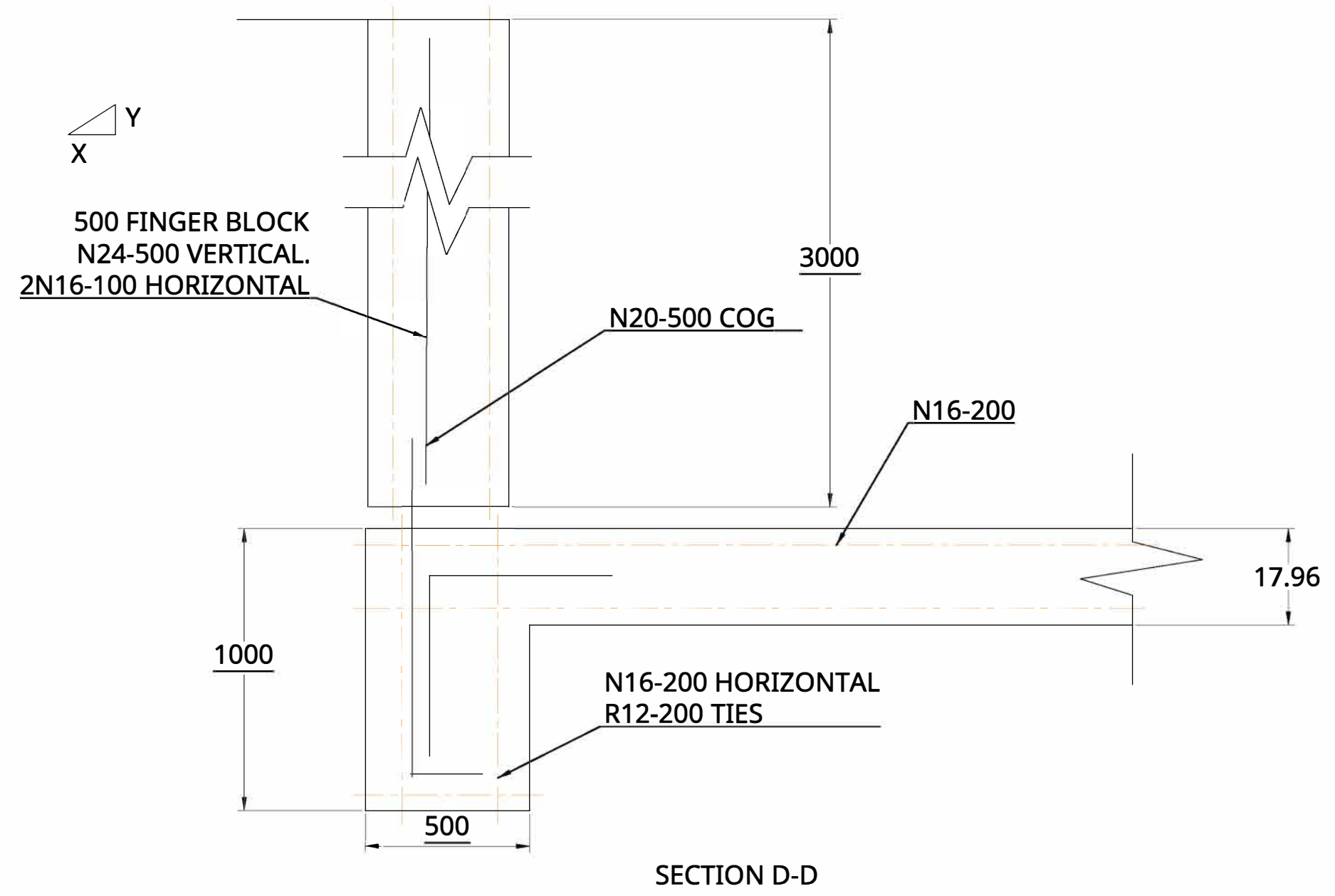
PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL


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Government

SDA approval: APC2024/006-01



SLAB CROSS SECTIONS



NOTES.
1. ENCIRCLING GRAVEL ROADWAYS CLEARANCE SUFFICIENT TO FIREBREAK ALL PROPOSED INFRASTRUCTURE.



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN MILLIMETERS
ANGULAR = ±0.00°
LINEAR NO DECIMAL ±0.20
LINEAR ONE DECIMAL ±0.10
LINEAR TWO DECIMAL ±0.05
SURFACE FINISH ✓ R3.2

DO NOT SCALE DRAWING
BREAK ALL SHARP EDGES AND REMOVE BLURS

THIRD ANGLE PROJECTION

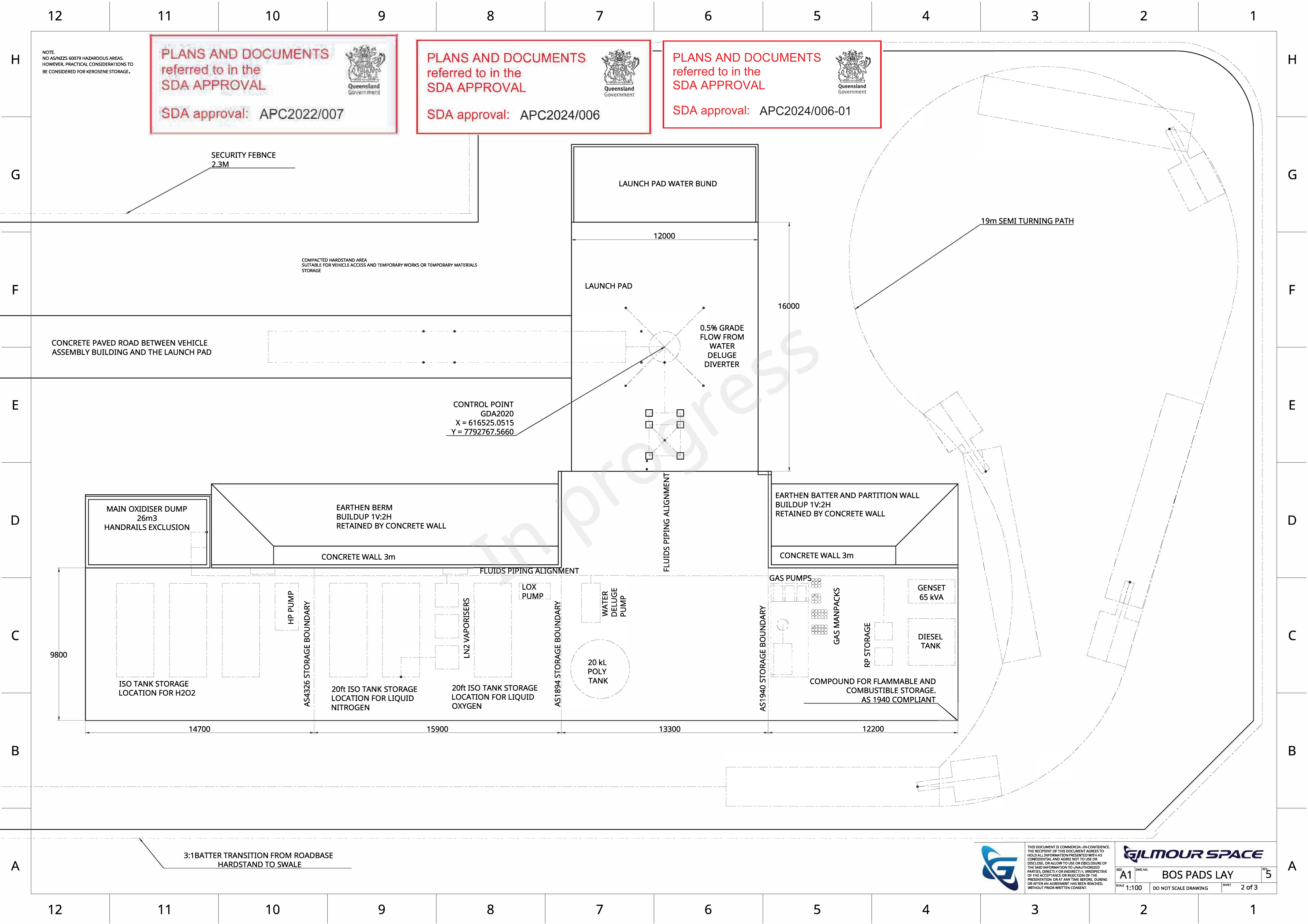
DRAWN: ADAM WILLIAMS
DATE: 2022-09-07

APPROVED: [Signature]
APPROVED DATE: [Date]

TITLE: BOWEN ORBITAL SPACEPORT LAYOUT DESIGN

SIZE: A1
SCALE: 1:400
SHEET: 1 of 3

REV: 5



PLANS AND DOCUMENTS
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SDA APPROVAL


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Government

SDA approval: APC2024/006-01

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL

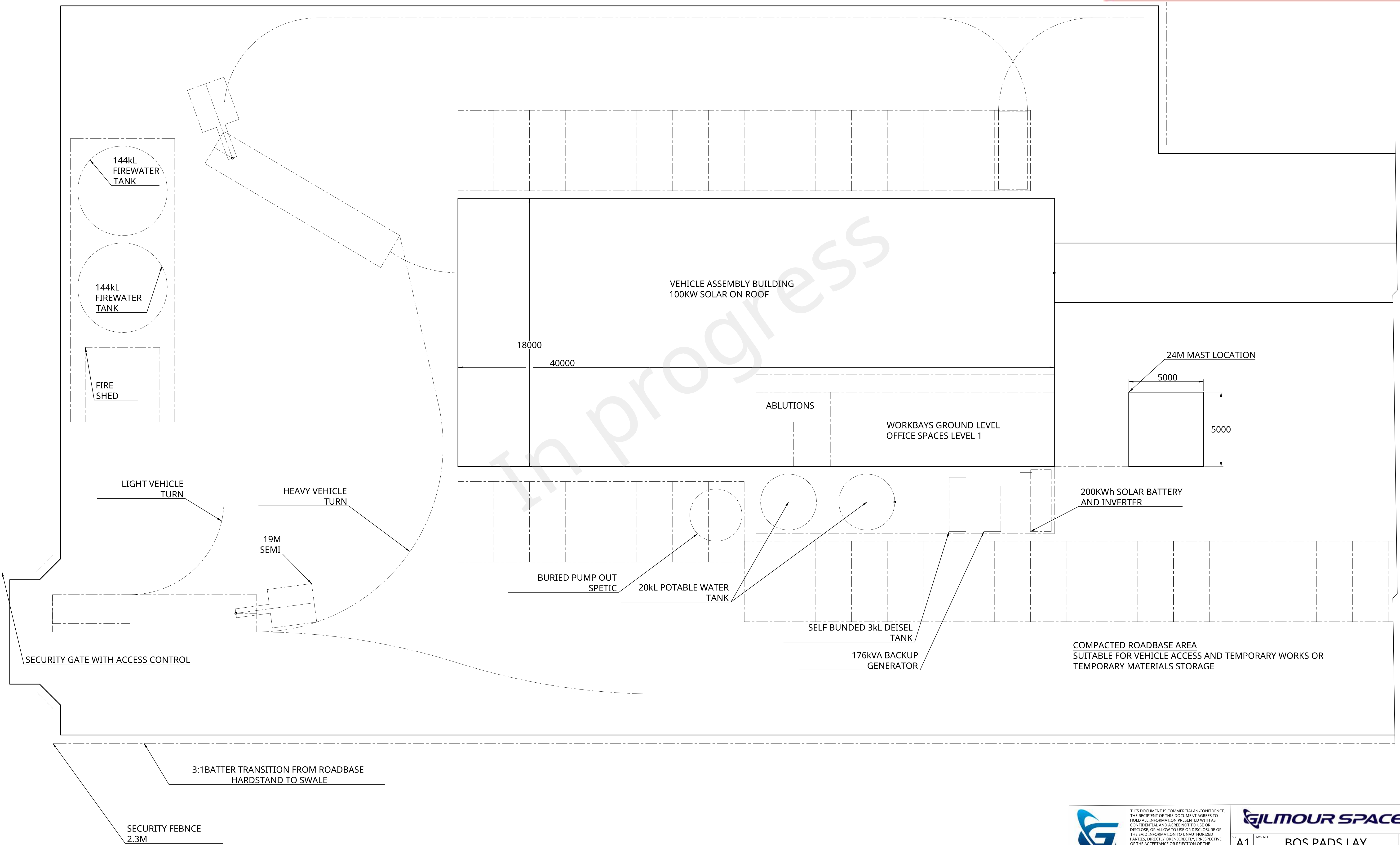

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SDA approval: APC2024/006

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL


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SDA approval: APC2022/007



BOWEN ORBITAL SPACE PORT

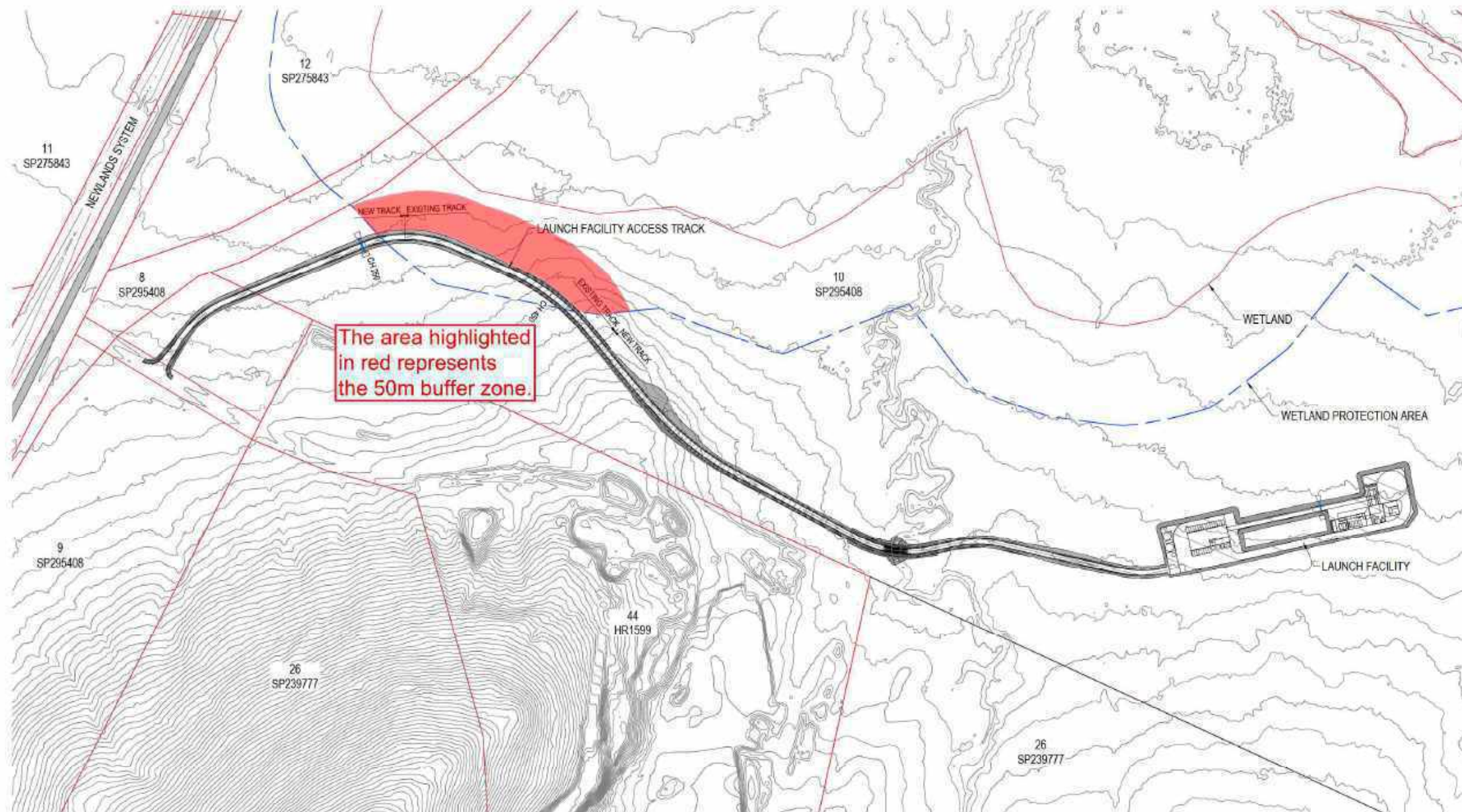
BULK EARTHWORKS, ACCESS ROAD AND STORMWATER

Amended by the Department
of Environment and Science
to show approximate location
of 50m buffer zone.
Date: 18/03/2022

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006-01



LOCALITY PLAN
SCALE 1:2,500

ACCESS ROAD - DRAWING INDEX

GSLF-I3C-CV-DWG-001-01	LOCALITY PLAN AND DRAWING INDEX
TYPICAL NOTES AND DETAILS	
GSLF-I3C-CV-DWG-002-01	SEDIMENT AND EROSION CONTROL TYPICAL DETAILS
GSLF-I3C-CV-DWG-003-01	TYPICAL NOTES AND DETAILS - SHEET 1 OF 3
GSLF-I3C-CV-DWG-003-02	TYPICAL NOTES AND DETAILS - SHEET 2 OF 3
GSLF-I3C-CV-DWG-003-03	TYPICAL NOTES AND DETAILS - SHEET 3 OF 3
STORMWATER CATCHMENT PLAN	
GSLF-I3C-CV-DWG-004-01	CATCHMENT PLAN - SHEET 1 OF 1
GSLF-I3C-CV-DWG-004-02	OUTLET UPGRADE SCHEDULE
LAYOUT AND LONGSECTION	
GSLF-I3C-CV-DWG-005-01	LAYOUT AND LONGSECTION - SHEET 1 OF 4
GSLF-I3C-CV-DWG-005-02	LAYOUT AND LONGSECTION - SHEET 2 OF 4
GSLF-I3C-CV-DWG-005-03	LAYOUT AND LONGSECTION - SHEET 3 OF 4
GSLF-I3C-CV-DWG-005-04	LAYOUT AND LONGSECTION - SHEET 4 OF 4
LAUNCH FACILITY	
GSLF-I3C-CV-DWG-006-01	LAYOUT PLAN - LAUNCH FACILITY
CROSS SECTIONS	
GSLF-I3C-CV-DWG-008-01	CROSS SECTIONS - SHEET 1 OF 3
GSLF-I3C-CV-DWG-008-02	CROSS SECTIONS - SHEET 2 OF 3
GSLF-I3C-CV-DWG-008-03	CROSS SECTIONS - SHEET 3 OF 3

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006

PLANS AND DOCUMENTS
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SDA APPROVAL



SDA approval: AP2021/007

No	DESCRIPTION	DATE
E	FOR APPROVAL	09.02.2022
D	FOR APPROVAL	08.02.2022
C	FOR APPROVAL	07.02.2022
B	FOR APPROVAL	19.01.2022
A	FOR REVIEW	23.11.2021

REVISION HISTORY



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ORBITAL SPACE

Engineers Certification:
Travis Smith MIE Aust, CPEng.
NPER Civil
RPEQ 16400
CPESC 9500
Signature: *T. Smith*
Date: 09.02.2022

PROJECT
BOWEN ORBITAL SPACE PORT
DRAWING TITLE
**BOWEN ORBITAL SPACE PORT
ACCESS ROAD
LOCALITY PLAN AND DRAWING INDEX**

DRAWN	T.J.S.	CHECKED	T.J.S.	APPROVED	T.J.S.
DRAWING STATUS		FOR APPROVAL			
SCALE	SIZE	DRAWING CODE			
NTS	A1	GSLF-I3C-CV-DWG-001-01			
REV					E

A

B

C

D

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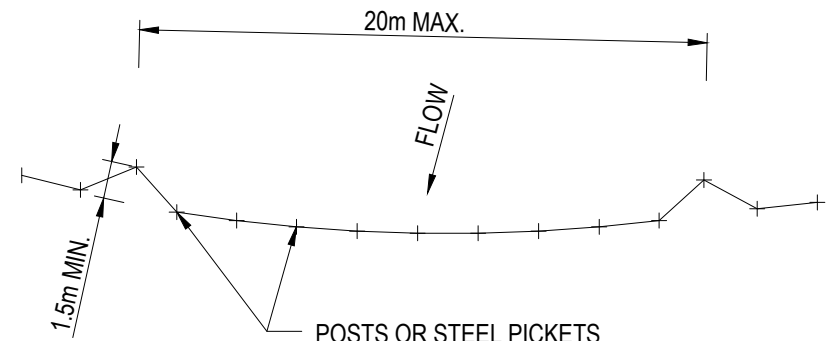
H

J

K

L

M



SILT FENCE PLAN

ENSURE POST HOLES AND TRENCH ARE PROPERLY BACKFILLED AND COMPACTED

PLANS AND DOCUMENTS referred to in the SDA APPROVAL

SDA approval: AP2021/007



TABLE DRAINS & CUTOFF DRAINS - SCOUR PROTECTION TREATMENTS				
GRADE < 2.5%	2.5% < GRADE < 5%	5% < GRADE < 7%	7% < GRADE < 10%	GRADE > 10%
TOP SOILED & GRASSED	TOP SOILED & GRASSED WITH ROCK CHECK DAMS AT 20m CENTRES	TOP SOILED & GRASSED WITH ROCK CHECK DAMS AT 10m CENTRES	TOP SOILED & GRASSED WITH ROCK CHECK DAMS AT 5m CENTRES	ROCK LINED WITH COMPACTED D50=100mm CRUSHED ROCK (150mm THICK)

OPERATION & MAINTENANCE NOTES

ALL ESC MEASURES MUST BE INSPECTED:
- AT LEAST DAILY (WHEN WORK IS OCCURRING ON SITE) OR WEEKLY (WHEN WORK IS NOT OCCURRING ON SITE);
- WITHIN 24 HOURS OF EXPECTED RAIN; AND
- WITHIN 18 HOURS OF A RAINFALL EVENT (ie AN EVENT OF SUFFICIENT INTENSITY AND DURATION TO MOBILISE SEDIMENT ON SITE).

ESC MEASURE	MAINTENANCE TRIGGER	TIMEFRAME FOR COMPLETION OF MAINTENANCE
OTHER ESC MEASURES	THE CAPACITY OF ESC MEASURES FALLS BELOW 30%.	WITHIN 7 DAYS OF THE INSPECTION.

PRIOR TO LONG PERIOD OF SHUT DOWN ALL ESC MEASURES TO BE INSPECTED AND CLEANED.

EROSION & SEDIMENT CONTROL NOTES

- CONSTRUCTION OF ALL SEDIMENT MANAGEMENT DEVICES SHALL BE COMPLETED AND EFFECTIVE PRIOR TO:
 - STRIPPING OF TOPSOIL AND GRASS
 - BULK EARTHWORKS TO THE SITE.
 - SERVICE INSTALLATION
- PRIOR TO CLEARING, AREAS OF PROTECTED VEGETATION AND SIGNIFICANT AREAS OF RETAINED VEGETATION SHALL BE CLEARLY IDENTIFIED (WITH HIGH VISIBILITY TAPE OR SIMILAR) FOR THE PURPOSES OF MINIMISING THE RISK OF UNNECESSARY CLEARING.
- ESC FOR DRAINS AND DISTURBED AREAS SHOULD BE PROVIDED IN ORDER OF PREFERENCE FROM SITE ENGINEER
 - SCARIFY AND GRASS SEED
 - SCARIFY, JUTE MAT AND GRASS SEED
 - SHOT ROCK AROUND CULVERT INLETS AND OUTLETS
 - SHOT ROCK CHECK DAMS IN TABLE DRAINS WHERE REQUIRED
- ENSURE NO RUN OFF OR SEDIMENT DISCHARGES TO ROAD, LAND, DRAINAGE LINES, WATER BODIES OR ADJOINING PROPERTIES.
- CONTRACTOR TO NOMINATE SITE REPRESENTATIVE TO BE RESPONSIBLE FOR THE IMPLEMENTATION AND UP KEEP OF THE EROSION AND SEDIMENT MANAGEMENT CONTROLS.
- ALL EROSION AND SEDIMENT CONTROLS ARE TO REMAIN UNTIL WRITTEN NOTICE FROM SUPERINTENDENT.
- BOTH TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED DURING CONSTRUCTION.
- SEDIMENT FENCES ARE TO BE CLEANED OUT WHEN CAPACITY IS REDUCED BY 30%.
- IF EROSION AND SEDIMENT CONTROL DEVICES HAVE BEEN FOUND TO BE DEFICIENT OR FAILED IN SERVICE, DUE TO UNFORESEEN CIRCUMSTANCES, CORRECTIVE ACTION IS TO BE UNDERTAKEN IMMEDIATELY WHICH MAY INCLUDE AMENDMENTS/ADDITIONS TO THE ORIGINAL APPROVED EROSION CONTROL PLANS. SUCH ADDITIONS OR AMENDMENTS ARE TO BE APPROVED BY SUPERINTENDENT.
- THE INSTALLATION, REMOVAL, RELOCATION OR MODIFICATION TO EROSION AND SEDIMENT CONTROL DEVICES MAY BE MADE BY THE UNITED GREEN ENVIRONMENTAL ADVISOR/S, IF DEEMED NECESSARY AND RELEVANT.
- ALL TEMPORARY EARTH BANKS, FLOW DIVERSION SYSTEMS AND EMBANKMENTS SHALL BE MACHINE-COMPACTED AND STABILISED WITH APPROPRIATE COVER APPROVED BY SUPERINTENDENT WITHIN 10 DAYS OF DISTURBANCE.
- ALL EARTHWORKS ENVIRONMENTAL CONTROLS SHALL BE GENERALLY IN ACCORDANCE WITH 'MANAGING URBAN STORMWATER: SOILS AND CONSTRUCTION' BY LANDCOM.
- SILT FENCE OR COIR LOGS MAY BE USED AS AN ALTERNATE TO HAY BALES AT DRAINAGE INLETS.
- SHAKEDOWNS TO BE CONSTRUCTED AT EXITS TO COUNCIL ROADS OR WHERE DEEMED NECESSARY BY SUPERINTENDENT.

SOIL AND STOCKPILE MANAGEMENT

- STOCKPILES SHALL BE APPROPRIATELY PROTECTED FROM THE WIND, RAIN, CONCENTRATED SURFACE FLOW AND EXCESSIVE UP-SLOPE STORMWATER SURFACE FLOWS.
- STOCKPILES SHALL BE LOCATED UPSTREAM OF AN APPROPRIATE SEDIMENT CONTROL SYSTEM. IF THE MATERIALS ARE LIKELY TO BE STOCKPILED FOR LONGER THAN 28 DAYS THEY SHALL BE PROTECTED BY PROVIDING AN APPROPRIATE COVER APPROVED BY SUPERINTENDENT WITHIN 10 DAYS.

TABLE DRAINS, CATCH DRAINS AND DIVERSION DRAINS SHALL BE STABILISED WITH APPROPRIATE COVER APPROVED BY SUPERINTENDENT AND SUPPLEMENTED WITH ROCK WEIRS AS DETAILED.

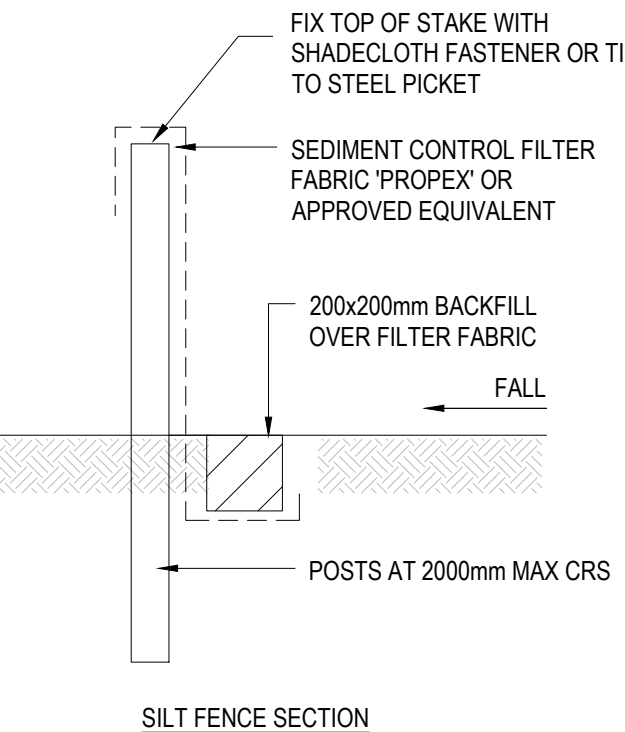
PLANS AND DOCUMENTS referred to in the SDA APPROVAL

SDA approval: APC2024/006

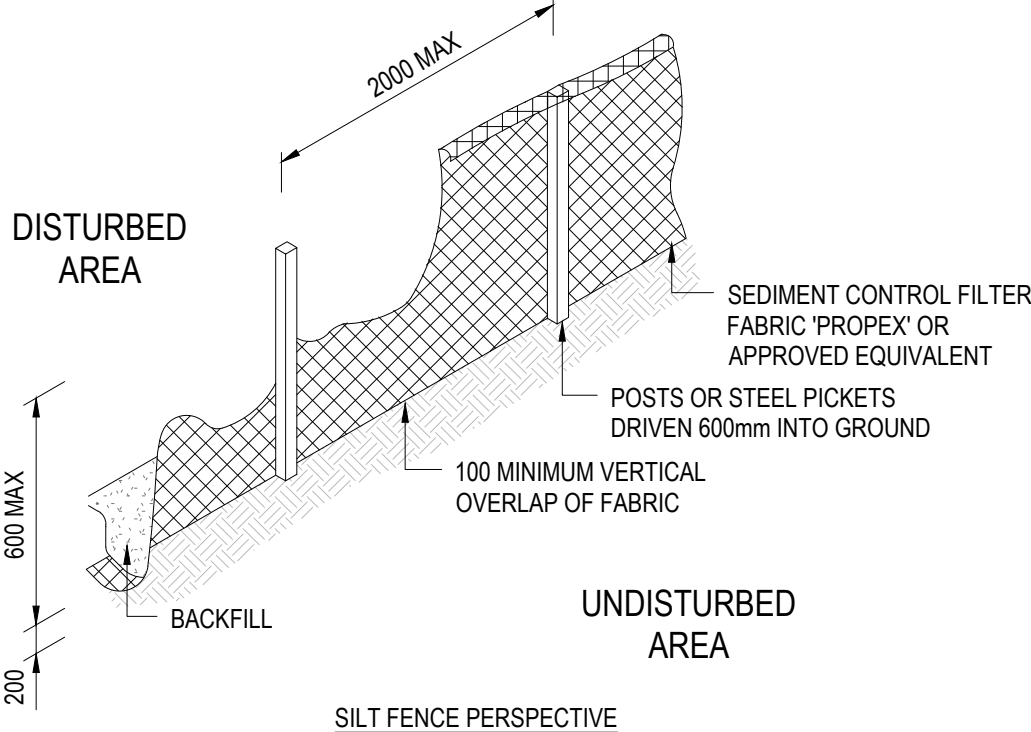


PLANS AND DOCUMENTS referred to in the SDA APPROVAL

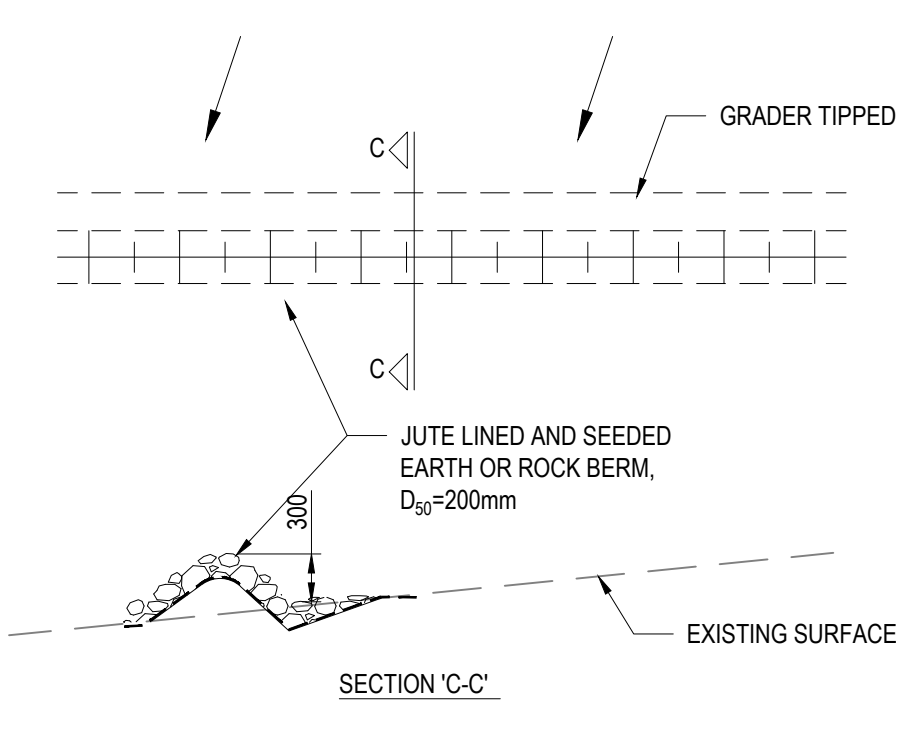
SDA approval: APC2024/006-01



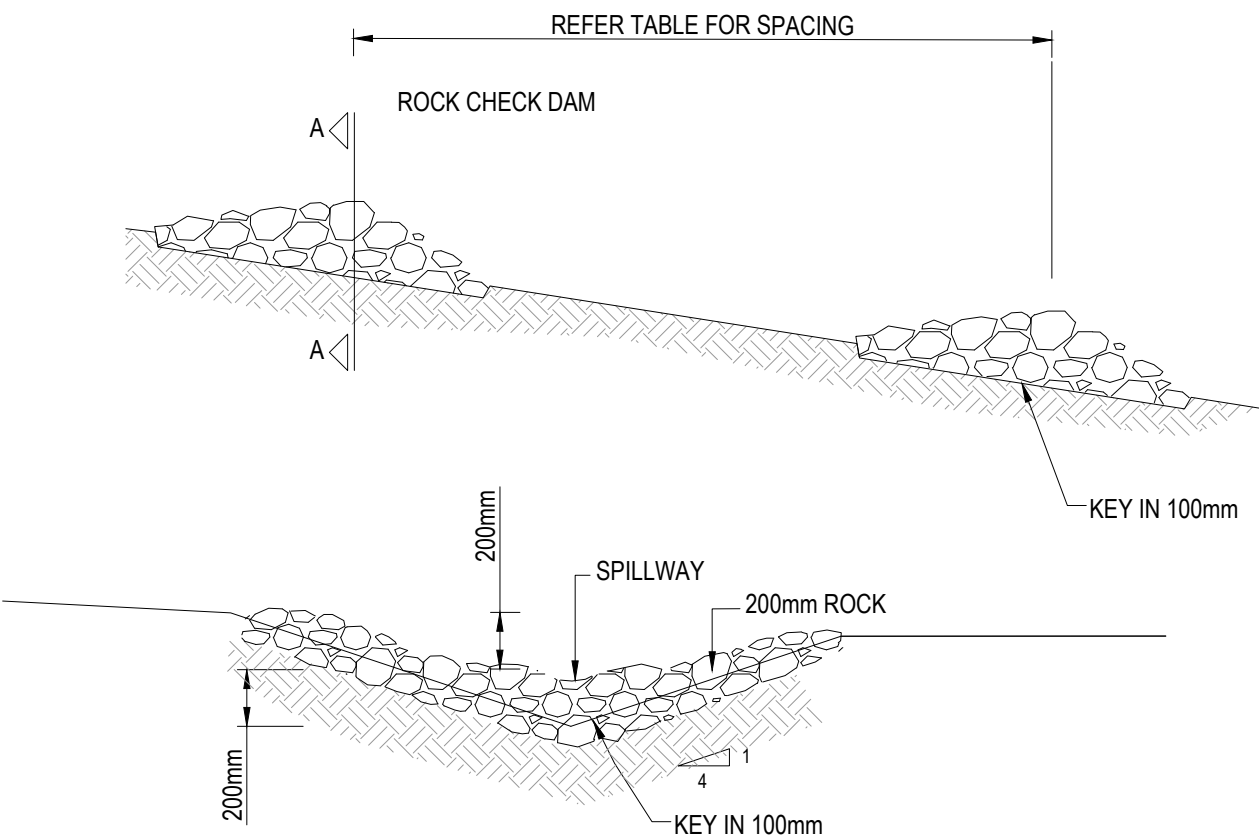
SILT FENCE SECTION



SILT FENCE PERSPECTIVE

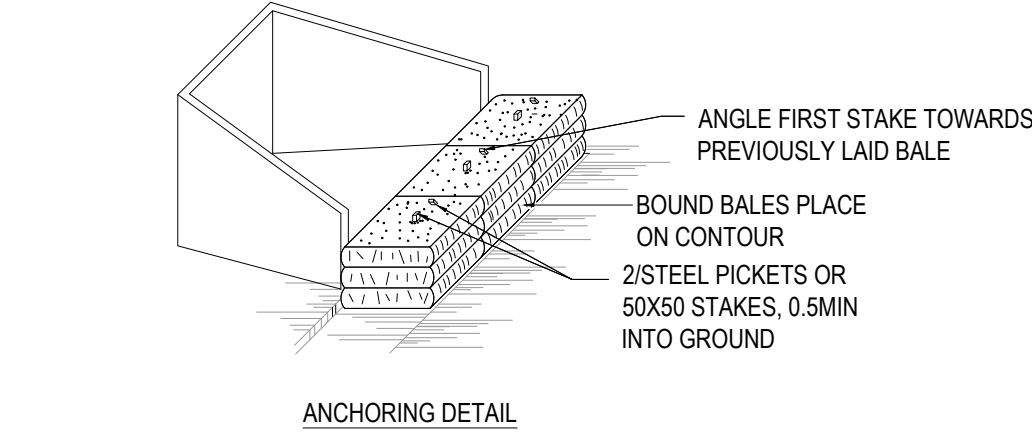


CORNER TIP SILT TRAP

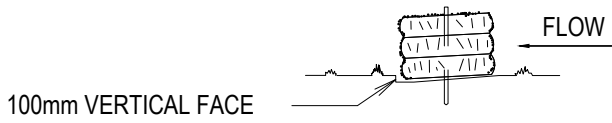


CROSS SECTION 'A-A' AT CREST OF CHECK DAM

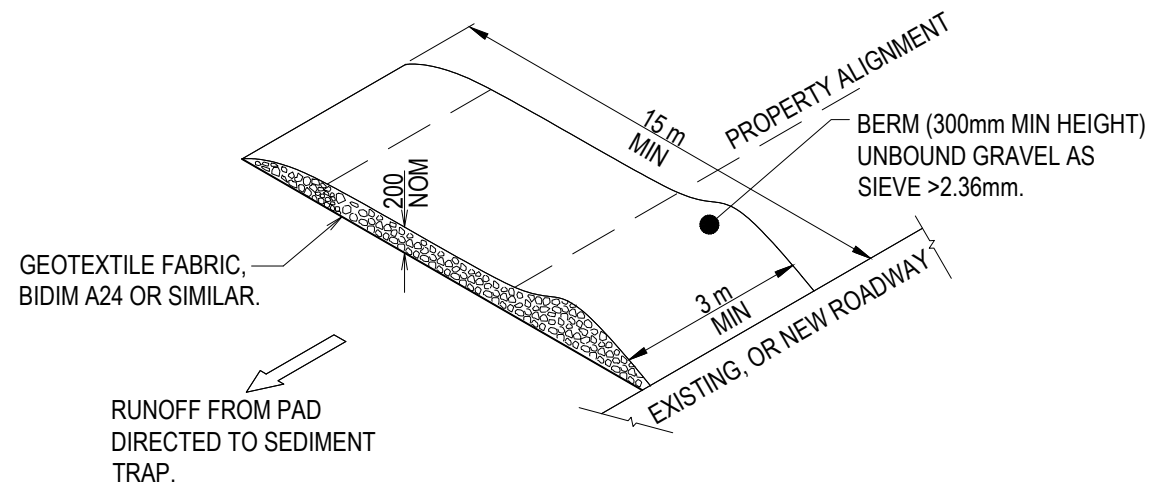
ROCK CHECK DAM DETAIL



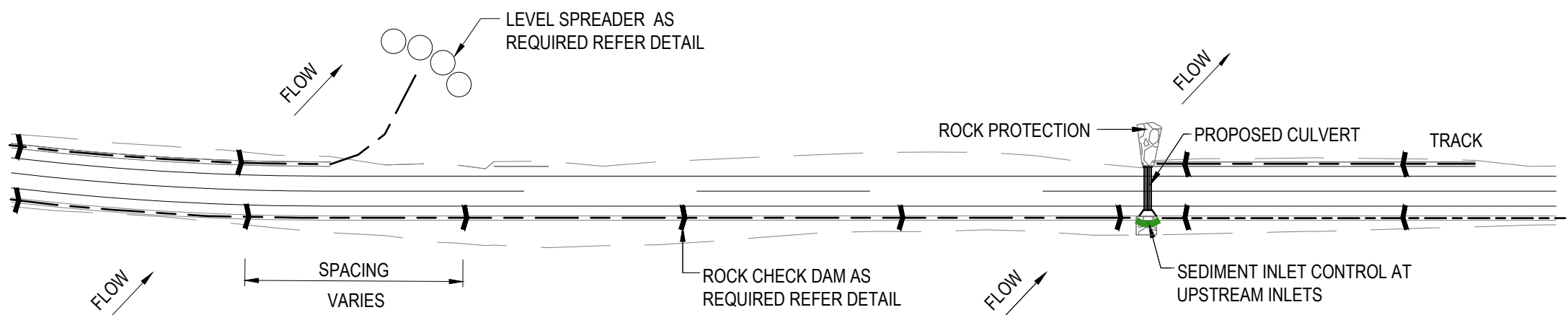
ANCHORING DETAIL



BEDDING DETAIL

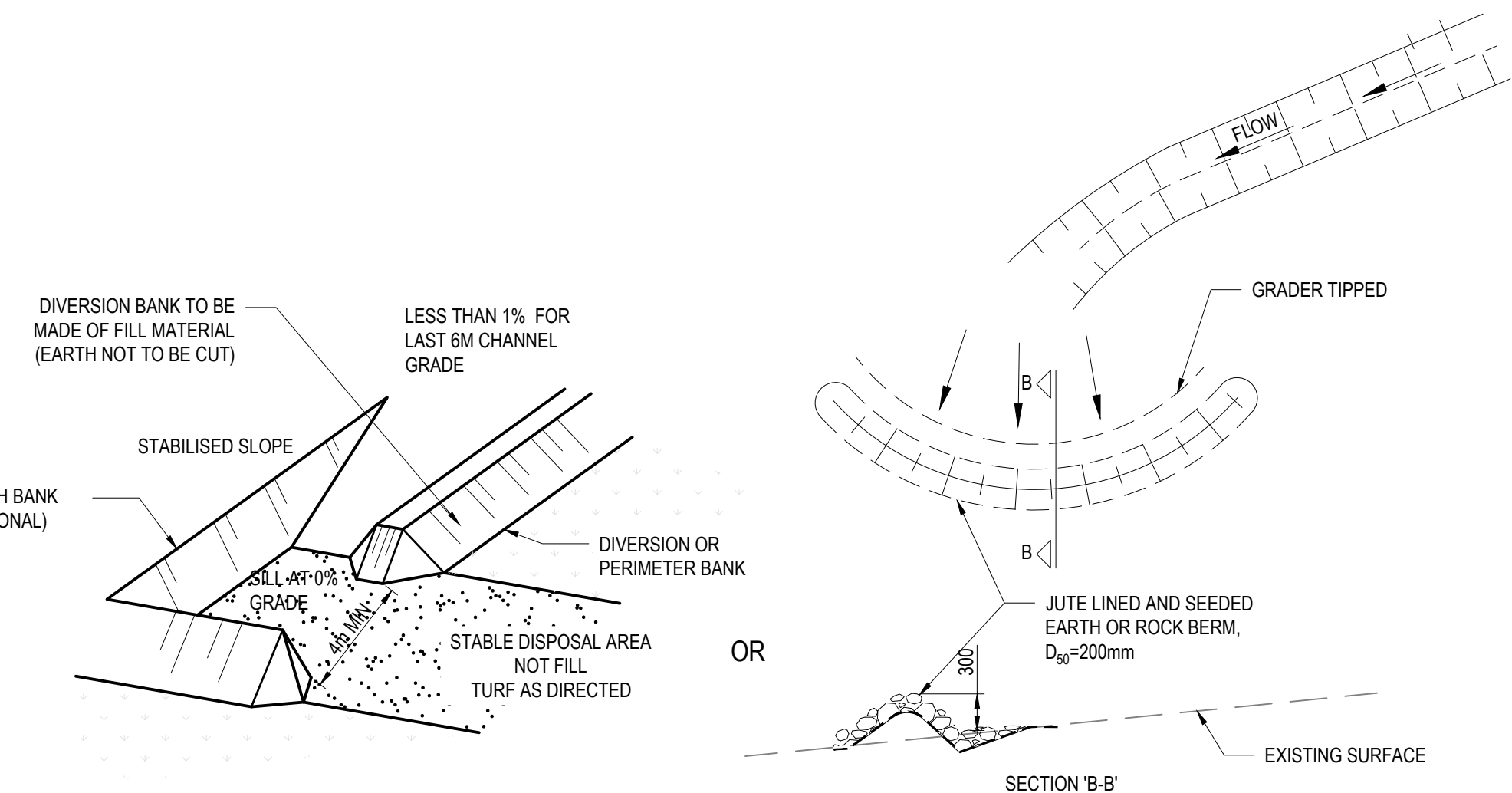


SHAKEDOWN DETAIL



TYPICAL ROAD/ CULVERT SEDIMENT AND EROSION CONTROL PLAN

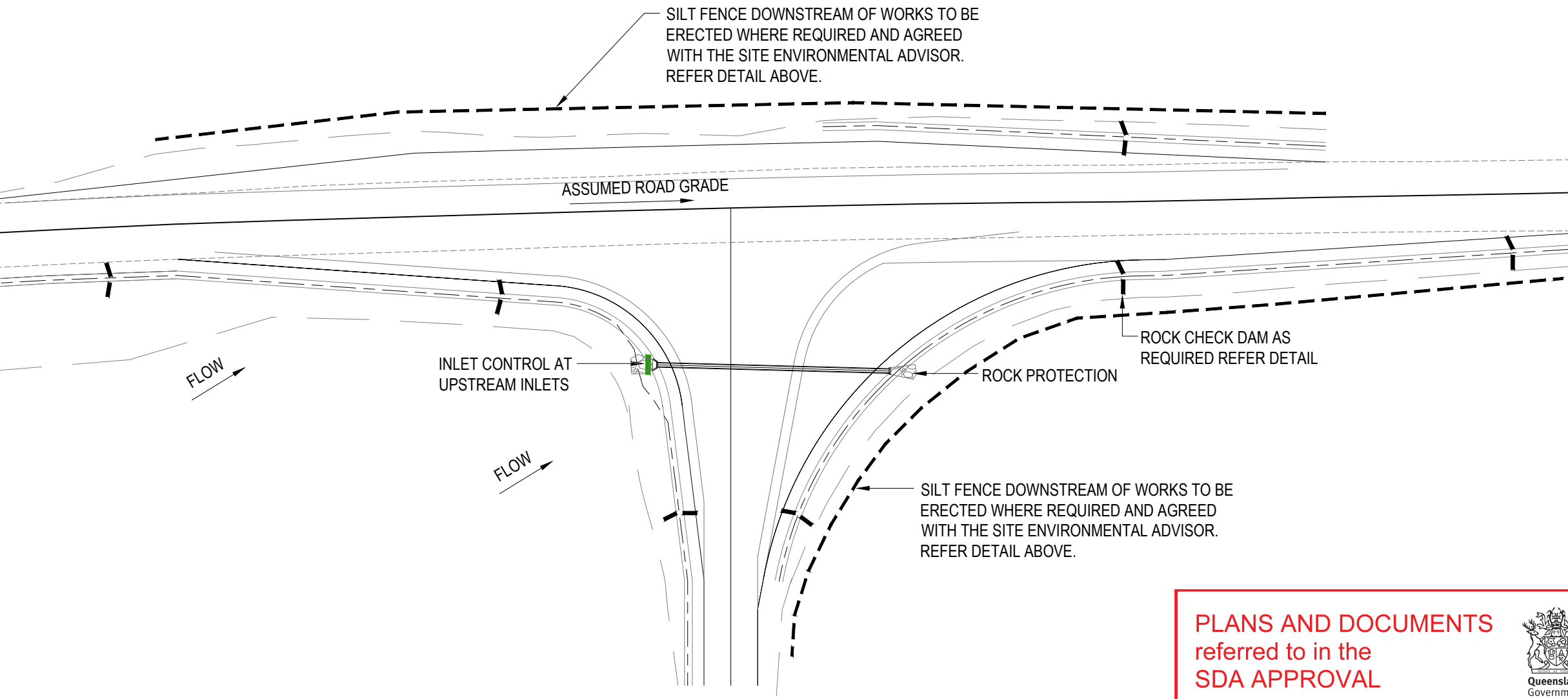
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BANK LEVEL SPREADER

CORNER TIP LEVEL SPREADER

LEVEL SPREADER OPTIONS

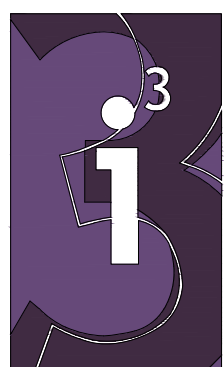


TYPICAL INTERSECTION SEDIMENT AND EROSION CONTROL PLAN

SCALE 1:500

NO	DESCRIPTION	DATE
D	FOR APPROVAL	08.02.2022
C	FOR APPROVAL	02.02.2022
B	FOR APPROVAL	19.01.2022
A	FOR REVIEW	23.11.2021
No	DESCRIPTION	DATE

REVISION HISTORY



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engineering consultants
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www.i3consulting.com.au
ABN 89 106 675 156
p 07 3870 8888

GILMOUR SPACE

Engineers Certification:

Travis Smith MIE Aust. CPEng.
NPER Civil
RPEQ 16400
CPESC 9500

Signature: T. Smith

Date: 08.02.2022

PROJECT

BOWEN ORBITAL SPACE PORT

DRAWING TITLE

BOWEN ORBITAL SPACE PORT

ACCESS ROAD

SEDIMENT AND EROSION CONTROL TYPICAL DETAILS

DRAWN	T.J.S.	CHECKED	T.J.S.	APPROVED	T.J.S.
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DRAWING STATUS FOR APPROVAL

SCALE

NTS

SIZE

A1

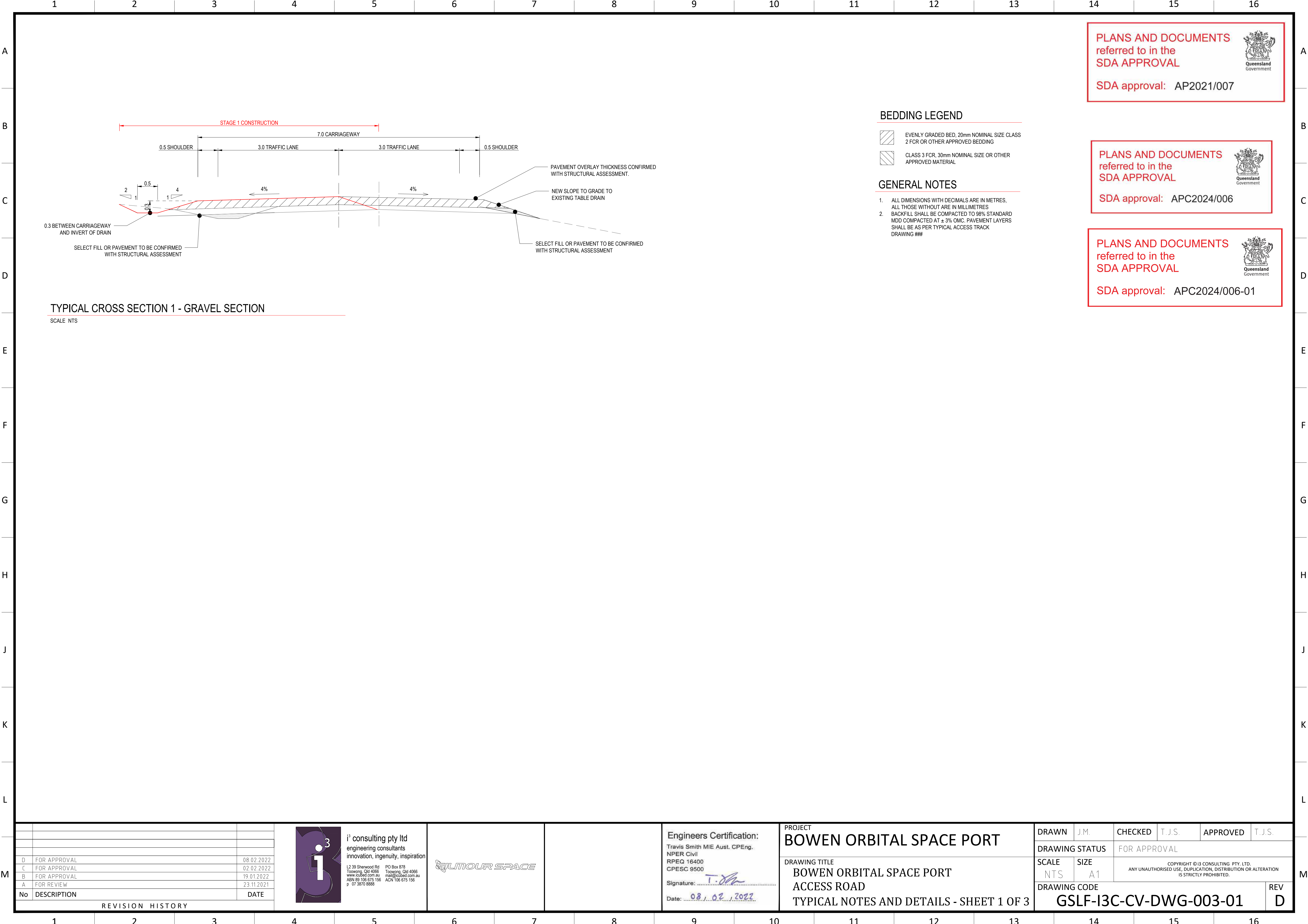
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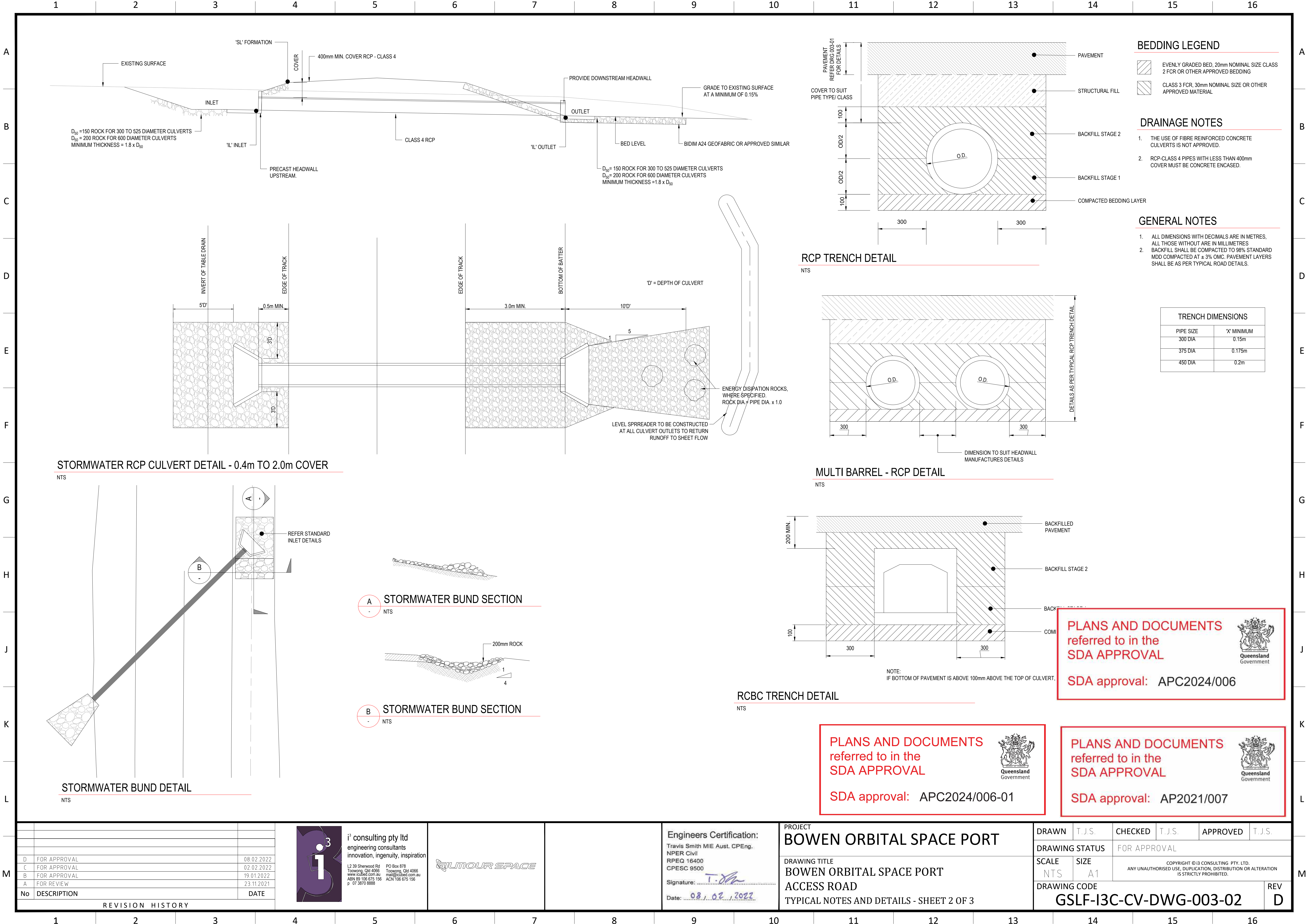
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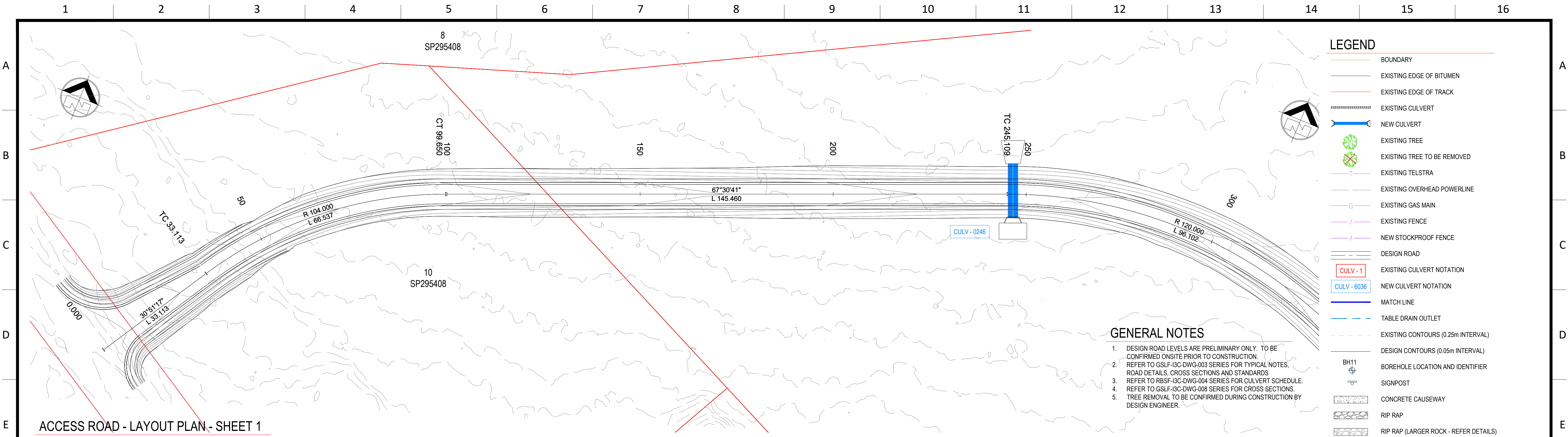
GSIF-I3C-CV-DWG-002-01

REV

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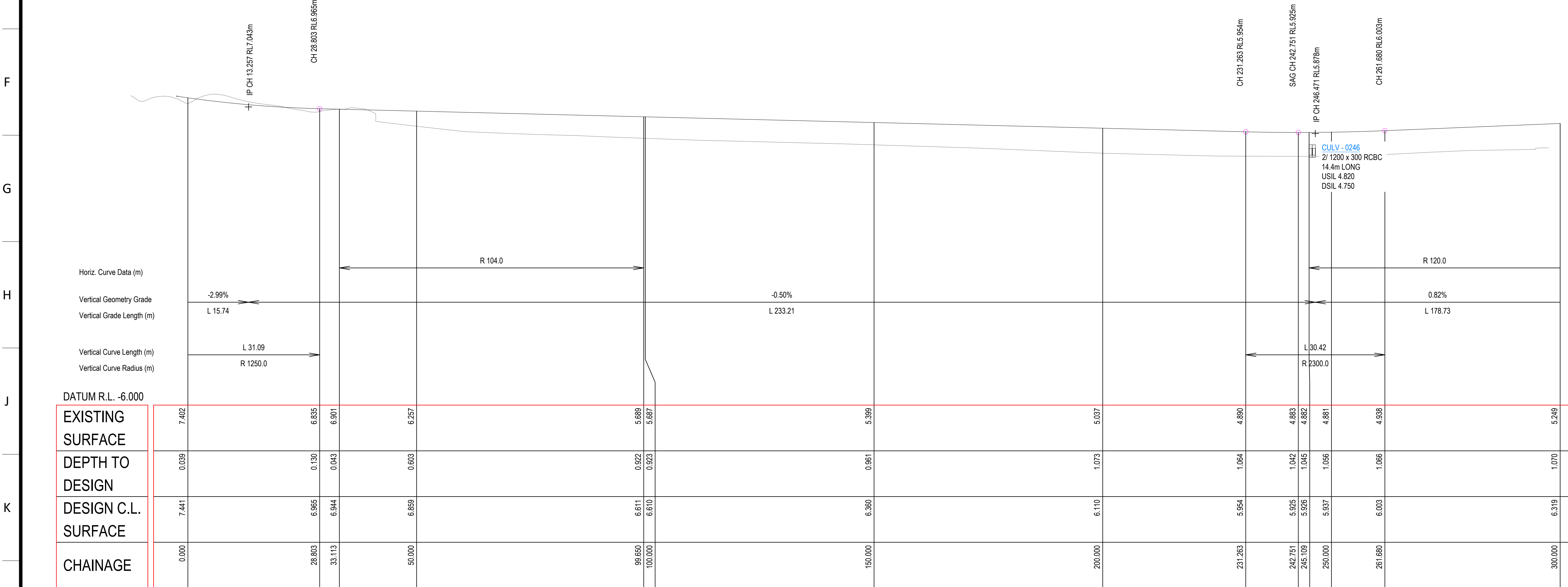






ACCESS ROAD - LAYOUT PLAN - SHEET 1

SCALE 1:500



ACCESS ROAD - LONGSECTION - SHEET 1

HORIZ. SCALE 1:1000
VERT. SCALE 1:100

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006-01

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006

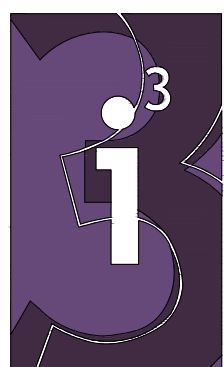
PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: AP2021/007

No	DESCRIPTION	DATE
D	FOR APPROVAL	08.02.2022
C	FOR APPROVAL	02.02.2022
B	FOR APPROVAL	19.01.2022
A	FOR REVIEW	23.11.2021
No	DESCRIPTION	DATE

REVISION HISTORY



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engineering consultants
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www.i3consult.com.au
ABN 89 106 675 156
p 07 3870 8888

GILMOUR SPACE

Engineers Certification:

Travis Smith MIE Aust. CPEng.
NPER Civil
RPEQ 16400
CPESC 9500

Signature:

Date: 08.02.2022

PROJECT

BOWEN ORBITAL SPACE PORT

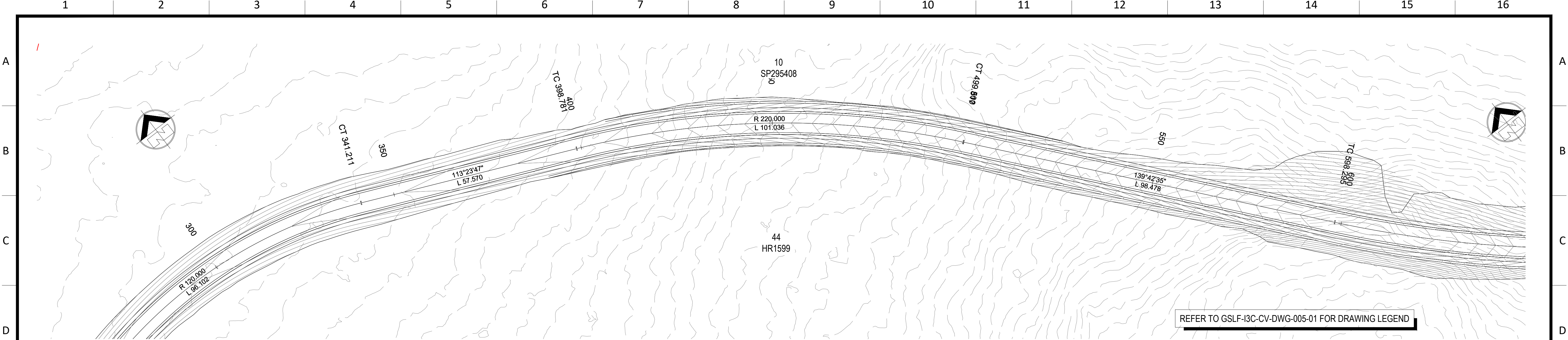
DRAWING TITLE

BOWEN ORBITAL SPACE PORT

ACCESS ROAD

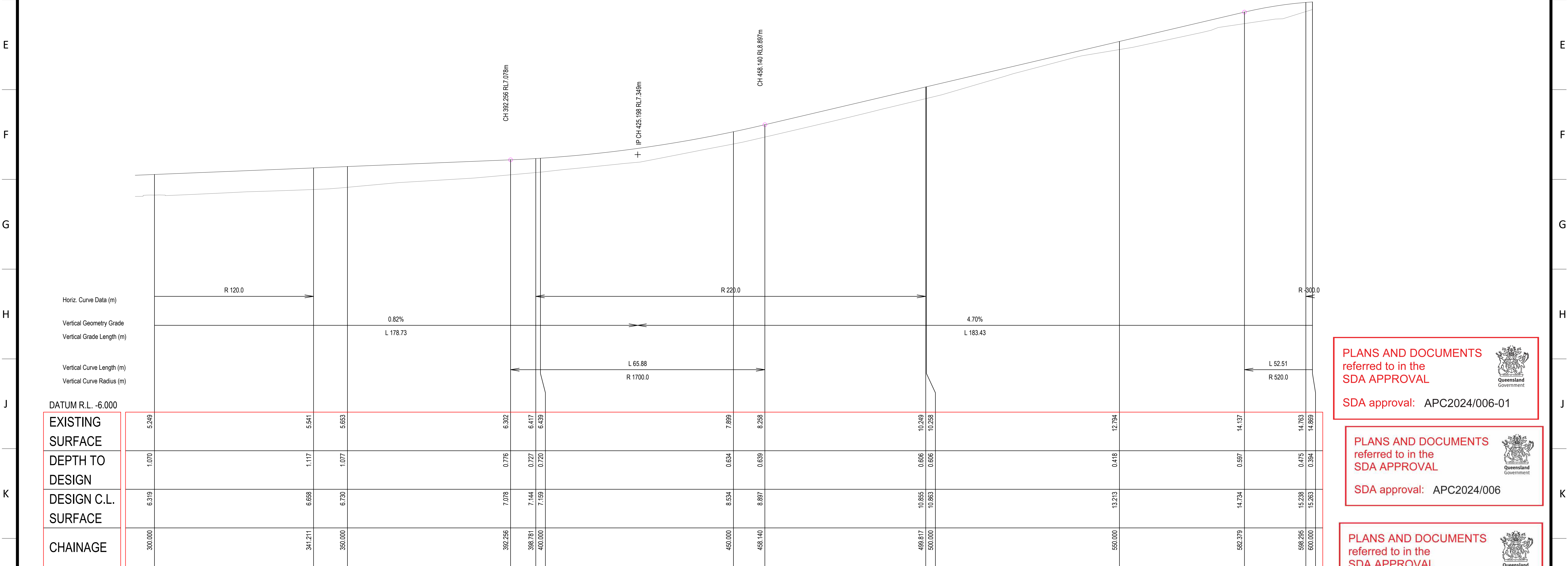
LAYOUT AND LONGSECTION - SHEET 1 OF 4

DRAWN	T.J.S.	CHECKED	T.J.S.	APPROVED	T.J.S.
DRAWING STATUS		FOR APPROVAL			
SCALE	NTS	SIZE	A1	COPYRIGHT ©I3 CONSULTING PTY. LTD. ANY UNAUTHORISED USE, DUPLICATION, DISTRIBUTION OR ALTERATION IS STRICTLY PROHIBITED.	
DRAWING CODE					REV
GSLF-I3C-CV-DWG-005-01					D



ACCESS ROAD - LAYOUT PLAN - SHEET 2

SCALE 1:500



ACCESS ROAD - LONGSECTION - SHEET 2

HORIZ. SCALE 1:1000
VERT. SCALE 1:250

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



REVISION HISTORY		
No	DESCRIPTION	DATE
D	FOR APPROVAL	08.02.2022
C	FOR APPROVAL	02.02.2022
B	FOR APPROVAL	19.01.2022
A	FOR REVIEW	23.11.2021



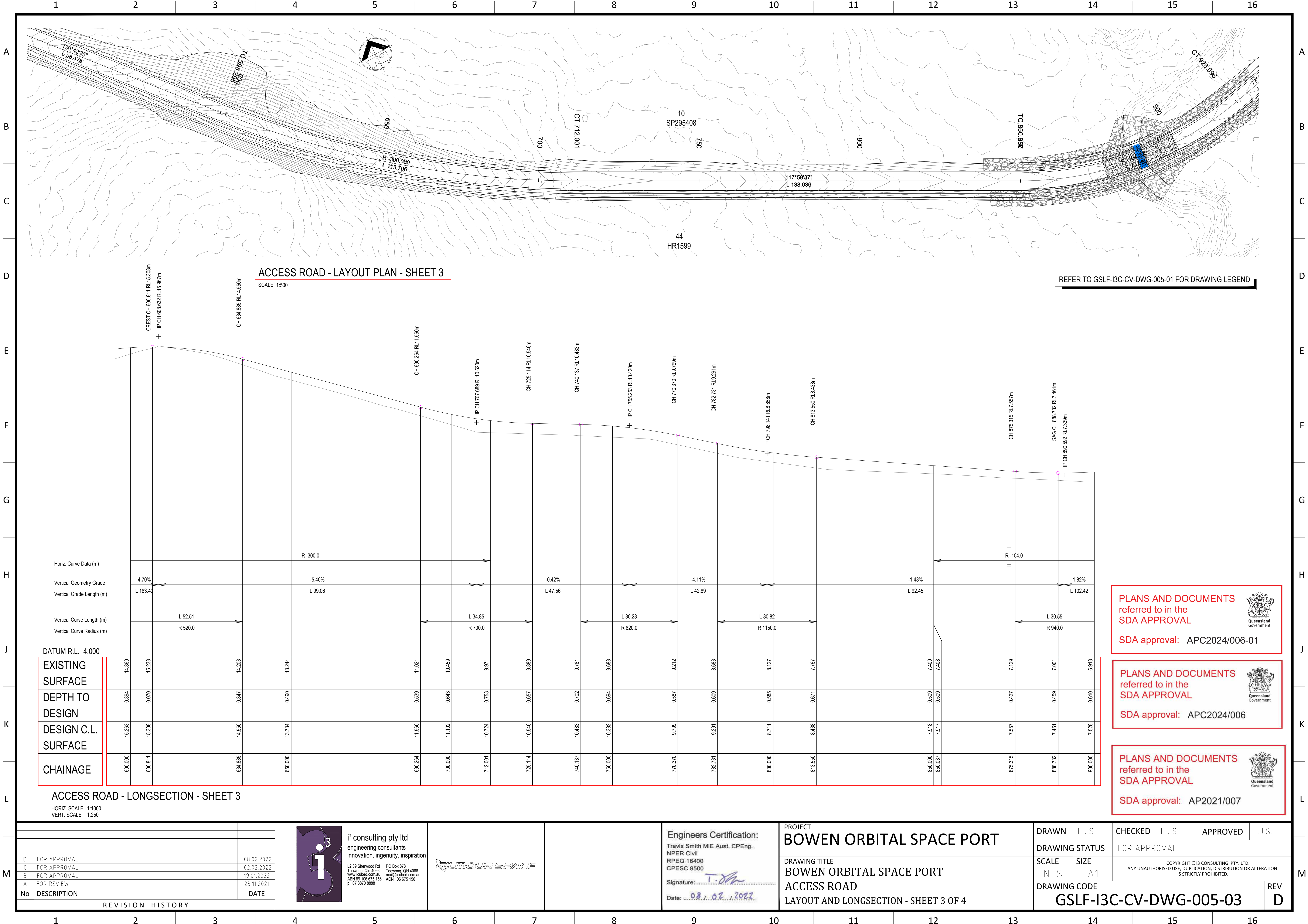
i³ consulting pty ltd
engineering consultants
innovation, ingenuity, inspiration
L2 39 Sherwood Rd Toowoomba, Qld 4066
www.i3consulting.com.au
ABN 89 106 675 156
p 07 3870 8888

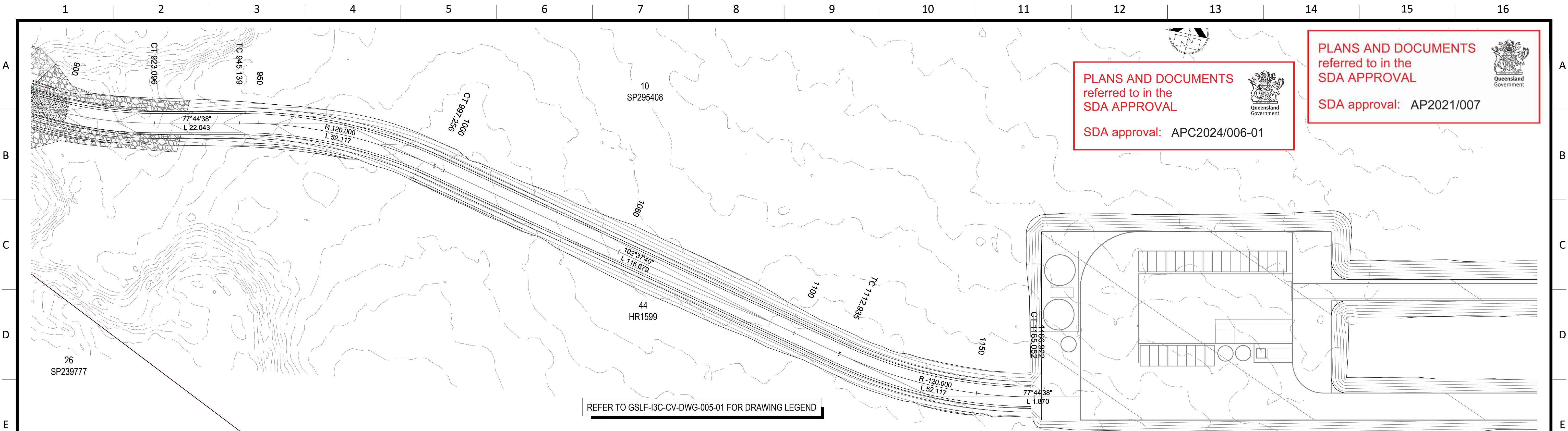


Engineers Certification:
Travis Smith MIE Aust. CPEng.
NPER Civil
RPEQ 16400
CPESC 9500
Signature: *T. Smith*
Date: 08.02.2022

PROJECT
BOWEN ORBITAL SPACE PORT
DRAWING TITLE
**BOWEN ORBITAL SPACE PORT
ACCESS ROAD**
LAYOUT AND LONGSECTION - SHEET 2 OF 4

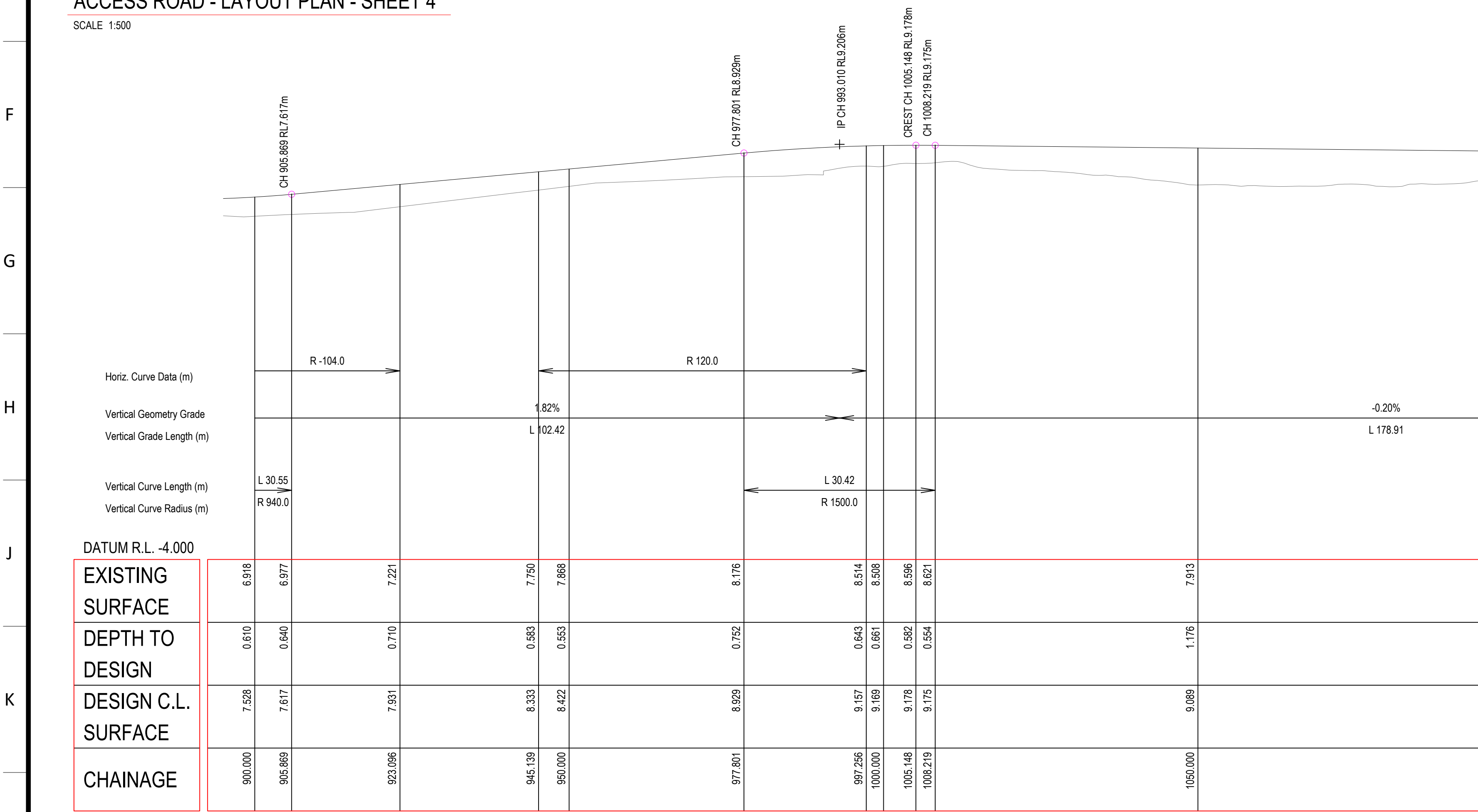
DRAWN	T.J.S.	CHECKED	T.J.S.	APPROVED	T.J.S.
DRAWING STATUS		FOR APPROVAL			
SCALE	SIZE	DRAWING CODE			
NTS	A1	GSLF-I3C-CV-DWG-005-02			
REV					D





ACCESS ROAD - LAYOUT PLAN - SHEET 4

SCALE 1:500



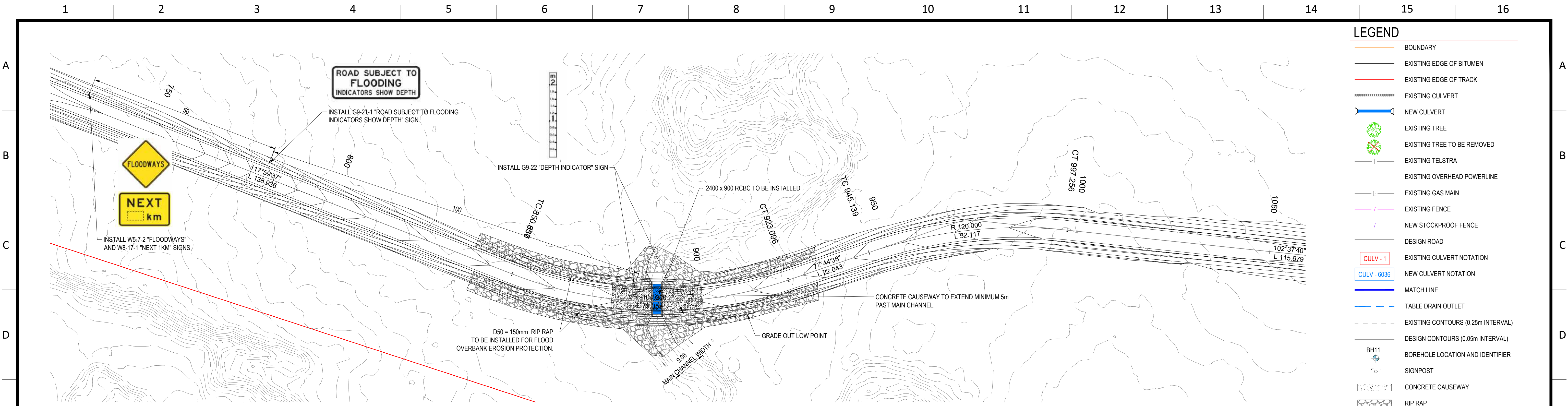
ACCESS ROAD - LONGSECTION - SHEET 4

HORIZ. SCALE 1:1000
VERT. SCALE 1:250

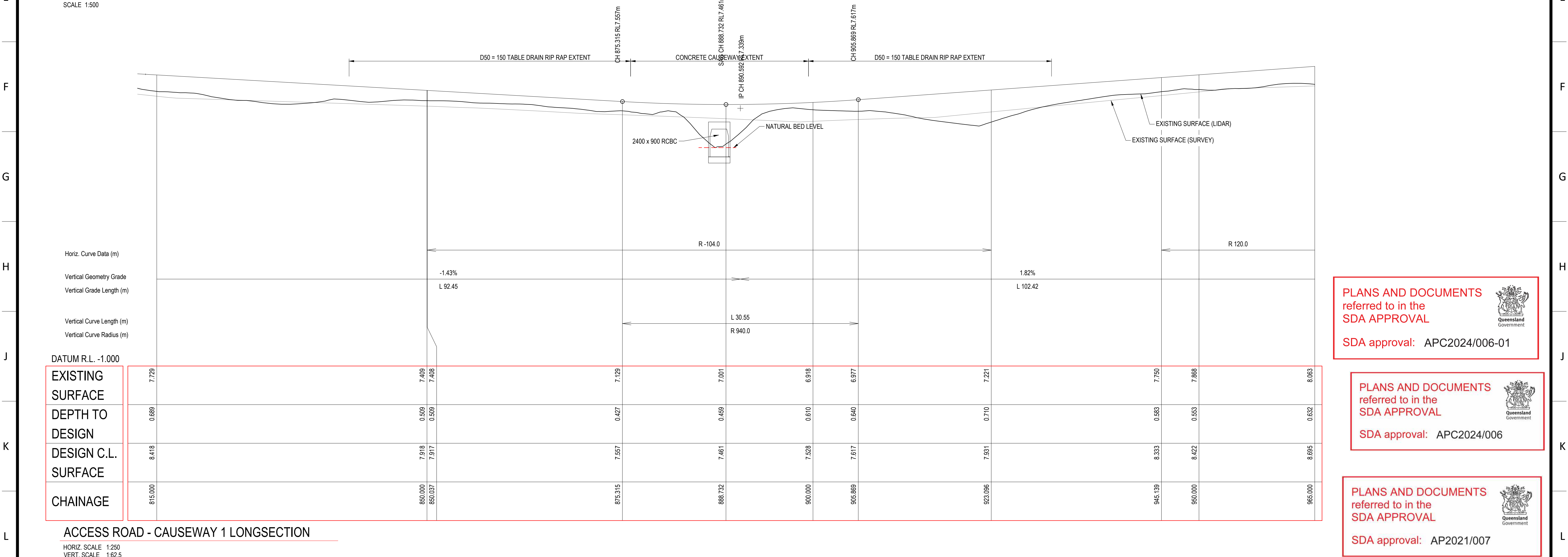
ACCESS ROAD - INTERSECTION LAYOUT

SCALE 1:200

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ACCESS ROAD - CAUSEWAY 1 LAYOUT PLAN
SCALE 1:500



LEGEND

	BOUNDARY
	EXISTING EDGE OF BITUMEN
	EXISTING EDGE OF TRACK
	EXISTING CULVERT
	NEW CULVERT
	EXISTING TREE
	EXISTING TREE TO BE REMOVED
	EXISTING TELSTRA
	EXISTING OVERHEAD POWERLINE
	EXISTING GAS MAIN
	EXISTING FENCE
	NEW STOCKPROOF FENCE
	DESIGN ROAD
	EXISTING CULVERT NOTATION
	NEW CULVERT NOTATION
	MATCH LINE
	TABLE DRAIN OUTLET
	EXISTING CONTOURS (0.25m INTERVAL)
	DESIGN CONTOURS (0.05m INTERVAL)
	BOREHOLE LOCATION AND IDENTIFIER
	SIGNPOST
	CONCRETE CAUSEWAY
	RIP RAP

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL

SDA approval: APC2024/006-01

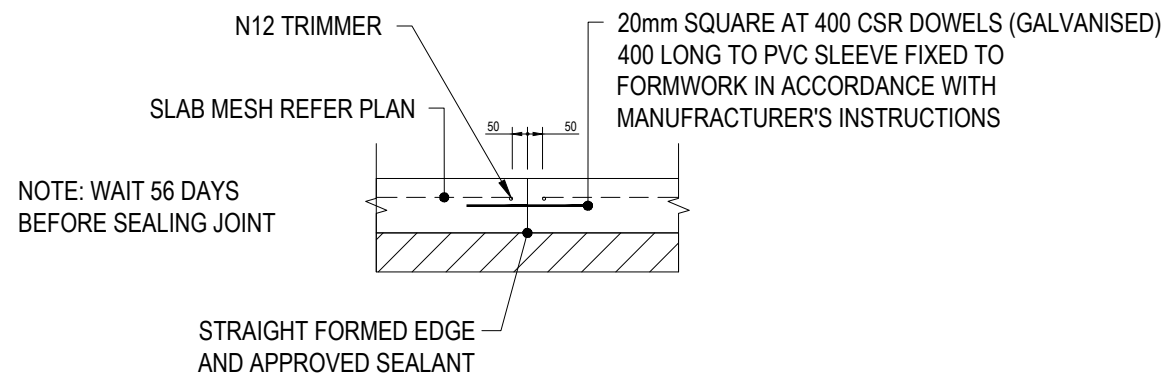
PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL

SDA approval: APC2024/006

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL

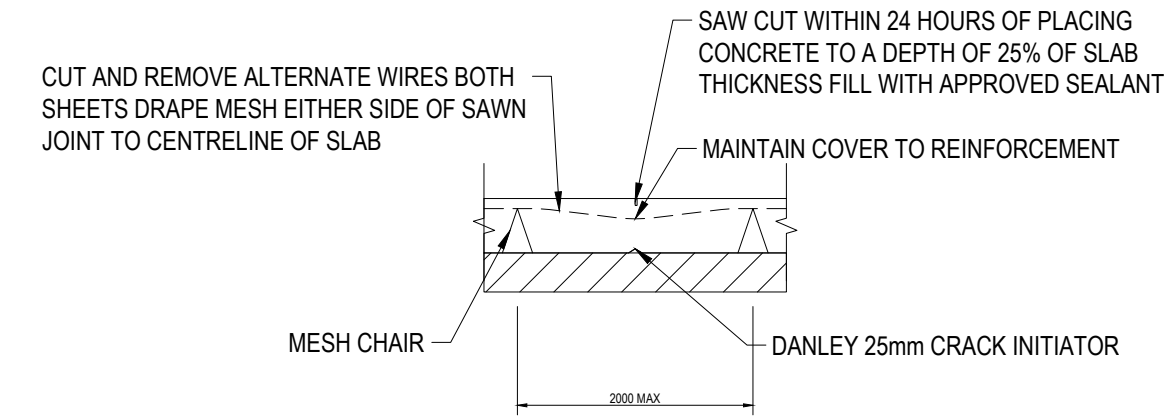
SDA approval: AP2021/007

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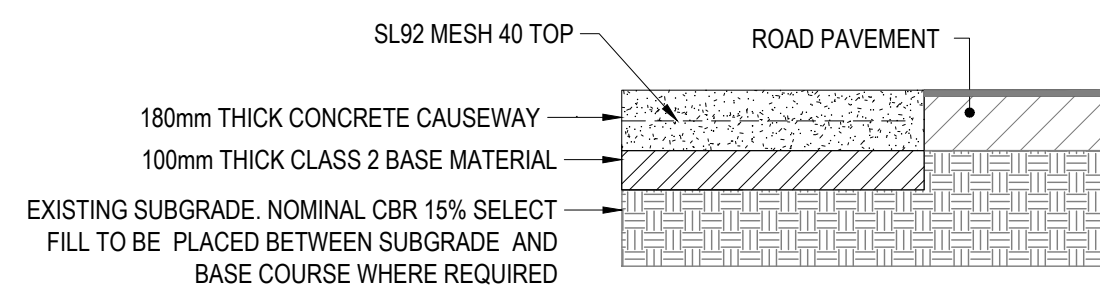
CAUSEWAY - DOWEL JOINT DETAIL (DJ)

NTS



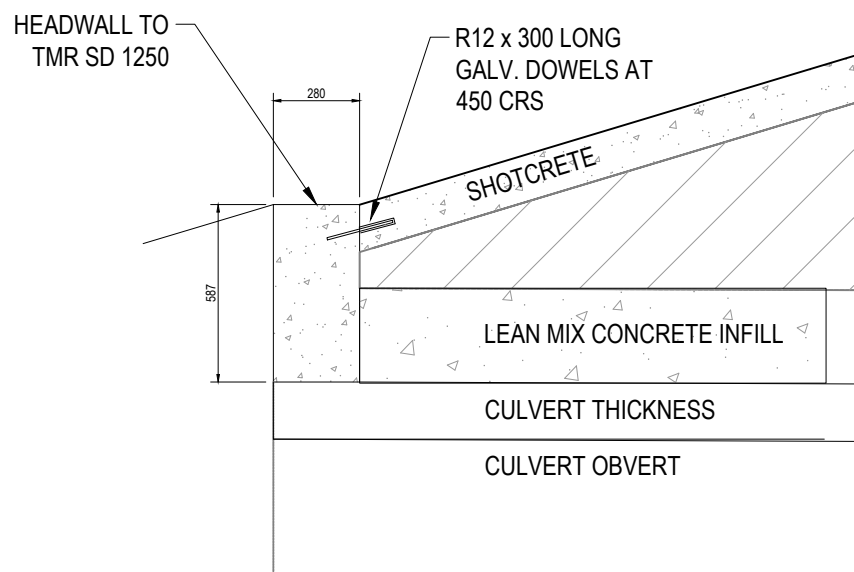
CAUSEWAY - SAWN JOINT DETAIL (SJ)

NTS



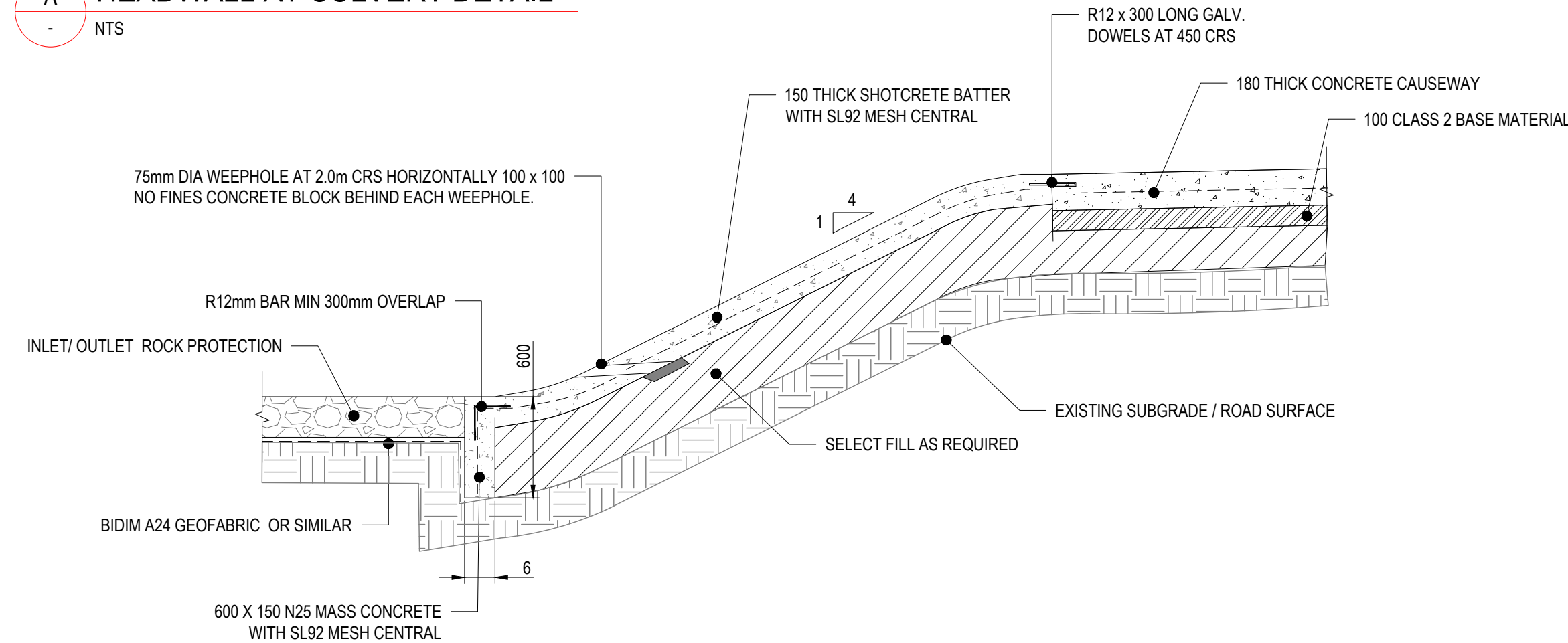
CAUSEWAY - LONGITUDINAL PAVEMENT JOINT DETAIL

NTS



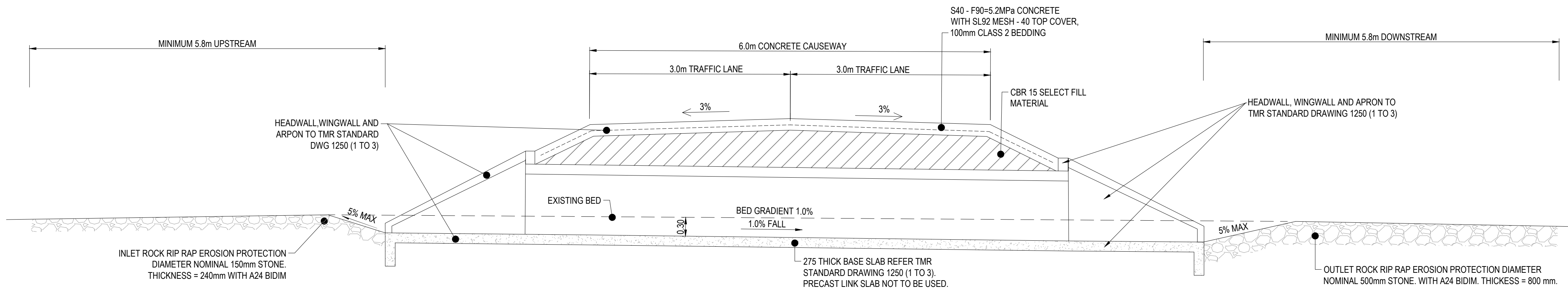
HEADWALL AT CULVERT DETAIL

NTS



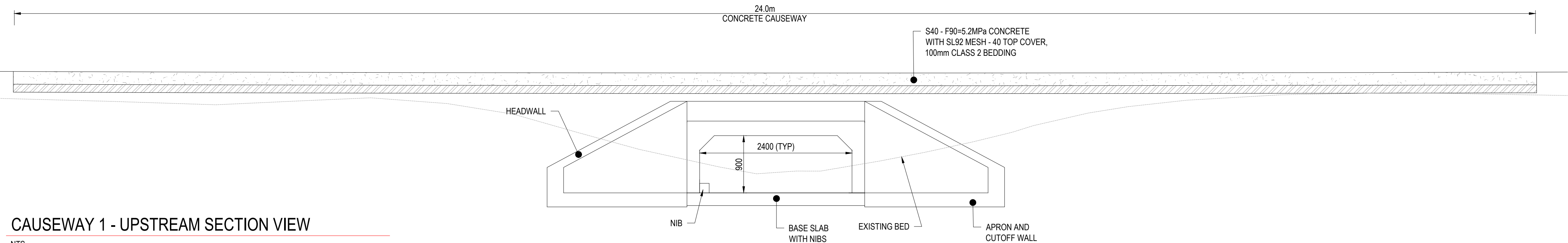
CAUSEWAY - SHOTCRETE BATTER SLOPE DETAIL

NTS



CAUSEWAY 1 - CULVERT LONGSECTION

NTS



CAUSEWAY 1 - UPSTREAM SECTION VIEW

NTS

PLANS AND DOCUMENTS referred to in the SDA APPROVAL



SDA approval: AP2021/007

PLANS AND DOCUMENTS referred to in the SDA APPROVAL



SDA approval: APC2024/006

PLANS AND DOCUMENTS referred to in the SDA APPROVAL



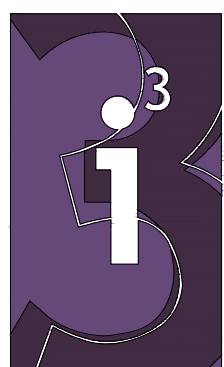
SDA approval: APC2024/006-01

CAUSEWAY TYPICAL NOTES

- ALL CULVERTS TO SIT A MINIMUM 300mm BELOW TRUE STREAM LEVEL (REFER UPSTREAM VIEWS FOR FURTHER DETAILS).
- CULVERT LINK BASE SLAB, HEADWALLS, WINGWALLS AND APRON TO BE AS PER TMR STD DWG 1250.
- CAUSEWAY 1 TO HAVE SIDEWALL BAFFLES INSTALLED REFER TO TMR STD DWG 1270 FOR INSTALLATION AND CONSTRUCTION DETAILS AND SIDEWALL BAFFLE SETOUT PLAN FOR DETAILS.
- CAUSEWAY EXTENTS SHOWN ON LONGSECTION VIEWS (REFER GSLF-I3C-CV-DWG-007-01 AND GSLF-I3C-CV-DWG-008-01).
- TREE REMOVAL TO BE CONFIRMED BY DESIGN ENGINEER DURING CONSTRUCTION.

M

REVISION HISTORY		
D	FOR APPROVAL	08.02.2022
C	FOR APPROVAL	02.02.2022
B	FOR APPROVAL	19.01.2022
A	FOR REVIEW	23.11.2021
No	DESCRIPTION	DATE



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L2 39 Sherwood Rd Toowoong, Qld 4066
www.i3consult.com.au mail@i3consult.com.au
ABN 89 106 675 156 ACN 106 675 156
p 07 3870 8888



Engineers Certification:

Travis Smith MIE Aust. CPEng.
NPER Civil
RPEQ 16400
CPESC 9500

Signature: T. Smith

Date: 08.02.2022

PROJECT

BOWEN ORBITAL SPACE PORT

DRAWING TITLE

BOWEN ORBITAL SPACE PORT
ACCESS ROAD
FLOODWAY DETAILS PLAN

DRAWN	T.J.S.	CHECKED	T.J.S.	APPROVED	T.J.S.
DRAWING STATUS		FOR APPROVAL			
SCALE	NTS	SIZE	A1	COPYRIGHT ©I3 CONSULTING PTY. LTD. ANY UNAUTHORISED USE, DUPLICATION, DISTRIBUTION OR ALTERATION IS STRICTLY PROHIBITED.	
DRAWING CODE					REV
GSLF-I3C-CV-DWG-007-02					D

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Centreline Data
X = 615375.669
Y = 7792964.041
Z = 6.61

Datum 5

DESIGN LEVEL		5.605		6.252	6.490	6.490	6.510		6.610		6.510	6.490	6.252		5.807
DEPTH		0.000		-0.614	-0.840	-0.840	-0.854		-0.923		-0.773	-0.742	-0.683		0.000
EXISTING SURFACE		5.605		5.637	5.649	5.649	5.656		5.687		5.736	5.747	5.768		5.807
DESIGN OFFSET		-6.541		-3.953	-3.001	-3.000	-2.500		0.000		2.500	3.001	3.953		5.730

CHAINAGE 100.000

Centreline Data
X = 615514.299
Y = 7793021.323
Z = 5.937

Datum 4

DESIGN LEVEL		4.764		5.579	5.817	5.817	5.837		5.937		5.837	5.817	5.579		5.023
DEPTH		0.000		-0.762	-0.985	-0.985	-0.997		-1.056		-0.899	-0.868	-0.807		0.000
EXISTING SURFACE		4.764		4.816	4.831	4.832	4.839		4.881		4.937	4.949	4.971		5.023
DESIGN OFFSET		-7.210		-3.953	-3.001	-3.000	-2.500		0.000		2.500	3.001	3.953		6.175

CHAINAGE 250.000

Centreline Data
X = 615657.249
Y = 7792995.456
Z = 7.159

Datum 6

DESIGN LEVEL		6.463		6.801	7.039	7.039	7.059		7.159		7.059	7.039	6.801		6.501
DEPTH		0.000		-0.320	-0.558	-0.558	-0.578		-0.720		-0.523	-0.483	-0.208		0.135
EXISTING SURFACE		6.463		6.481	6.481	6.481	6.481		6.439		6.536	6.556	6.593		6.637
DESIGN OFFSET		-5.304		-3.953	-3.001	-3.000	-2.500		0.000		2.500	3.001	3.953		5.153

CHAINAGE 400.000

Centreline Data
X = 615335.642
Y = 7792934.885
Z = 6.859

Datum 6

DESIGN LEVEL		6.206		6.201	6.501	6.739	6.739		6.859		6.739	6.501	6.201		6.411
DEPTH		0.000		0.005	-0.283	-0.512	-0.512		-0.603		-0.478	-0.454	-0.190		0.000
EXISTING SURFACE		6.206		6.206	6.218	6.227	6.227		6.257		6.281	6.286	6.311		6.411
DESIGN OFFSET		-5.163		-5.163	-3.953	-3.001	-3.000		0.000		2.500	3.001	3.953		6.073

CHAINAGE 50.000

Centreline Data
X = 615468.065
Y = 7793002.291
Z = 6.11

Datum 4

DESIGN LEVEL		4.899		5.752	5.990	5.990	6.010		6.110		6.010	5.990	5.752		5.154
DEPTH		0.000		-0.792	-1.011	-1.011	-1.022		-1.073		-0.932	-0.903	-0.646		0.000
EXISTING SURFACE		4.899		4.961	4.979	4.979	4.989		5.037		5.078	5.088	5.106		5.154
DESIGN OFFSET		-7.366		-3.953	-3.001	-3.000	-2.500		0.000		2.500	3.001	3.953		6.346

CHAINAGE 200.000

Centreline Data
X = 615611.361
Y = 7793015.314
Z = 6.73

Datum 5

DESIGN LEVEL		5.685		6.372	6.610	6.610	6.630		6.730		6.630	6.610	6.372		5.752
DEPTH		0.000		-0.774	-1.000	-1.000	-1.013		-1.077		-0.932	-0.905	-0.654		0.000
EXISTING SURFACE		5.685		5.598	5.610	5.610	5.617		5.663		5.688	5.705	5.718		5.752
DESIGN OFFSET		-6.700		-3.953	-3.001	-3.000	-2.500		0.000		2.500	3.001	3.953		6.433

CHAINAGE 350.000

Centreline Data
X = 615314.105
Y = 7792901.502
Z = 7.196

Datum 6

DESIGN LEVEL		7.196		7.096	7.096	7.076	7.076		7.196		7.096	7.076	7.096		7.591
DEPTH		0.000		0.466	0.466	0.509	0.509		0.361		0.466	0.466	0.466		0.000
EXISTING SURFACE		7.196		7.562	7.562	7.585	7.585		7.557		7.562	7.562	7.562		7.591
DESIGN OFFSET		0.000		2.500	3.001	3.001	3.001		0.000		2.500	3.001	3.953		7.760

CHAINAGE 10.222

Centreline Data
X = 615421.867
Y = 7792983.166
Z = 6.36

Datum 5

DESIGN LEVEL		5.327		6.002	6.240	6.240	6.260		6.360		6.260	6.240	6.002		5.512
DEPTH		0.000		-0.646	-0.874	-0.874	-0.888		-0.961		-0.814	-0.784	-0.528		0.000
EXISTING SURFACE		5.327		5.355	5.366	5.366	5.371		5.399		5.446	5.456	5.474		5.512
DESIGN OFFSET		-6.654		-3.953	-3.001	-3.000	-2.500		0.000		2.500	3.001	3.953		5.912

CHAINAGE 150.000

Centreline Data
X = 615583.429
Y = 7793028.418
Z = 6.319

Datum 5

DESIGN LEVEL		5.096		5.961	6.199	6.199	6.219		6.319		6.219	6.199	5.961		5.373
DEPTH		0.000		-0.817	-1.043	-1.043	-1.056		-1.070		-0.922	-0.892	-0.639		0.000
EXISTING SURFACE		5.096		5.143	5.156	5.156	5.163		5.249		5.296	5.307	5.322		5.373
DESIGN OFFSET		-7.411		-3.953	-3.001	-3.000	-2.500		0.000		2.500	3.001	3.953		6.303

CHAINAGE 300.000

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006-01

PLANS AND DOCUMENTS
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SDA APPROVAL



SDA approval: APC2024/006

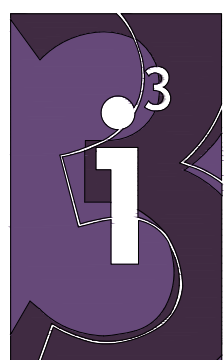
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ACCESS ROAD - CROSS SECTIONS

HORIZ. SCALE 1:100
VERT. SCALE 1:100



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p 07 3870 8888

GILMOUR SPACE

Engineers Certification:

Travis Smith MIE Aust. CPEng.
NPER Civil
RPEQ 16400
CPESC 9500

Signature: *T. Smith*

Date: 08.02.2022

PROJECT

BOWEN ORBITAL SPACE PORT

DRAWING TITLE

BOWEN ORBITAL SPACE PORT

ACCESS ROAD

CROSS SECTIONS - SHEET 1 OF 3

DRAWN T.J.S.

CHECKED T.J.S.

APPROVED T.J.S.

DRAWING STATUS

FOR APPROVAL

SCALE

SIZE

NTS A1
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REVISION HISTORY

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PLANS AND DOCUMENTS
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SDA approval: APC2024/006-01



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TYPICAL CROSS SECTION NOTES

- REFER TO GLSF-I3C-DWG-005 SERIES FOR ROADWORKS UPGRADE SCHEDULE AND SPECIFIC LOCATIONS (CHAINAGES) WHERE TYPICAL CROSS SECTIONS APPLY.
- TYPICAL CROSS SECTIONS MAY VARY THROUGH THE APPLICATION OF SUPERELEVATION, DRAINAGE ELEMENTS, EXISTING ROAD WIDTH OR PAVEMENT DESIGN.
- REFER TO GLSF-I3C-DWG-007 AND 008 SERIES FOR CAUSEWAY DETAILS WHICH ALTER CROSS SECTION SURFACE.
- REFER TO GLSF-I3C-DWG-003-002 FOR PAVEMENT TYPES.
- REFER TO GLSF-I3C-DWG-005 FOR LOCATIONS OF PAVEMENT TYPES.

Centreline Data
X = 615769.034
Y = 7792898.019
Z = 13.213

Datum 12

DESIGN LEVEL	12.211		12.855	13.093	13.113		13.213		13.113	12.855	12.555	13.207
DEPTH	0.000		-0.462	-0.596	-0.596	-0.596	-0.418		-0.146	-0.092	0.584	0.000
EXISTING SURFACE	12.211		12.393	12.496	12.496	12.551	12.794		12.967	13.001	13.138	13.207
DESIGN OFFSET	-6.529		-3.953	-3.001	-3.000	-2.500	0.000		2.500	3.001	5.153	6.957

CHAINAGE 550.000

Centreline Data
X = 615736.701
Y = 7792936.158
Z = 10.863

Datum 10

DESIGN LEVEL	10.323	10.205	10.205	10.505	10.743	10.743	10.863	10.763	10.323	10.323	10.205	10.424
DEPTH	0.000	0.115	0.109	-0.204	-0.453	-0.453	-0.606	-0.459	-0.430	-0.430	-0.178	0.000
EXISTING SURFACE	10.323	10.320	10.315	10.302	10.291	10.291	10.258	10.304	10.313	10.327	10.411	10.424
DESIGN OFFSET	-5.888	-5.653	-5.153	-3.953	-3.001	-3.000	0.000	2.500	3.001	3.953	5.153	6.091

CHAINAGE 500.000

Centreline Data
X = 615700.359
Y = 7792970.341
Z = 8.534

Datum 7

DESIGN LEVEL	8.422	7.876	7.876	8.176	8.414	8.414	8.534	8.434	8.176	7.876	7.876	8.018
DEPTH	0.000	0.555	0.549	0.232	-0.554	-0.554	-0.634	-0.495	-0.464	-0.464	-0.136	0.000
EXISTING SURFACE	8.422	8.431	8.425	8.408	7.860	7.860	7.899	7.938	7.950	7.972	8.000	8.018
DESIGN OFFSET	-6.747	-5.653	-5.153	-3.953	-3.001	-3.000	0.000	2.500	3.001	3.953	5.153	5.938

CHAINAGE 450.000

ACCESS ROAD - CROSS SECTIONS

HORIZ. SCALE 1:100
VERT. SCALE 1:100

Centreline Data
X = 615836.925
Y = 7792824.81
Z = 13.734

Datum 11

DESIGN LEVEL	11.614	13.376	13.614	13.614	13.734	13.634	13.614	13.376	13.076	13.076	14.263
DEPTH	0.000	-0.582	-0.712	-0.712	-0.490	-0.081	0.022	0.426	0.862	0.918	0.000
EXISTING SURFACE	11.614	12.794	12.902	12.902	13.244	13.553	13.636	13.802	13.938	13.994	14.263
DESIGN OFFSET	-11.001	-3.953	-3.001	-3.000	0.000	2.500	3.001	3.953	5.153	5.653	8.026

CHAINAGE 650.000

Centreline Data
X = 615801.371
Y = 7792859.883
Z = 15.263

Datum 11

DESIGN LEVEL	11.302	14.905	15.143	15.143	15.263	15.163	15.143	14.905	14.605	14.605	15.953
DEPTH	0.000	-1.021	-1.022	-1.021	-0.394	-0.023	0.051	0.393	0.875	0.975	0.000
EXISTING SURFACE	11.302	13.884	14.122	14.122	14.869	15.140	15.195	15.296	15.480	15.580	15.953
DESIGN OFFSET	-18.368	-3.953	-3.001	-3.000	0.000	2.500	3.001	3.953	5.153	5.653	8.348

CHAINAGE 600.000

Centreline Data
X = 615965.99
Y = 7792748.974
Z = 8.711

Datum 8

DESIGN LEVEL	8.030	8.353	8.591	8.591	8.711	8.611	8.591	8.353	8.053	8.053	8.153
DEPTH	0.000	-0.308	-0.522	-0.522	-0.585	-0.481	-0.460	-0.220	0.085	0.095	0.000
EXISTING SURFACE	8.030	8.046	8.070	8.070	8.127	8.131	8.132	8.133	8.138	8.149	8.153
DESIGN OFFSET	-5.248	-3.953	-3.001	-3.000	0.000	2.500	3.001	3.953	5.153	5.652	5.852

CHAINAGE 800.000

Centreline Data
X = 615921.84
Y = 7792772.442
Z = 10.382

Datum 9

DESIGN LEVEL	9.517	10.024	10.262	10.262	10.382	10.282	10.262	10.024	9.724	9.724	9.800
DEPTH	0.000	-0.447	-0.656	-0.656	-0.694	-0.543	-0.512	-0.255	0.070	0.077	0.000
EXISTING SURFACE	9.517	9.578	9.606	9.606	9.688	9.740	9.750	9.770	9.795	9.801	9.800
DESIGN OFFSET	-5.983	-3.953	-3.001	-3.000	0.000	2.500	3.001	3.953	5.153	5.653	5.805

CHAINAGE 750.000

Centreline Data
X = 615877.805
Y = 7792796.121
Z = 11.102

Datum 10

DESIGN LEVEL	10.247	10.744	10.982	10.982	11.102	11.002	10.982	10.744	10.444	10.444	10.755
DEPTH	0.000	-0.428	-0.633	-0.633	-0.643	-0.415	-0.371	-0.091	0.261	0.283	0.000
EXISTING SURFACE	10.247	10.316	10.350	10.350	10.459	10.587	10.611	10.653	10.706	10.728	10.755
DESIGN OFFSET	-5.944	-3.953	-3.001	-3.000	0.000	2.500	3.001	3.953	5.153	5.653	6.275

CHAINAGE 700.000

D	FOR APPROVAL	08.02.2022
C	FOR APPROVAL	02.02.2022
B	FOR APPROVAL	19.01.2022
A	FOR REVIEW	23.11.2021
No	DESCRIPTION	DATE
REVISION HISTORY		



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ABN 89 106 675 156 ACN 106 675 156
p 07 3870 8888



Engineers Certification:

Travis Smith MIE Aust. CPEng.
NPER Civil
RPEQ 16400
CPESC 9500

Signature: T. Smith

Date: 08.02.2022

PROJECT

BOWEN ORBITAL SPACE PORT

DRAWING TITLE

BOWEN ORBITAL SPACE PORT

ACCESS ROAD

CROSS SECTIONS - SHEET 2 OF 3

DRAWN T.J.S. CHECKED T.J.S. APPROVED T.J.S.

DRAWING STATUS FOR APPROVAL

SCALE

NTS

SIZE

A1

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PLANS AND DOCUMENTS
referred to in the
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SDA approval: AP2021/007

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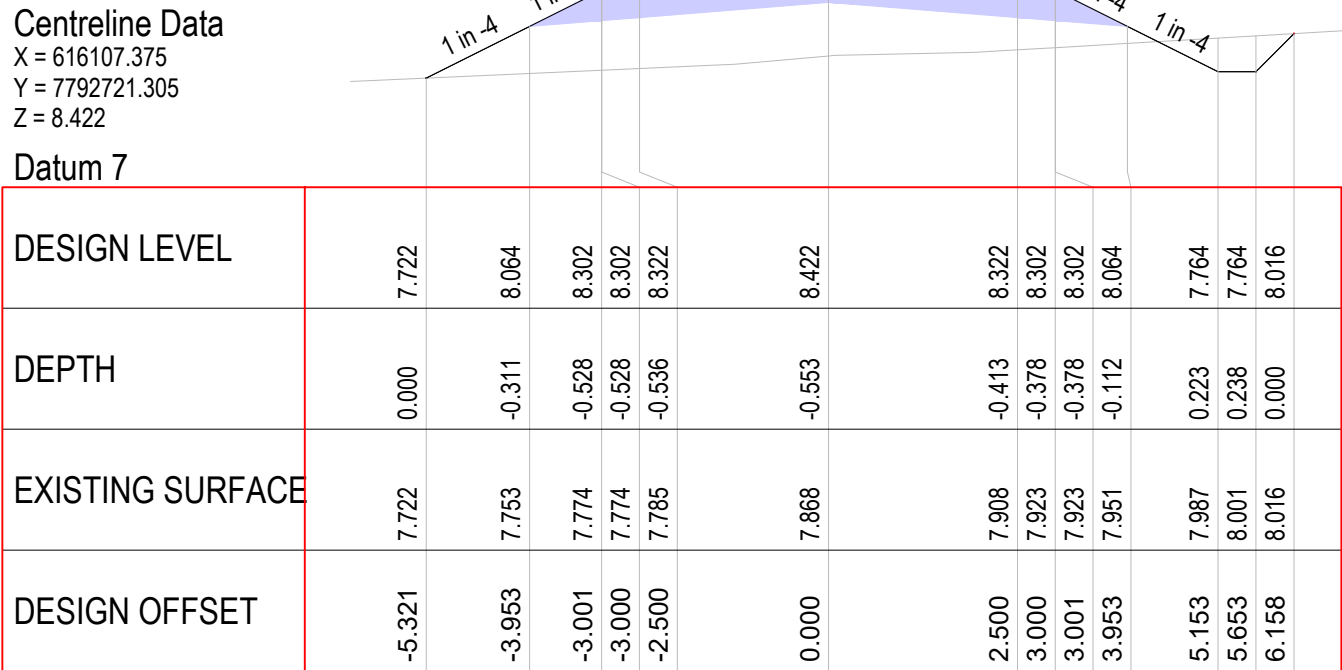

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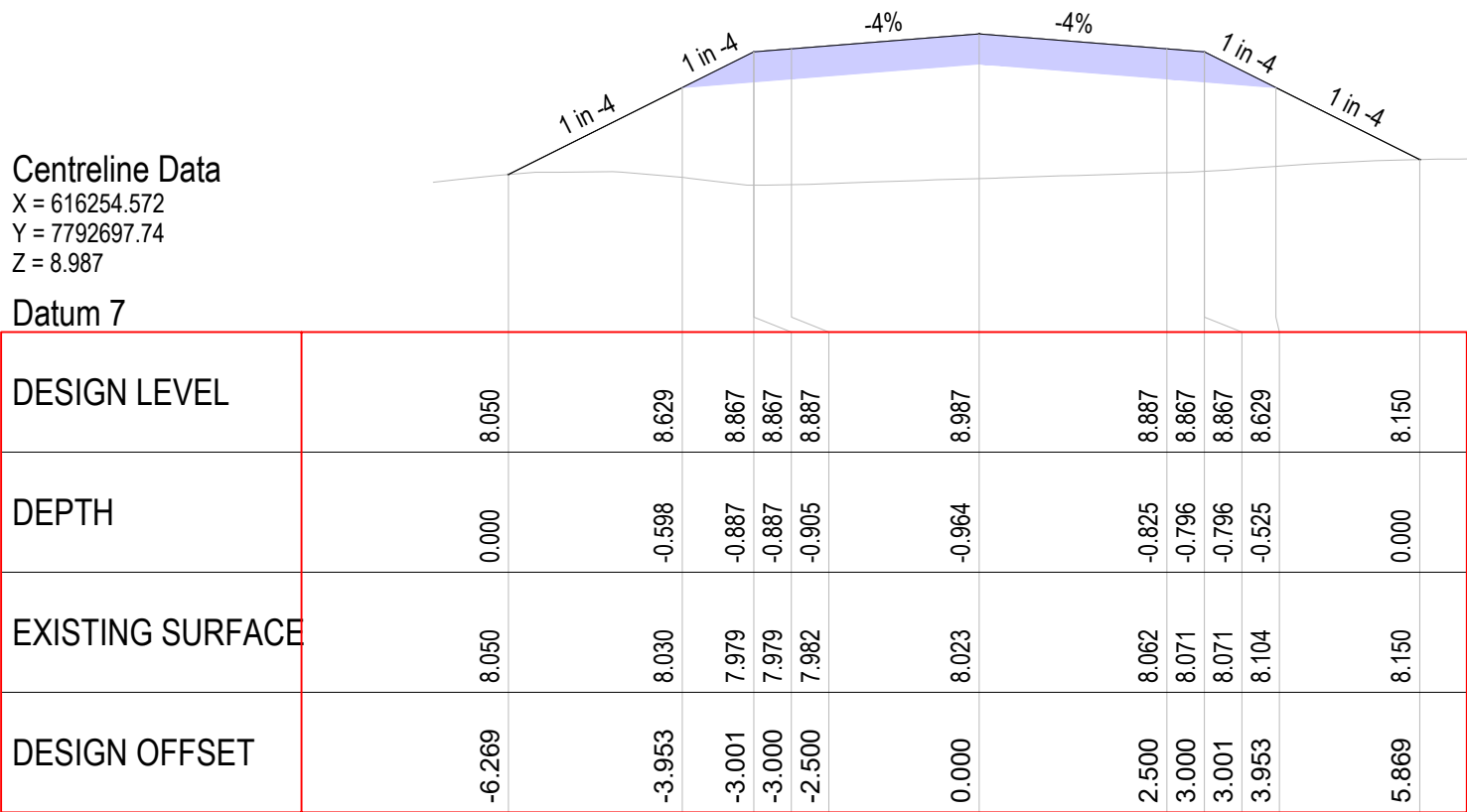
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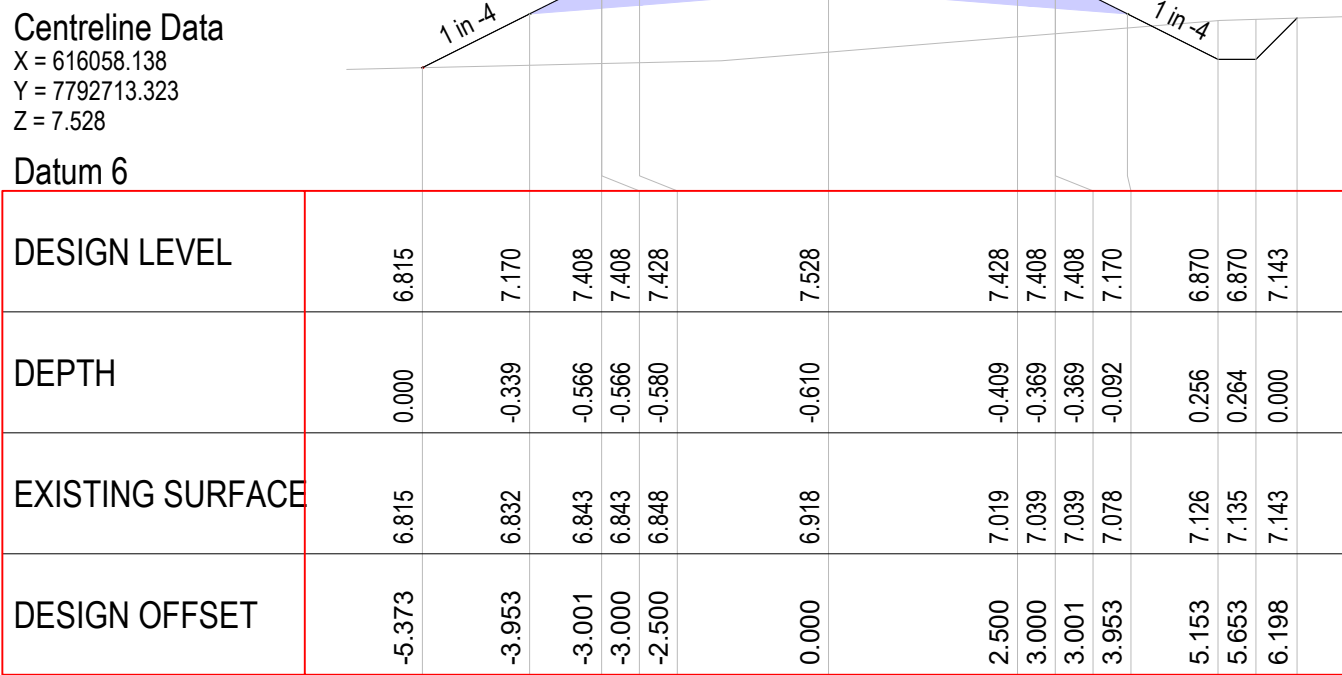
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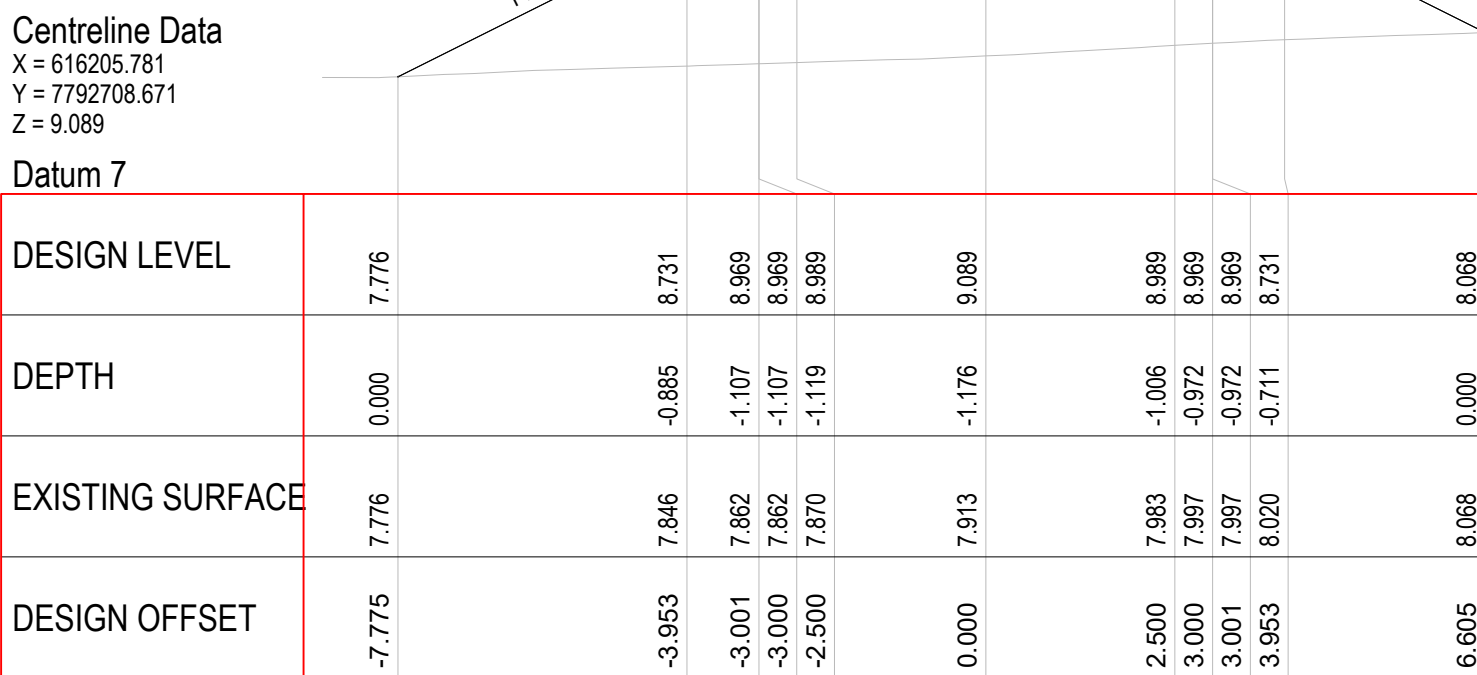
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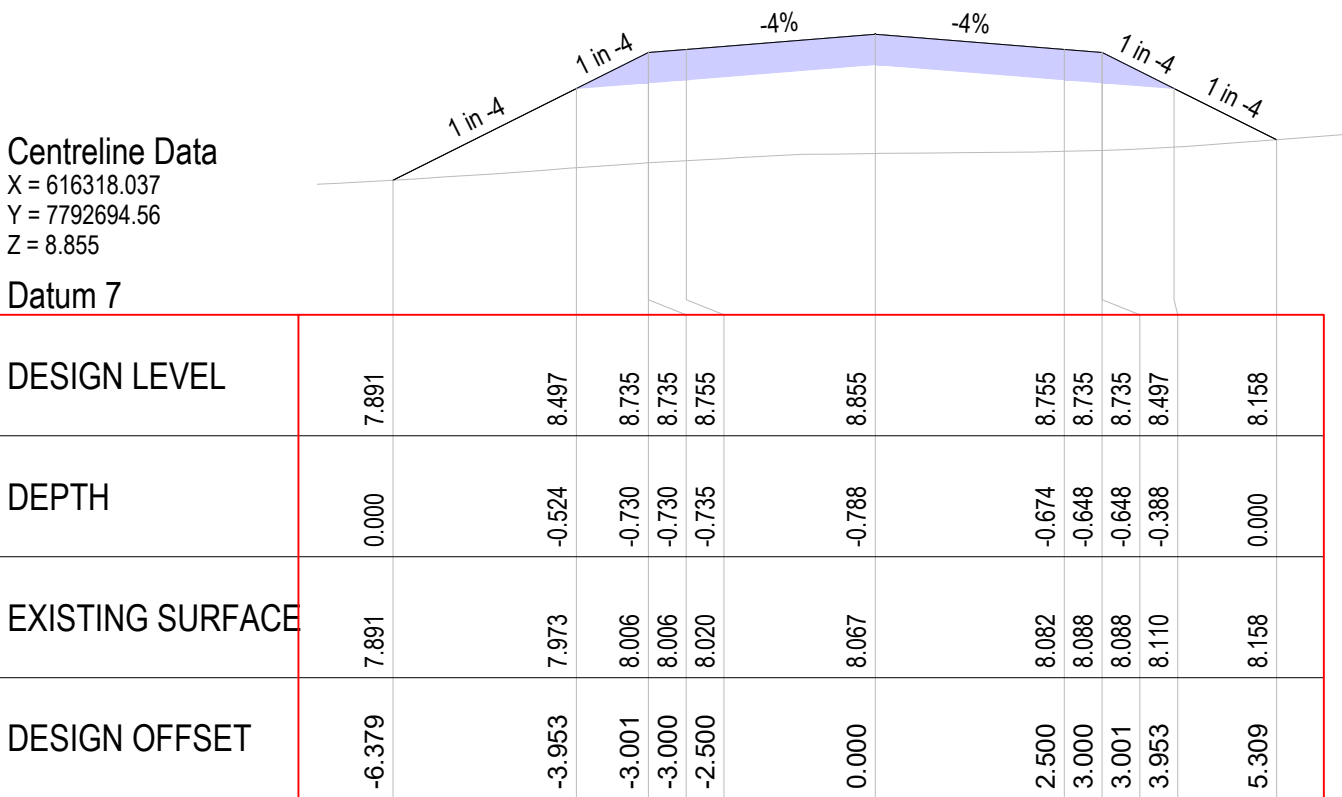
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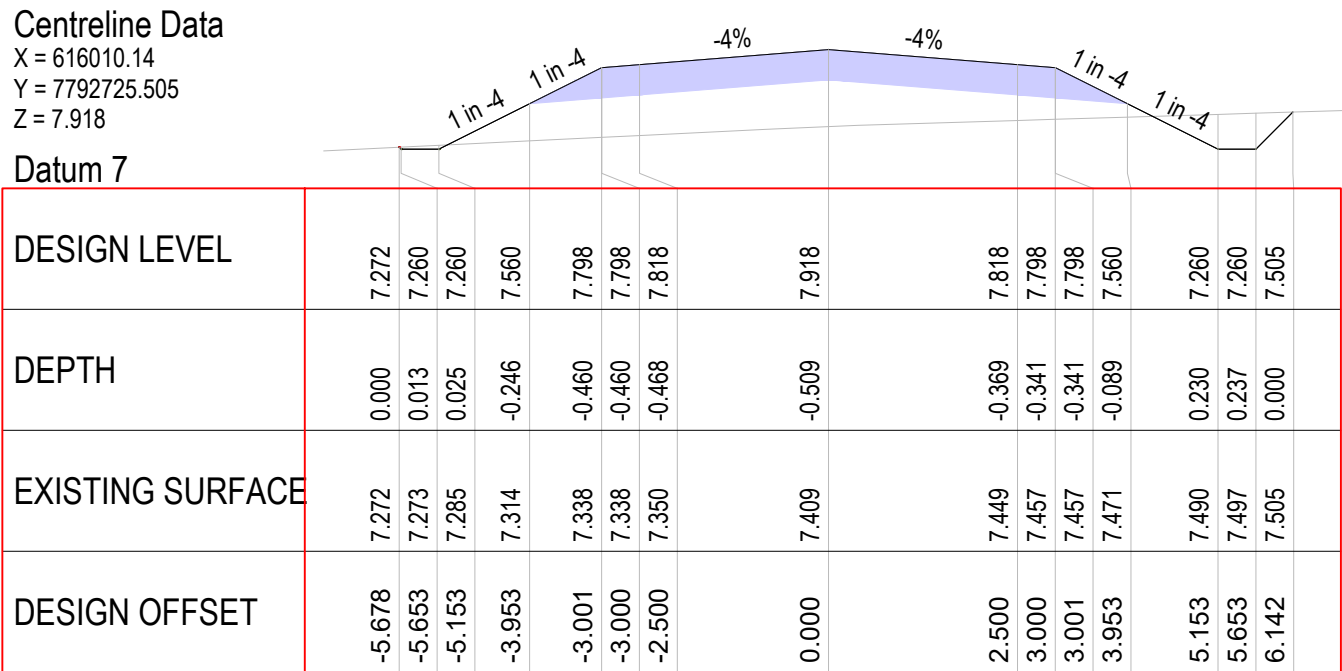
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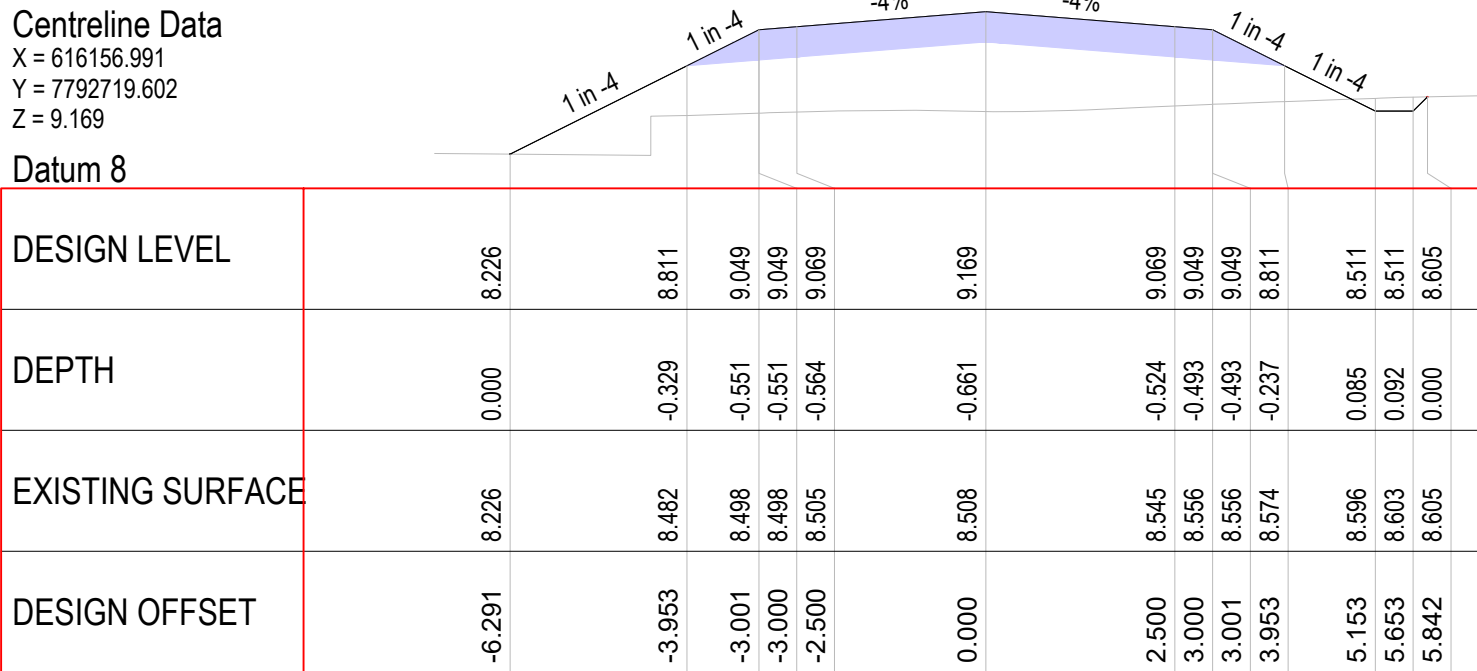
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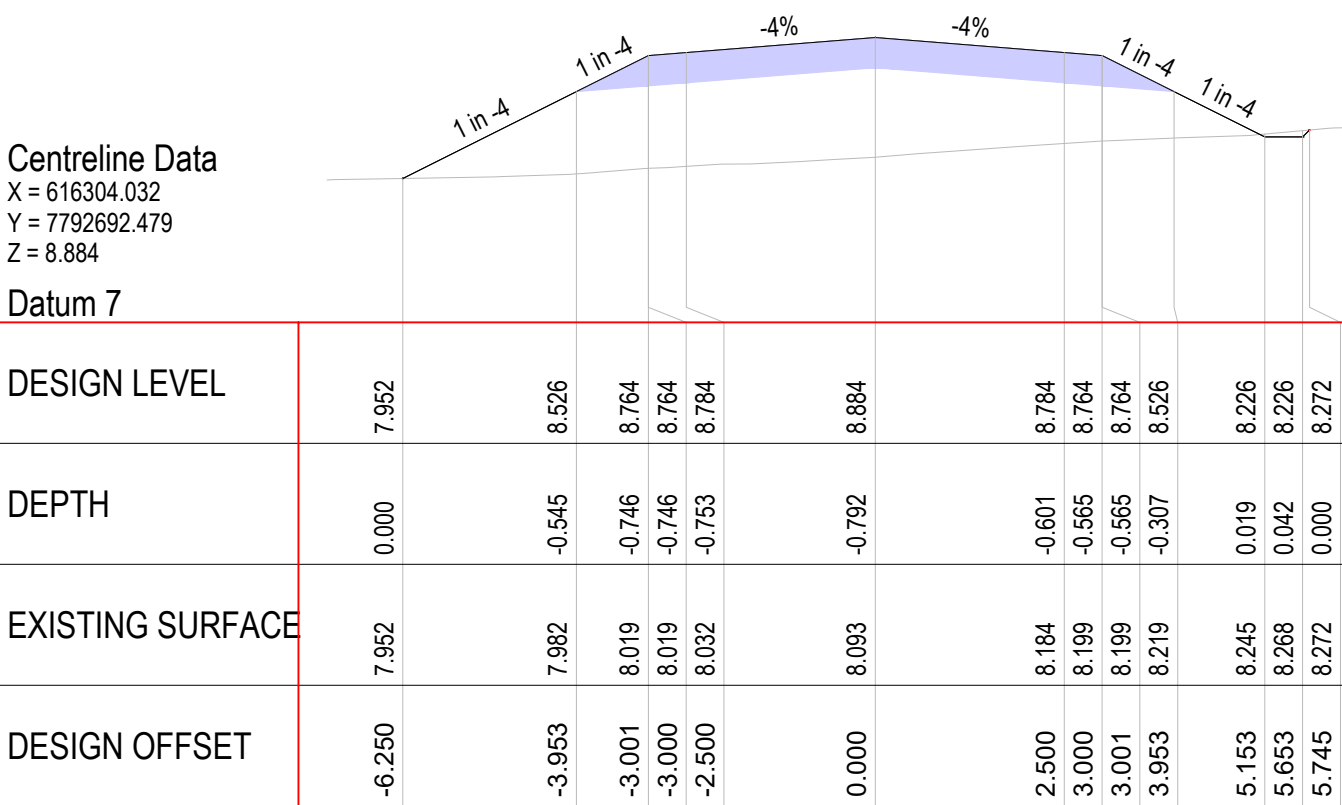
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CHAINAGE 850.000



CHAINAGE 1000.000



CHAINAGE 1150.000

ACCESS ROAD - CROSS SECTIONS

HORIZ. SCALE 1:100
VERT. SCALE 1:100

No	DESCRIPTION	DATE
D	FOR APPROVAL	08.02.2022
C	FOR APPROVAL	02.02.2022
B	FOR APPROVAL	19.01.2022
A	FOR REVIEW	23.11.2021
No	DESCRIPTION	DATE

REVISION HISTORY


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p 07 3870 8888

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ACN 106 675 156



Engineers Certification:

Travis Smith MIE Aust. CPEng.

NPER Civil
RPEQ 16400
CPESC 9500

Signature: 

Date: 08.02.2022

PROJECT

BOWEN ORBITAL SPACE PORT

DRAWING TITLE

**BOWEN ORBITAL SPACE PORT
ACCESS ROAD**

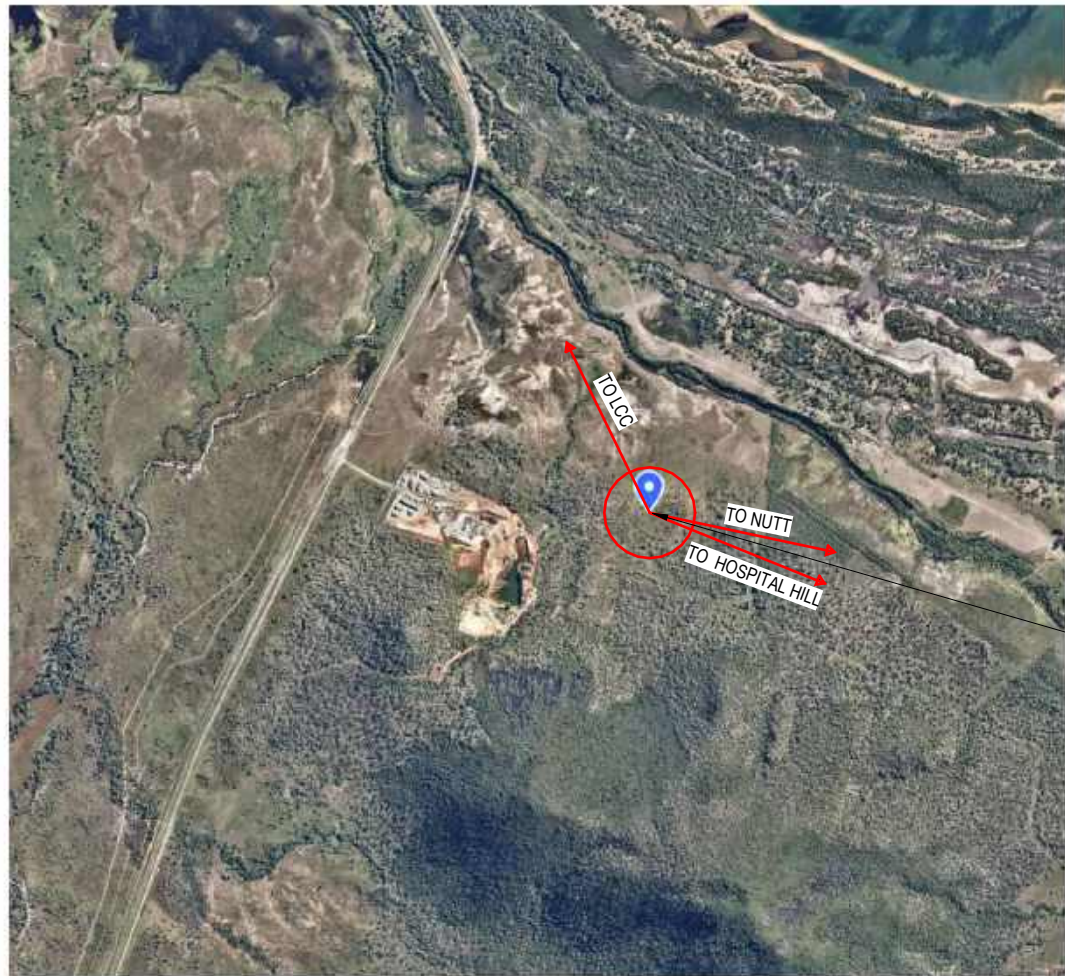
CROSS SECTIONS - SHEET 3 OF 3

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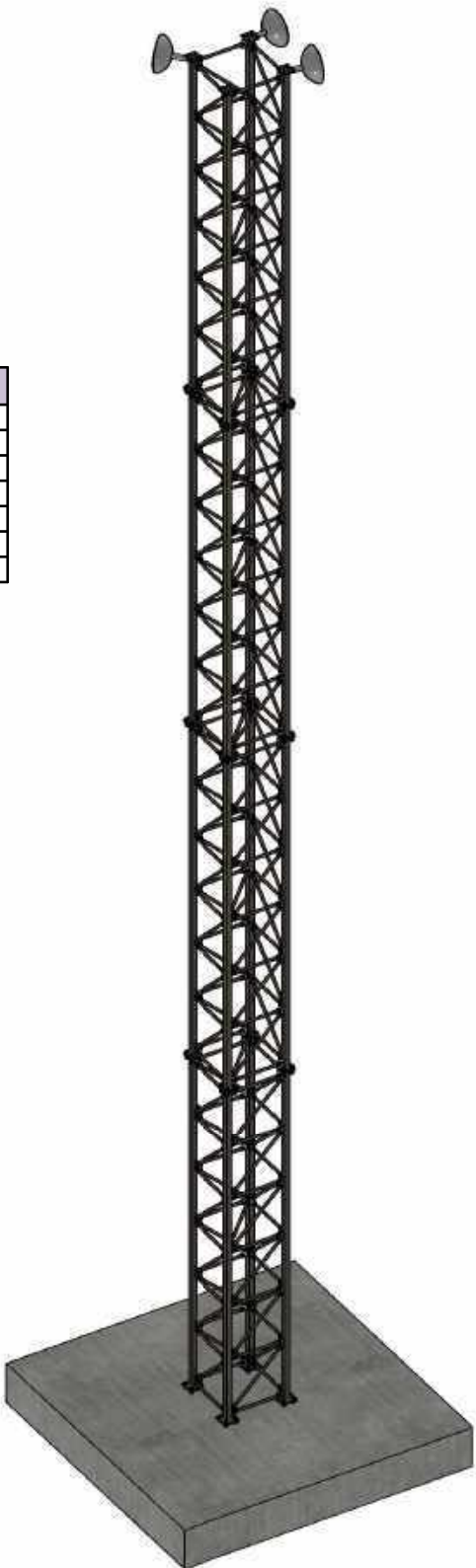
24m COMMUNICATION TOWER

BOWEN ORBITAL SPACEPORT

for
TELCO ANTENNAS



DRAWING LIST	
SHEET NUMBER	SHEET NAME
S00	COVER PAGE
S01	PROJECT NOTES
S50	GENERAL ARRANGEMENT AND ELEVATION
S100	FOOTING DETAILS
S400	TOWER FRAMING PLAN AND ELEVATIONS
S401	TOWER FRAMING DETAILS



PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006-01

0	FOR CONSTRUCTION	04.07.22	D.J.
REV	DESCRIPTION	DATE	BY

Status
FOR CONSTRUCUTION

Project
24m COMMUNICATION TOWER
BOWEN ORBITAL SPACEPORT

for
TELCO ANTENNAS

Title
COVER PAGE

Drawn	Date	Chkd	Date
DJ		RL	
Design	Date	Apprd	Date
MF		LS	
Scale	A3	Certif	Date
NTS		LS	
Project No.	Dwg. No.	Rev	
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SDA approval: APC2022/007

PLANS AND DOCUMENTS
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SDA approval: APC2024/006

GENERAL NOTES	
1.	THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS.
2.	BEFORE PROCEEDING WITH THE WORK ANY DISCREPANCIES IN THE CONTRACT DOCUMENTS SHALL BE REFERRED FOR DECISION TO THE ENGINEER.
3.	SETTING OUT DIMENSIONS AND SIZES OF STRUCTURAL MEMBERS SHALL NOT BE OBTAINED BY SCALING THE STRUCTURAL DRAWINGS.
4.	ANY SETTING OUT DIMENSIONS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR BEFORE CONSTRUCTION COMMENCES.
5.	THE STRUCTURE HAS BEEN DESIGNED FOR THE FINAL INSERVICE CONDITION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND CERTIFICATION OF ALL TEMPORARY WORKS REQUIRED TO COMPLETE THE WORKS INCLUDING, RIGGING METHODOLOGY, TEMPORARY BRACING, PROPPING, SHORING, ASSESSMENT OF CONSTRUCTION LOADS AND ASSOCIATED WORK METHOD STATEMENTS, SUCH THAT THE CONSTRUCTION LOADS DO NOT EXCEED THE CAPACITY OF THE STRUCTURE. THE STRUCTURAL ENGINEER WILL NOT ASSESS, OR APPROVE ANY TEMPORARY WORKS, NOR ADVISE ON THE TIMING FOR THEIR REMOVAL.
6.	ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITIONS INCLUDING AMENDMENTS OF THE RELEVANT SAA STANDARDS, SAA CODES OF PRACTICE EXCEPT AS VARIED BY THE CONTRACT DOCUMENTS AND OF THE BY-LAWS OF THE LOCAL GOVERNMENT AUTHORITY.

DESIGN CRITERIA	
1.	GENERAL PRINCIPLES:
	- IMPORTANCE LEVEL 2
	- DESIGN LIFE 50 YEARS
2.	SELF-WEIGHT OF THE STEEL MEMEBERS AND CONNECTIONS HAVE BEEN ASSESSED IN ACCORDANCE WITH AS1170.1 PERMANENT ACTION DESIGN LOADS.
3.	WIND LOADS HAVE BEEN ASSESSED IN ACCORDANCE WITH AS1170.2:
	- REGION C
	- TERRAIN CATEGORY TC2.0
	- WIND DIRECTION MULTIPLIER Md = 0.9
	- CLIMATE CHANGE MULTIPLIER Mc = 1.05
	- TERRAIN/HEIGHT MULTIPLIER Mz,cat = 1.1
	- SHIELDING MULTIPLIER Ms = 1.0
	- TOPOGRAPHICAL MULTIPLIER Mt = 1.0
	- DESIGN WIND SPEED (ULS) Vdes = 67.9m/s
	- DESIGN WIND PRESSURE (ULS) qzu = 2.77kPa

FOUNDATION NOTES	
1.	FOOTINGS SHALL BE PLACED CENTRALLY UNDER COLUMNS UNLESS NOTED OTHERWISE.
2.	EXCAVATIONS SHALL BE KEPT FREE OF PONDED WATER BEFORE PLACING CONCRETE.
3.	FOOTINGS HAVE BEEN DESIGNED BASED ON THE FOLLOWING GEOTECHNICAL REPORT:
GEOTECHNICAL DETAILS	
GEOTECHNICAL REPORT BY	CQ Soil Testing
REPORT JOB NUMBER	CQ20875
REPORT DATE	6/04/2022
SITE CLASSIFICATION TO AS2870	H2
CHARACTERISTIC SURFACE MOVEMENT (Ys)	60-70 mm
MIN. BEARING CAPACITY (ULS)	350kPa
EXPECTED FOUNDING MATERIAL	VERY STIFF SILTY CLAY
4.	GEOTECHNICAL ENGINEER TO CONFIRM FOUNDATION DESIGN PARAMETERS PRIOR TO PLACING CONCRETE BLINDING.
5.	PLACE BLINDING CONCRETE TO BASE OF FOOTING EXCAVATION TO ACHIEVE DESIGN AND / OR UNIFORM BEARING MATERIAL.

EARTHWORKS NOTES	
1.	REMOVE ALL TOPSOIL FROM THE AREA OF THE WORKS. TOPSOIL TO BE STOCKPILED AND REUSED AS REQUIRED OR REMOVED FROM SITE.
2.	REMOVE BOULDERS AND ROCKS WITHIN 100mm OF UNDERSIDE OF OCNCRETE SLABS AND PAVEMENTS.
3.	CUT SURFACE TO BE COMPACTED TO 98% STANDARD COMPACTION.
4.	ANY SETTING OUT DIMENSIONS SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR BEFORE CONSTRUCTION COMMENCES.

GROUT NOTES	
1.	DUE TO HIGHLY REACTIVE SOIL FOUNDATION THE TOWER MAY NEED RESETTNG VERTICALLY FROM TIME TO TIME BY REMOVING THE GROUT, ADJUSTING THE ANCHOR BOLT NUTS AND RE-GROUTING THE BASE PLATES.
2.	GROUT IS TO BE CEMENTITIOUS. HIGH STRENGTH AND NON-SHRINK (FOSROC CONBEXTRA BB92 OR EQUIVALENT).
3.	INSTALLATION IS TO BE IN ACCORDANCE WITH MANUFACTURES SPECIFICATION.

CONCRETE NOTES	
1.	ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600 & AS 1379.
2.	CONCRETE QUALITY:
	ELEMENTMAX SIZEAGGREGATECONCRETE GRADE
	FOOTING20mmN32
3.	CLEAR CONCRETE COVER TO REINFORCEMENT (OUTSIDE OF STIRRUPS AND TIES) SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE .
	ELEMENTCLEAR COVER
	FOOTING50 COVER
4.	SPECIFIED STRUCTURAL THICKNESSES FOR CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.
5.	CONSTRUCTION JOINTS OR POUR BREAKS WHERE NOT SHOWN ON PLANS OR DETAILS SHALL BE LOCATED AND FORMED TO THE APPROVAL OF THE ENGINEER.
6.	NO PENETRATIONS, RECESSES OR CHASES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT APPROVAL OF THE ENGINEER.
7.	AT PENETRATIONS IN SLABS UNLESS OTHERWISE DETAILED REINFORCEMENT MUST NOT BE CUT BUT SHALL BE GATHERED EQUALLY TO EACH SIDE OF PENETRATION AND EXTRA REINFORCEMENT PROVIDED BETWEEN THE PENETRATIONS AS DIRECTED BY THE ENGINEER.
8.	REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY. IT IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.
9.	PROVIDE THE ENGINEER WITH 48 HOURS NOTICE OF REINFORCEMENT BEING READY FOR INSPECTION. NO CONCRETE IS TO BE POURED WITHOUT THE APPROVAL OF THE ENGINEER. THIS IS TO BE CONFIRMED AT A LATER DATE.
10.	SPLICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN. WHERE LAP LENGTH IS NOT SHOWN IT SHALL BE SUFFICIENT TO DEVELOP THE FULL STRENGTH OF THE REINFORCEMENT. THE FOLLOWING MINIMUM SPLICE LENGTHS SHALL BE USED UNLESS NOTED OTHERWISE.
	THE FOLLOWING MINIMUM BAR SPLICE LENGTHS ARE APPLICABLE FOR f _c >= 25MPa.
	A - FOR VERTICAL OR HORIZONTAL BARS WITH LESS THAN 300mm OF CONCRETE CAST BELOW
	BAR DIAMETER N10 N12 N16 N20 N24 N28
	LAP LENGTH 360mm 440mm 605mm 865mm 1165mm 1485mm
	BAR DIAMETER N32 N32
	LAP LENGTH 1835mm 2210mm
	B - FOR HORIZONTAL BARS GREATER THAN OR EQUAL TO 300mm OF CONCRETE CAST BELOW
	BAR DIAMETER N10 N12 N16 N20 N24 N28
	LAP LENGTH 470mm 570mm 785mm 1125mm 1550mm 1958mm
	BAR DIAMETER N32 N36
	LAP LENGTH 2385mm 2870mm
11.	WELDING OF REINFORCEMENT WILL ONLY BE PERMITTED WITH THE PRIOR APPROVAL OF THE ENGINEER.
12.	REINFORCEMENT MUST NOT BE CONTINUOUS THROUGH CONTRACTION JOINTS.
13.	PLACE SUFFICIENT STOOLS UNDER MAIN BOTTOM REINFORCING RODS AND TOP CROSS RODS IN SLABS TO ALLOW THEM TO BE SUPPORTED IN THEIR CORRECT POSITIONS DURING CONCRETING (NOT GREATER THAN 900mm).
14.	REINFORCEMENT SYMBOLS:
	SYMBOLSPECIFICATION
	N GRADE D500N DEFORMED BAR
	R STRUCTURAL GRADE ROUND BAR
	RF AND SL HARD DRAWN SHEET RIBBED WIRE REINFORCING FABRIC
	THE NUMBER FOLLOWING THESE SYMBOLS IS THE BAR DIAMETER IN MILLIMETERS.
15.	SLABS TO BE CURED BY COVERING WITH 0.20mm BLACK POLYETHYLENE SHEETING AND KEPT MOIST FOR 7 DAYS MINIMUM.
16.	NO CONCRETE TO BE POURED WHEN SITE TEMPERATURE EXCEEDS 35°C OR FALLS BELOW 5°C.
17.	SUPPLY AND LAY FABRIC IN FLAT SHEETS AT SPLICES. FABRIC SHALL BE LAPPED AS SPECIFIED IN AS 3600.

COATING NOTES	
1.	THE FOLLOWING COATING REQUIREMENTS HAVE BEEN DETERMINED BY AS4312.
2.	ALL FABRICATED STRUCTURAL STEELWORK TO BE PREPARED WITH ABRASIVE BLAST CLASS 2.5.
3.	SURFACES REQUIRING ONSITE TREATMENT ARE TO BE PRIMED IN ACCORDANCE WITH SURFACE TREATMENT MANUFACTURERS REQUIREMENTS.
4.	COATINGS HAVE BEEN SPECIFIED BASED ON THE FOLLOWING:
	CORROSIIVITY CATERGORYC3 (MEDIUM)
	STEEL CORROSION RATE µm/y25-50
	TYPICAL ENVIRONMENTCOASTAL OR INDUSTRIAL
	DURABILITY CLASSEL (EXTRA LONG TERM)
	LIFE TO FIRST MAINTENANCE50 YEARS

STRUCTURAL STEELWORK NOTES	
1.	ALL STEELWORK TO BE IN ACCORDANCE WITH AS4100 UNO.
2.	ALL WELDING TO BE IN ACCORDANCE WITH AS 1554 EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS. WELDING CONSUMABLES TO HAVE A MINIMUM NOMINAL TENSILE STRENGTH f _{uw} = 490MPa. ALL WELDS NOT DESIGNATED ON PLAN SHALL BE 6mm GENERAL PURPOSE FILLET WELDS. COMPLETE PENETRATION BUTT WELDS (CPBW) SHALL BE STRUCTURAL PURPOSE WELDS.
3.	UNLESS NOTED OTHERWISE, ALL STEEL SHALL BE IN ACCORDANCE WITH:
	BHP GRADE 300 PLUS FOR UNIVERSAL BEAMS AND COLUMNS
	GRADE 250 PLUS FOR ALL PLATES AND CLEATS
	AS 1163 FOR SHS AND RHS SECTIONS GR350 OR 450 AS APPLICABLE
	AS1163 FOR CHS SECTIONS GR250 OR 350 AS APPLICABLE
4.	THE CONTRACTOR SHALL PREPARE FABRICATION DRAWINGS AND SUBMIT TO THE ENGINEER FOR REVIEW. FABRICATION IS NOT TO COMMENCE UNTIL FABRICATION DRAWINGS HAVE BEEN APPROVED.
5.	ALL STEELWORK THAT WILL BE EXPOSED TO VIEW IS TO HAVE WELD SPATTER, FLUX, DAGS AND BURRS REMOVED, AND ALL SEALING AND BUTT WELDS GROUND FLUSH.
6.	THE BUILDER SHALL PROVIDE ALL CLEATS AND HOLES FOR FIXING ALL BUILDING ELEMENTS TO STEEL AS REQUIRED BY THE DRAWINGS WHETHER OR NOT SHOWN.
7.	BOLTS:
	4.6/S COMMERCIAL BOLT GRADE 4.6 TO AS1111 SNUG TIGHT.
	8.8/S HIGH STRENGTH STRUCTURAL BOLT GRADE 8.8 TO AS1252 SNUG TIGHT.
	8.8/TB HIGH STRENGTH STRUCTURAL BOLT GRADE 8.8 TO AS1252 TENSIONED TO AS4100 BEARING JOINT.
	8.8/TF HIGH STRENGTH STRUCTURAL BOLT GRADE 8.8 TO AS1252 TENSIONED TO AS4100 FRICTION JOINT.
8.	ALL BOLTS TO BE HOT DIP GALVANISED EXCLUDING PURLIN BOLTS.
9.	ALL BOLTED CONNECTIONS OF FRICTION GRIP TYPE SHALL HAVE CONNECTION SURFACES UNPAINTED.
10.	MECHANICAL PROPERTIES AND PROCEDURES CERTIFICATES FOR ALL MATERIALS, BOLTS AND WELDS SHALL BE MAINTAINED BY THE MAIN CONTRACTOR AND PROVIDED ON DEMAND.
11.	REFER TO ARCHITECTURAL DETAILS FOR ADDITIONAL NON-STRUCTURAL STEELWORK.

ERECTION NOTES	
1.	INSTALLATION / ERECTION BY OTHERS.
2.	THE CONTRACTOR / INSTALLER IS TO ENSURE THE TOWER IS MAINTAINED IN A STABLE CONDITION AND THAT NO PART OF THE STRUCTURE IS OVERSTRESSED DURING CONSTRUCTION.
3.	INSTALLATION OF TOWER TO BE ERECTED IN ACCORDANCE WITH AS4100.
4.	ENSURE ALL BOLT HEADS & NUTS SIT FLAT ON FLANGES.
5.	ALL FLANGES MUST MAKE FULL CONTACT AT EACH BOLT PRIOR TO 'SNUG-TIGHT' BOLTS. ADVISE DESIGNER IF THIS IS NOT ACHIEVED.
6.	ERECTION TOLERANCES SHALL BE LIMITED TO:
	VERTICALITY - LESS THAN H/360
	TWIST - LESS THAN 2° PER MODULE
7.	TOWER EARTHING DESIGNED & SPECIFIED BY OTHERS.

TOWER ACCESS	
STRUCTURAL ELEMENTS HAVE BEEN ASSESSED FOR LOADS GENERATED FROM CLIMBING/WORKING AT HEIGHTS. A SINGLE PERSON LOAD OF 15KN IS APPLIED IN ACCORDANCE WITH TABLE 3.1 IN AS1891.4.	
AS1891.4 REQUIRES THAT SIGNAGE BE INSTALLED AT THE TOWER BASE DESCRIBING WHICH AREAS OF THE STRUCTURE CAN BE USED FOR ANCHORAGE.	
1.	THE TOWER SHALL ONLY BE ASCENDED BY QUALIFIED AND COMPETENT PERSONNEL.
2.	FALL ARREST DEVICES MUST ONLY BE ATTACHED TO THE LEG MEMBER OR A DIAGONAL CROSS BRACES OR FALL ARREST ATTACHMENT POINT NOMINATED ON THE DRAWINGS.
3.	PERSONNEL CLIMBING THE TOWER ARE TO HAVE APPROPRIATE CLIMBING GEAR TO SUIT THE LEG OR BRACING MEMBERS.
4.	ONLY THE BRACE MEMBERS SHOWN IN Purple IN THE GENERIC DIAGRAM BELOW CAN BE USED AS A CLIMBING/WORK AT HEIGHTS ANCHOR POINT.
5.	THE SPECIFIED ANCHOR POINTS ARE LIMITED TO ONE (1) PERSON AT ANY TIME.
6.	PRIOR TO ANCHORING TO ANY ELEMENT, VISUALLY CHECK CONNECTIONS ARE COMPLETE AND HAVE NO DAMAGE. ANY DEFECTS SHOULD BE REPORTED TO THE MANUFACTURER.
7.	ANY STRUCTURAL MEMBER MAY BE USED TO PHYSICALLY MOVE AROUND THE STRUCTURE.
8.	DO NOT ATTACH FALL ARREST DEVICES TO HORIZONTAL CROSS BRACING.
9.	DO NOT ATTACH FALL ARREST DEVICES TO BRACING OR ATTACHMENT POINTS THAT EXHIBITS DAMAGE, RUST OR CRACKING.



FIGURE 1
FIGURE 1 - LANYARD HOOK SAFE PLACEMENT (PURPLE SHADING)



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innovation, ingenuity, inspiration

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ABN 89 106 675 156 ACN 106 675 156

p 07 3870 8888

PLANS AND DOCUMENTS referred to in the SDA APPROVAL



SDA approval: APC2024/006-01

0	FOR CONSTRUCTION	04.07.22	D.J.
REV	DESCRIPTION	DATE	BY
Status			
FOR CONSTRCUTION			
Project			
24m COMMUNICATION TOWER BOWEN ORBITAL SPACEPORT			
for			
TELCO ANTENNAS			
Title			
PROJECT NOTES			
Drawn	Date	Chkd	Date
DJ		RL	
Design	Date	Apprd	Date
MF		LS	
Scale	A3	Certif	Date
NTS		LS	
Project No.	Dwg. No.	Rev	
22-055	S01	0	
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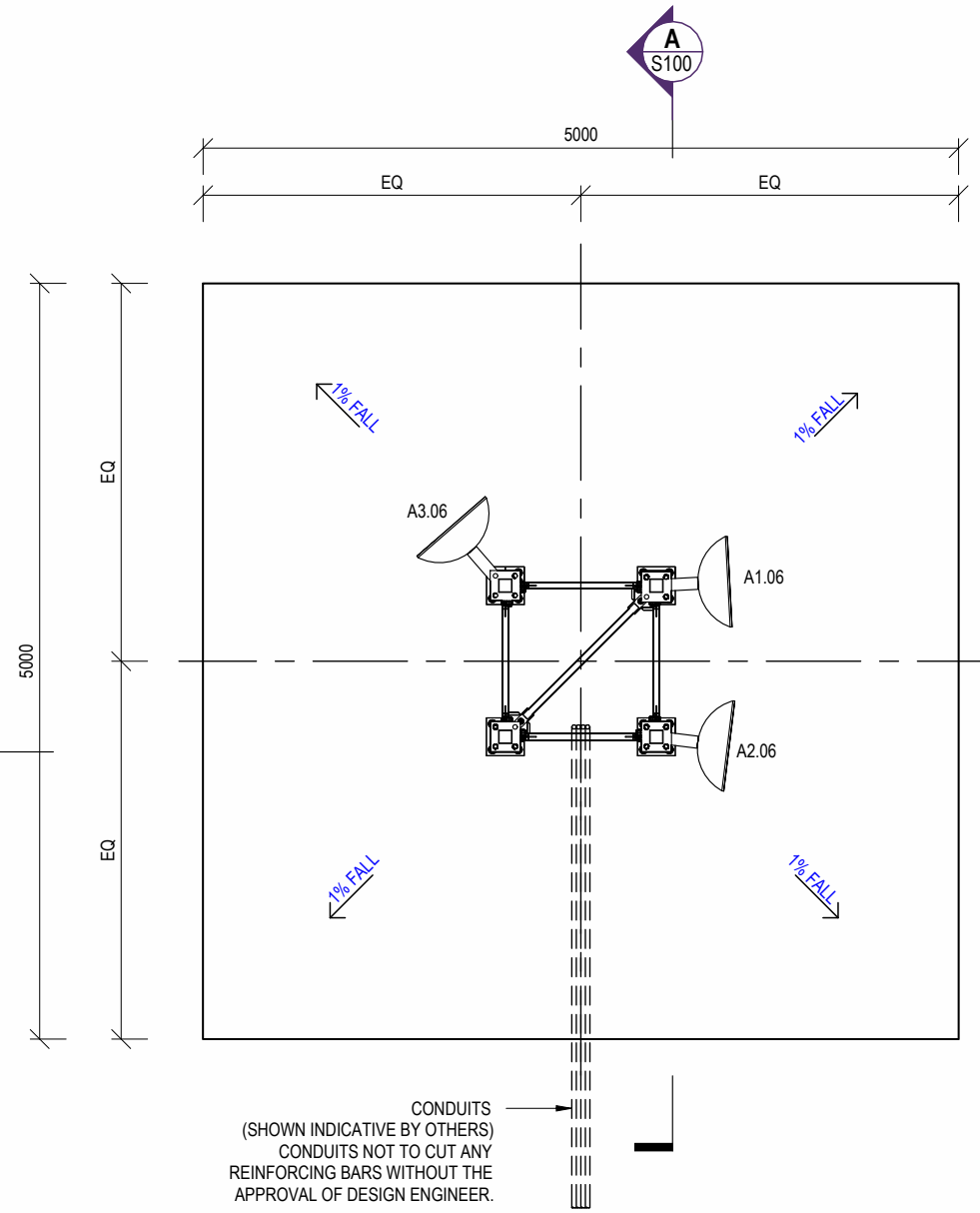


SDA approval: APC2022/007

PLANS AND DOCUMENTS referred to in the SDA APPROVAL



SDA approval: APC2024/006



GENERAL ARRANGEMENT

1 : 50

ANTENNA SCHEDULE				
ID	SIZE / STYLE	BEARING	WEIGHT (kg)	ABOVE GROUND LEVEL (AGL)
A1.06	600 DIAMETER PARABOLIC ANTENNA	102°	8	24m
A2.06	600 DIAMETER PARABOLIC ANTENNA	112°	8	24m
A3.06	600 DIAMETER PARABOLIC ANTENNA	334°	8	24m
FUTURE	600 DIAMETER PARABOLIC ANTENNA	(TBC)	8	22m
FUTURE	600 DIAMETER PARABOLIC ANTENNA	(TBC)	8	22m

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referred to in the
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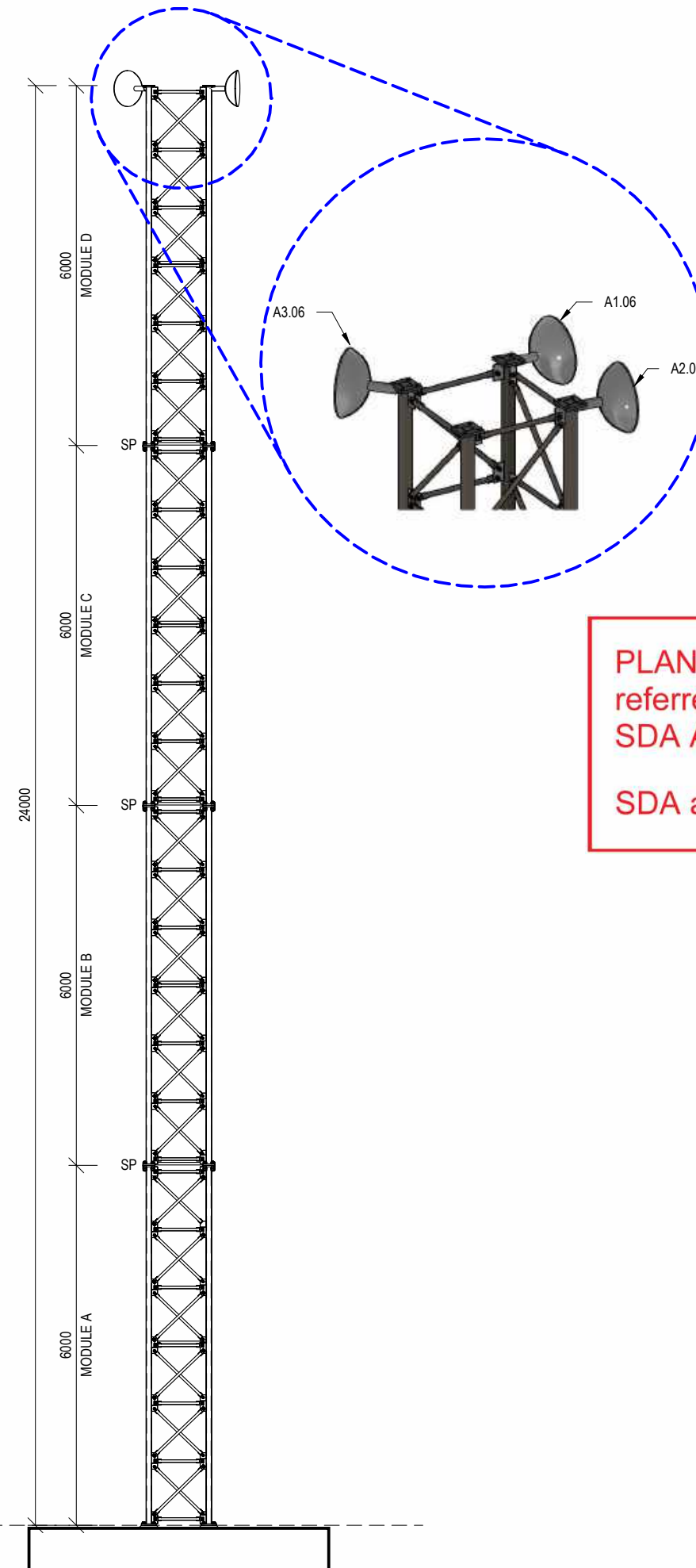


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▽ BOTTOM OF BASE PLATE
0.00

ELEVATION

1 : 100



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referred to in the
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SDA approval: APC2024/006

0	FOR CONSTRUCTION	04.07.22	D.J.
REV	DESCRIPTION	DATE	BY

Status

FOR CONSTRUCTION

Project

24m COMMUNICATION TOWER
BOWEN ORBITAL SPACEPORT

for

TELCO ANTENNAS

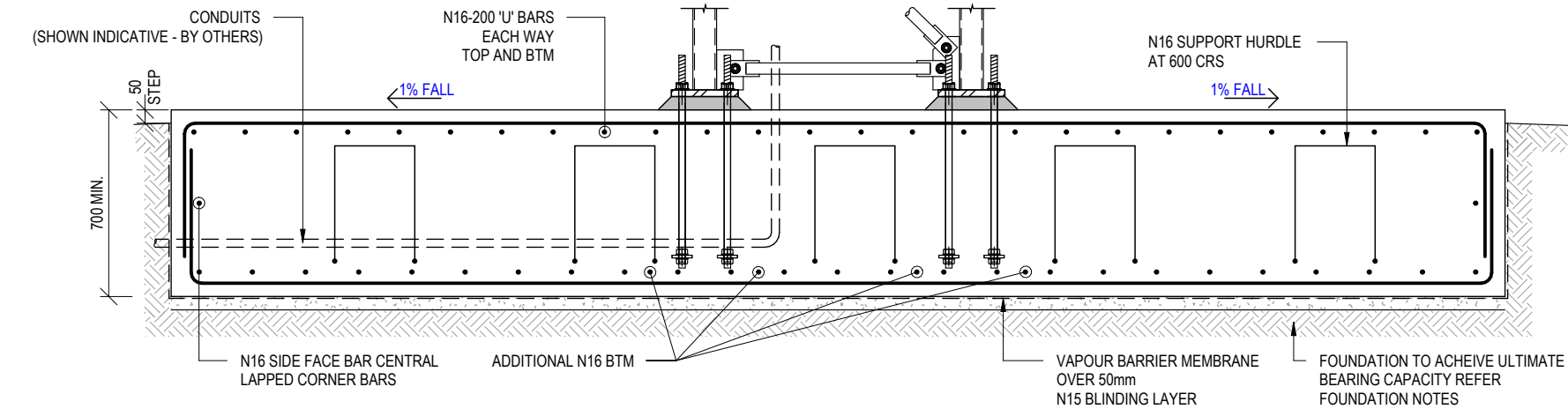
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GENERAL ARRANGEMENT AND
ELEVATION

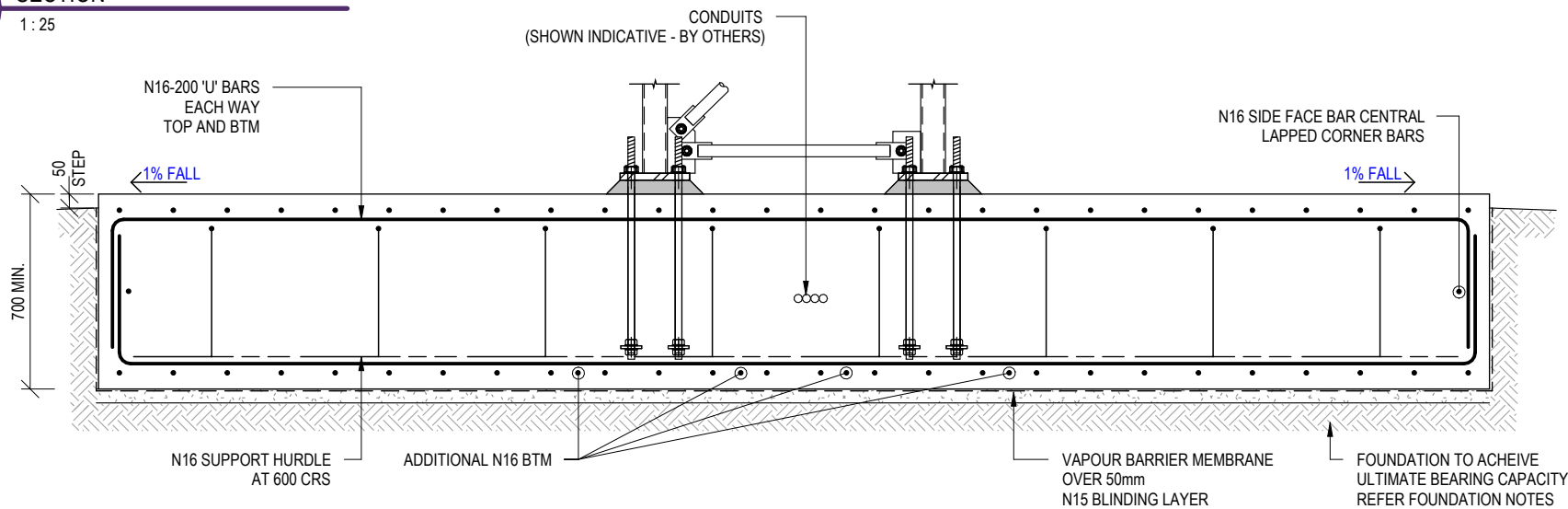
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NTS		LS	
Project No.	Dwg. No.	Rev	
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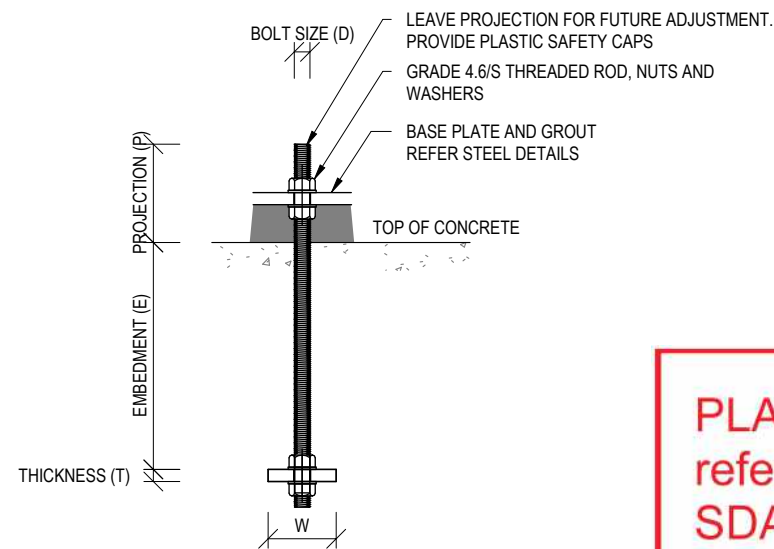
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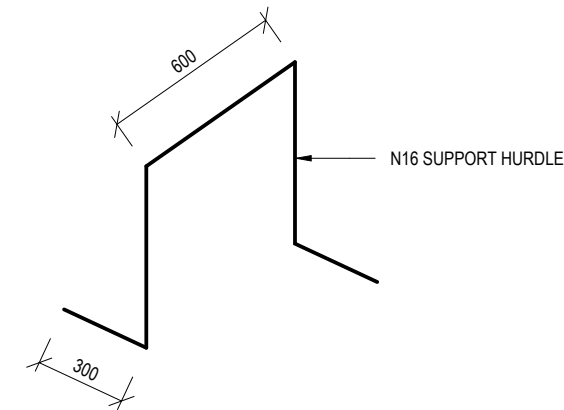
A SECTION
S50 1 : 25



B SECTION
S50 1 : 25



HD BOLT DETAIL - THREADED ROD
1 : 10



SUPPORT HURDLE DETAIL
1 : 25

PLANS AND DOCUMENTS
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SDA APPROVAL

SDA approval: APC2024/006



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0	FOR CONSTRUCTION	04.07.22	D.J.
REV	DESCRIPTION	DATE	BY

Status
FOR CONSTRUCTION
Project
24m COMMUNICATION TOWER BOWEN ORBITAL SPACEPORT
for
TELCO ANTENNAS
Title
FOOTING DETAILS

Drawn	Date	Chkd	Date
DJ		RL	
Design	Date	Apprd	Date
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0	FOR CONSTRUCTION	04.07.22	D.J.
REV	DESCRIPTION	DATE	BY

Status

FOR CONSTRUCTION

Project
24m COMMUNICATION TOWER
BOWEN ORBITAL SPACEPORT

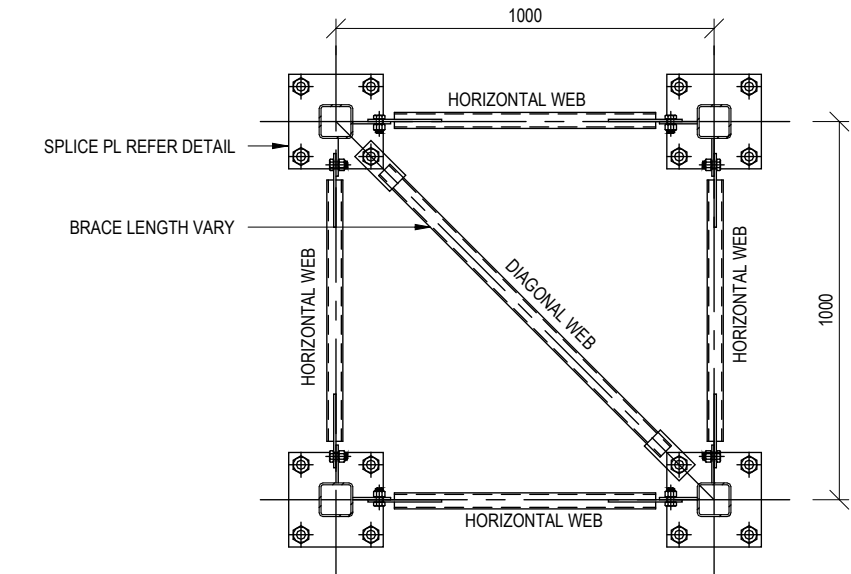
for
TELCO ANTENNAS

Title
TOWER FRAMING PLAN AND
ELEVATIONS

Drawn	Date	Chkd	Date
JAW		RL	
Design	Date	Apprd	Date
LS		LS	
Scale	A3	Certif	Date
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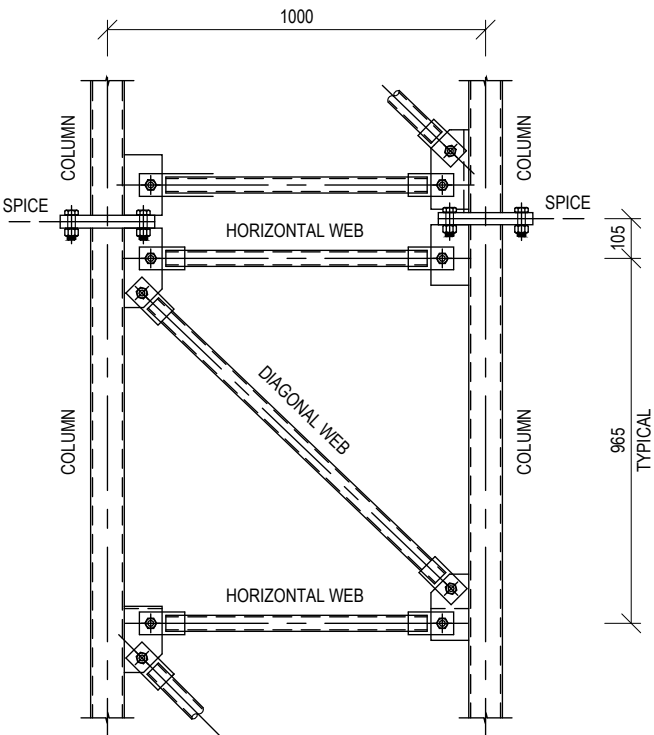
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NOTE:
ALL LEG TO SPLICE/BASE PLATE CONNECTIONS
TO BE COMPLETE PENETRATION BUTT WELDS.
ALL OTHER WELDS TO REMAIN 6mm CFW (U.N.O.).



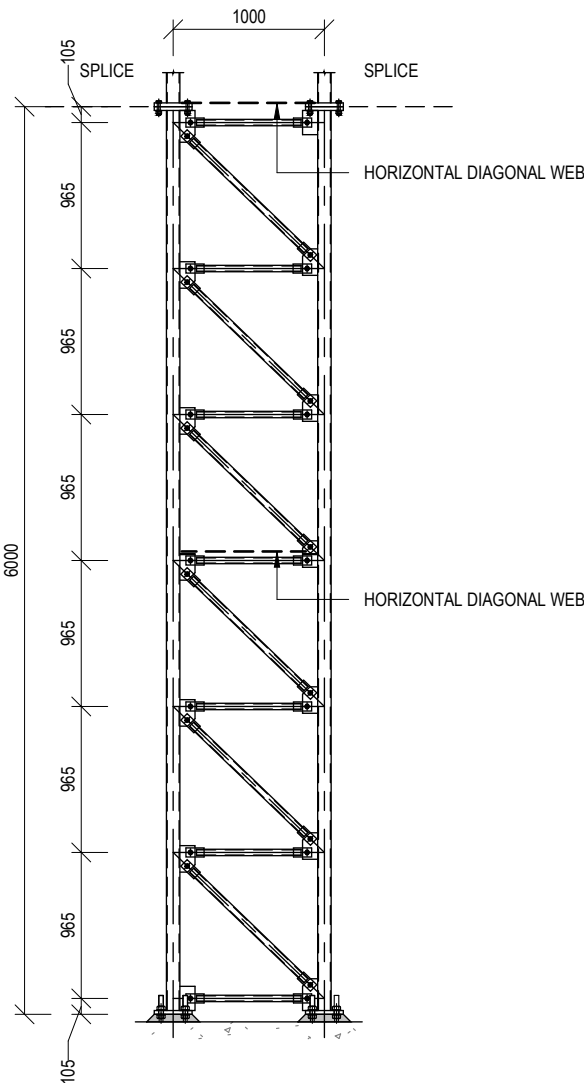
TYPICAL SECTION AT SPLICE

1 : 20



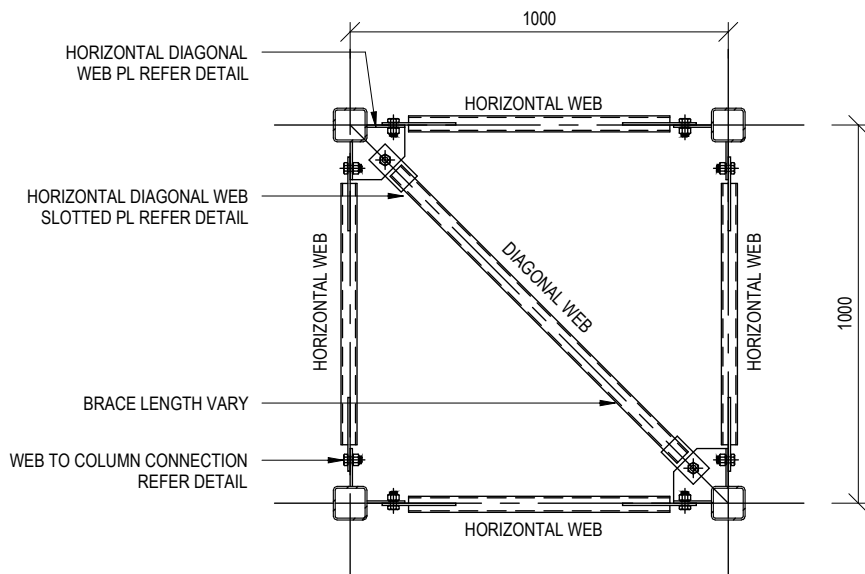
LEG AND WEB MEMBER SET OUT

1 : 20



TYPICAL MODULE

1 : 50



TYPICAL SECTION AT MID-SECTION

1 : 20

MEMBER SCHEDULE			
MODULE	MEMBER	DESCRIPTION	GRADE
MODULE A	COLUMN	89x89x6.0 SHS	350
MODULE B TO D	COLUMN	89x89x3.5 SHS	350
MODULE A TO D	HORIZONTAL AND DIAGONAL WEB	42.4x3.2 CHS	250

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Client:



BULK EARTHWORKS LEGEND

LINE	DESCRIPTION
	FINISHED PAD LEVEL
	EXISTING SURFACE CONTOURS
	EXISTING SURFACE CONTOUR LABEL
	BULK EARTHWORKS SPOT ELEVATIONS

NOTES:

- BULK EARTHWORKS ARE TO BE GRADED LINEARLY BETWEEN EARTHWORKS POINTS.
- REFER SEDIMENT AND EROSION CONTROL NOTES AND DETAILS.
- REFER EARTHWORKS PLAN FOR PAVEMENT ALLOWANCES.
- TOLERANCES REFER CONTRACT DOCUMENTATION
- SITE BOUNDARIES TO BE CONFIRMED BY SURVEY
- SITE SERVICES PROVIDED BY SUBDIVISION DOCUMENTATION ONLY AND IT IS THE CONTRACTORS RESPONSIBILITY TO CONFIRM ALL LOCATIONS AND HEIGHTS BEFORE COMMENCING WORK

LRE LAUNCH PAD EARTHWORK VOLUMES	
STRIP	166.0 cub.m
CUT	123.9 cub.m
TYPE 2.5 GRAVEL	854.5 cub.m
TYPE 2.3 GRAVEL	106.3 cub.m

A	PRELIMINARY	03.03.2023	L.K.
REV	DESCRIPTION	DATE	BY

Status

PRELIMINARY

NOT TO BE USED FOR CONSTRUCTION

Project

BOWEN ORBITAL SPACE PORT
BOWEN QUEENSLAND

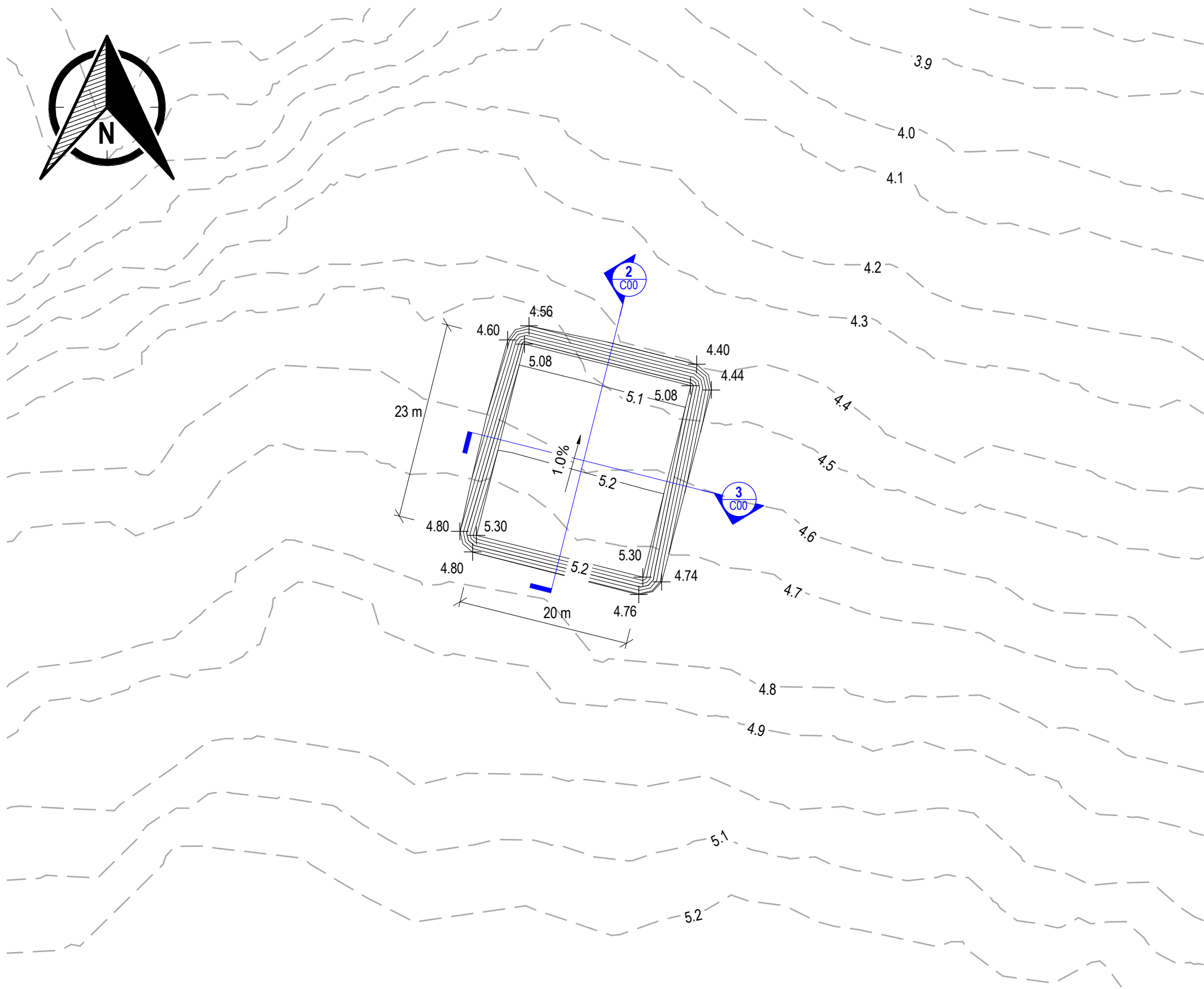
for
GILMORE SPACE TECH

Title

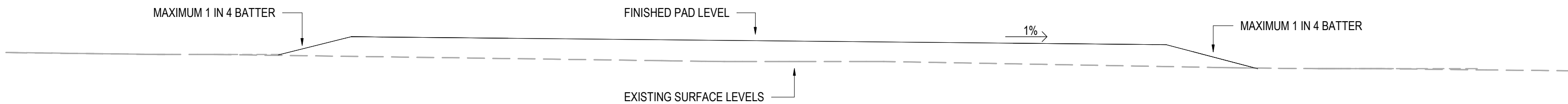
LRE LAUNCH PAD
EARTHWORKS PLAN

Drawn	Date	Chkd	Date
L.K.	03.03.2023	T.J.S	
Design	Date	Apprd	Date
L.K.		T.J.S	
Scale	A1	Certif	Date
As indicated		T.J.S	
Project No.	Dwg. No.	Rev	
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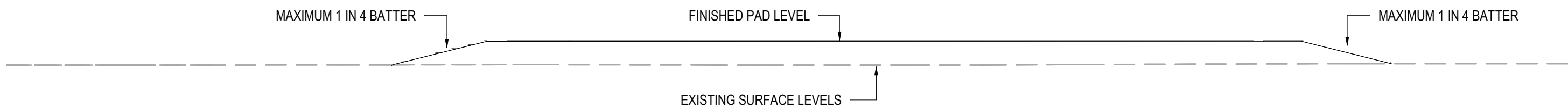
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1 LAYOUT PLAN
1 : 500



2 BULK EARTHWORKS SECTION 1
C00 1 : 100



3 BULK EARTHWORKS SECTION 2
C00 1 : 100

BULK EARTHWORKS NOTES

THE CONTRACTOR SHALL CARRY OUT FIELD DENSITY TESTING OF BULK FILLED AREAS INCLUDING BUILDING PLATFORMS AND REPLACED INSITU MATERIAL AS PER THE FOLLOWING REQUIREMENTS:

- WORKS TO BE IN ACCORDANCE WITH AS 3798 - 2007.
- TESTING TO BE IN ACCORDANCE WITH AS 1289 (RELEVANT PORTIONS).
- SPECIFIC TESTING REQUIREMENTS
 - LEVEL ONE TESTING TO BE PROVIDED BY GEOTECHNICAL TESTING AUTHORITY (GTA).
 - A DAILY GEOTECHNICAL SITE RECORD IS TO BE KEPT, REFER AS 3798, APPENDIX C
- QUANTITY OF TESTING TO BE NOT LESS THAN ANY OF THE FOLLOWING
 - 1 TEST PER LAYER PER 2500sqm
 - 1 TEST PER 500cub.m DISTRIBUTED EVENLY THROUGHOUT THE DEPTH AND AREA OF OF THE FILLING
 - 3 TESTS PER VISIT BY THE GEOTECHNICAL TESTING AUTHORITY (GTA)
- DEGREE OF COMPACTION TO BE AS FOLLOWS
 - NSL TO 500mm BELOW FSL = 95% STANDARD COMPACTION
 - 500mm BELOW FSL TO FSL OR FPL = 100% STANDARD COMPACTION
- MATERIAL MOISTURE CONTENT TO BE IN THE RANGE OF 85% TO 115% OF OPTIMAL MOISTURE CONTENT (OMC)
- COMPACT SUBGRADE SURFACES IN CUT AREAS OF THE PLATFORM SHALL HAVE DRY DENSITY TESTING PERFORMED AT INTERVALS NOT LESS THAN 1 PER 2000sq.m
- THE EXPENSE OF THE TESTING IS THE RESPONSIBILITY OF THE CONTRACTOR.

PAVEMENT NOTES

- ALL PAVEMENTS ARE BASED ON A SOUND AND TRAFFICABLE SUBGRADE.
- WET AND/ OR SOFT AREAS FAILING THE SUBGRADE PROOF ROLL TEST MAY REQUIRE SOME FORM OF SUBGRADE IMPROVEMENT.
- THE DESIGN ENGINEER SHALL BE CONSULTED TO ASSESS OPTIONS SUCH AS:
 - LIME STABILISATION
 - GEOTEXTILE STRENGTHENING
 - COARSE ROCKFILL STRENGTHENING
 - SUBGRADE REPLACEMENT
 - OR A COMBINATION OF ALL THESE OPTIONS.

GENERAL NOTES

- THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS. THE PROJECT SPECIFICATION SHALL TAKE PRECEDENCE OVER THESE GENERAL NOTES.
- BEFORE PROCEEDING WITH THE WORK ANY DISCREPANCIES IN THE CONTRACT DOCUMENTS SHALL BE REFERRED FOR DECISION TO THE DESIGN ENGINEER.
- ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITIONS INCLUDING AMENDMENTS OF THE RELEVANT GLADSTONE REGIONAL COUNCIL STANDARDS, TMR STANDARDS, QLD CODES OF PRACTICE.
- PROVIDE AS-CONSTRUCTED SURVEY FOR ALL WORKS.
- THE SURVEY OF EXISTING SURFACE LEVELS HAS BEEN DERIVED FROM PUBLICLY AVAILABLE LIDAR AND MAY NOT BE 100% ACCURATE. CONFIRM EXISTING SURFACE LEVELS PRIOR TO CONSTRUCTION.
- ACCESS RAMPS TO THE LAUNCH PAD TO BE DESIGNED BY OTHERS
- AS PER GEOTECHNICAL REPORT GE. 2211.1150, ACID SULPHATE HAS BEEN IDENTIFIED AND NEEDS TO BE TREATED APPROPRIATELY. REFER TO ACID SULPHATE TREATMENT PLAN.
- CONCRETE SLAB DESIGNS FOR THE STORAGE TANKS ARE TO BE DESIGNED BY OTHERS.

HOLD POINT:
PROOF ROLL TO BE CONDUCTED ON THE SUBGRADE. CONTACT ENGINEER FOR AN INSPECTION 24 HOURS PRIOR TO THE REQUIRED INSPECTION TIME.

FOR A SUCCESSFUL PROOF ROLL INSPECTION:

- NO SOFT SPOTS ARE TO BE FOUND - CONTRACTOR TO CONDUCT A PROOF ROLL ON SITE PRIOR TO CONTACTING ENGINEER TO ENSURE PAVEMENT WILL PASS.
- THE PROOF ROLL IS ASSUMED TO BE CONDUCTED IN A SINGLE STAGE. IF A DIFFERENT APPROACH IS NEEDED, CONTACT THE ENGINEER.

PLANS AND DOCUMENTS
referred to in the
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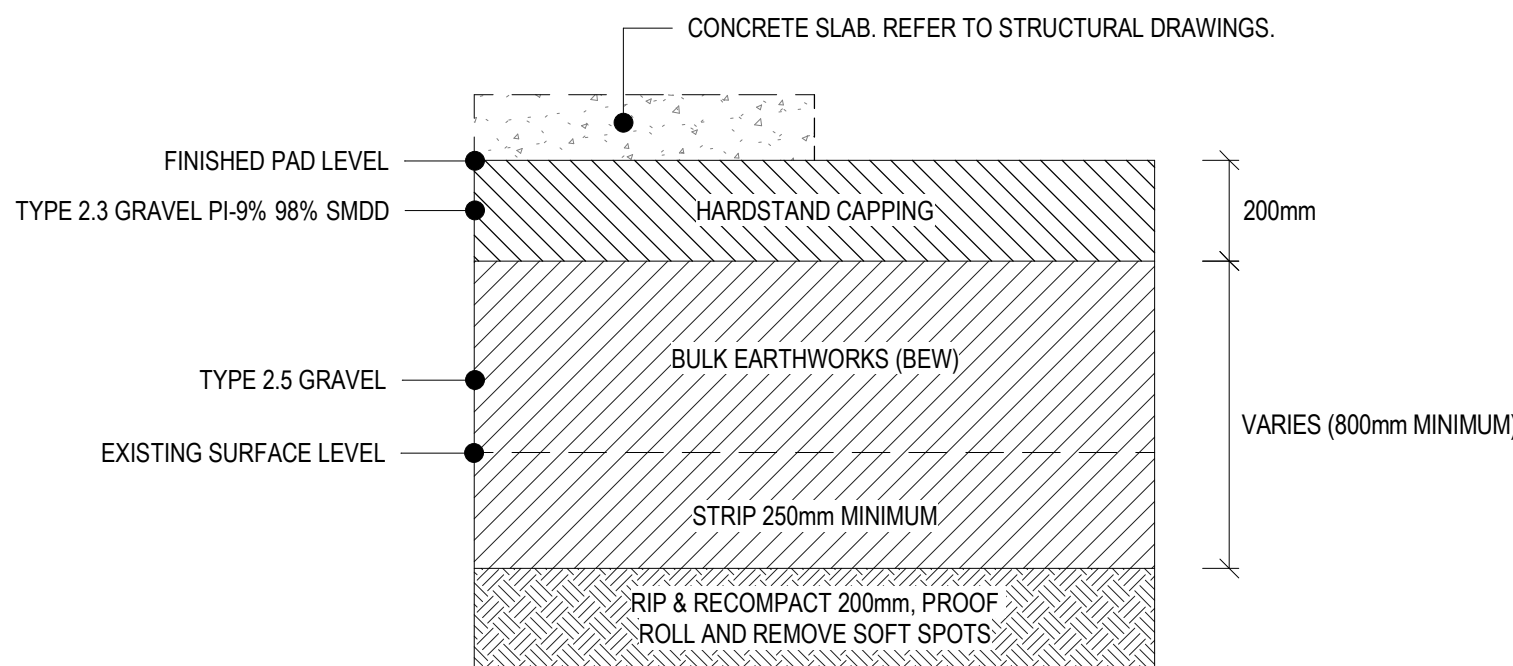


SDA approval: APC2024/006

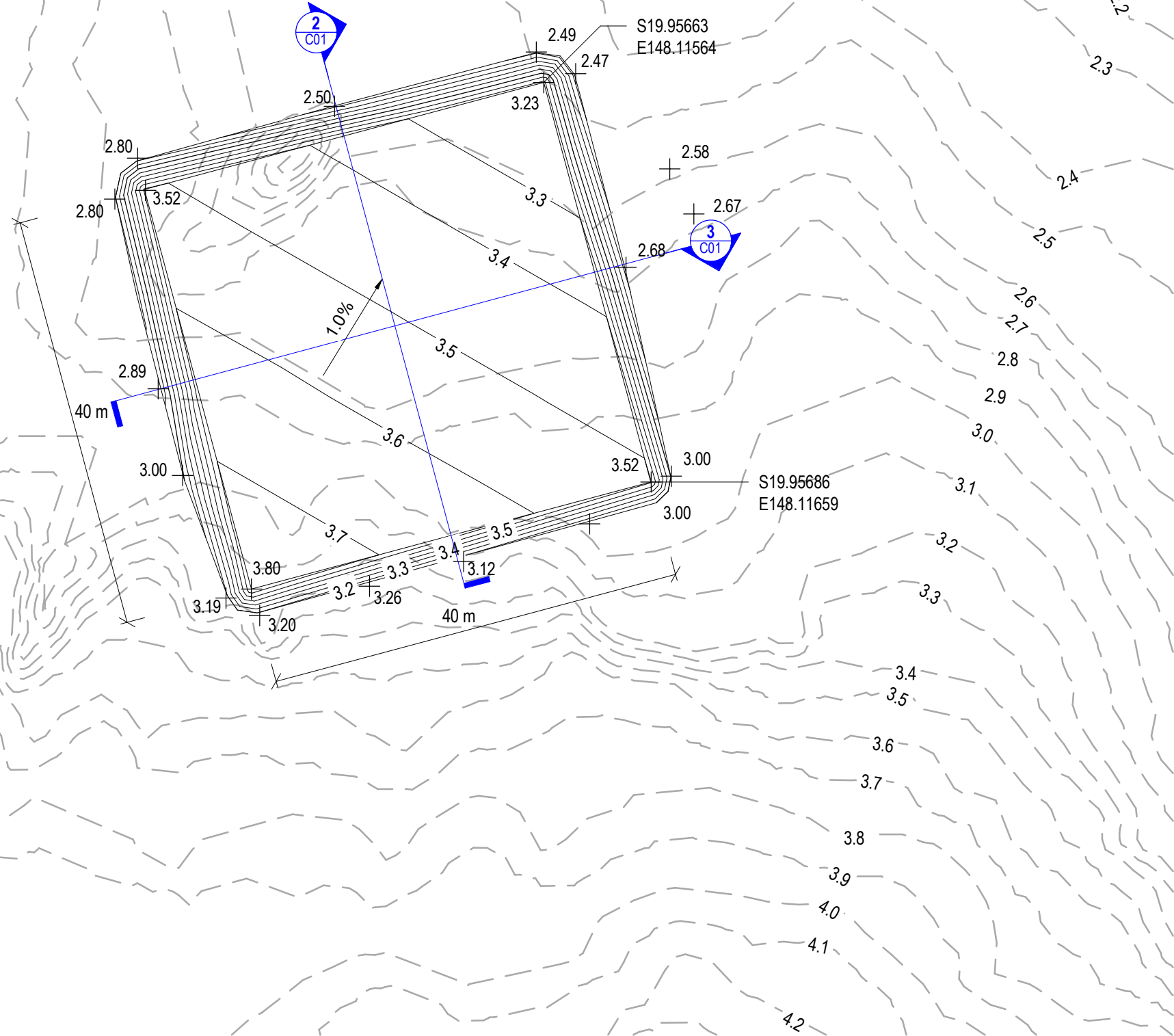
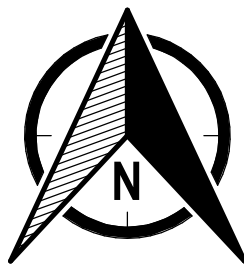
PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006-01



4 TYPICAL PAD PAVEMENT DETAILS
1 : 150



1 LAYOUT PLAN

1 : 500

GENERAL NOTES

- THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS. THE PROJECT SPECIFICATION SHALL TAKE PRECEDENCE OVER THESE GENERAL NOTES.
- BEFORE PROCEEDING WITH THE WORK ANY DISCREPANCIES IN THE CONTRACT DOCUMENTS SHALL BE REFERRED FOR DECISION TO THE DESIGN ENGINEER.
- ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITIONS INCLUDING AMENDMENTS OF THE RELEVANT **GLADSTONE REGIONAL COUNCIL** STANDARDS, TMR STANDARDS, QLD CODES OF PRACTICE.
- PROVIDE AS-CONSTRUCTED SURVEY FOR ALL WORKS.
- THE SURVEY OF EXISTING SURFACE LEVELS HAS BEEN DERIVED FROM PUBLICLY AVAILABLE LIDAR AND MAY NOT BE 100% ACCURATE. CONFIRM EXISTING SURFACE LEVELS PRIOR TO CONSTRUCTION.
- ACCESS RAMPS TO THE LAUNCH PAD TO BE DESIGNED BY OTHERS
- AS PER GEOTECHNICAL REPORT GE_2211.1150, ACID SULPHATE HAS BEEN IDENTIFIED AND NEEDS TO BE TREATED APPROPRIATELY. REFER TO ACID SULPHATE TREATMENT PLAN.
- CONCRETE SLAB DESIGNS FOR THE STORAGE TANKS ARE TO BE DESIGNED BY OTHERS.

PAVEMENT NOTES

- ALL PAVEMENTS ARE BASED ON A SOUND AND TRAFFICABLE SUBGRADE.
- WET AND/ OR SOFT AREAS FAILING THE SUBGRADE PROOF ROLL TEST MAY REQUIRE SOME FORM OF SUBGRADE IMPROVEMENT.
- THE DESIGN ENGINEER SHALL BE CONSULTED TO ASSESS OPTIONS SUCH AS:
 - LIME STABILISATION
 - GEOTEXTILE STRENGTHENING
 - COARSE ROCKFILL STRENGTHENING
 - SUBGRADE REPLACEMENTOR A COMBINATION OF ALL THESE OPTIONS.

BULK EARTHWORKS NOTES

- WORKS SHALL BE EXECUTED BY THE CONTRACTOR IN ACCORDANCE WITH AS3798 - 2007, 'GUIDELINES FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS' AND SHALL BE SUPERVISED BE AN APPROVED GEOTECHNICAL TESTING AUTHORITY, (GTA) AS DEFINED IN THE CODE TO A LEVEL 2 STANDARD.
- FOLLOWING INITIAL MOBILISATION AND PRIOR TO STRIPPING OF THE SITE, THE CONTRACTOR SHALL IMMEDIATELY UNDERTAKE THE EROSION AND SEDIMENT RUNOFF PREVENTION MEASURES.
- FOLLOWING THE STRIPPING OF THE UPPER ORGANIC SOIL, THE SITE SHALL BE PROOF ROLLED TO IDENTIFY ANY SOFT SPOTS OR FURTHER SIGNS OF UNSUITABLE MATERIAL. ANY SUCH AREAS SHALL BE RECTIFIED PRIOR TO COMMENCEMENT OF FILLING OPERATIONS.
- FILLING SHALL BE COMPLETED IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS
 - WORKS TO BE IN ACCORDANCE WITH AS3798 - 2007
 - DEGREE OF COMPACTION TO BE AS FOLLOWS
 - SUBGRADE COURSES LESS THAN 300mm BELOW DESIGN SURFACE LEVEL 98% SMDD.
 - SUBGRADE COURSES 300mm OR MORE BELOW DESIGN SURFACE LEVEL 95% SMDD.
 - SUBBASE COURSES 98% SMDD
 - BASE COURSES 98% SMDD
 - MATERIAL MOISTURE CONTENT TO BE IN THE RANGE OF $\pm 3\%$ OF OPTIMAL MOISTURE CONTENT (OMC)
 - THE EXPENSE OF TESTING IS ON THE CONTRACTOR
- IT IS THE CONTRACTORS RESPONSIBILITY TO PROTECT THE SITE AND SURROUNDING AREAS FROM DAMAGE RESULTING FROM STORMWATER RUNOFF. TEMPORARY DIVERSION DRAINS AND OR OTHER DRAINAGE CONTROL DEVICES ARE TO BE IMPLEMENTED BY THE CONTRACTOR DURING CONSTRUCTION TO MINIMISE THE EFFECTS OF WEATHER. NO EXTENSIONS OF TIME WILL BE GRANTED SHOULD DAMAGE TO THE WORK AND SURROUNDING AREAS RESULT FROM THE CONTRACTORS NEGLIGENCE IN NOT PROVIDING ADEQUATE PROTECTION.
- EXCESS SPOIL MATERIAL GENERATED DURING CONSTRUCTION SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR.

HOLD POINT:

PROOF ROLL TO BE CONDUCTED ON THE SUBGRADE. CONTACT ENGINEER FOR AN INSPECTION 24 HOURS PRIOR TO THE REQUIRED INSPECTION TIME.

FOR A SUCCESSFUL PROOF ROLL INSPECTION:

- NO SOFT SPOTS ARE TO BE FOUND - CONTRACTOR TO CONDUCT A PROOF ROLL ON SITE PRIOR TO CONTACTING ENGINEER TO ENSURE PAVEMENT WILL PASS.
- THE PROOF ROLL IS ASSUMED TO BE CONDUCTED IN A SINGLE STAGE. IF A DIFFERENT APPROACH IS NEEDED, CONTACT THE ENGINEER.

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006-01

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006

BULK EARTHWORKS LEGEND

LINE	DESCRIPTION
————	FINISHED PAD LEVEL
- - - - -	EXISTING SURFACE CONTOURS
- - 12.00 - -	EXISTING SURFACE CONTOUR LABEL
12.00	BULK EARTHWORKS SPOT ELEVATIONS

NOTES:

- BULK EARTHWORKS ARE TO BE GRADED LINEARLY BETWEEN EARTHWORKS POINTS.
- REFER SEDIMENT AND EROSION CONTROL NOTES AND DETAILS.
- REFER EARTHWORKS PLAN FOR PAVEMENT ALLOWANCES.
- TOLERANCES REFER CONTRACT DOCUMENTATION
- SITE BOUNDARIES TO BE CONFIRMED BY SURVEY
- SITE SERVICES PROVIDED BY SUBDIVISION DOCUMENTATION ONLY AND IT IS THE CONTRACTORS RESPONSIBILITY TO CONFIRM ALL LOCATIONS AND HEIGHTS BEFORE COMMENCING WORK

SIRIUS LAUNCH PAD EARTHWORK VOLUMES	
STRIP	525.9 cub.m
CUT	0 cub.m
SELECT FILL	1478 cub.m
TYPE 2.3 GRAVEL	346.112 cub.m

1	PAD AMENDED	29.02.2024	T.J.S.
0	FOR CONSTRUCTION	21.04.2023	P.J.M.
A	PRELIMINARY	03.03.2023	L.K.
REV	DESCRIPTION	DATE	BY

Status

FOR CONSTRUCTION

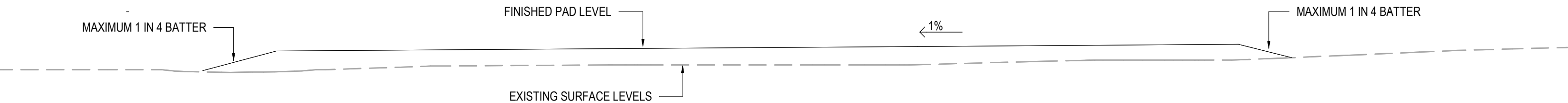
Project
**BOWEN ORBITAL SPACE PORT
BOWEN QUEENSLAND**

for
GILMORE SPACE TECH

Title
**SIRIUS LAUNCH PAD
EARTHWORKS PLAN**

Drawn	Date	Chkd	Date
L.K.	03.03.2023	T.J.S	
Design	Date	Apprd	Date
L.K.		T.J.S	
Scale	A1	Certif	Date
As indicated		T.J.S	
Project No.	Dwg. No.	Rev	
21-307	C01	1	

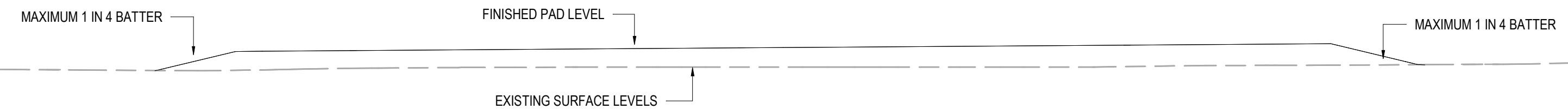
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2 BULK EARTHWORKS SECTION 3

C01

1 : 150



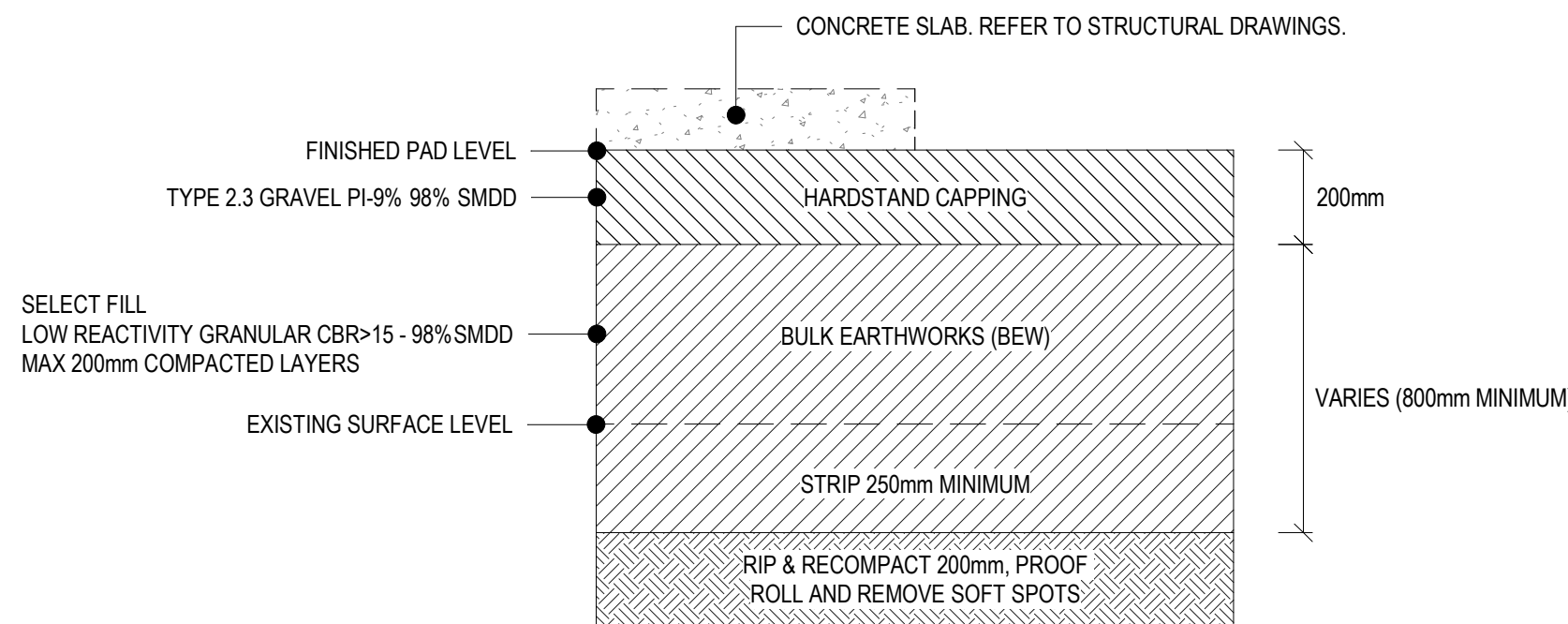
3 BULK EARTHWORKS SECTION 4

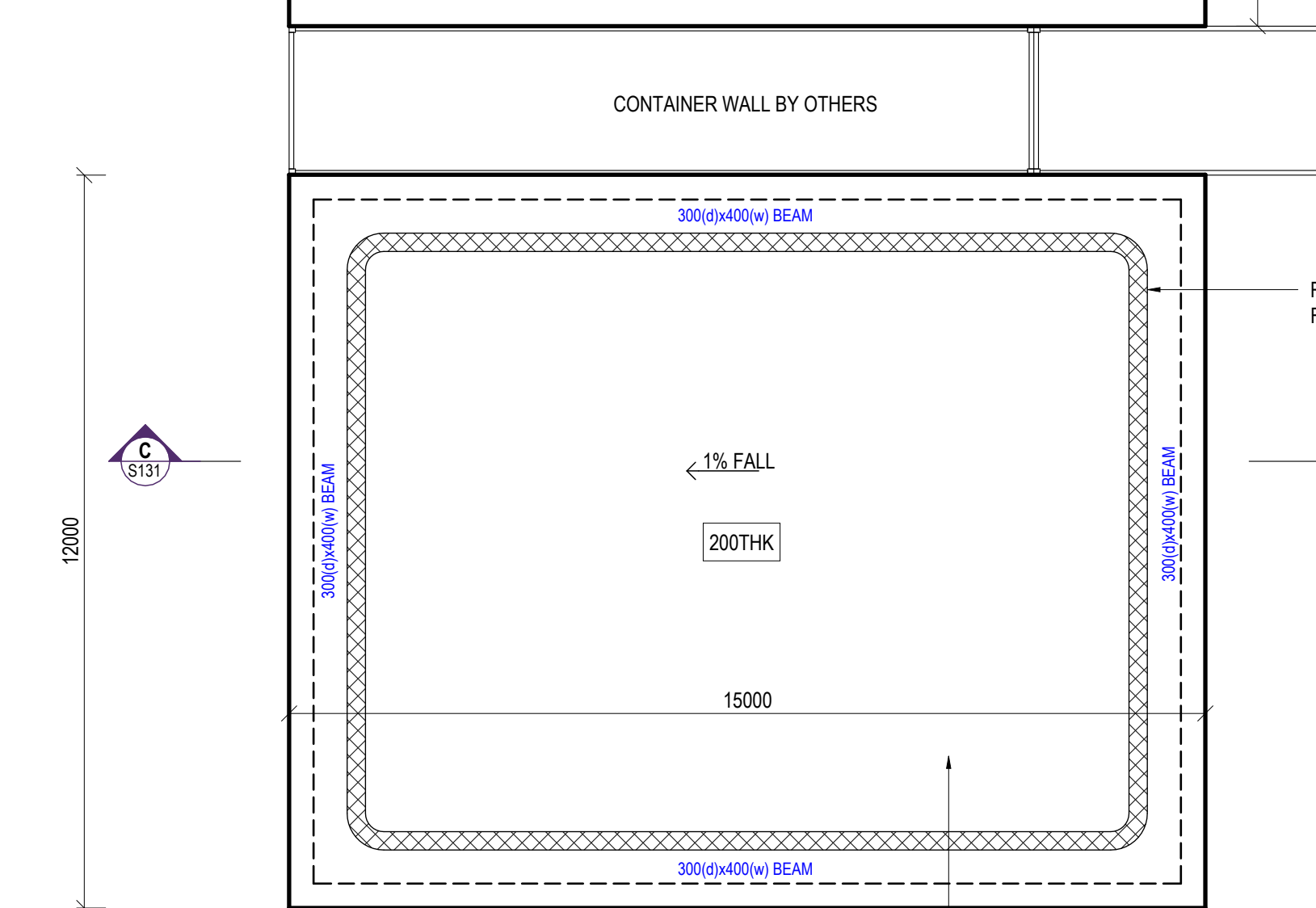
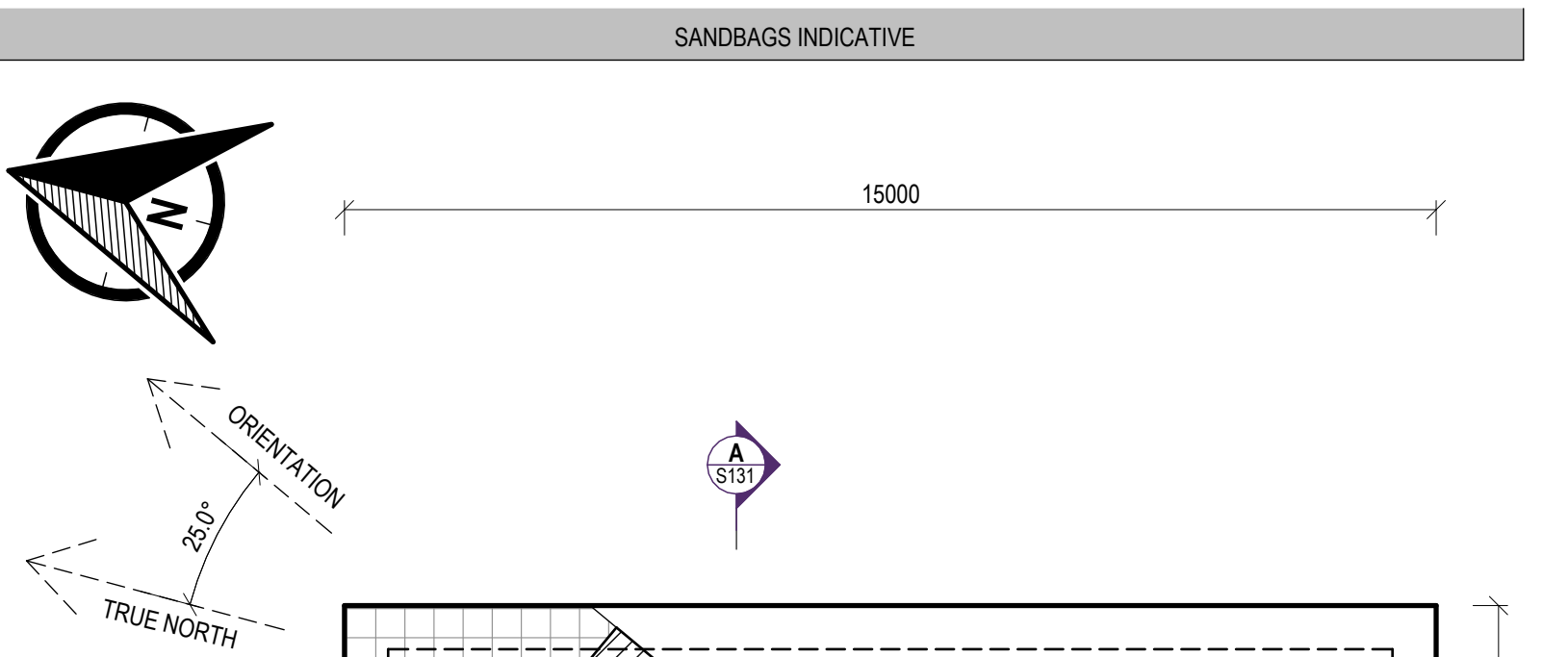
C01

1 : 150

4 TYPICAL PAD PAVEMENT DETAILS

1 : 150





1:100

FOUNDATION NOTES	
1.	FOOTINGS SHALL BE PLACED CENTRALLY UNDER COLUMNS UNLESS NOTED OTHERWISE.
2.	EXCAVATIONS SHALL BE KEPT FREE OF PONDED WATER BEFORE PLACING CONCRETE.
3.	FOOTINGS HAVE BEEN DESIGNED BASED ON THE FOLLOWING GEOTECHNICAL REPORT:
GEOTECHNICAL DETAILS	
GEOTECHNICAL REPORT BY	GROUND ENVIRONMENTS PTY LTD
REPORT JOB NUMBER	GE_2211.1150
REPORT DATE	11.01.2023
SITE CLASSIFICATION	H1
MIN. BEARING CAPACITY (ULS)	200kPa
MIN PILE SKIN FRICTION (ULS)	N/A
EXPECTED FOUNDING MATERIAL	CONTROLLED FILL
4.	GEOTECHNICAL ENGINEER TO CONFIRM FOUNDATION DESIGN PARAMETERS PRIOR TO PLACING CONCRETE.
5.	PLACE BLINDING CONCRETE TO BASE OF FOOTING EXCAVATION TO ACHIEVE DESIGN AND / OR UNIFORM BEARING MATERIAL.

SLAB ON GROUND NOTES	
1.	SUBGRADE TO BE CONSTRUCTED AS PER EARTHWORKS NOTES.
2.	SLAB TO BE PLACED ON 50mm BEDDING SAND WITH WATERPROOF MEMBRANE AS PER CONCRETE NOTES.
3.	PROVIDE 2N12 TRIMMER BARS 1000 LONG TO ALL RE-ENTRANT CORNERS.
4.	SLAB TO HAVE A NOMINAL 1% FALL FOR SURFACE DRAINAGE OF SLAB.



NTS

OVERHANGS DO NOT CONTRIBUTE TO LAP LENGTH

12. MAINTAIN 30 MIN. COVER TO REINFORCEMENT AT SERVICES AND CAST IN ITEMS THROUGH SLABS AND FOOTINGS. ALL SERVICES THROUGH FOOTING TO BE WRAPPED WITH COMPRESSIBLE MATERIAL MINIMUM 10mm ABLEFLEX OR SIMILAR.
13. WELDING OF REINFORCEMENT WILL ONLY BE PERMITTED WITH THE PRIOR APPROVAL OF THE ENGINEER.
14. REINFORCEMENT MUST NOT BE CONTINUOUS THROUGH CONTRACTION JOINTS.
15. PLACE SUFFICIENT SUPPORT HURDLES/CHAIRS UNDER MAIN BOTTOM REINFORCING BARS AND TOP CROSS BARS IN SLABS AND FOOTINGS TO ALLOW THEM TO BE SUPPORTED IN THEIR CORRECT POSITIONS AND ALIGNMENT DURING CONCRETING (NOT GREATER THAN 900mm CENTRES UNLESS SHOWN OTHERWISE).
16. REINFORCEMENT SYMBOLS:
- | SYMBOL | SPECIFICATION |
|-----------|---|
| N | GRADE D500N DEFORMED BAR |
| R | STRUCTURAL GRADE ROUND BAR |
| RF AND SL | HARD DRAWN SHEET RIBBED WIRE REINFORCING FABRIC |
- THE NUMBER FOLLOWING THESE SYMBOLS IS THE BAR DIAMETER IN MILLIMETERS.
17. SLABS TO BE CURED BY COVERING WITH 0.20mm BLACK POLYETHYLENE SHEETING AND KEPT MOIST FOR 7 DAYS MINIMUM OR APPROVED ALTERNATIVE CURING METHOD.
18. NO CONCRETE TO BE POURED WHEN SITE TEMPERATURE EXCEEDS 35°C OR FALLS BELOW 5°C.

STRUCTURAL GROUT NOTES		
1.	GROUT IS TO BE HIGH STRENGTH AND NON-SHRINK.	
2.	ALL GROUT TO BE CEMENTITIOUS UNLESS NOTED OTHERWISE.	
3.	MINIMUM 20MPa COMPRESSIVE STRENGTH FLOWABLE GROUT TO BE APPROVED BY ICUBED	
4.	WHERE ALTERNATIVE GROUT PRODUCTS ARE USED THE FOLLOWING PROPERTIES ARE TO BE ACHIEVED:	
	COMPRESSIVE STRENGTH (AS1478 2.2005)	55MPa AT 1 DAYS 80MPa AT 7 DAYS
	FLEXURAL STRENGTH (MODULUS OF RUPTURE AS1012.2.11:2000)	11.4MPa AT 7 DAYS
	INDIRECT TENSILE STRENGTH (AS1012.2.10:2000)	5.1MPa AT 7 DAYS
5.	TOP OF CONCRETE TO HAVE A CONCRETE SURFACE PROFILE (CSP) OF MIN 2.0 (GRIND AND WATER BLAST SURFACE) IN ACCORDANCE WITH ICRI TECHNICAL GUIDELINE NO. 310.2R2013.	
6.	ALL GROUT PRODUCTS ARE TO BE STORED, HANDLED AND PLACED STRICTLY IN ACCORDANCE WITH MANUFACTURERS CURRENT TECHNICAL DATA SHEET AND INSTRUCTIONS.	

COATING NOTES											
1.	THE FOLLOWING COATING REQUIREMENTS HAVE BEEN DETERMINED BY AS4312.										
2.	ALL FABRICATED STRUCTURAL STEELWORK TO BE PREPARED WITH ABRASIVE BLAST CLEANING CLASS 2.5.										
3.	SURFACES REQUIRING ONSITE TREATMENT ARE TO BE PRIMED IN ACCORDANCE WITH SURFACE TREATMENT MANUFACTURERS REQUIREMENTS.										
4.	COATINGS HAVE BEEN SPECIFIED BASED ON THE FOLLOWING:										
	<table> <tr> <td>CORROSIVITY CATEGORY</td><td>C3</td></tr> <tr> <td>STEEL CORROSION RATE $\mu\text{m/y}$</td><td>25 - 50</td></tr> <tr> <td>TYPICAL ENVIRONMENT</td><td>COASTAL/INDUSTRIAL</td></tr> <tr> <td>DURABILITY CLASS</td><td>LONG TERM</td></tr> <tr> <td>LIFE TO FIRST MAINTENANCE</td><td>10 YEARS TBC BY GILMOUR SPACE TECH</td></tr> </table>	CORROSIVITY CATEGORY	C3	STEEL CORROSION RATE $\mu\text{m/y}$	25 - 50	TYPICAL ENVIRONMENT	COASTAL/INDUSTRIAL	DURABILITY CLASS	LONG TERM	LIFE TO FIRST MAINTENANCE	10 YEARS TBC BY GILMOUR SPACE TECH
CORROSIVITY CATEGORY	C3										
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TYPICAL ENVIRONMENT	COASTAL/INDUSTRIAL										
DURABILITY CLASS	LONG TERM										
LIFE TO FIRST MAINTENANCE	10 YEARS TBC BY GILMOUR SPACE TECH										
5.	SURFACE TREATMENT:										
	<table> <tr> <td>EXPOSED STRUCTURAL STEEL</td><td>HDG390/1LG100/ZB100</td></tr> <tr> <td>INTERNAL STRUCTURAL STEEL</td><td>HDG390/1LG100/ZB100</td></tr> </table>	EXPOSED STRUCTURAL STEEL	HDG390/1LG100/ZB100	INTERNAL STRUCTURAL STEEL	HDG390/1LG100/ZB100						
EXPOSED STRUCTURAL STEEL	HDG390/1LG100/ZB100										
INTERNAL STRUCTURAL STEEL	HDG390/1LG100/ZB100										

SDA approval: APC2024/006-01

1	FOR CONSTRUCTION	26.02.2024	J.A.W.
0	FOR CONSTRUCTION	17.05.2023	J.A.W.
B	FOR APPROVAL	03.05.2023	J.A.W.
A	FOR COMMENT	03.03.2023	J.A.W.
REV	DESCRIPTION	DATE	BY

Drawn	Date	Chkd	Date
JAW		RM	
Design	Date	Apprd	Date
LV		RM	
Scale	A1	Certif	Date
As indicated			
Project No.	Dwg. No.	Rev	
21-307	S130	1	

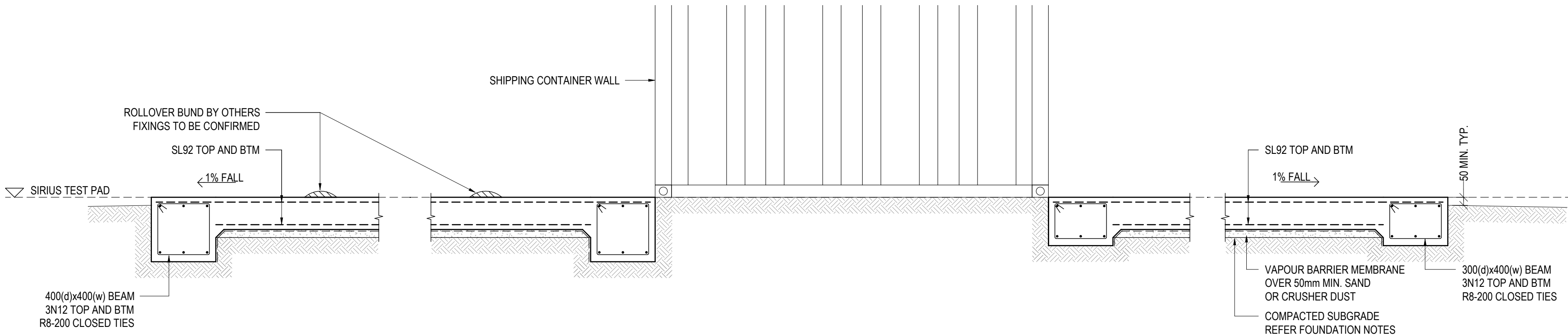
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PROJECT TEAM

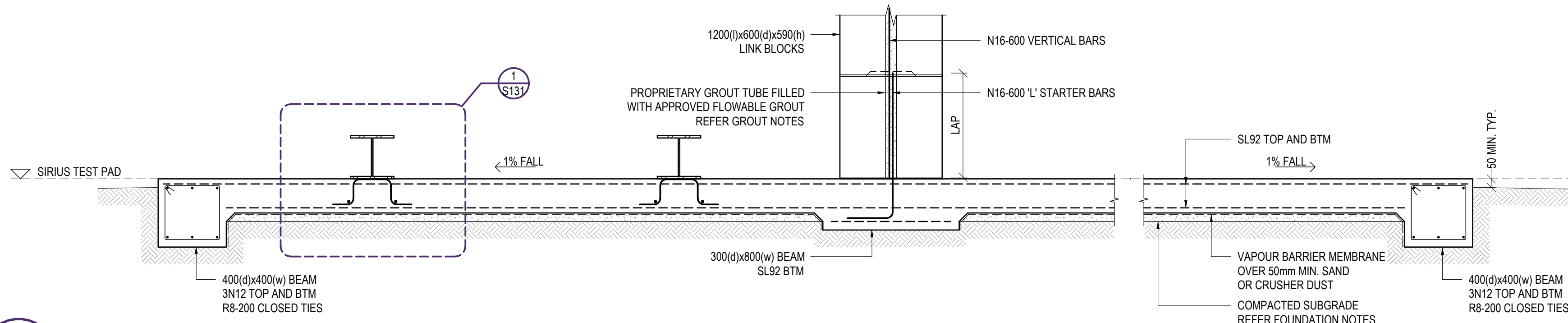
Consulting Engineer:



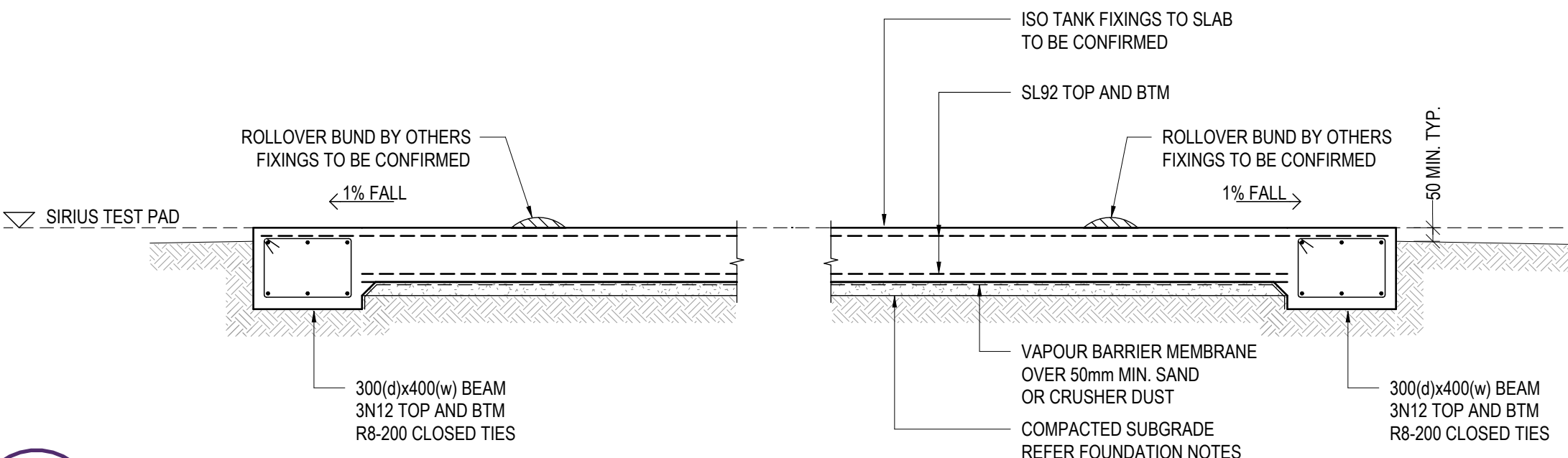
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p 07 3870 8888



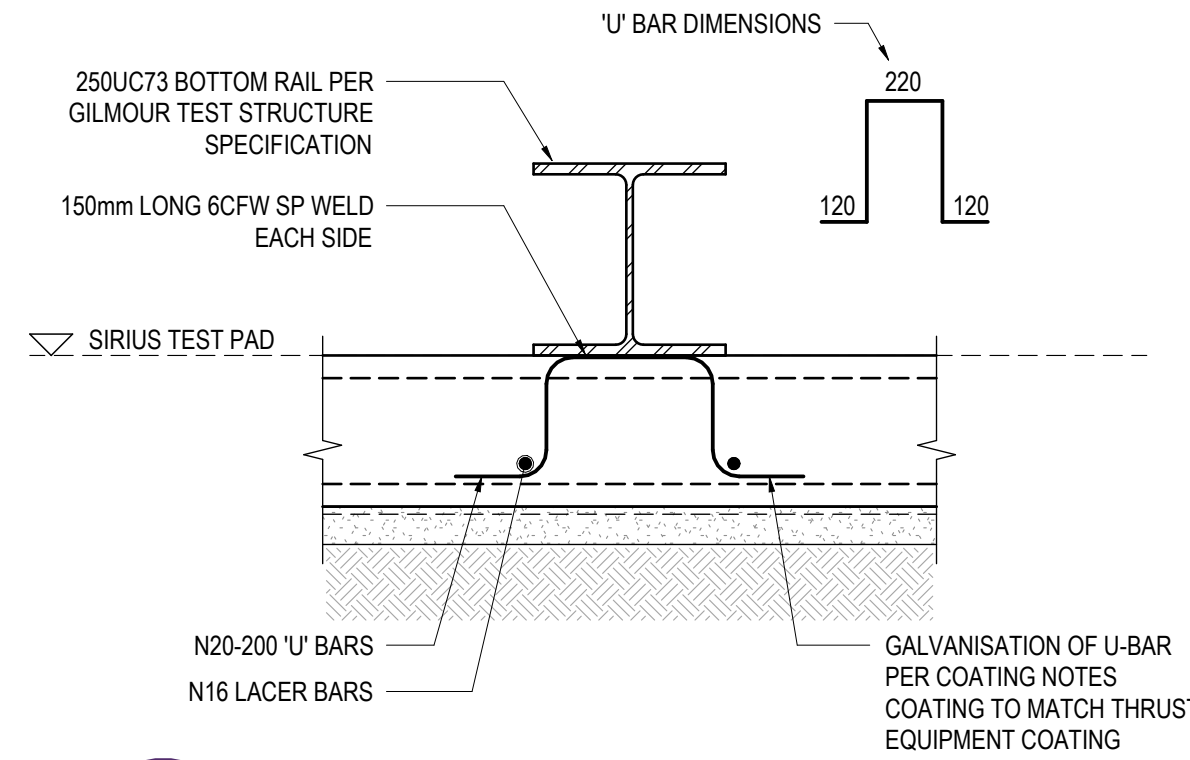
A SECTION A
S130 1:20



B SECTION B
S130 1:20



C SECTION C
S130 1:20



1 RAIL DETAIL
S131 1:10

A	FOR COMMENT	10.03.2023	J.A.W.
REV	DESCRIPTION	DATE	BY

Status

FOR COMMENT
NOT TO BE USED FOR CONSTRUCTION

Project
**BOWEN ORBITAL SPACE PORT
SIRIUS TEST PAD
BOWEN QUEENSLAND**

for
GILMOUR SPACE TECH

Title
**SIRIUS TEST PAD CONCRETE
DETAILS**

Drawn JAW	Date	Chkd RM	Date
Design LV	Date	Apprd RM	Date
Scale As indicated	A1	Certif	Date
Project No. 21-307	Dwg. No. S131	Rev A	

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PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006-01

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006

PROJECT TEAM

Consulting Engineer:



i³ consulting pty ltd
engineering consultants
innovation, ingenuity, inspiration

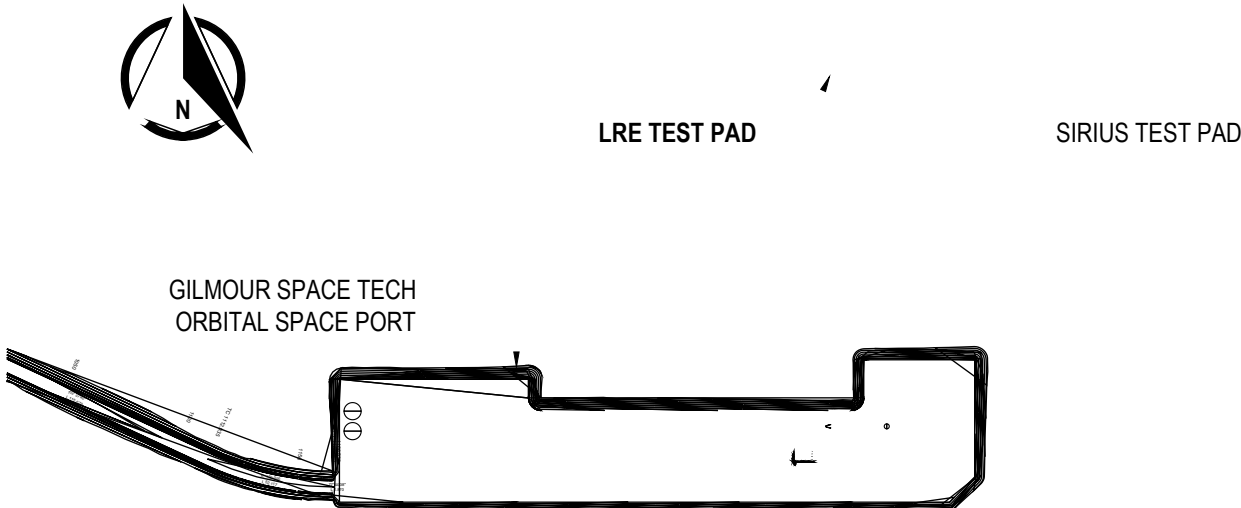
Milton, Qld 4064
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p 07 3870 8888



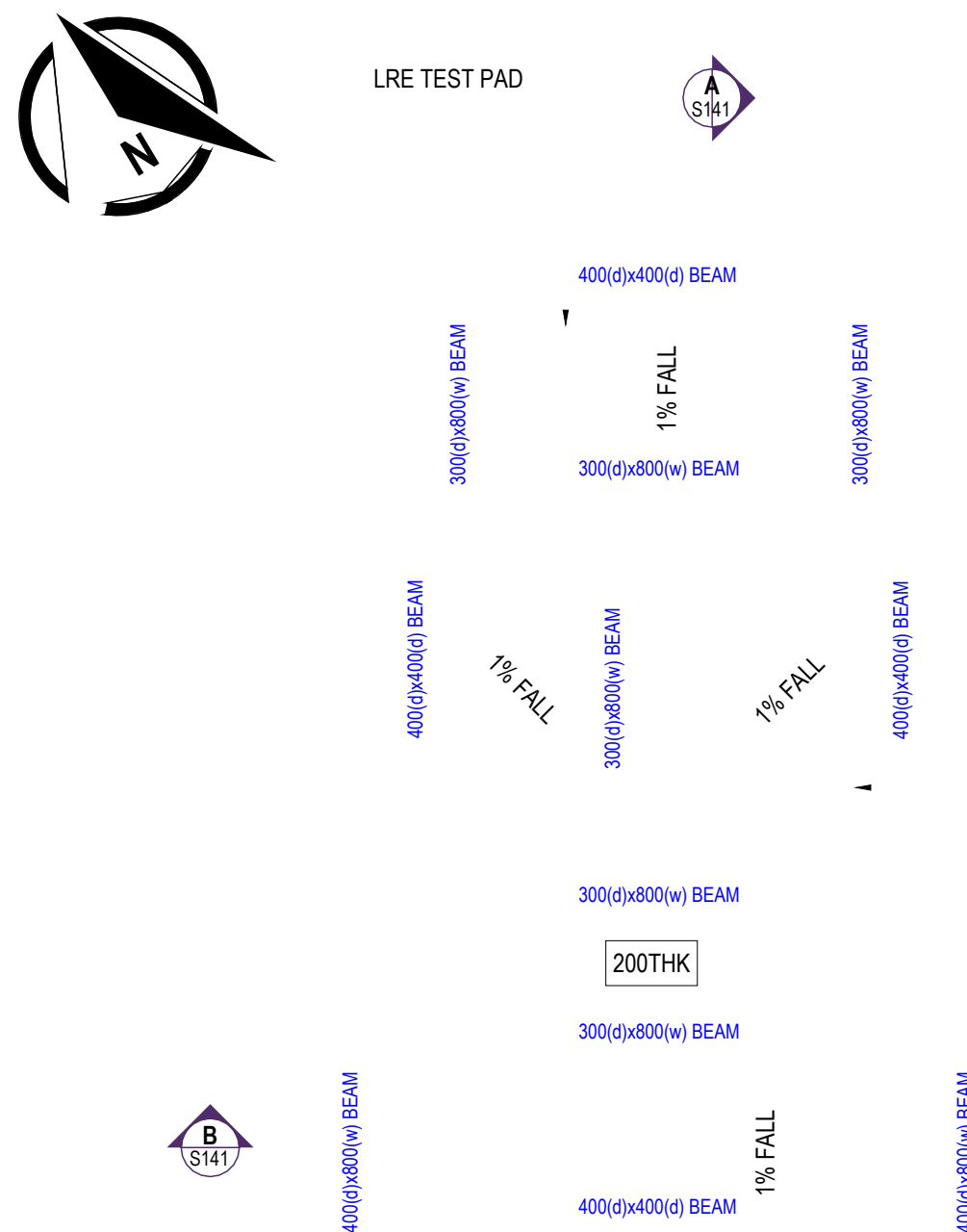
CONSTRUCTION NOTES:

- REFER GENERAL CONSTRUCTION NOTES ON DWG S01
- REFER DRAWING ABBREVIATIONS ON S01
- REFER EARTHWORKS NOTES ON DWG S01



LOCALITY PLAN

1 : 3000



SIRIUS PAD SLAB PLAN

1 : 100

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006-01

DESIGN CRITERIA		
1.	GENERAL PRINCIPLES HAVE BEEN ASSESSED IN ACCORDANCE WITH AS1170.0:	
	IMPORTANCE LEVEL	IL2
	DESIGN LIFE	50 YEARS
2.	PERMANENT ACTIONS HAVE BEEN ASSESSED IN ACCORDANCE WITH AS1170.1:	
	LINK BLOCK	3m HIGH SELF-WEIGHT
	CYLINDER MAN PACK	16kN POINT LOAD
	VARIOUS STORAGE TANKS	26kL STORAGE
	HTP STORAGE TANK	7t EMPTY, 13t FULL
3.	IMPOSED ACTIONS HAVE BEEN ASSESSED IN ACCORDANCE WITH AS1170.1:	
	LRE THRUST LOAD	1.5t SELF WEIGHT 60kN THRUST DIRECTION
	VEHICLE LOADING	2.5t FORKLIFT
	FOOT TRAFFIC	5kPa
4.	WIND LOADS HAVE BEEN ASSESSED IN ACCORDANCE WITH AS1170.2:	
	REGION	C
	TERRAIN CATEGORY	TC2
	WIND DIRECTION MULTIPLIER	0.9
	SHIELDING MULTIPLIER	1.0
	TOPOGRAPHICAL MULTIPLIER	1.0
	DESIGN WIND SPEED (ULS)	55.90m/s
	DESIGN WIND PRESSURE (ULS)	1.875kPa

FOUNDATION NOTES		
1.	FOOTINGS SHALL BE PLACED CENTRALLY UNDER COLUMNS UNLESS NOTED OTHERWISE.	
2.	EXCAVATIONS SHALL BE KEPT FREE OF PONDED WATER BEFORE PLACING CONCRETE.	
3.	FOOTINGS HAVE BEEN DESIGNED BASED ON THE FOLLOWING GEOTECHNICAL REPORT:	
	GEOTECHNICAL DETAILS	
	GEOTECHNICAL REPORT BY	GROUND ENVIRONMENTS PTY LTD
	REPORT JOB NUMBER	GE_2211.1150
	REPORT DATE	11.01.2023
	SITE CLASSIFICATION	H1
	MIN. BEARING CAPACITY (ULS)	200kPa
	MIN PILE SKIN FRICTION (ULS)	N/A
	EXPECTED FOUNDING MATERIAL	CONTROLLED FILL
4.	GEOTECHNICAL ENGINEER TO CONFIRM FOUNDATION DESIGN PARAMETERS PRIOR TO PLACING CONCRETE.	
5.	PLACE BLINDING CONCRETE TO BASE OF FOOTING EXCAVATION TO ACHIEVE DESIGN AND / OR UNIFORM BEARING MATERIAL.	

ONLY FORKLIFT VEHICLE LOAD
HAS BEEN ALLOWED ON SLAB

ALL FIXINGS TO SLAB TO BE
CONFIRMED AND APPROVED BY
ENGINEER PRIOR TO POUR

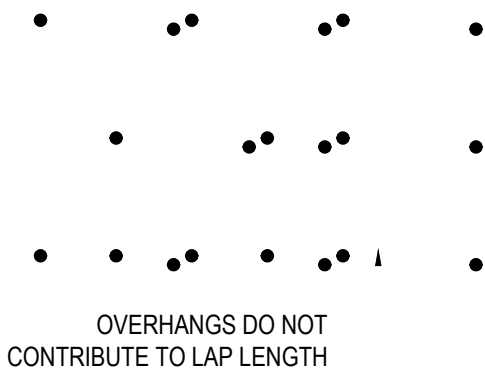
ALLOWED FIXINGS:
- HTP STORAGE TANK HOLD DOWN - 1M16 CHEMSET ANCHOR EACH LEG (4 TOTAL)
100 MIN. EMBEDMENT
150 MIN. EDGE DISTANCE
- LRE BASE ANCHORS - 2M16 CHEMSET ANCHOR EACH LEG (6 TOTAL)
100 MIN. EMBEDMENT
150 MIN. EDGE DISTANCE

SLAB ON GROUND NOTES

- SUBGRADE TO BE CONSTRUCTED AS PER EARTHWORKS NOTES.
- SLAB TO BE PLACED ON 50mm BEDDING SAND WITH WATERPROOF MEMBRANE AS PER CONCRETE NOTES.
- PROVIDE 2N12 TRIMMER BARS 1000 LONG TO ALL RE-ENTRANT CORNERS.
- SLAB TO HAVE A NOMINAL 1% FALL FOR SURFACE DRAINAGE OF SLAB.

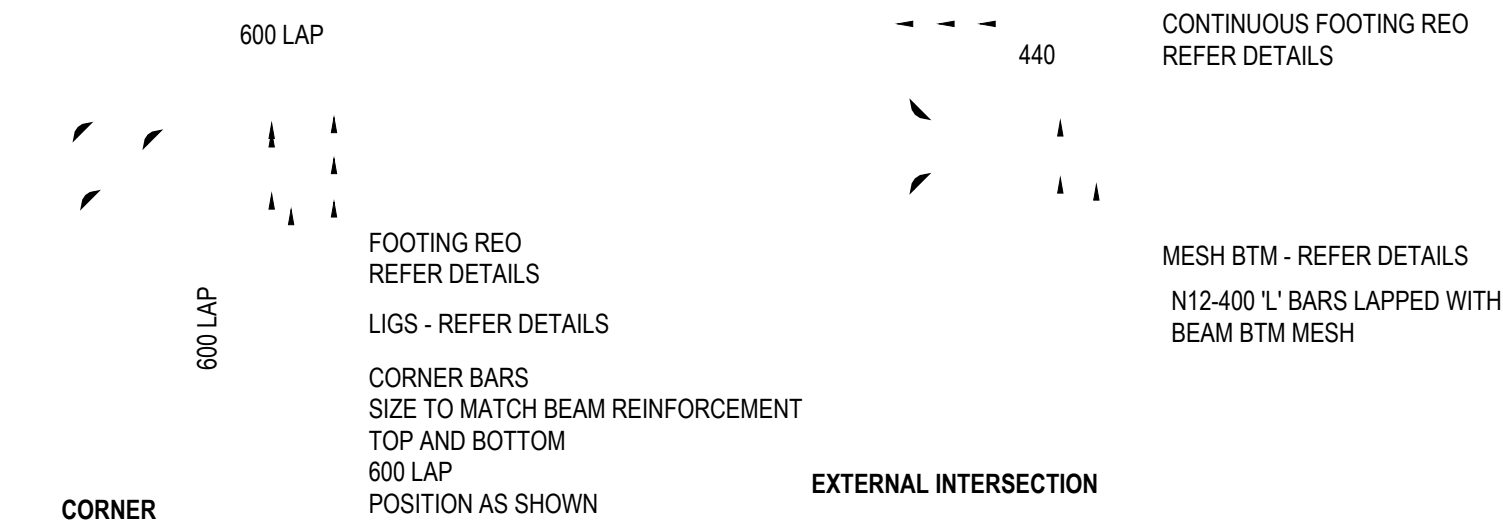
CONCRETE NOTES			
1.	ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600 & AS 1379.		
2.	CONCRETE QUALITY AND CLEAR CONCRETE COVER TO REINFORCEMENT (OUTSIDE OF STIRRUPS AND TIES) SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE:		
	ELEMENT	CONCRETE GRADE	CLEAR COVER
			SLUMP
	BEAMS	N32	30 TOP COVER 50 BTM COVER 50 SIDE COVER
			SLUMP 90 PLUS 20 MINUS 20
	SLABS	REFER SLAB ON GROUND SCHEDULE ON DRAWINGS	30 TOP COVER 50 BTM COVER 50 SIDE COVER
			SLUMP 90 PLUS 20 MINUS 20
3.	CONCRETE MIX TO HAVE A MAXIMUM AGGREGATE SIZE OF 20mm.		
4.	SPECIFIED STRUCTURAL THICKNESSES FOR CONCRETE ELEMENTS DO NOT INCLUDE THICKNESS OF APPLIED FINISHES.		
5.	CONSTRUCTION JOINTS OR POUR BREAKS WHERE NOT SHOWN ON PLANS OR DETAILS SHALL BE LOCATED AND FORMED TO THE APPROVAL OF THE ENGINEER.		
6.	NO PENETRATIONS, RECESSES OR CHASES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT APPROVAL OF THE ENGINEER.		
7.	AT PENETRATIONS IN SLABS UNLESS OTHERWISE DETAILED REINFORCEMENT MUST NOT BE CUT BUT SHALL BE GATHERED EQUALLY TO EACH SIDE OF PENETRATION AND EXTRA REINFORCEMENT PROVIDED BETWEEN THE PENETRATIONS AS DIRECTED BY THE ENGINEER.		
8.	REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY. IT IS NOT NECESSARILY SHOWN IN TRUE PROJECTION.		
9.	PROVIDE THE ENGINEER WITH 48 HOURS NOTICE OF REINFORCEMENT BEING READY FOR INSPECTION. NO CONCRETE IS TO BE POURED WITHOUT THE APPROVAL OF THE ENGINEER. THIS IS TO BE CONFIRMED AT A LATER DATE.		
10.	SPICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITIONS SHOWN. WHERE LAP LENGTH IS NOT SHOWN IT SHALL BE SUFFICIENT TO DEVELOP THE FULL STRENGTH OF THE REINFORCEMENT. THE FOLLOWING MINIMUM SPLICE LENGTHS SHALL BE USED UNLESS NOTED OTHERWISE: THE FOLLOWING MINIMUM BAR SPLICE LENGTHS ARE APPLICABLE FOR f _c >= 25MPa TO 65MPa. A - FOR VERTICAL OR HORIZONTAL BARS WITH LESS THAN 300mm OF CONCRETE CAST BELOW		
	BAR DIAMETER	LAP LENGTH (mm)	BAR DIAMETER
	N10	360	N24
	N12	440	N28
	N16	605	N32
	N20	865	N36
			LAP LENGTH (mm)
			1165
			1485
			1835
			2210
	B - FOR HORIZONTAL BARS GREATER THAN OR EQUAL TO 300mm OF CONCRETE CAST BELOW		
	BAR DIAMETER	LAP LENGTH (mm)	BAR DIAMETER
	N10	470	N24
	N12	570	N28
	N16	785	N32
	N20	1125	N36
			LAP LENGTH (mm)
			1550
			1960
			2385
			2870

- SUPPLY AND LAY FABRIC IN FLAT SHEETS AT SPLICES. FABRIC SHALL BE LAPPED AS SPECIFIED IN AS 3600. STEEL MESH SHOULD BE LAPPED AS SHOWN BELOW IE THE TWO OUTERMOST CROSS-WIRES OF ONE SHEET SHOUD OVERLAP THE TWO OUTERMOST WIRES AT THE OTHER.



- MAINTAIN 30 MIN. COVER TO REINFORCEMENT AT SERVICES AND CAST IN ITEMS THROUGH SLABS AND FOOTINGS. ALL SERVICES THROUGH FOOTING TO BE WRAPPED WITH COMPRESSIBLE MATERIAL MINIMUM 10mm ABLEFLEX OR SIMILAR.
- WELDING OF REINFORCEMENT WILL ONLY BE PERMITTED WITH THE PRIOR APPROVAL OF THE ENGINEER.
- REINFORCEMENT MUST NOT BE CONTINUOUS THROUGH CONTRACTION JOINTS.
- PLACE SUFFICIENT SUPPORT HURDLES/CHAIRS UNDER MAIN BOTTOM REINFORCING BARS AND TOP CROSS BARS IN SLABS AND FOOTINGS TO ALLOW THEM TO BE SUPPORTED IN THEIR CORRECT POSITIONS AND ALIGNMENT DURING CONCRETING (NOT GREATER THAN 900mm CENTRES UNLESS SHOWN OTHERWISE).
- REINFORCEMENT SYMBOLS:
SYMBOL SPECIFICATION
N GRADE D500N DEFORMED BAR
R STRUCTURAL GRADE ROUND BAR
RF AND SL HARD DRAWN SHEET RIBBED WIRE REINFORCING FABRIC
THE NUMBER FOLLOWING THESE SYMBOLS IS THE BAR DIAMETER IN MILLIMETERS.
- SLABS TO BE CURED BY COVERING WITH 0.20mm BLACK POLYETHYLENE SHEETING AND KEPT MOIST FOR 7 DAYS MINIMUM OR APPROVED ALTERNATIVE CURING METHOD.
- NO CONCRETE TO BE POURED WHEN SITE TEMPERATURE EXCEEDS 35°C OR FALLS BELOW 5°C.

STRUCTURAL GROUT NOTES		
1.	GROUT IS TO BE HIGH STRENGTH AND NON-SHRINK.	
2.	ALL GROUT TO BE CEMENTITIOUS UNLESS NOTED OTHERWISE.	
3.	THE FOLLOWING GROUT PRODUCT IS TO BE USED UNLESS NOTED OTHERWISE: CEMENTITIOUS FLOWABLE GROUT	
4.	WHERE ALTERNATIVE GROUT PRODUCTS ARE USED THE FOLLOWING PROPERTIES ARE TO BE ACHIEVED: COMPRESSIVE STRENGTH (AS1478.2:2005)	55MPa AT 1 DAYS 80MPa AT 7 DAYS 11.4MPa AT 7 DAYS 5.1MPa AT 7 DAYS
	FLEXURAL STRENGTH (MODULUS OF RUPTURE AS1012.2.11:2000)	
	INDIRECT TENSILE STRENGTH (AS1012.2.10:2000)	
5.	TOP OF CONCRETE TO HAVE A CONCRETE SURFACE PROFILE (CSP) OF MIN 2.0 (GRIND AND WATER BLAST SURFACE) IN ACCORDANCE WITH ICRI TECHNICAL GUIDELINE NO. 310.2R2013.	
6.	ALL GROUT PRODUCTS ARE TO BE STORED, HANDLED AND PLACED STRICTLY IN ACCORDANCE WITH MANUFACTURERS CURRENT TECHNICAL DATA SHEET AND INSTRUCTIONS.	



STRIP FOOTING WITH REINFORCEMENT BARS

STRIP FOOTING WITH REINFORCEMENT BARS

TYPICAL FOOTING CORNER DETAIL

TYPICAL FOOTING INTERSECTION DETAIL

FOOTING CORNER DETAILS

NTS

A	FOR COMMENT	10.03.2023	J.A.W.
REV	DESCRIPTION	DATE	BY
Status			

FOR COMMENT

NOT TO BE USED FOR CONSTRUCTION

Project

BOWEN ORBITAL SPACE PORT
LRE TEST PAD
BOWEN QUEENSLAND

for

GILMOUR SPACE TECH

Title

LRE TEST PAD SLAB PLAN

Drawn	Date	Chkd	Date
JAW		RM	
Design	Date	Apprd	Date
LV		RM	
Scale	A1	Certif	Date
As indicated			
Project No.	Dwg. No.	Rev	

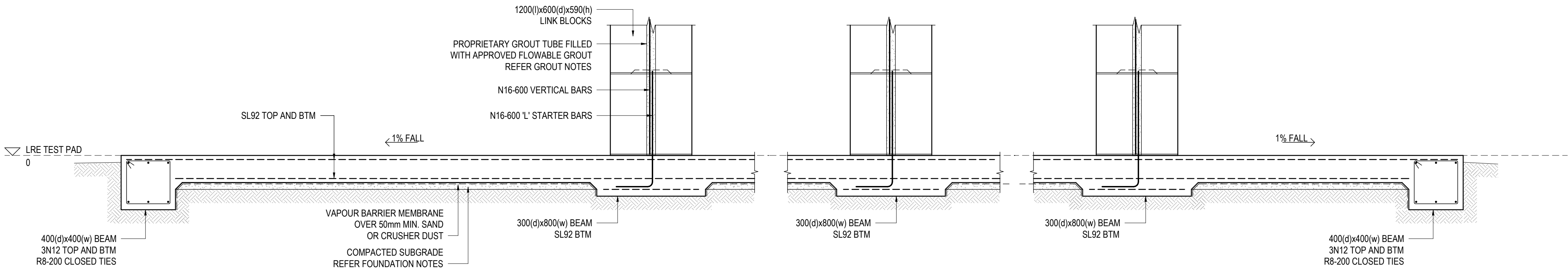
21-307 S140 A

PROJECT TEAM

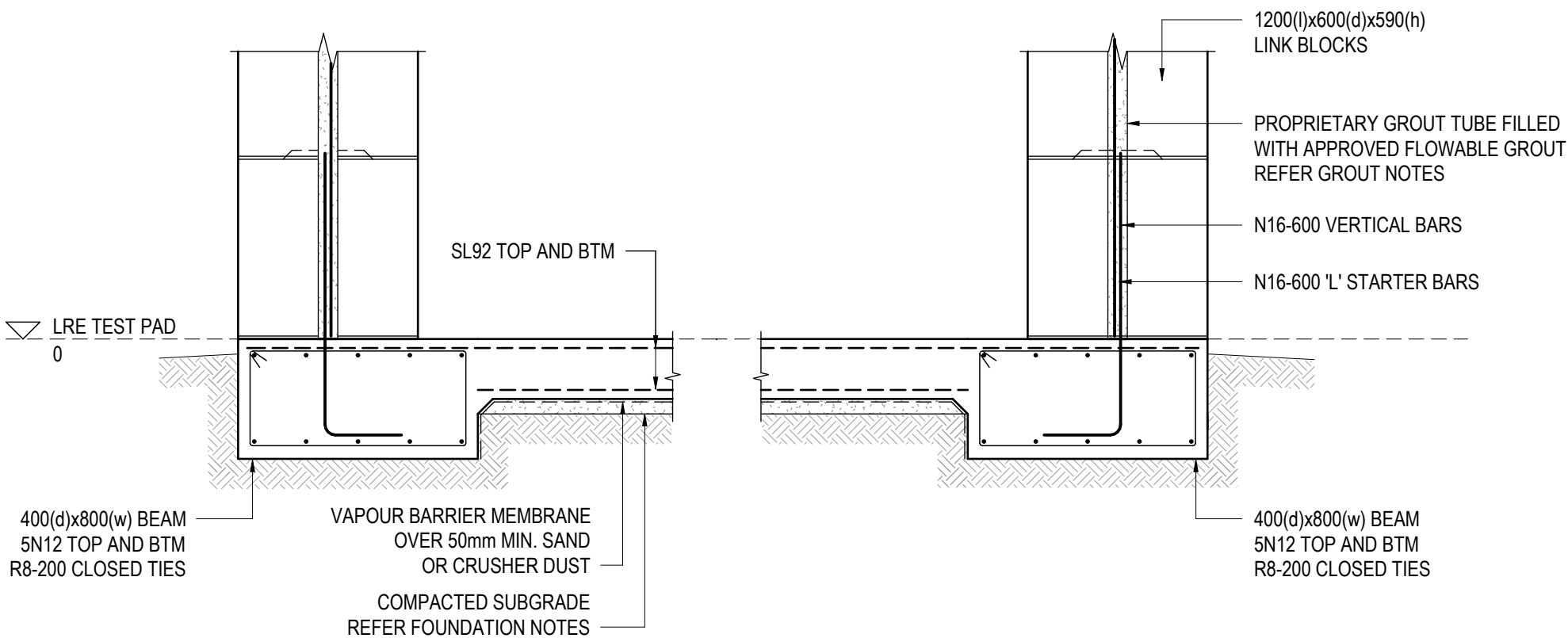
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A
S140 1 : 20
SECTION A



B
S140 1 : 20
SECTION B



PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL

SDA approval: APC2024/006

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL

SDA approval: APC2024/006-01

A	FOR COMMENT	10.03.2023	J.A.W.
REV	DESCRIPTION	DATE	BY
Status			
FOR COMMENT			
NOT TO BE USED FOR CONSTRUCTION			
Project			
BOWEN ORBITAL SPACE PORT			
LRE TEST PAD			
BOWEN QUEENSLAND			
for			
GILMOUR SPACE TECH			
Title			
LRE TEST PAD CONCRETE			
DETAILS			
Drawn	Date	Chkd	Date
JAW		RM	
Design	Date	Apprd	Date
LV		RM	
Scale	A1	Certif	Date
1 : 20			
Project No.	Dwg. No.	Rev	
21-307	S141	A	
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STRUCTURAL COMPUTATION REPORT

22-055 –24m COMMUNICATION TOWER AT BOWEN ORBITAL SPACEPORT

Prepared for:

TECLO ANTENNAS

PLANS AND DOCUMENTS
referred to in the
SDA APPROVAL



SDA approval: APC2024/006

PLANS AND DOCUMENTS
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	Section Structural Computation Report				Sheet No./Rev. 2 / 1	
	Calc. by MF	Date 04/07/22	Chk'd by LS	Date 04/07/22	App'd by LS	Date 04/07/22

Document1	
Prepared By	MF
Approved By	LS
Date	04/07/22
Job Number	22-055
Document Name	Structural Computation Report
Version	V 1.0

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Version	Revision History
1.0	Initial issue

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STATEMENT OF LIMITATION

Data and conclusions of this report are the findings and opinions of icubed consulting and are not an expressed or implied representation, warranty or guarantee. This report has been prepared for Telco Antennas. icubed consulting does not accept liability for any third party's use or reliance on this report.

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1 Scope

i3 consulting was engaged by Telco Antennas to undertake a structural design and certification of the 1m face steel tower and footing for the proposed project at Orbital Spaceport Bowen QLD. This 24m high tower is to support communication equipment (ie. parabolic antennas)

1.1 Design scope:

The following structural design and certification was performed on the steel tower structure, connections and concrete footing:

- Calculate wind loads for the proposed orbital spaceport site in accordance with AS1170.2-2021
- Determine wind loads on the tower and the specific set of antennas.
- Structural model and analysis of the proposed tower
- Design check steel member sizes and connections for the bolted web members
- Design reinforced concrete pad footing
- Structural drawings of the footings, steel towers and connection details
- Design computation report and design compliance statement (form 15)

1.2 Structural Assessment & Certification Limitations

This design and certification is based on the fabrication and installation of the steel tower being carried out in accordance with i3 computation report and drawings 22-055 – S00, S01, S50, S100, S400 and S401.

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2 Client Specification

Client provided information for the proposed 24m steel framed tower

- Geometry of 1m square steel frame tower
- Proposed antennas size, above ground level and bearings – refer antenna schedule in section 4.2

2.1 Site Location

The proposed steel tower is to be installed at Orbital Spaceport Bowen, Queensland with the following GPS co-ordinates:



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3 Applicable Design Standards

AS/NZS 1170.0:2002	Structural Design Actions – General principles
AS/NZS 1170.1-2002	Structural Design Actions – Permanent, imposed, and other actions
AS/NZS 1170.2-2011	Structural Design Actions – Wind actions
AS 1891.4:2009	Industrial fall-arrest systems and devices – selection, use and maintenance
AS 3995 -2009	Design of steel lattice masts & Masts (Section E1)
AS/NZS 3678 2011	Structural Steel – hot-rolled plates, floorplates and slabs
AS/NZS 3679.1 2016	Structural Steel – hot rolled bars and sections
AS 1163 2016	Cold-formed structural steel hollow sections
AS/NZS 4100 2020	Steel Structures
AS/NZS 1554.1 2014	Structural Steel Welding – Welding of Steel Structures
AS 3600 2018	Concrete Structures

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4 Design Actions

The following design parameters were adopted in the structural analysis and design of the steel tower and concrete footing

4.1 General Principals

- Importance level 2
- Design working life 50 years

4.2 Permanent Actions

- Design loads based on AS1170.1
- Self-weight of steel tower members and connections
- Self-weight of concrete footing
- Antenna details as tabled below

ANTENNA SCHEDULE				
ID	SIZE / STYLE	BEARING	WEIGHT (kg)	ABOVE GROUND LEVEL (AGL)
A1.06	600 DIAMETER PARABOLIC ANTENNA	102°	8	24m
A2.06	600 DIAMETER PARABOLIC ANTENNA	112°	8	24m
A3.06	600 DIAMETER PARABOLIC ANTENNA	334°	8	24m
FUTURE	600 DIAMETER PARABOLIC ANTENNA	(TBC)	8	22m
FUTURE	600 DIAMETER PARABOLIC ANTENNA	(TBC)	8	22m

4.3 Imposed Actions

- Design loads based on AS1891.4 Industrial fall arrest systems and devices; part 4
- Single point anchorage - 15kN applied at 5° from vertical to simulate real world conditions

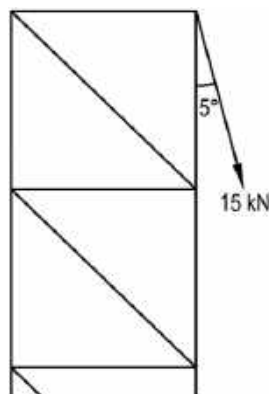


Figure 1 – Fall Arrest Load



Client / Project

Telco Antennas / 24m Steel Tower at Bowen Orbital Spaceport

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4.4 Wind Actions

The following wind parameters were used based on AS3995 and AS1170.2:

- Regions: C (refer map below for Australian wind regions)
- Terrain category: 2
- Terrain / height multiplier: 1.098
- Wind directional multiplier mast / antennas: 0.9
- Topographical Multiplier: 1.0
- Climate Change Multiplier: 1.05
- Shielding Multiplier: 1.0
- Lateral deflection to allow continuous communication is taken from AS3995 Appendix E1 which specifies a wind speed of 27m/s
- The ultimate wind speed and pressures (without the aerodynamic shape factors C_{fig}) are listed in the following table:

Region	V_R (m/s)	V_{des} (m/s)	P_w (kpa)
C	65.6	67.9	2.77

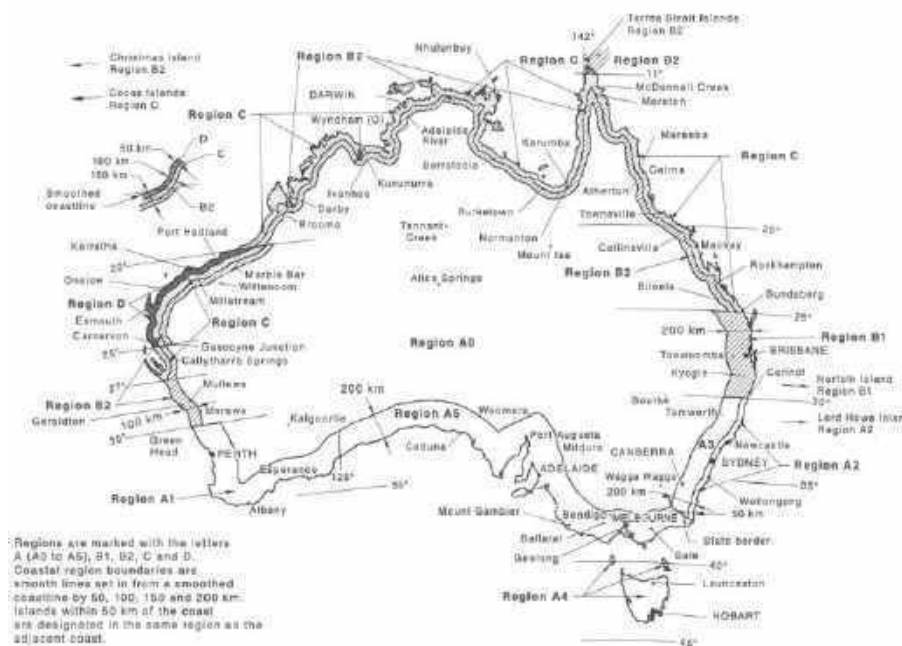


Figure 3.1(A) — Wind regions — Australia

Figure 2 – AS1170.2 - Wind Regions - Australia

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5 Tower Climbing Adequacy

Structural elements have been assessed for loads generated from climbing / working at heights. A single person load of 15kN is applied in accordance with Table 3.1 in AS1891.4.

AS1891.4 requires that signage be installed at the tower base describing which elements of the structure can be used for anchorage.

Any climber / worker at heights must be competent and qualified to do so.

Two (2) climbers / workers at heights can be supported by the tower with adherence to the following specifications.

- ONLY** the members shown in purple in the generic diagram below can be used as a climbing / work at heights anchor point.
- The specified anchor points are limited to one (1) person at any time.
- Prior to anchoring to any element, visually check connections are complete and have no damage. Any defects should be reported to the manufacturer.
- Do not attach fall arrest devices to horizontal cross bracing.
- Any anchor point is limited to the tower leg above the brace connection points.

Generic Tower Anchor points

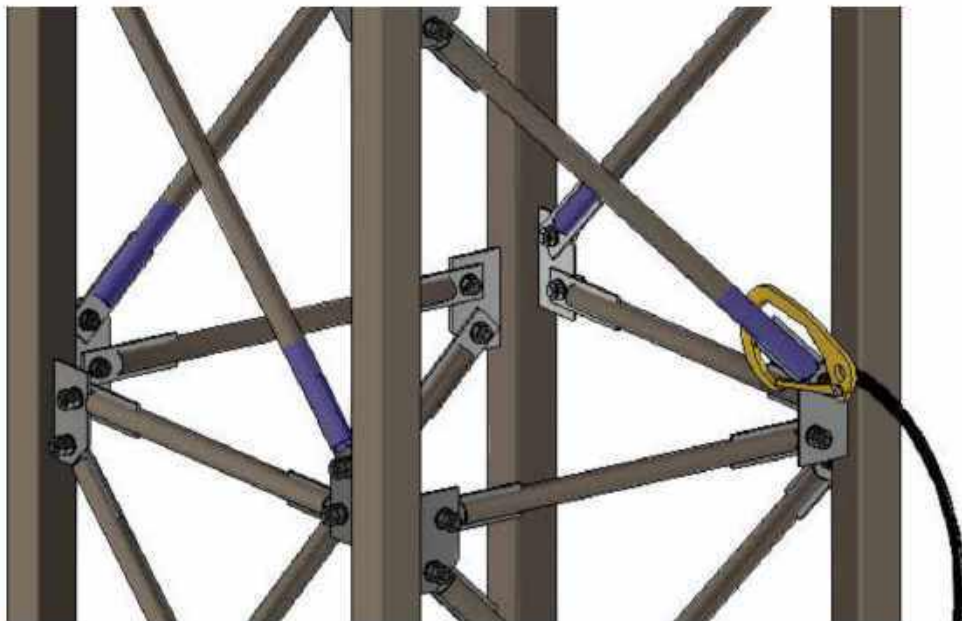


Figure 3 – Lanyard Hook must be placed around diagonal tower web above bracing connections only (purple shading)



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6 Safety In Design

Safety in Design (SID) is a statutory requirement on construction projects. In all jurisdictions within Australia there is a general requirement that the safety of a design is reviewed where non-standard construction techniques or novel building or structural designs are proposed.

4.2.1.1 DESIGN RISK ASSESSMENT

PROJECT NAME / NUMBER: 24m Tower at Bowen Orbital Spaceport / 22 - 055

DRAWING NUMBERS: icubed consulting drawings (DRAWING LIST) S00 - S401

PARTICIPANTS: icubed consulting (NAMES) Matthew Falcke, Leonel Sobral

DATE OF REVIEW: 15/06/2022

DISTRIBUTION:

CODE	DESCRIPTION	SEVERITY
A - Always certain	Is considered to occur in most circumstances	Very serious
B - Likely	It is probably occur in most circumstances	Serious
C - Possible	Might possibly occur at some time	Minor
D - Unlikely	Could occur at some time but doubtful	Very minor
E - Rare	May occur but only in exceptional circumstances	Very minor

CODE	DESCRIPTION	SEVERITY
1 - Catastrophic	Fatality / multiple serious injury, environmental disaster, huge cost	Very serious
2 - Major	Serious fatality / serious injury, severe environmental damage, major cost	Serious
3 - Moderate	Injury requiring medical treatment, controlled environmental impact, moderate cost	Minor
4 - Minor	First aid treatment, some environmental/financial impact	Very minor
5 - Negligible	No injury, few environmental/financial impact	Very minor

LIKELIHOOD	CONSEQUENCE				
	High Score	Minor	Minor	Minor	Catastrophic
1 (Always certain)	5	4	3	2	1
2 (Likely)	4	3	2	1	0
3 (Possible)	3	2	1	0	0
4 (Unlikely)	2	1	0	0	0
5 (Rare)	1	0	0	0	0

PRA Ref	Hazard	Risk	Site / Building Location	PHASE			Suggested Treatment - Change or specify new control	RESIDUAL RISK			Responsibility	Status (Open / Closed)
				CO	OP / US	MAINT		L	C	SCORE		
1	Structural Collapse	The tower could collapse under an extreme wind event	ALL	✓	✓	✓	Tower designed to AS/NZS 1170.1-2002 and AS/NZS 4100 2020. The design was also peer reviewed and signed off by a senior engineer.	E	2	L	i3	CLOSED
2	Working at Heights	Worker could fall from height when climbing the tower	TOWER	✓	✗	✓	Instruction have been provided for climbing the tower/signage will be installed at the base of the tower describing which areas of the structure can be climbed and used as an anchor point/ climbers must be working from heights trained	C	3	M	Telco Antennas	OPEN
3	Dangerous Weather Conditions	personal injury / commercial loss during high winds / thunderstorms / Earthquake	ALL	✓	✓	✓	Avoid working on or around the tower during extreme weather events	C	2	M	Telco Antennas	OPEN
4	Exposed Steel during construction	A worker could fall onto the slab reo causing personal injury	TOWER	✓	✗	✗	Warn workers of the potential hazard.	D	2	L	Telco Antennas	OPEN
5	Falling objects	Someone working at the top of the tower could drop something from a height and hit someone.	ALL	✓	✗	✓	Hard hats are to be worn within the near vicinity of the tower and workers are to use the proper anchoring points when lifting is required.	D	5	M	Telco Antennas	OPEN
6	Manual handling issue	A worker manipulating steel members or antennas could possibly injure themselves whilst doing so	ALL	✓	✗	✓	Proper lifting technique is to be carried out at all times and workers are to use appropriate lifting tools/devices when required.	C	2	M	Telco Antennas	OPEN
7	PPE	Personal injury / fatigue / stress	ALL	✓	✓	✓	Standard work health and safety methods are to be implemented and all works must wear required PPE.	C	4	H	Telco Antennas	OPEN
8	Improper Foundation	The soil under the foundations cannot resist the forces applied to it causing failure	ALL	✓	✓	✓	Soil tests required to confirm minimum bearing capacity	C	3	M	Telco Antennas	OPEN
9	Trip Hazards	There is potential for someone to trip whilst walking around the site. Both around the tower and at the edge of the concrete slab	ALL	✓	✓	✓	Workers to take care when moving around the site	D	1	L	Telco Antennas	OPEN
10	Access/Egress	Limited Access to rescue someone from the tower during an emergency	TOWER	✓	✗	✓	2 working from heights trained people must be on site when the tower needs to be climbed	E	4	M	Telco Antennas	OPEN
11	Electricity	Potential electrocution	TOWER	✓	✓	✓	If a faulty or exposed wire/connection is discovered work on the tower is to stop and a certified electrician must repair the issue before work can commence.	E	5	M	Telco Antennas	OPEN

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7 Structural Analysis & Results

Below are the analysis and capacity results from the structural modelling for the 24m high, 1m face steel tower:

- The tower was analysed with the calculated ultimate and serviceability design loads
- Antenna loads were applied as a concentrated load at the specified AGL and bearing orientation as noted in section 4.2.

1m Face Lattice Tower – 24m high	
Wind region	C
Material	Steel
Tower leg	
- module A	89 x 6 SHS (G350)
- module B, C and D	89 x 3.5 SHS (G350)
Tower web	42.4 x 3.2 CHS (G250)
leg centre to centre	1000 mm
max tower design height	24 m
No. of modules	4 x 6.0m
Leg max design stress (Mpa)	171.27
Grade 350 steel stress capacity (Mpa)	350
Web max design stress (Mpa)	94.52
Grade 250 steel stress capacity (Mpa)	250

It can be seen from the table above that the stress capacity of the tower framing members are greater than the maximum design stress. Therefore, the steel tower is deemed structurally adequate.

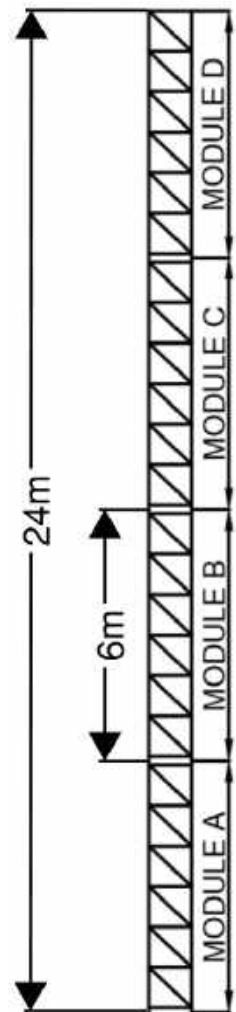


Figure 4 – Tower Layout

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7.1 Lateral Displacement

Tower lateral displacement at the top of the tower is tabled below

24m Tower at Bowen Orbital Spaceport	Lateral shift	Rotation
Lateral displacement at top of tower based on 27m/s wind	42.5mm	1.1°

Notes:

- Deflections for communication serviceability taken as 27m/s as per AS3995 appendix E1
- Actual deflections are subject to the antenna size, shape, orientation and placement on the tower.

7.2 Tower Base Reactions

From the structural analysis model, the table below provides the base reaction forces per leg to be supported by the footing system.

1m Face Lattice Tower – 24m high – Design Actions				
Location	Uplift	Shear	Bearing	Bending
Max tower base reaction ULS (kN)	498.28	14.97	509.76	-

7.3 Geotechnical Parameters

Geotechnical data of soil properties and conditions were obtained in the Site Classification & Geotechnical Recommendations report from CQ Soil Testing number CQ20875, dated 06/04/22. The results are shown below.

Soil Description & Assumed Design Parameters	
Soil type / description	silty clay / very stiff
Friction angle Φ	19°
Undrained shear strength C_u (kPa)	350 kPa(ULS)
Static Stress-Strain E_s (MPa)	8-30

7.4 Footing Design

See the below capacity summary of the concrete footing.

Concrete footing Design Actions	Design Load	Design Capacity	Capacity Utilisation
Bearing	50.9 kPa	150 kPa	33.9 %
Sliding	51.42 kN	263.01 kN	19.6 %
Bending Moment	213.5 kN-m	481.4 kN-m	44.3 %
Shear	304.4 kN	522.6 kN	58.3 %
Punching Shear	509.76 kN	3078.6 kN	16.6 %
Minimum Steel	5313mm ²	6232mm ²	85.3%

As seen in the above table, the footing resistance against the design actions is satisfactory and therefore can be concluded that the footing system will be adequate for the conditions at Bowen Orbital Spaceport.