

Longford Shared Path - Project 2019/11



D

DRAWING NUMBER	DESCRIPTION	LATEST REV
GENERAL:		
GDC_2019/11_S_001	COVER SHEET	D
GENERAL ARRANGEMENT DRAWINGS:		
GDC_2019/11_S_100	BRIDGE PLAN	D
GDC_2019/11_S_101	BRIDGE ELEVATION	D
GDC_2019/11_S_102	BRIDGE CROSS SECTIONS	D
GDC_2019/11_S_103	BRIDGE ISOMETRIC	D
GDC_2019/11_S_104	WEST BRIDGE APPROACH	D
GDC_2019/11_S_105	EAST BRIDGE APPROACH	D
GDC_2019/11_S_102	WEST EMBANKMENT	D
ABUTMENTS AND ANCHORAGES:		
GDC_2019/11_S_110	PILE SETOUT & SPEC	D
GDC_2019/11_S_111	EAST ABUTMENT	D
GDC_2019/11_S_112	EAST ABUTMENT REBAR	D
GDC_2019/11_S_113	WEST ABUTMENT	D
GDC_2019/11_S_114	WEST ABUTMENT REBAR	D
GDC_2019/11_S_115	BACKSTAY ANCHORAGE	D
GDC_2019/11_S_116	ANCHORAGE DETAILS	D
GDC_2019/11_S_117	BEARINGS	D
STEELWORK DRAWINGS:		
GDC_2019/11_S_120	STEELWORK NOTES & ISOMETRIC	D
GDC_2019/11_S_121	SUPER STEELWORK - SHEET 1	D
GDC_2019/11_S_122	SUPER STEELWORK - SHEET 2	D
GDC_2019/11_S_123	SUPER STEELWORK - SHEET 3	D
GDC_2019/11_S_125	MAST STEELWORK - SHEET 1	D
GDC_2019/11_S_126	MAST STEELWORK - SHEET 2	D
GDC_2019/11_S_127	MAST STEELWORK - SHEET 3	D
CABLES		
GDC_2019/11_S_130	STAY-CABLE DETAILS	D
GDC_2019/11_S_131	BACK STAY-CABLES	D
GDC_2019/11_S_132	CABLE STRESSING SEQUENCE	D
GLULAM TIMBER		
GDC_2019/11_S_140	GLULAM BEAMS	D
BALUSTRADE		
GDC_2019/11_S_150	BRIDGE BALUSTRADE - SHEET 1	D
GDC_2019/11_S_151	BRIDGE BALUSTRADE - SHEET 2	D

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PROJECT
LONGFORD SHARED PATH
PROJECT NO.
2019/11

LONGFORD SHARED PATH
MATAURA CYCLEBRIDGE
COVER SHEET

S001
Rev D

DWG: GDC_2019/11_S_001





NOTES:
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

LOT 2 SEC 80 BLK XVI
TOWN OF GORE

TOP OF NW ANCHOR
CONCRETE

BACK-STAY ANCHORAGE
REFER S115

TOP OF SW ANCHOR
CONCRETE

EARTH EMBANKMENT
REFER S105

LOT 1 SEC 80 BLK XVI
TOWN OF GORE

LEGAL ROAD
(FUTURE) SURREY STREET

PT BLK XXVI
TOWN OF GORE
(RECREATIONAL RESERVE)

SCOPE OF WORKS
(10000 FROM BASE OF EMBANKMENT)

SCOPE OF WORKS
(FINISH AT TIE-IN TO STOP-BANK)

MATAURA RIVER

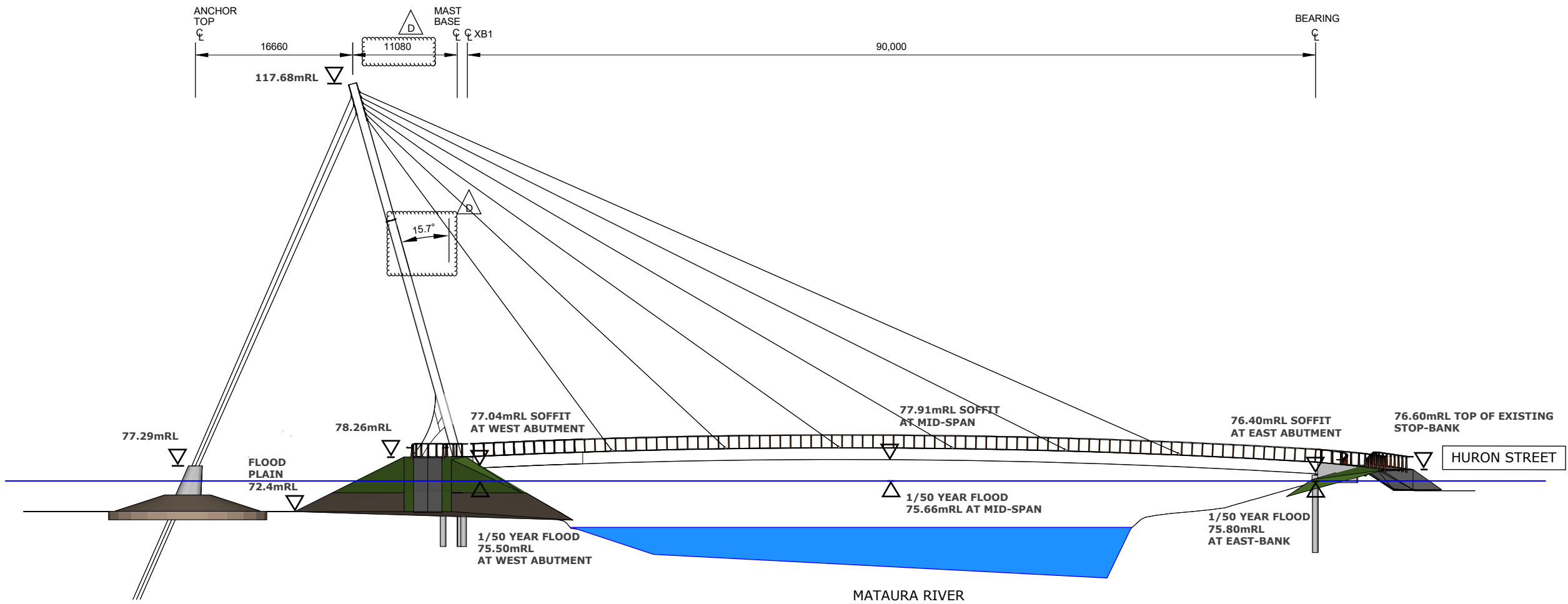
HURON STREET

BRIDGE PLAN

BP - 1:500 @ A3

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A	PRELIM DESIGN	NOV 19	DC	PS	DC
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DO NOT SCALE. IF IN DOUBT ASK



BRIDGE ELEVATION (FROM SOUTH LOOKING UPSTREAM)

BE - 1:500 @ A3

INSPECTION/MAINTENANCE ACTIVITY	REPLACEMENT	REFERENCE
RE-APPLY / CLEAN ANTI-GRAFFITI CONCRETE COATINGS	AS REQUIRED	NOTE 6. S111
REPAIR / RE-APPLY STEELWORK ANTI-CORROSION SYSTEM	≤ 40 YEARS	S120
CABLE REPLACEMENT AND RESTRESS #	≤ 100 YEARS	S130, S131, S132
REPLACE GLULAM TIMBER BEAMS	≤ 50 YEARS	S140
REPLACE GLULAM BALUSTRADE POST	≤ 50 YEARS	S150

CABLE REPLACEMENT GUIDANCE IS CONTAINED ON S132 AND THE "LONGFORD CABLE-STAY FOOTBRIDGE DESIGN STATEMENT" REV D

BRIDGE MAINTENANCE SCHEDULE

MS	-
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MAINTENANCE AND INSPECTION:

- BRIDGE INSPECTION AND REPORTING SHALL BE IN ACCORDANCE WITH THE NZTA *BRIDGE INSPECTION POLICY TNZ S6-2000* WHICH REFERENCES THE DEPARTMENT OF TRANSPORT (UK) *BRIDGE INSPECTION GUIDE, (DOT, 1983)*.
- AS PER TNZ S6-2000 A "GENERAL INSPECTION" SHALL BE CARRIED OUT EVERY 2 YEARS AND A "DETAILED INSPECTION" EVERY 6 YEARS.
- THE DETAILED INSPECTION SHALL BE PERFORMED BY A SUITABLY QUALIFIED BRIDGE INSPECTOR OR BRIDGE ENGINEER (AS PER TNZ S6-2000). IT IS RECOMMENDED THAT THE DETAILED INSPECTION (EVERY 6 YEARS) IS CARRIED OUT BY A BRIDGE ENGINEER WITH FAMILIARITY WORKING WITH CABLE STAY STRUCTURES.
- THE INSPECTIONS SHALL RECORD ANY REQUIRED MAINTENANCE/REPLACEMENT ACTIVITIES AND THEN BE FORWARDED TO THE MAINTENANCE TEAMS FOR COMPLETION WITHIN A PRE-SET TIMEFRAME.
- TO IMPROVE AWARENESS OF DESIGN LIVES, SPECIFICATIONS, AND GENERAL DETAILS OF REPLACEABLE ITEMS, PLEASE REFER TO THE MAINTENANCE SCHEDULE OPPOSITE. THE INTENTION OF THIS TABLE IS TO IDENTIFY KEY INSPECTION ITEMS.
- THE MAINTENANCE TABLE ALSO ENABLES INSPECTION TEAMS TO APPRECIATE "WHEN" THE DESIGNERS ARE ANTICIPATING THAT STEELWORK IS TO BE RECOATED, CABLES ARE TO BE REPLACED, AND TIMBER REPLACED, ETC. THIS SHOULD PREVENT THE INSPECTOR NEEDING TO AIR ON THE SIDE OF CAUTION (WHEN SUCH INFORMATION IS NOT OTHERWISE PRESENTED).
- IT IS STRONGLY RECOMMENDED THAT THE "LONGFORD CABLE-STAY FOOTBRIDGE DESIGN STATEMENT" (REV D) SHALL BE READ PRIOR TO ANY SIGNIFICANT CHANGES BEING MADE TO THE BRIDGE (E.G. ADDITIONAL SERVICES BEING ADDED, CHANGE OF BALUSTRADES, ETC.).
- ALLOWABLE MAINTENANCE VEHICLE LOADS ARE DISCUSSED ON DRAWING S100.
- REPLACEMENT OF CABLES IS DISCUSSED IN MORE DETAIL ON DRAWING S132.

FLOOD MANAGEMENT:

- THE CONTRACTOR IS TO PREPARE AND HAVE IN PLACE A CONSTRUCTION FLOOD MANAGEMENT PLAN THAT CLEARLY OUTLINES PROCEDURES AND PROCESSES FOR REMOVAL OF ALL PLANT, STOCKPILES, MATERIALS, PEOPLE, TEMPORARY WORKS, ETC. FROM THE FLOODPLAIN WITHIN 20 HOURS OF A FLOOD WARNING BEING RAISED AND/OR INCREASED LEVELS BEING RECORDED AT THE "FAIRLIGHT" OR "PIANO FLAT" MONITORING STATIONS. THIS PLAN IS TO BE SUBMITTED TO ENVIRONMENT SOUTHLAND 14 DAYS PRIOR TO THE START OF CONSTRUCTION FOR REVIEW AND CONFIRMATION.
- THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING A PLAN ACCEPTABLE TO ENVIRONMENT SOUTHLAND.
- EMBANKMENT THAT HAS BEEN CONSTRUCTED ABOVE A LEVEL OF 74.1MRL (3.25M ABOVE NORMAL FLOW) MAY BE CONSIDERED PERMANENT WORKS AND NOT REQUIRE REMOVAL.
- TO BE CONSIDERED PERMANENT WORKS IT MUST BE CONSTRUCTED AND PROTECTED WITH RIP RAP AS PER DRAWINGS AND SIGNED OFF BY THE GEOTECHNICAL/HYDRAULIC ENGINEER.
- MORE INFORMATION RELATING TO MONITORING STATION CONTACT DETAILS CAN BE FOUND HERE: [HTTPS://WWW.ES.GOV.T.NZ/REPOSITORY/LIBRARIES/ID:26GI9AY0517Q9STT81SD/HIERARCHY/ONLINE-SERVICES/FLOOD%20WARNING/DOCUMENTS/FLOOD-WARNING-FACTSHEETS/MATAKURA_FLOOD_WARNING_WEB.PDF](https://www.es.govt.nz/repository/libraries/id:26gi9ay0517q9stt81sd/hierarchy/online-services/flood%20warning/documents/flood-warning-factsheets/matakura_flood_warning_web.pdf)

REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
A	PRELIM DESIGN	NOV 19	DC	PS	DC
B	SPECS ADDED	NOV 19	DC	PS	DC
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PROJECT
LONGFORD SHARED PATH
PROJECT NO.
2019/11

LONGFORD SHARED PATH
MATAURA CYCLEBRIDGE
BRIDGE ELEVATION

DWG: GDC_2019/11_SK02

S101

Rev D

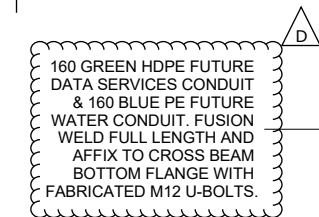
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PROJECT
LONGFORD SHARED PATH
PROJECT NO.
2019/11

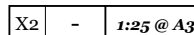
MATAURA CYCLEBRIDGE
BRIDGE CROSS SECTIONS

DWG: GDC_2019/11_S102

S102
Rev D



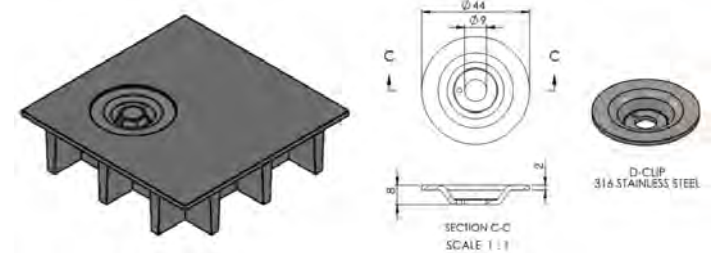
X1	-	1:25 @ A3
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— DO NOT SCALE. IF IN DOUBT ASK

FRP DECKING AND FIXINGS:

1. FIBRE REINFORCED PLASTIC (FRP) DECKING PANELS ARE TO BE PROVIDED BY "FRP PRODUCTS LTD. (NZ).
2. PANELS ARE TO BE 25mm thick 38 x38 FRP grid with a 3mm solid panel topping (28mm total depth).
3. PANEL COLOUR TO BE "TBC" (RAL XXXX).
4. INDEPENDENT LABORATORY TESTING IS TO BE PERFORMED, AND CERTIFIED BY A CPeng ENGINEER (OR RECOGNISED TESTING LAB), TO CONFIRM:
 - A. ULS STRENGTH USING A LOAD FACTOR OF 1.76 FOR:
 - i. 5KPA LIVE LOAD APPLIED OVER THE WHOLE PANEL;
 - ii. 2.2KN POINT LOAD (600x600);
 - B. 5KPa DEFLECTIONS < SPAN/200 = 3mm;
 - C. WET PENDULUM (SLIP RESISTANCE) TESTING AS/NZS 4586 2004 SRV >39
 - D. ≥ 40 YEARS DURABILITY / UV EXPOSURE
5. FIXINGS FOR ATTACHING THE FRP PANELS AND ALUMINIUM EXPANSION JOINT PLATES TO THE GLULAM JOISTS WILL BE A 14g (M6.3) 125 LONG SS316 SCREW WITH HEX HEAD (FROM ANZOR). 4 FIXINGS ARE REQUIRED ALONG A JOIST FOR ATTACHING A SINGLE PANEL (12 FIXINGS PER PANEL). FIX AT JOISTS: #1, #3, #5, #6, #8, & #10.
6. FIXINGS WILL BE COUNTERSUNK INTO THE FRP DECK PANELS USING THE FRP PRODUCT "D-CUP" WASHER (REFER FIGURE BELOW).



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STEEL CHS MAST
PAINTED WHITE.
REFER TO
DWGS S125 TO S127

SPIRAL CABLE WITH
95% ZINC + 5% ALUMINIUM COATING
REFER TO DRAWINGS S130 AND S131.

REINFORCED CONCRETE
ANCHORAGE PROTECTION
REFER TO DWGS S115 TO S116

GLULAMINATED TIMBER BEAMS
BETWEEN STEELWORK.
REFER TO DWG S102 & S140

SUPERSTRUCTURE STEELWORK
REFER TO DWGS S120 TO S123

WESTERN ABUTMENT BEAM ON BORED PILES
REFER TO DWGS S113 AND S114

BRIDGE ISOMETRIC (LOOKING NORTH TOWARDS WEST ABUTMENT)

1	-	NTS
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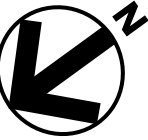
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PROJECT
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PROJECT NO.
2019/11

MATAURA CYCLEBRIDGE
WEST BRIDGE APPROACH

DWG: GDC_2019/11_S104

S104
Rev D



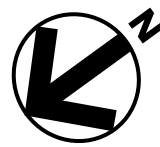
1. REFER TO DRAWING S150 FOR NOTES RELATING TO BALUSTRADES.

WESTERN APPROACH

WP	-	1:100 @ A3
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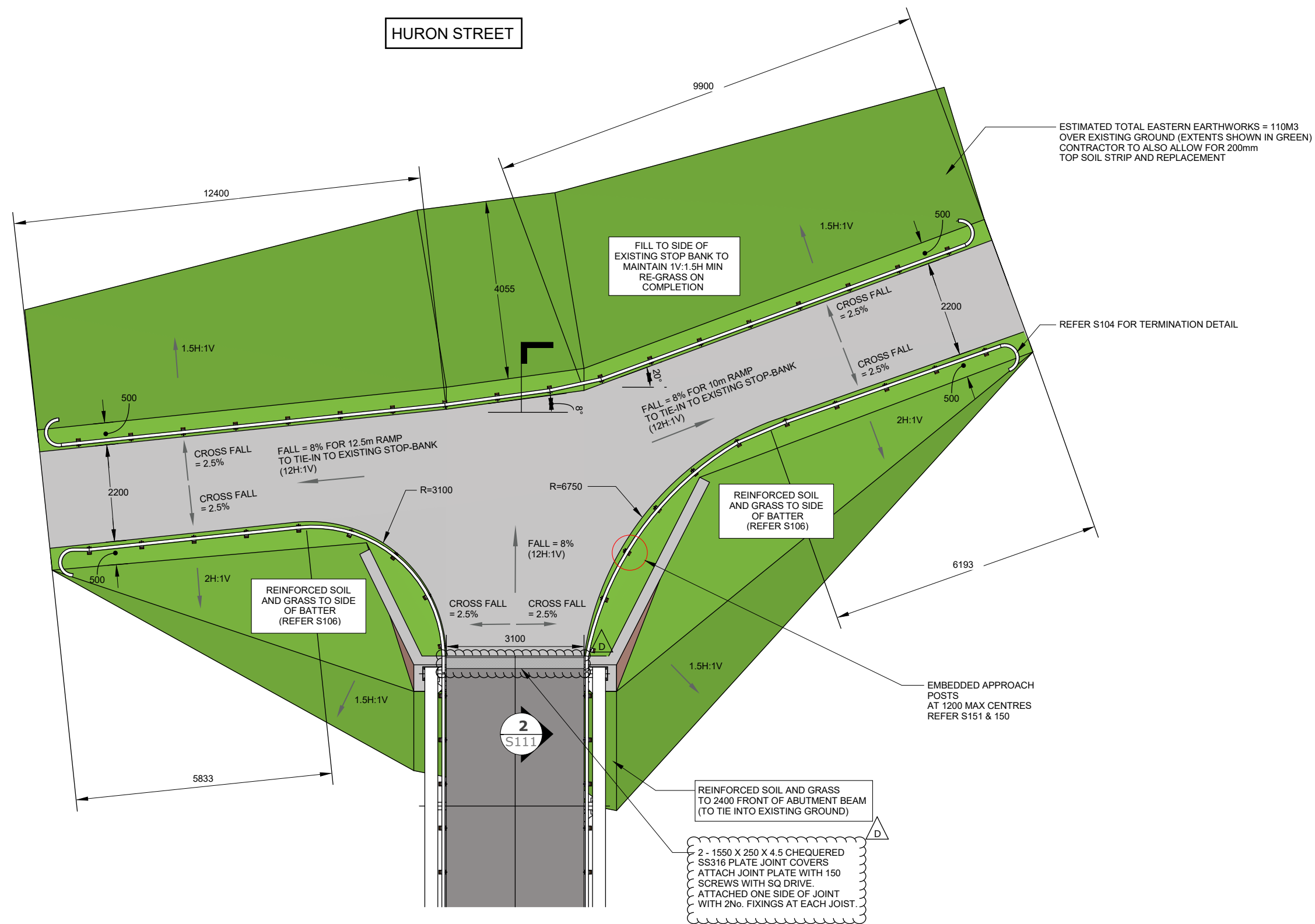
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REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
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B	ROAD SAFETY AUDIT	APR 20	DC	PS	DC
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D	FOR CONSTRUCTION	JUN 20	DC	PS	DC



NOTES:

1. REFER TO DRAWING S150 FOR NOTES RELATING TO BALUSTRADES.



EASTERN APPROACH

WP - 1:100 @ A3

REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
A	(NOT USED)				
B	ROAD SAFETY AUDIT	APR 20	DC	PS	DC
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D	FOR CONSTRUCTION	JUN 20	DC	PS	DC

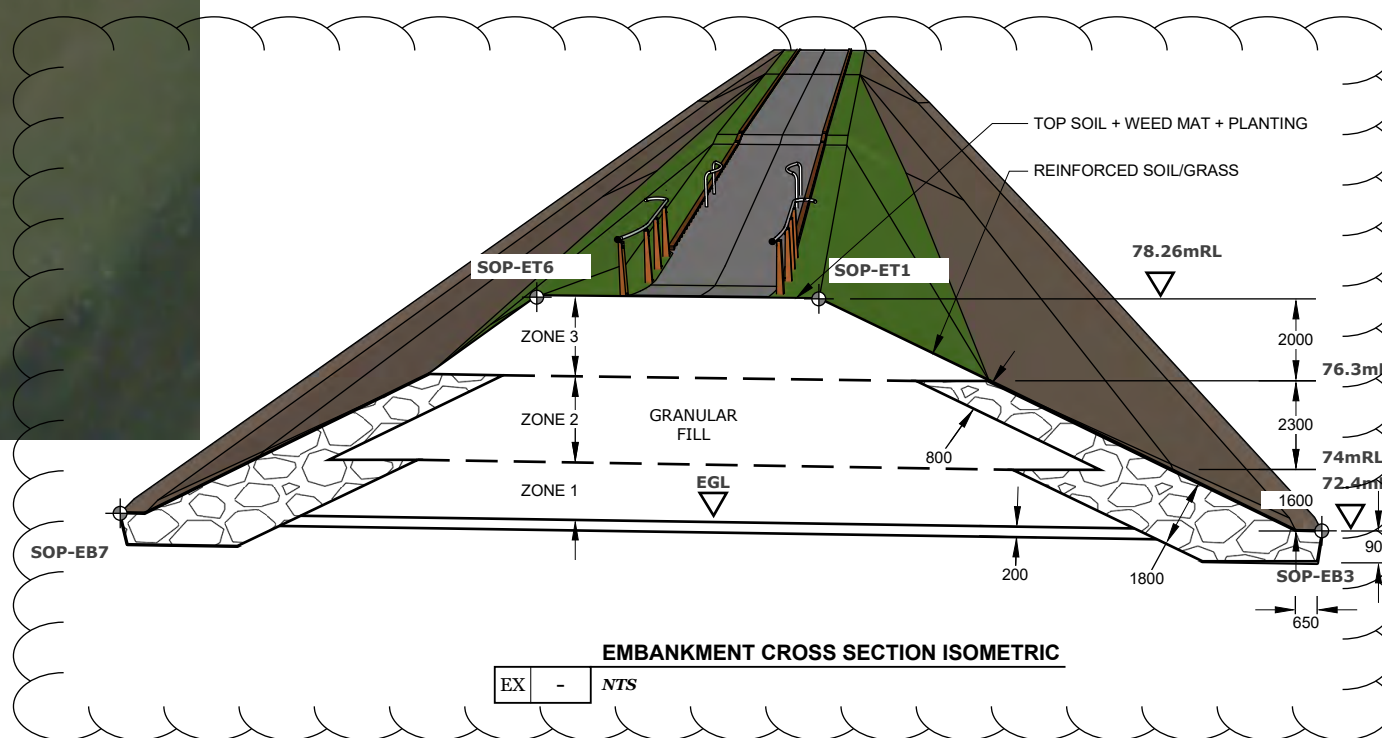
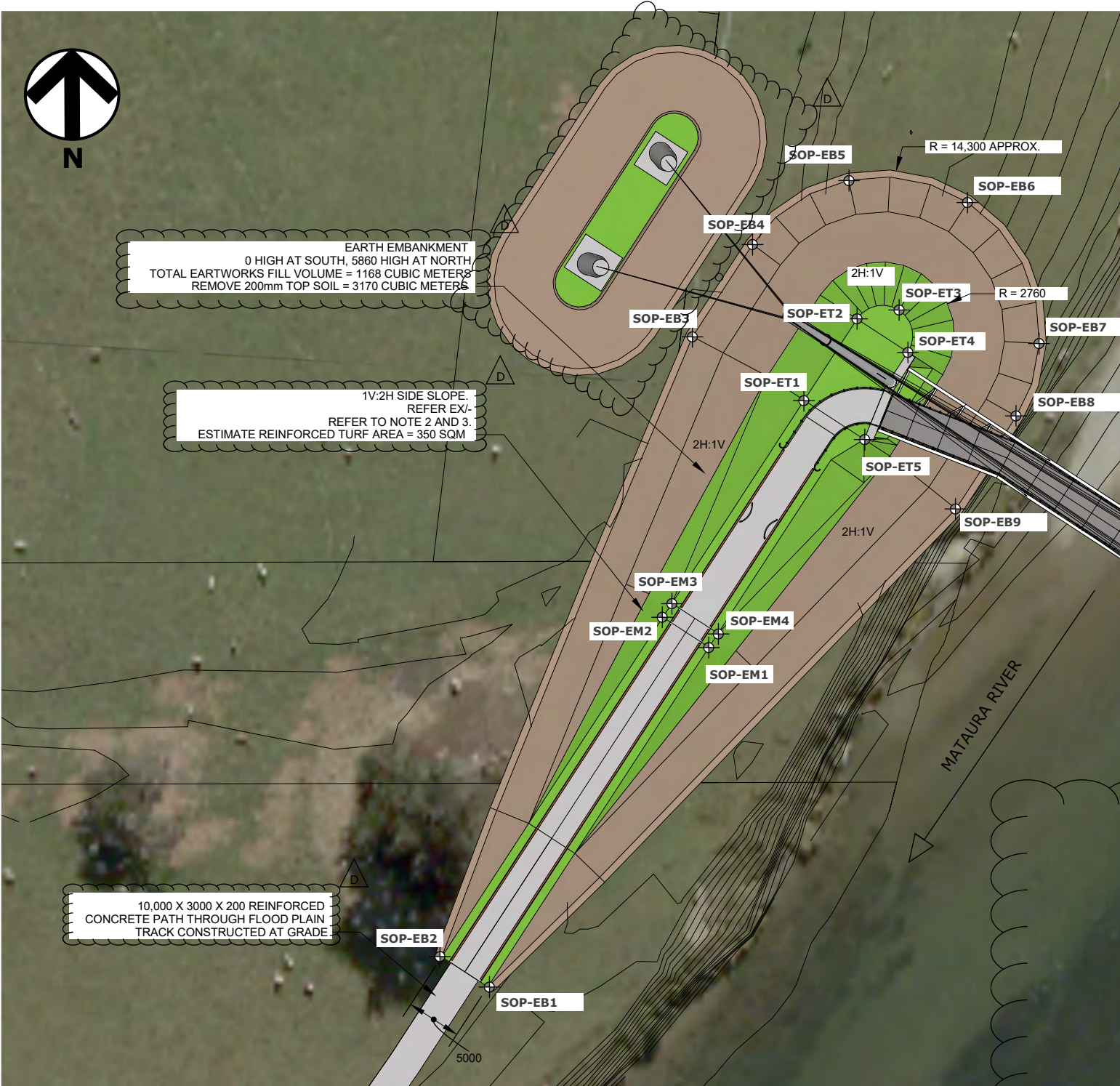
NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
- ZONE 1 RIPRAP TO BE 1.8m THICK LAYER OF RIPRAP WITH A $D_{50} \approx 0.9m$. ZONE 2 RIPRAP TO HAVE 0.8m THICK LAYER OF RIPRAP WITH $D_{50} \approx 0.4m$. ALL RIP RAP TO HAVE HEAVY-DUTY GEOTEXTILE BELOW THAT LAYER. ALL RIPRAP ROCK TO BE HARD, DURABLE, ANGULAR ROCK HAVING A SPECIFIC GRAVITY $SG > 2.65$.
- ZONE 3 TURF REINFORCEMENT TO BE CIRTEX ECC3 (OR SIMILAR APPROVED BY ENGINEER) INSTALLED TO MANUFACTURER SPECIFICATIONS. OVERLAP RIPRAP BY 300mm AT INTERFACE.

EARTHWORKS SPECIFICATION:

- EARTHWORKS SHALL BE SURVEYED AND MARKED ON SITE BY A REGISTERED SURVEYOR EMPLOYED BY THE BRIDGE CONTRACTOR.
- ALL EARTHWORKS SHALL BE CARRIED OUT TO THE LINES, LEVELS AND GRADES SHOWN ON THE DRAWINGS. THE ACCURACY OF SURFACES TO BE OVERLAIN BY SPECIFIED PAVEMENT LAYERS SHALL BE SUCH AS TO PRESERVE THE MINIMUM THICKNESS OF THE OVERLYING LAYERS. TOLERANCES SHALL OTHERWISE BE AS FOLLOWS:
ROAD SUBGRADES -25MM TO +0MM
BATTERS 0MM TO +150 MM
OTHER SURFACES 0MM TO +75 MM
- THE GEOTECHNICAL ENGINEER SHALL INSPECT ALL FINAL CUT SURFACES TO ENSURE THEY WILL REMAIN STABLE.
- ALL TOPSOIL, ORGANIC MATTER AND OTHER UNSUITABLE MATERIAL IS TO BE REMOVE FROM THE CONSTRUCTION AREAS PRIOR TO FILL PLACEMENT.
- ENGINEERED FILL TO BE SITE-WON OR IMPORTED FREE DRAINING GRANULAR FILL. THE CONTRACTOR SHALL PROVIDE THE GEOTECHNICAL ENGINEER WITH REPRESENTATIVE NZ STANDARD COMPACTION AND PARTICLE SIZE DISTRIBUTION CURVES FOR APPROVAL BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT.

ASSUMED GRANULAR FILL PROPERTIES
> BULK DENSITY, $\gamma = 20 \text{ KN/m}^3$
> FRICTION ANGLE, $\theta' = 35^\circ$
> AT REST EARTH PRESSURE COEFFICIENT, $K_0 = 0.4$
> ACTIVE EARTH PRESSURE COEFFICIENT, $K_0 = 0.2$
> PASSIVE EARTH PRESSURE COEFFICIENT, $K_0 = 5.9$
- BEFORE FILLING THE CONTRACTOR SHALL FACILITATE ONE PLATEAU TEST (COMPACTION TRIAL), SUPERVISED BY THE GEOTECHNICAL ENGINEER, FOR EACH MATERIAL PROPOSED FOR FILLING.
- ALL FILL SHALL BE TO BE PLACED IN 200 MM THICK LAYERS (PRIOR TO COMPACTION) AT OPTIMUM MOISTURE CONTENT (OMC) $\pm 2\%$.
- THE CONTRACTOR SHALL UNDERTAKE COMPACTION TESTING OF EACH COMPACTED LAYER (OR AT AN INTERVAL AGREED WITH THE GEOTECHNICAL ENGINEER) USING NDM OR OTHER METHODOLOGY APPROVED BY THE GEOTECHNICAL ENGINEER. COMPACTION OF EACH LAYER SHALL BE SUFFICIENT TO OBTAIN THE FOLLOWING:
8.1 IN SITU DRY DENSITY SHALL NOT BE LESS THAN 92% OF THE MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT
8.2 TOTAL VOIDS SHALL BE LESS THAN 16%
- THE CONTRACTOR IS RESPONSIBLE FOR ALL STORMWATER, SEDIMENT AND DUST CONTROL DURING EARTHWORKS, WITH PARTICULAR ATTENTION TO ANY DISCHARGES TO THE WATER OF LEITH AND HARBOUR.



EMBANKMENT PLAN

EP - 1:500 @ A3

WEST EMBANKMENT BASE SET-OUT

REF	X	Y	Z
SOP-EB1	447089.589	856127.036	72.468
SOP-EB2	447085.399	856129.765	72.468
SOP-EB3	447108.222	856186.183	72.358
SOP-EB4	447113.685	856194.571	72.358
SOP-EB5	447122.437	856200.409	72.358
SOP-EB6	447133.259	856198.388	72.358
SOP-EB7	447139.772	856185.563	72.358
SOP-EB8	447137.680	856178.942	72.358
SOP-EB9	447132.190	856170.512	72.358

WEST EMBANKMENT TOP SET-OUT

REF	X	Y	Z
SOP-ET1	447118.375	856180.393	78.258
SOP-ET2	447123.188	856187.782	78.258
SOP-ET3	447127.009	856188.588	78.258
SOP-ET4	447127.815	856184.768	78.258
SOP-ET5	447123.841	856176.833	78.258

WEST EMBANKMENT MIDDLE SET-OUT

REF	X	Y	Z
SOP-EM1	447109.716	856157.927	76.258
SOP-EM2	447105.522	856160.659	76.258
SOP-EM3	447106.341	856161.916	76.258
SOP-EM4	447110.535	856159.184	76.258

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MATAURA RIVER



PILE PLAN

PP	-	1:250 @ A3
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EAST ABUTMENT PILE SET-OUT & CAPACITIES

REF	X	Y	TOP OF PILE, mRL	PILE TOE, mRL	PILE LENGTH, m	ULT GEOTECHNICAL CAPACITY (COMPRESSION)*, KN	ULT GEOTECHNICAL CAPACITY x θ (TENSION)*, KN
EAP-N	447203.397	856134.058	75.495	69.470	6.025	1820	205
EAP-S	447201.323	856130.874	75.495	69.470	6.025	1820	205

WEST ABUTMENT PILE SET-OUT & CAPACITIES

REF	X	Y	TOP OF PILE, mRL	PILE TOE, mRL	PILE LENGTH, m	ULT GEOTECHNICAL CAPACITY x θ (COMPRESSION)*, KN	ULT GEOTECHNICAL CAPACITY x θ (TENSION)*, KN
WAP-01	447124.927	856182.899	77.674	68.749	8.925	1820	210
WAP-02	447127.909	856184.179	76.774	68.749	8.025	1820	210
WAP-03	447126.927	856182.671	76.774	68.749	8.025	1820	210
WAP-04	447125.972	856181.149	76.774	68.749	8.025	1820	210
WAP-05	447125.296	856179.481	76.774	68.749	8.025	1820	210

BACK-STAY ANCHOR SET-OUT & CAPACITIES

REF	X	Y	ANCHOR AT UNDERSIDE OF CONCRETE FOOTING	EMBEDMENT ANGLE, DEGREES FROM HORIZONTAL	PLAN ALIGNMENT (DEGREES FROM BRIDGE CENTRELINE)	STRAIGHT ANCHOR LENGTH (BELOW GROUND), m	ULT GEOTECHNICAL CAPACITY x θ (TENSION)*, KN
ANCH-NT	447104.740	856203.541	73.729	65.4	18.0	11.700	660
ANCH-NM	447104.993	856203.230	73.729	65.4	18.0	11.700	660
ANCH-NB	447105.245	856202.920	73.729	65.4	18.0	11.700	660
ANCH-ST	447097.890	856193.024	73.729	65.4	-18.0	11.700	660
ANCH-SM	447098.275	856192.917	73.729	65.4	-18.0	11.700	660
ANCH-SB	447098.661	856192.811	73.729	65.4	-18.0	11.700	660

TABLE NOTES:

* ULTIMATE GEOTECHNICAL CAPACITY IS BASED ON RECOMMENDED VALUES FROM TABLE 6 AND SECTION 8.2 OF THE LONGFORD SHARED PATH GEOTECHNICAL INTERPRETIVE REPORT TITLED "GEOTECHNICAL AND HYDRAULIC INPUTS - LONGFORD SHARED PATH, GORE" (MAY 2020) AND INCLUDES A 0.5 STRENGTH REDUCTION FACTOR.
ANCHOR DESIGN INCLUDES 85% FACTOR TO ACCOUNT FOR SPACING < 3D

PILE SPECIFICATION:

- PILE AND ANCHOR POSITIONS SHALL BE SURVEYED AND MARKED ON SITE BY A REGISTERED SURVEYOR EMPLOYED BY THE BRIDGE CONTRACTOR AND CONFIRMED BY THE ENGINEER AND DESIGNER PRIOR TO PILING. PILE SETOUT POINT IS TAKEN AT THE CENTRE OF THE WEB AND AT TOP OF PILE (WHICH INCLUDES EMBEDMENT INTO CONCRETE). OFFSET TO BASE OF CONCRETE WORKS ARE SHOWN ON DRAWINGS S111, S113 AND S115 FOR WEST ABUTMENT, EAST ABUTMENT AND DEADMAN RESPECTIVELY.
- LATERAL TOLERANCE ON PILE PLACEMENT (MEASURED AT TOP OF PILE) IS ASSUMED AT +/- 75mm. ANY DISCREPENCY OUTSIDE OF THESE TOLERANCES MAY AFFECT DESIGN AND/OR SUBSEQUENT CONCRETE WORKS AND SHALL BE RECTIFIED BY THE CONTRACTOR AS DISCUSSED WITH THE DESIGNER AND ENGINEER ON SITE AT THE EARLIEST OPPORTUNITY.
- ALL PILES SHALL BE INSTALLED IN ACCORDANCE WITH THE AUCKLAND STRUCTURAL GROUP PILING SPECIFICATION (MARCH 2002) REV G. A COPY CAN BE OBTAINED AT THE FOLLOWING LINK:
[HTTP://WWW.SESOC.ORG.NZ/REGIONAL-GROUPS/ASGPILES-REV%20G.PDF](http://www.sesoc.org.nz/regional-groups/asg/piles-rev%20g.pdf)
- THE GEOTECHNICAL ENGINEER REQUIRES TO HAVE THE OPPORTUNITY OF OBSERVING ALL PHASES OF THE PILING OPERATIONS. THE CONTRACTOR SHALL THEREFORE KEEP THE ENGINEER INFORMED DAILY AS TO THE WORK ANTICIPATED TO BE CARRIED OUT ON THE NEXT WORKING DAY.
- PILE LENGTHS AND ANCHOR LENGTHS LISTED ARE BASED ON ANALYSIS USING KNOWN/AVAILABLE DATA. THE GEOTECHNICAL ENGINEER WILL BE WORKING IN COLLABORATION WITH PILING TEAMS AND ANCHOR CREWS TO CONFIRM ACTUAL EMBEDMENTS REQUIRED TO ACHIEVE THE LOADS INDICATED (NOTE THE NEED ON S116 FOR INSTALLING A TEST ANCHOR TO CONFIRM ANCHOR CAPACITIES). AS-BUILT LENGTHS WILL BE CONFIRMED ON AS-BUILT DRAWINGS.
- REFER S116 FOR ANCHOR SPECIFICATION.

REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
A&B	(NOT USED)				
C	FOR PEER REVIEW	MAY 20	DC	PS	DC
D	FOR CONSTRUCTION	JUN 20	DC	PS	DC

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PROJECT
LONGFORD SHARED PATH
PROJECT NO.
2019/11

LONGFORD SHARED PATH
MATAURA CYCLEBRIDGE
PILE SET-OUT & SPEC

DWG: GDC_2019/11_S110

S110
Rev D

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PROJECT
LONGFORD SHARED PATH
PROJECT NO.
2019/11

**LONGFORD SHARED PATH
MATAURA CYCLEBRIDGE
EAST ABUTMENT**

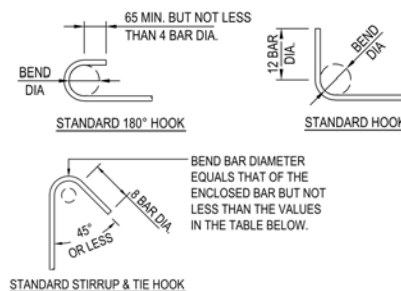
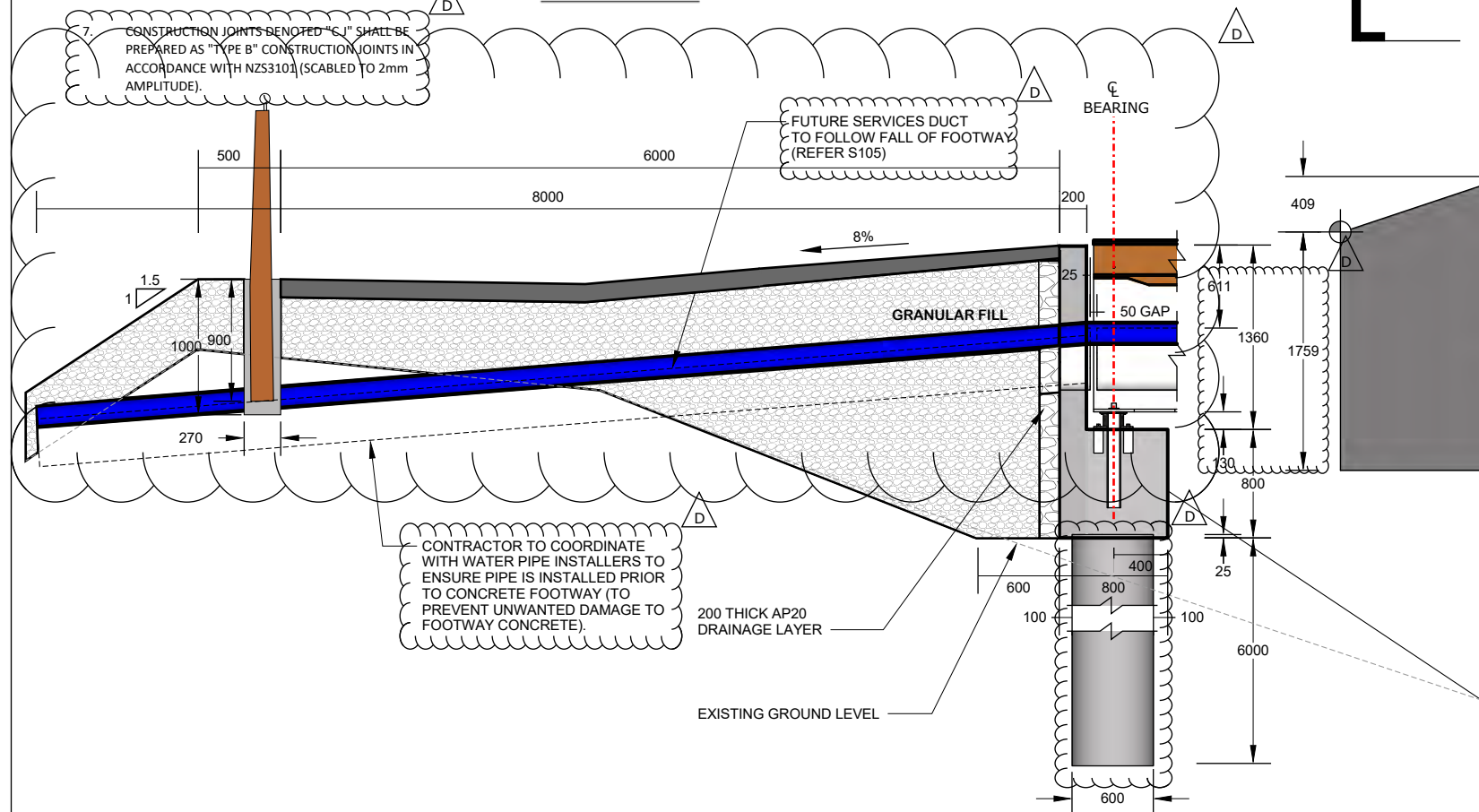
DWG: GDC 2019/11 S111

S111
Rev D

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2. REFER TO DRAWING S106 FOR EARTHWORKS SPECIFICATIONS WHICH APPLY TO BACKFILLING BEHIND ABUTMENTS.

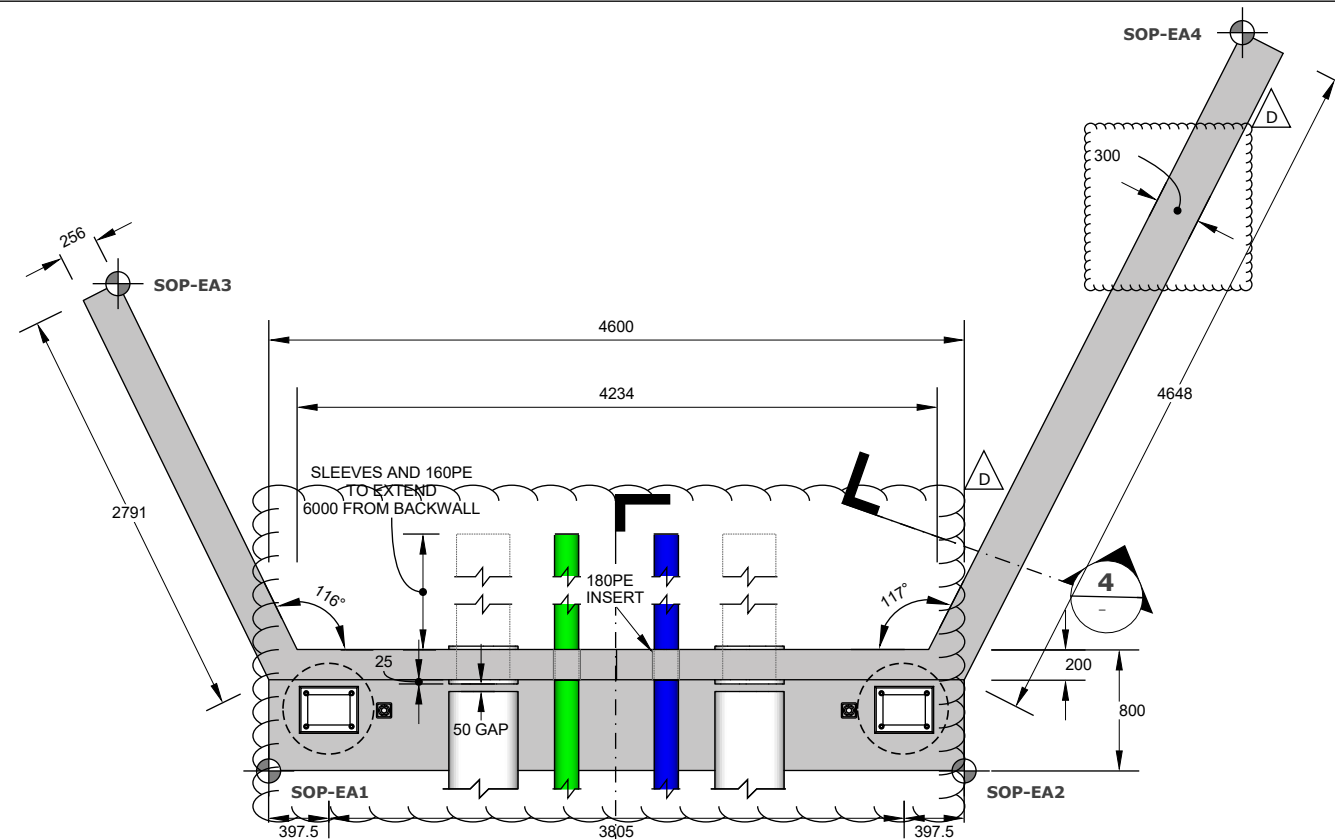
1. CONCRETE STRENGTH TO BE $f_c' = 40\text{MPa}$ AT 28 DAYS AS DEFINED IN NZS3109.
2. SURFACE FINISHES SHALL BE AS FOLLOWS (REFER NZS 3114 FOR DEFINITIONS):
 - a) DEADMAN = F1
 - b) VISIBLE FACES = F4
 - c) HIDDEN FACES = F4
 - d) TOP OF ABUTMENT BEAMS = U2
 - e) TOP OF DEADMAN = U1
3. CONCRETE COVER TO NZS3101:2006 FOR B2 COASTAL FRONTAGE = 50mm MIN. WHERE CAST DIRECTLY AGAINST SOIL = 75mm MIN.
4. TOLERANCE ON COVER SHALL BE:
 - a) FOR 20mm BAR DIAMETER & UNDER = $\pm 10/-0$
 - b) FOR $>20\text{mm}$ BAR DIAMETER = $\pm 15/-0$
5. THE CONTRACTORS ATTENTION IS DRAWN TO THE ZERO TOLERANCE SPECIFIED FOR COVERS. IT IS RECOMMENDED THAT ALL REINFORCEMENT IS BENT, FABRICATED AND SUPPORTED TO PROVIDE $\pm 5\text{mm}$ TOLERANCE OVER AND ABOVE THE SPECIFIED MINIMUM COVERS TO ENSURE COMPLIANCE WITH SPECIFIED MINIMUM COVERS.
6. ALL VISIBLE FACES OF CONCRETE TO BE TREATED WITH A CLEAR ANTI-GRAFFITI SYSTEM. PRODUCT = "COTEC 2K ANTI-GRAFFITI WB".

1. ALL REINFORCING BARS TO BE GRADE 500E MANUFACTURED BY THE MICROALLOY PROCESS TO AS/NZS 4671 2001.
2. LAP LENGTHS ARE AS SHOWN ON THE DRAWINGS AND ARE IN ACCORDANCE WITH NZS3101:2006.
3. ALL HOOKS ON STIRRUPS AND TIES MUST FIT CLOSELY AROUND MAIN BARS U.N.O.
4. BENDING OF BARS (EXCEPT STIRRUP AND TIES) SHALL BE BENT TO AN INSIDE DIAMETER OF 6 X THE DIAMETER OF THE BAR BEING BENT.
5. BENDING OF STIRRUPS AND TIES SHALL BE BENT TO AN INSIDE DIAMETER OF 4 X THE DIAMETER OF THE BAR BEING BENT AND SHALL BE BENT TO 135 DEGREES.
6. WELDING OF REINFORCEMENT IS NOT PERMITTED UNLESS AGREED WITH THE DESIGNER.
7. STANDARD HOOKS AND TIES SHALL BE BENT TO MEET THE DETAILS AS BELOW:

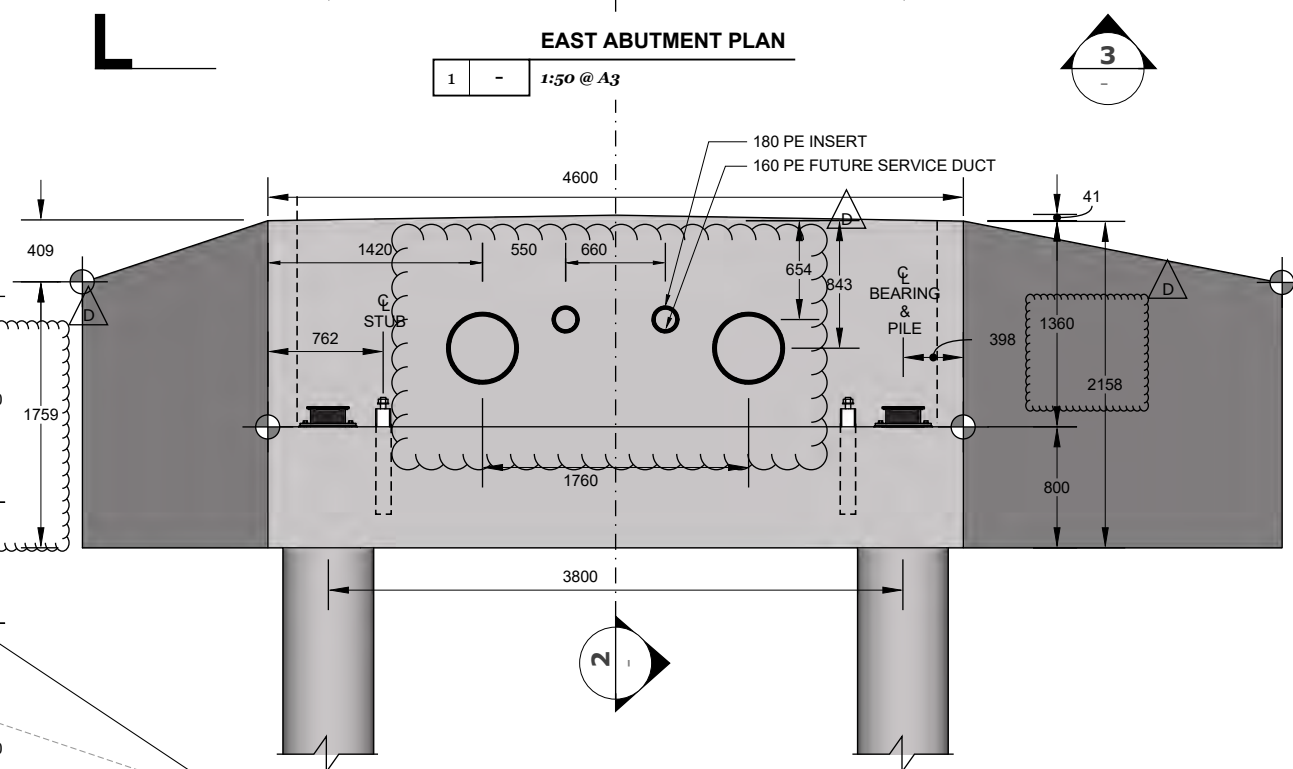


2	S105	1:50 @ A3
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REF	X	Y	Z
SOP-EA1	447203.276	856134.615	76.269
SOP-EA2	447200.765	856130.760	76.269
SOP-EA3	447206.522	856133.692	77.223
SOP-EA4	447203.848	856126.556	77.219



1	-	1:50 @ A
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3	-	1:50 @ A3
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REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
A	PRELIM DESIGN	NOV 19	DC	PS	DC
B	PRELIM DESIGN	NOV 19	DC	PS	DC
C	FOR PEER REVIEW	MAY 20	DC	PS	DC
D	FOR CONSTRUCTION	JUN 20	DC	PS	DC

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LONGFORD SHARED PATH
PROJECT NO.
2019/11

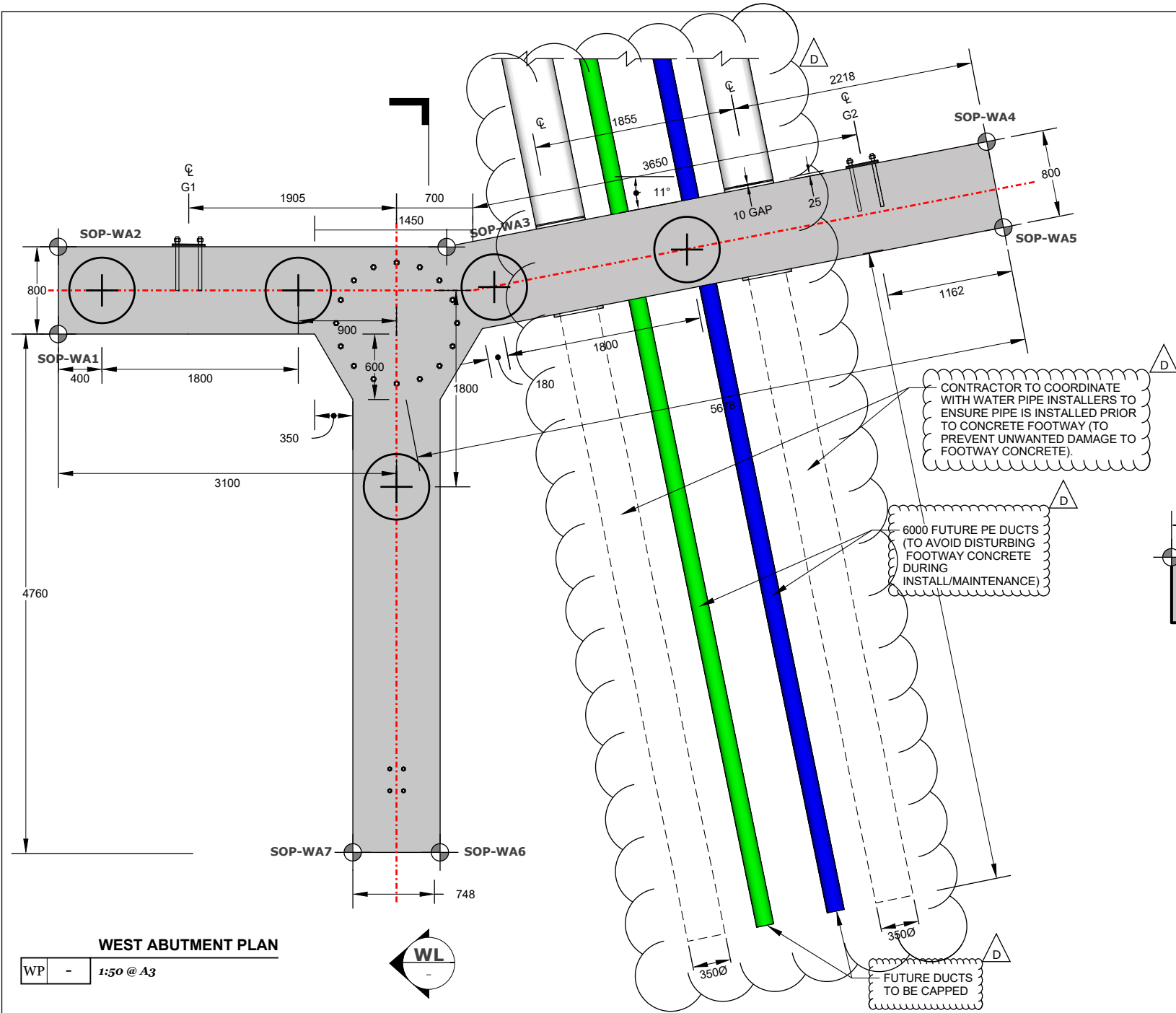
**LONGFORD SHARED PATH
MATAURA CYCLEBRIDGE
EAST ABUTMENT REBAR**

DWG: GDC_2019/11_S112

S112
Rev D

5	-	1:50 @ A3
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REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
A&B	(NOT USED)				
C	FOR PEER REVIEW	MAY 20	DC	PS	DC
D	FOR CONSTRUCTION	JUN 20	DC	PS	DC



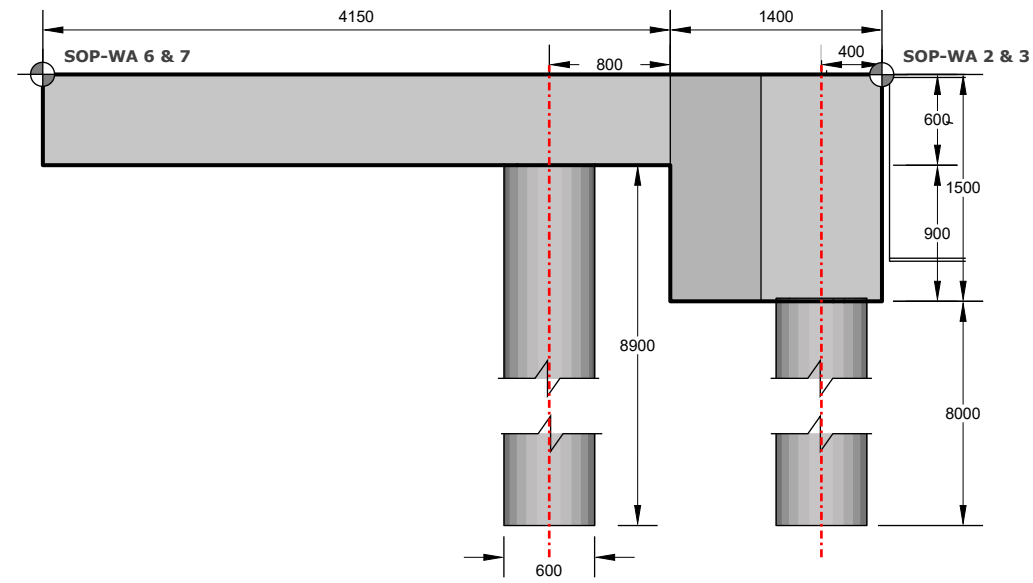
WEST ABUTMENT PLAN
WP - 1:50 @ A3

WEST ABUTMENT SET-OUT

REF	X	Y	Z
SOP-WA1	447127.792	856184.733	78.274
SOP-WA2	447128.463	856184.296	78.274
SOP-WA3	447126.523	856181.318	78.274
SOP-WA4	447124.625	856176.638	78.236
SOP-WA5	447123.883	856176.938	78.236
SOP-WA6	447121.902	856184.392	78.274
SOP-WA7	447122.339	856185.063	78.274

NOTES:

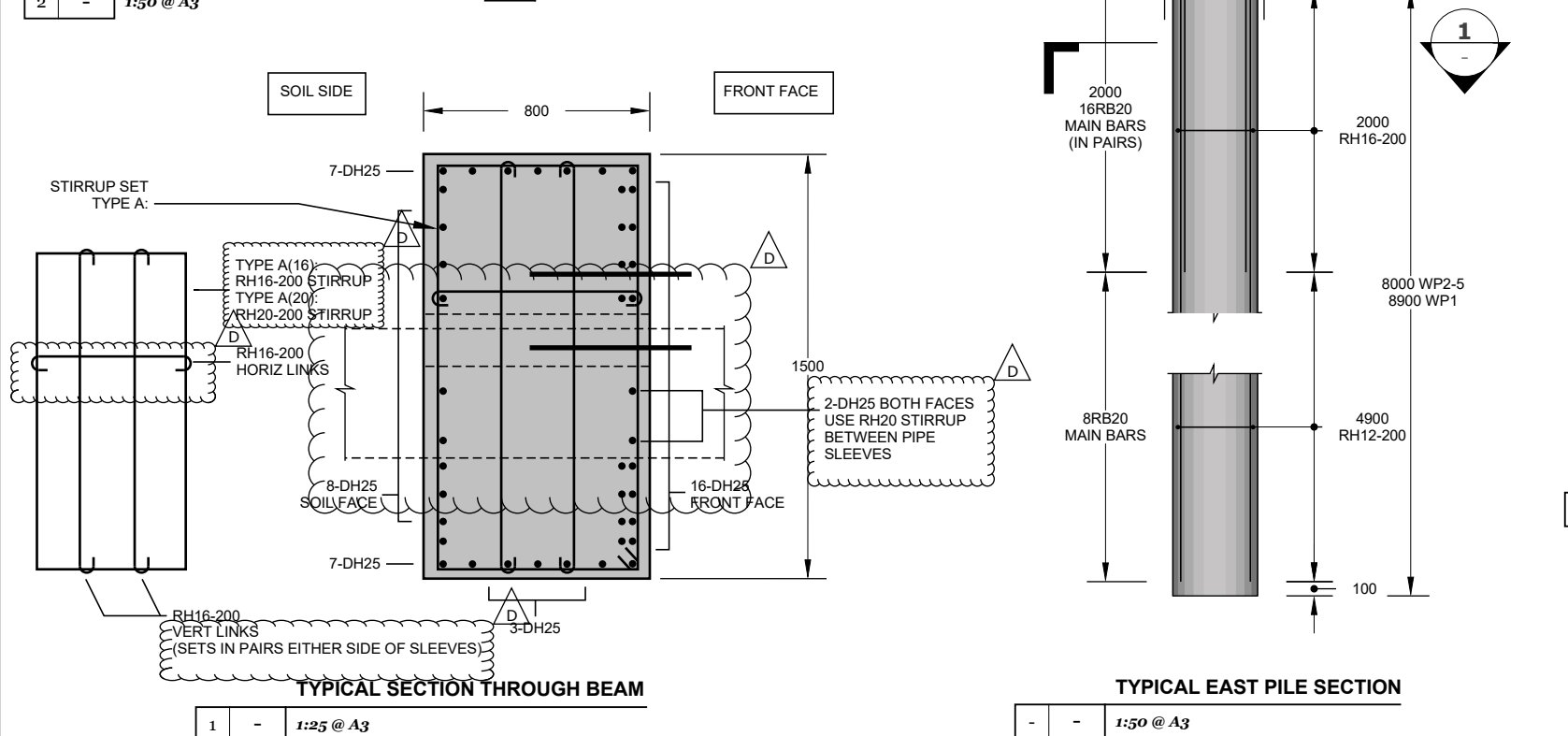
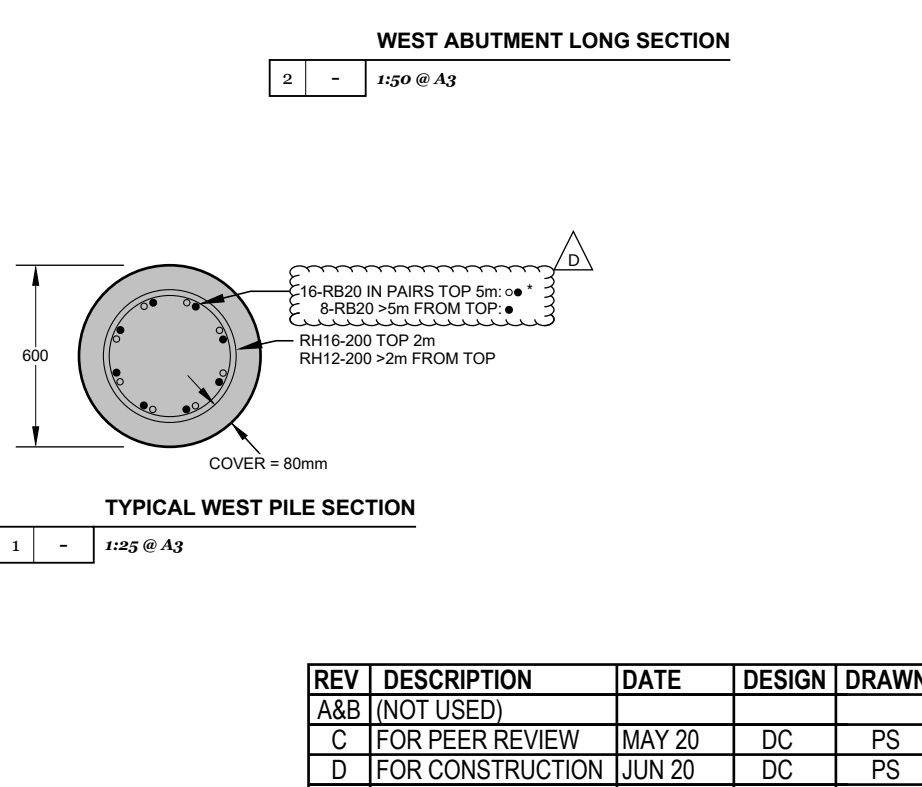
1. REFER TO DRAWING S111 FOR CONCRETE NOTES.
2. DESIGN OF ABUTMENT IS ON THE BASIS THAT PILING OCCURS AFTER THE CONSTRUCTION OF THE WESTERN EMBANKMENT AND THAT HANDHELD PLATE COMPACTORS ARE USED FOR COMPACTION BEHIND THE ABUTMENT BEAM (IN LIEU OF A ROLLER OR OTHER LARGE PLANT). CONSTRUCTOR TO ADVISE ENGINEER AT EARLIEST OPPORTUNITY IF AN ALTERNATIVE CONSTRUCTION METHODOLOGY IS PROPOSED (MINIMUM 15 DAYS PRIOR TO CONSTRUCTION COMMENCEMENT).



WEST ABUTMENT LONG SECTION
WL - 1:50 @ A3

REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
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PROJECT
LONGFORD SHARED PATH
PROJECT NO.
2019/11



REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
A&B	(NOT USED)				
C	FOR PEER REVIEW	MAY 20	DC	PS	DC
D	FOR CONSTRUCTION	JUN 20	DC	PS	DC

NOTES:

- REFER TO DRAWING S111 FOR CONCRETE AND REINFORCING NOTES.
- UPSTREAM CONCRETE SURROUND HAS BEEN DESIGNED TO RESIST A 550KN (ULS) LOAD CAUSED BY A 15M x 2.3M DEBRIS RAFT DURING THE 1/500 FLOOD AT 3.25m/s. DESIGN IS IN ACCORDANCE WITH A55100.2 2017 SECTION 16.
- FILL UNDERNEATH FOOTINGS SHALL BE CONFIRMED BY GEOTECHNICAL ENGINEER FOR $(\phi=0.5) \times 350kPa$.

BACK-STAY CABLES. REFER TO S131

BS1
S131

TYPE 1 RIP RAP BATTER DETAIL
SIDES AND DOWNSTREAM END
D50 RIP RAP = 860
REFER TO S106 FOR GRADING

ALL RIP RAP UNDERLAIN BY HEAVY-DUTY
COASTAL GRADE GEOTEXTILE

72.4mRL
EXISTING GROUND

DEADMAN ANCHORAGE LONG SECTION

1 - 1:100 @ A3

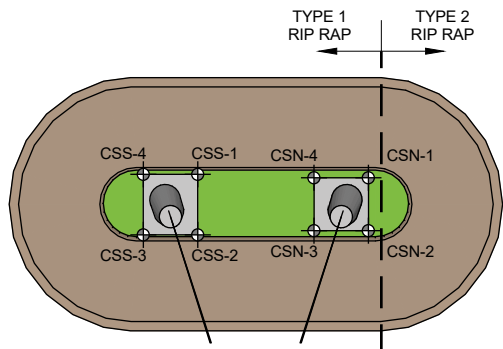
TYPE 2 RIP RAP BATTER DETAIL
UPSTREAM END
D50 RIP RAP = 860
REFER TO S106 FOR GRADING

DEADMAN ANCHORAGE SECTION

2 - 1:200 @ A3

CONCRETE SURROUND FOOTING SET-OUT

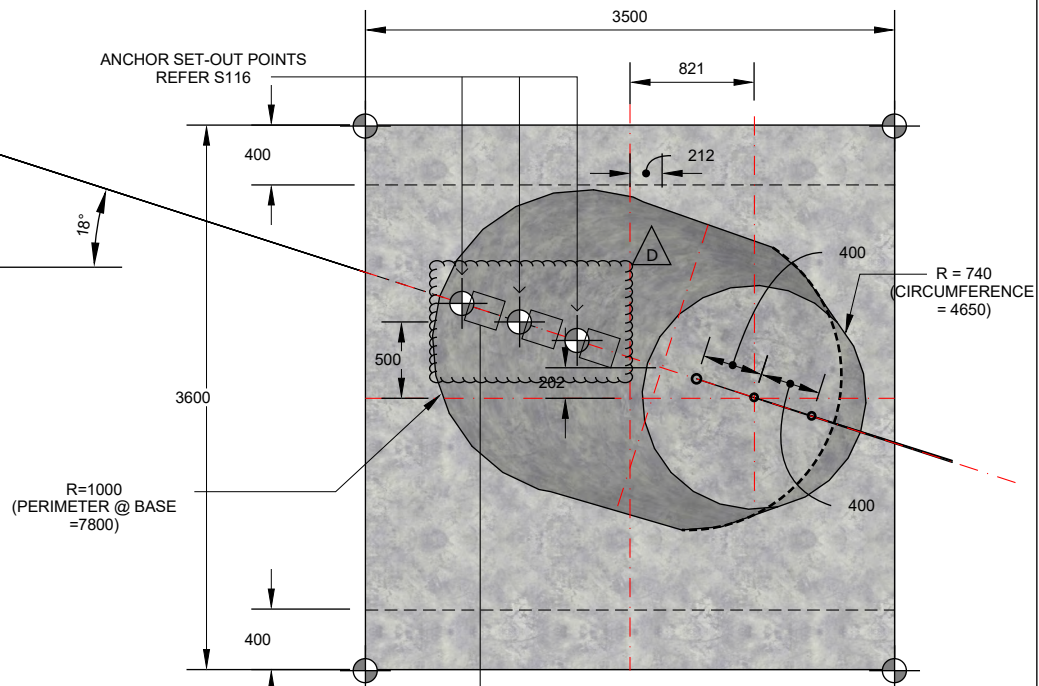
REF	X	Y	Z
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CSN-2	447107.798	856202.946	74.129
CSN-3	447105.833	856199.929	74.129
CSN-4	447102.901	856201.840	74.129
CSS-1	447098.508	856195.513	74.129
CSS-2	447101.860	856193.330	74.129
CSS-3	447099.895	856190.313	74.129
CSS-4	447096.543	856192.496	74.129



DEADMAN ANCHORAGE PLAN

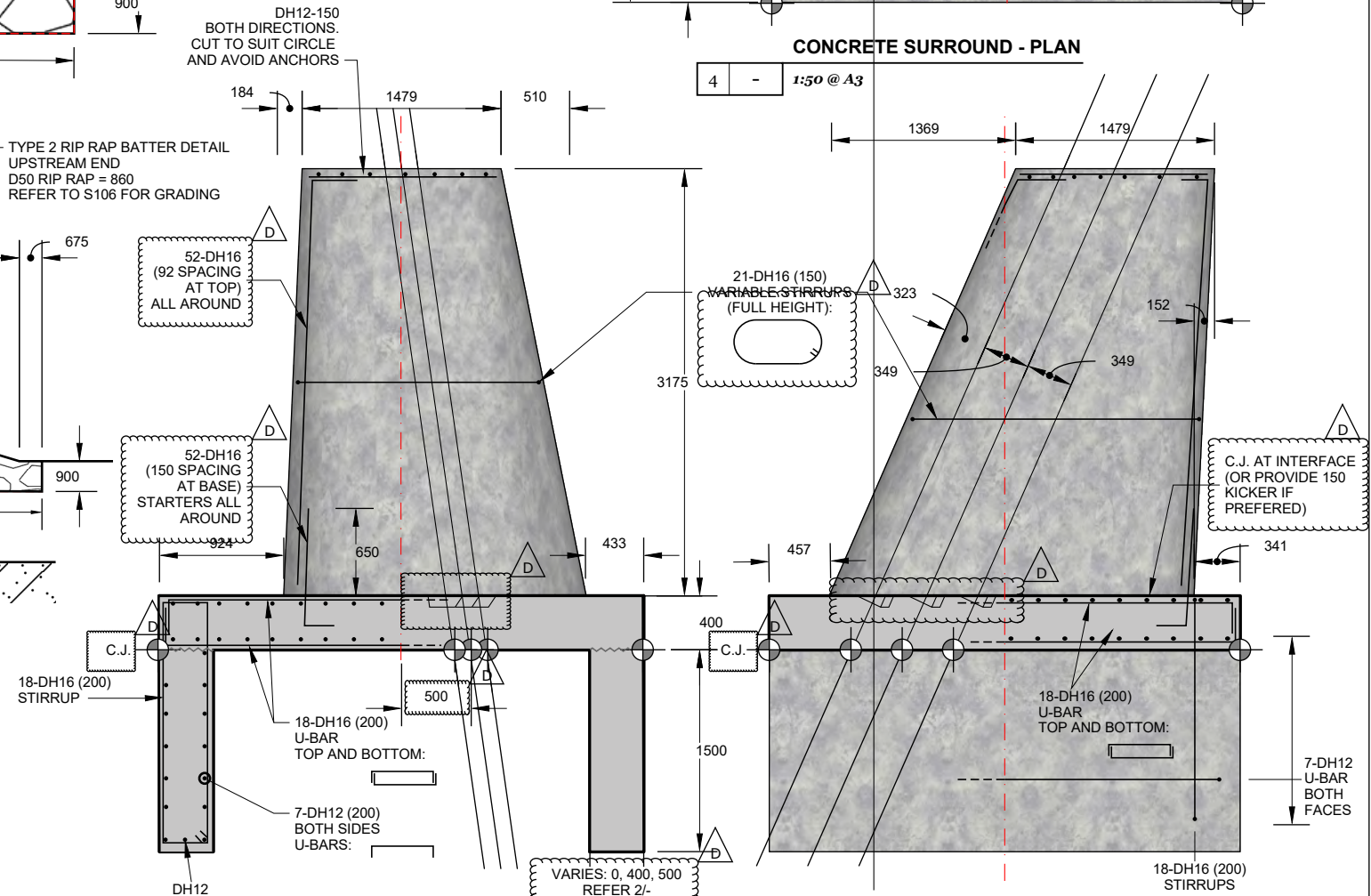
3 - 1:500 @ A3

DO NOT SCALE. IF IN DOUBT ASK



CONCRETE SURROUND - PLAN

4 - 1:50 @ A3



CONCRETE SURROUND - CROSS SECTION

5 - 1:50 @ A3

CONCRETE SURROUND - LONGSECTION

4 - 1:50 @ A3

REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
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PROJECT
LONGFORD SHARED PATH
PROJECT NO.
2019/11

**LONGFORD SHARED PATH
MATAURA CYCLEBRIDGE
ANCHORAGE DETAILS**

DWG: GDC 2019/11 S116

S116
Rev D

1. REFER TO DRAWING S111 FOR CONCRETE AND REINFORCING NOTES.
2. REFER TO DRAWING S107 FOR ANCHORAGE SET-OUT. ENTRY HOLE TO BE SURVEYED PRIOR TO DRILLING. ENTRY TO BE WITHIN $\pm 50\text{mm}$ OF SURVEYED PLAN LOCATION. ENTRY ANGLE TOLERANCE ON DRILLING SHALL BE ± 3 DEGREES (AS PER PTI GUIDANCE).
3. ALL DETAILS AS PER WILLIAMS FORM RECOMMENDED SYSTEM. ALTERNATIVE PRODUCTS TO THOSE SHOWN E.G. GROUTING, TUBING ETC. SHALL BE PRE-APPROVED. CHANGES WILL BE CONSIDERED BY DESIGNER PROVIDED THAT DOCUMENTATION AND/OR TESTING CAN BE PROVIDED TO SHOW PROPOSED PRODUCT IS EQUIVALENT (OR BETTER).
4. ALTERNATIVE SYSTEMS WILL BE CONSIDERED WHERE IT CAN BE SHOWN THAT THEY ARE CLASS 1 (DOUBLE CORROSION PROTECTION) SYSTEMS AS PER "PTI RECOMMENDATIONS FOR PRESTRESSED ROCK AND SOIL ANCHORS" (POST TENSIONING INSTITUTE, 2014) SECTION 5.3.

50MPA GROUT AROUND CORRUGATE PIPE.

6. CONSTRUCTION AND HANDLING OF ROCK ANCHOR COMPONENTS SHALL BE AS PER "PTI RECOMMENDATIONS FOR PRESTRESSED ROCK AND SOIL ANCHORS" (POST TENSIONING INSTITUTE, 2014) SECTION 7.0.

3500 PROTECTED LENGTH

400 E

700 UNBONDED LENGTH

7000 BONDED LENGTH

SOIL ANCHOR DETAIL

A	-	1:10 @ A3
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- JACKING ASSEMBLY.
REFER S131

– HDG 46DIA 150kSI
WILLIAMS FORM BAR

- FLOOD PROTECTION SURROUND.

POLY CABLE TIES
ELECTRICAL NYLON

150 DIA CORRUGATED HDPE PIPE

☒ WIL-X-CEMENT GROUT
☐ PORTLAND CEMENT GROUT

- 46 DIA 150kSI

WILLIAMS FORM BAR.

- SURFACE LEVEL (MINUS TOP SOIL)

- SMOOTH PVC SLEEVE
SCHEDULE 40 PIPE
ASTM D1785
CLASS 200 PIPE
ASTM D-1785 & D-2241
AASHTO No. R-6

GROUT SEAL

POLY CORUGATED TUBING
HIGH DENSITY POLYETHYLENE ASTM D-3350
INDEX No. 324420 C TABLE 1
ASTM D-1248
AASHTO No.M252

PVC CENTRALIZER
SCHEDULE 40 PIPE - ASTM D-1785
CLASS 200 PIPE - ASTM d-2241
ASSHTO No-. R-6

PLASTIC GROUT TUBE
HIGH DENSITY POLYETHYLENE
.06 WALL

POLY CORRUGATED END CAP
FACTORY PRE-GROUTED
ASTM D-3350 POLYETHYLENE
INDEX No. 324420 C RTABLE 1
ASTM D-1248, AASHTO No. M2

1. STRESSING AND LOAD TESTING TO BE PERFORMED AS PER "PTI RECOMMENDATIONS FOR PRESTRESSED ROCK AND SOIL ANCHORS" (POST TENSIONING INSTITUTE, 2014) SECTION 8.0. REFERRED TO HEREIN AS "PTI".
2. ONE TEST ANCHOR NOT ASSOCIATED WITH THE PERMANENT WORKS SHALL BE "PERFORMANCE TESTED" IN ACCORDANCE WITH PTI 8.3.2 ALL THE WAY TO 1385KN (0.8*UTS OF BAR). METHODOLOGY TO BE CONFIRMED WITH GEOTECHNICAL ENGINEER PRIOR TO COMMENCEMENT. ONCE COMPLETED, RESULTS ARE TO BE FORWARDED TO THE GEOTECHNICAL ENGINEER FOR REVIEW/CONFIRMATION 48 HOURS PRIOR TO PERMANENT WORKS ANCHOR INSTALLATION.
3. ALL PERMANENT ANCHORS ARE TO BE "PROOF TESTED" AS PER PTI 8.3.3 USING THE FOLLOWING LOAD SCHEDULE, WHERE DESIGN LOAD "DL" = 660KN. ALL RECORDS ARE TO BE FORWARDED TO GEOTECHNICAL ENGINEER FOR CONFIRMATION. THE PROOF TEST SHALL BE CONDUCTED BY INCREMENTALLY LOADING THE ANCHOR IN ACCORDANCE WITH THE SCHEDULE IN TABLE 8.2. AT THE TEST LOAD, THE LOAD SHALL BE MAINTAINED CONSTANT FOR 10 MINUTES AND TOTAL MOVEMENT READINGS SHALL THEN BE RECORDED AT 1, 2, 3, 4, 5, 6, AND 10 MINUTES AFTER REACHING THE TEST LOAD. IF THE TOTAL CREEP MOVEMENT BETWEEN 1 AND 10 MINUTES EXCEEDS 1 MM(0.040 IN.), THE TEST LOAD THEN SHALL BE MAINTAINED FOR AN ADDITIONAL 50 MINUTES AND THE MOVEMENT READINGS SHALL BE RECORDED AT 20, 30, 40, 50, AND 60 MINUTES. TABLE 8.2 - PROOF TEST STEPS.
4. ALL ANCHORS ARE TO BE SET TO A "LOCK-OFF LOAD" OF 660KN (0.38*UTS).

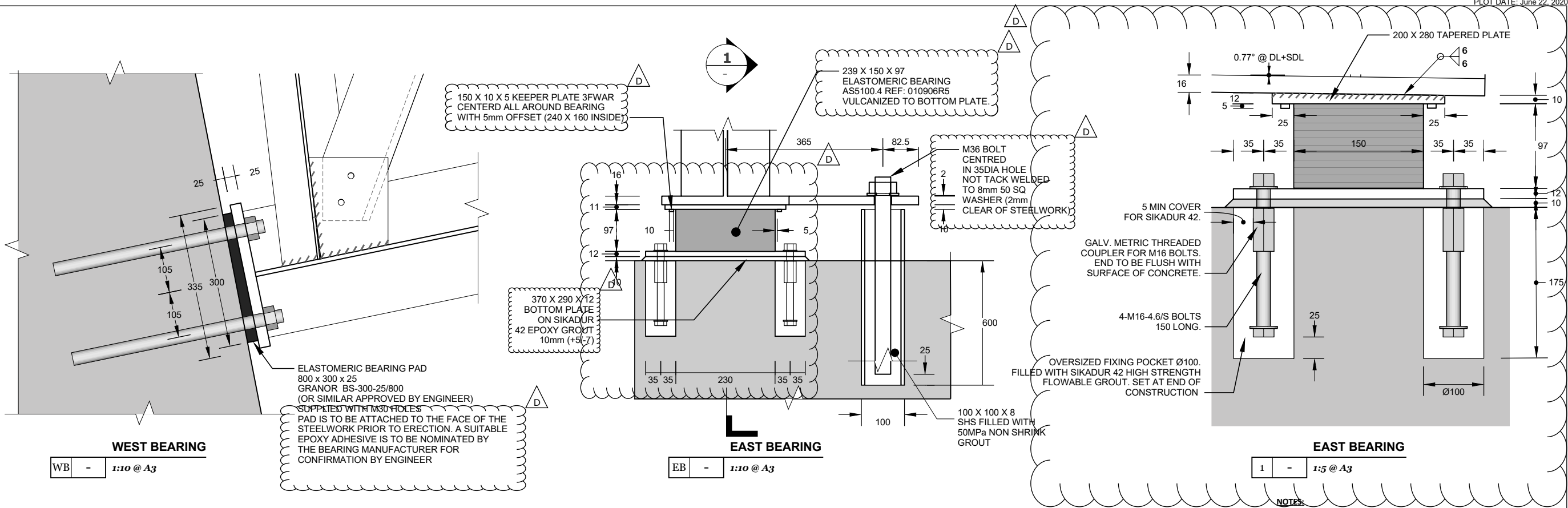
AL
0.25 DL
0.50 DL
0.75 DL
1.0 DL
1.20 DL
1.33 DL (test load) (minimum 10-minute hold)
AL (optional)
Adjust to lock-off load

 Δ

SOIL ANCHOR FOOTING DETAIL

1	-	1:20 @ A3
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A	PRELIM DESIGN	NOV 19	DC	PS	DC
B	(NOT USED)				
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D	FOR CONSTRUCTION	JUN 20	DC	PS	DC



NOTES:

1 - GENERAL NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.

2 - BEARING REQUIREMENTS:

- BEARINGS SHALL BE PROPRIATORY ELEMENTS CONFORMING TO THE LOADS AND DEFLECTION SHOWN OPPOSITE IN THE TABLE AND CONFORMING TO ASS100.4 AMMENDED BY NZTA BRIDGE MANUAL.

3 - BEARING PLACEMENT:

- BEARINGS SHALL BE CENTRED BELOW THE CENTRE OF GIRDERS.
- MORTAR PADS SUPPORTING BEARINGS SHALL ACHIEVE 40MPa PRIOR TO LOADING. BEARINGS SHALL BE BEDDED OVER THE WHOLE AREA. AFTER INSTALLATION THERE SHALL BE NO VOIDS OR HARD SPOTS.
- BEARING SURFACE SHALL BE HORIZONTAL +/- 0.005 RADIANS.
- BEARING PAD HEIGHT AT SUPPORTS SHALL BE ADJUSTED TO ENSURE SOFFIT OF GIRDERS IS +/- 5mm OF EXPECTED VERTICAL OFFSET.
- GROUT/EPOXY THICKNESS AT ANY CORNER OF BEARING TO BE NOT LESS THAN 3mm.

4 - TESTING/CERTIFICATION OF BEARINGS:

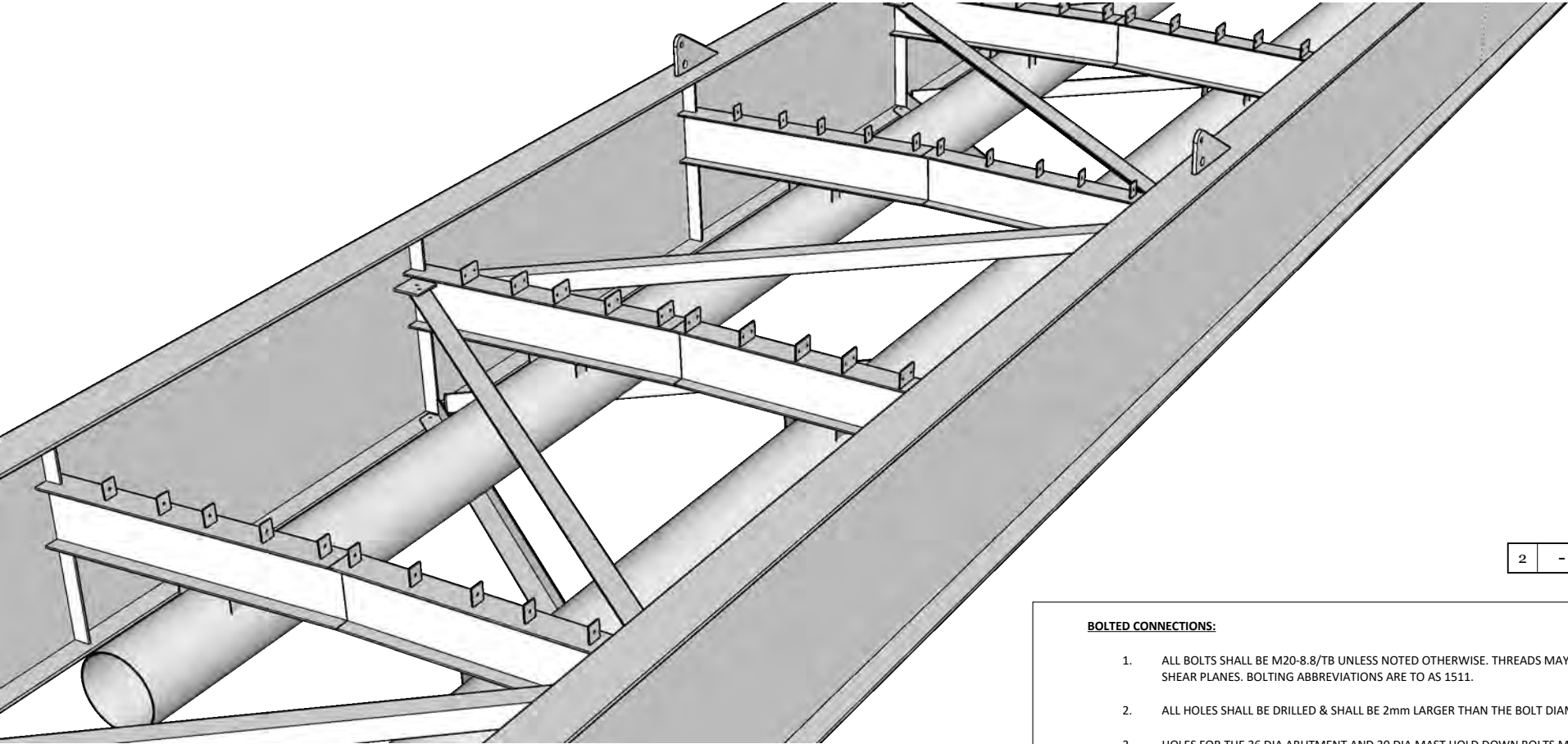
- ALL BEARINGS TO BE TESTED AS PER THE REQUIREMENTS OF ASS100.4:2017.
- PRODUCTION TEST ALL BEARINGS:
 - SHEAR STIFFNESS TEST ON ONE IN EVERY 20 BEARINGS OF THE SAME TYPE (ROUNDED UP).
 - COMPRESSIVE STIFFNESS TEST ON ONE IN EVERY 20 BEARINGS OF THE SAME TYPE (ROUNDED UP).
 - TESTING CERTIFICATES SHALL BE PROVIDED TO THE SATISFACTION OF THE ENGINEER 20 DAYS PRIOR TO SHIPPING/SUPPLY.

LOAD COMBINATION	SOUTH WEST MAST END (NW SHOWN IN BRACKETS)				
	LONG	TRANS	VERT	DISPLACEMENT	ROTATION
	KN	KN	KN	mm	RADIANS
DL + SDL + PT (FINAL CASE)^	415 (785)	70	30	0	0.0112
SLS1A DL + SDL + FP	635 (1215)	105	70	0	0.0041
ULS1A 1.35DL + 1.35SDL + 1.76FP	895 (1710)	145	105	0	-0.0041
ULS1B(-) 1.35DL + 1.35SDL + 1.69TP(-) **	515 (935)	145 ~	50	0	0.0065
ULS1B(+) 1.35DL + 1.35SDL + 1.69TP(+) + 1.69TPDif **	515 (980)	145 ~	50	0	0.0092
ULS2B 1.35DL + 1.35SDL + WDu + PT	710 (830)	80	60	0	0.0079
ULS2B 1.35DL + 1.35SDL + 1.35FP + WD(28m/s) + PT	865 (1495)	80	95	0	-0.0013
ULS3A DL + SDL + EQLAT + 0.3EQLONG	300 (670)	155	45	0	0.0113
ULS3A DL + SDL + 0.3EQLAT + EQLONG	280 (1035)	120	40	0	0.0115
ULS3A DL + SDL + EQVERT	390 (875)	80	40	0	0.0117
ULS3B 1.35DL + 1.35SDL + FW + 0.85WD + PT	650 (695)	110	45	0	0.0102

EASTERN ROLLER END								
LONG	TRANS	VERT #	MODELLED DISPLACEMENT	BEARING DISPLACEMENT*	MODELLED ROTATION	TAPERED PLATE	BEARING ROTATION#	
KN	KN	KN	mm	mm	RADIANS	RADIANS	RADIANS	
0	0	10	-26	0	0.0135	-0.0100	0.0035	
0	0	85	-22	4	-0.0043	-0.0100	-0.0143	
0	0	175	-18	8	-0.0247	-0.0100	-0.0347	
0	0	55	-46	ULS -46 (SLS -27)	0.0025	-0.0100	-0.0075	
0	0	40	46	ULS 46 (SLS 27)	0.0082	-0.0100	-0.0018	
0	100	80 (20)	-16	10	0.0050	-0.0100	-0.0050	
0	45	150 (140)	-17	9	-0.0178	-0.0100	-0.0278	
0	55	30 (0)	-32	-6	0.0132	-0.0100	0.0032	
0	30	20 (5)	-36	-10	0.0135	-0.0100	0.0035	
0	0	20 (10)	-27	-1	0.0155	-0.0100	0.0055	
0	140	50 (-25)	-16	10	0.0107	-0.0100	0.0007	

- LONGITUDINAL AND TRANSVERSE FORCES ARE PER BEAM AND RESISTED BY ANCHOR BOLTS AT ABUTMENTS (NOT ELASTOMERIC BEARINGS) & ROUNDED TO NEAREST 5KN. VERTICAL FORCES ARE SHOWN AS "MAX (MIN)".
- EASTERN MOVEMENT JOINT PLATE IN THE DECK IS ASSUMED INSTALLED AFTER FULL DL + SDL + PT DISPLACEMENTS. CONSIDERED FOR SLS +/- 30mm RANGE.
- ALL DISPLACEMENTS AND ROTATIONS ARE IN THE LONGITUDINAL DIRECTION.
^ DL + SDL DISPLACEMENT HAS BEEN MODIFIED ASSUMING EASTERN **BEARINGS ARE RE-SET VERTICAL FOLLOWING FINAL STRESSING OF THE BRIDGE & PRIOR TO GROUTING BASE COUPLERS** (REMOVES 26mm OF HORIZONTAL TRANSLATION TOWARDS RIVER).
POSITIVE VALUE IS UPWARD ROTATION. BEARING ROTATIONS SHOULD HAVE AN ADDITIONAL 0.005 RADIANS ADDED FOR CONSTRUCTION TOLERANCES AS PER ASS100.4 SECTION 12.4.2 (NOT USED FOR "DL +SDL" CASE).
LONGITUDINAL SUPERSTRUCTURE ROTATION OF THE ABUTMENT TOWARD RIVER ARE BENEFICIAL (CIRCA 0.0058 RADS BASED ON SOFT SOIL AT PERMANENT LOADS)
THIS HAS BEEN IGNORED WHERE GROUT PADS REMOVE CONSTRUCTION TOLERANCES.
* POSITIVE VALUE IS AWAY FROM RIVER. VALUES ABOVE ONLY CONSIDER THE SUPERSTRUCTURE.
LONGITUDINAL SUPERSTRUCTURE MOVEMENTS OF THE ABUTMENT TOWARD RIVER ARE BENEFICIAL (CIRCA -15mm BASED ON SOFT SOIL AT PERMANENT LOADS)
RELATIVE MOVEMENT CAUSED BY THE ABUTMENT MOVING TOWARD THE RIVER WHEN SUBJECTED TO STATIC AND SURCHARGE EARTH PRESSURES
** LONGITUDINAL ULS1B DISPLACEMENTS ONLY CONSIDER FACTORED GLOBAL TEMPERATURE VARIATION (NOT DIFFERENTIAL) AS PER ASS100.2 SECTION 17.1 a)
~ OVERSIZED BOLTED HOLES (+3mm) ARE ASSUMED TO RELEASE TRANSVERSE TEMPERATURE RESTRAINT EFFECTS ACROSS THE SUPERSTRUCTURE.

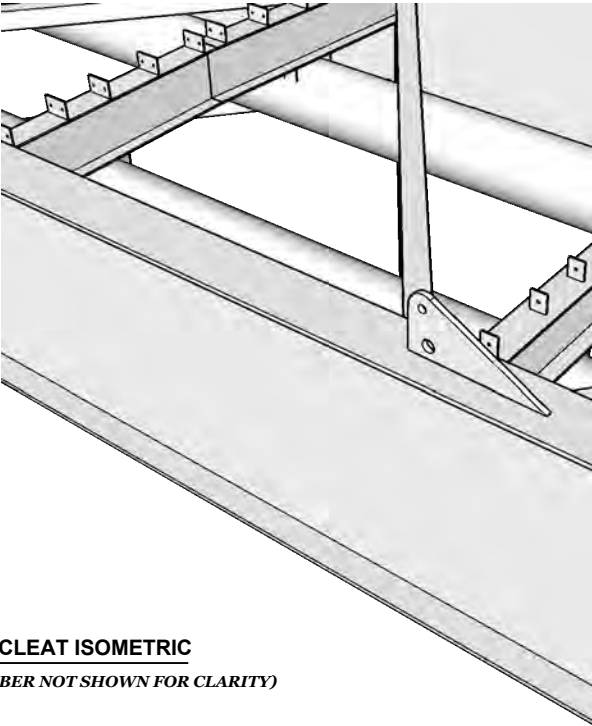
REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
A&B	(NOT USED)				DC
C	FOR PEER REVIEW	MAY 20	DC	PS	DC
D	FOR CONSTRUCTION	JUN 20	DC	PS	DC



SUPERSTRUCTURE STEELWORK ISOMETRIC

1	-
---	---

NTS



CABLE CLEAT ISOMETRIC

2	-
---	---

 NTS (TIMBER NOT SHOWN FOR CLARITY)

BOLTED CONNECTIONS:

1.

ALL BOLTS SHALL BE M20-8.8/TB UNLESS NOTED OTHERWISE. THREADS MAY BE INCLUDED IN SHEAR PLANES. BOLTING ABBREVIATIONS ARE TO AS 1511.
2.

ALL HOLES SHALL BE DRILLED & SHALL BE 2mm LARGER THAN THE BOLT DIAMETER.
3.

HOLES FOR THE 36 DIA ABUTMENT AND 30 DIA MAST HOLD DOWN BOLTS MAY BE 3mm LARGER THAN THE BOLT DIAMETER TO AID ERECTION.
4.

TIGHTENING PROCEDURE SHALL COMPLY WITH AS 1511 AND ALL BOLTS SHALL HAVE AT LEAST THREE THREADS PROJECTING THROUGH NUTS.
5.

ALL BOLTS, NUTS & WASHERS SHALL BE HOT DIP GALVANISED BY THE MANUFACTURER TO CONFORM TO AS 1214.
6.

HDG HOLD-DOWN BOLTS FOR MAST BASE CONNECTION SHALL BE SUITABLY PREPARED AND OVERCOATED WITH 75 MICRONS OF WHITE POLYURETHANE (COLOUR MATCHED TO MAST) FOLLOWING COMPLETION OF BOLT TENSIONING.
7.

ALL CORROSION PROTECTION SYSTEMS SHALL BE PROVIDED WITH A 10 YEAR WARRANTY AGAINST DEFECTS AND FAILURE FROM THE APPLICATOR.

VISIBLE SUPERSTRUCTURE STEELWORK CORROSION PROTECTION SYSTEM:

- VISIBLE STEELWORK INCLUDES:
- PRIMARY BEAM AND STIFFENERS

- CABLE CLEATS

- ALL CROSS BEAMS, END PLATES, BRACING & BRACING CLEATS FROM (AND INCLUDING) XB1 TO XB5
- AS/NZS 2312 SYSTEM = TSZ100s + 75 MICRONS OF GRAFFITI RESISTANT HIGH GLOSS POLYURETHANE TOP COAT
- TOP COAT COLOUR = "WHITE"

HIDDEN SUPERSTRUCTURE STEELWORK CORROSION PROTECTION SYSTEM:

- HIDDEN STEELWORK INCLUDES:
- ALL CROSS BEAMS, BRACING, & BRACING CLEATS BEYOND XB5

- GLULAM JOIST CLEATS
- AS/NZS 2312 SYSTEM = TSZ100 (or HDG600 FOR BOLTED BRACING MEMBERS)
- MAST CORROSION PROTECTION SYSTEM:
- AS/NZS 2312 SYSTEM = PUR5
- TOP COAT COLOUR = "WHITE"
- WATER PIPE SLEEVE:
- PIPE SLEEVE SHALL BE HDG600 (INSIDE AND OUT). SYSTEM SHALL BE MADE GOOD AT WELDS.

CORROSION PROTECTION SYSTEMS:

1.

CORROSION PROTECTION SYSTEMS ARE AS PER "PROTECTIVE COATINGS FOR STEEL BRIDGES" (NZ TRANSPORT AGENCY, 2017) WHICH IS CONSISTENT WITH AUSTRALIAN AND NEW ZEALAND STANDARD AS/NZS 2312 "GUIDE TO THE PROTECTION OF STRUCTURAL STEEL AGAINST ATMOSPHERIC CORROSION BY THE USE OF PROTECTIVE COATINGS".
2.

INLAND CORROSION ZONE "C2" HAS BEEN ASSUMED FOR EXTERNAL STEELWORK (ASSUMED WASHED BY RAIN) AND "C3" FOR ALL STEELWORK ENCLOSED BY JOISTS OR DECKING.
3.

ASSUMED TIME TO FIRST MAJOR MAINTENANCE OF THE SPECIFIED SYSTEMS IS 40 YEARS. MINOR/LOCALIZED PAINT DEFECTS IDENTIFIED DURING ROUTINE MAINTENANCE INPSECTIONS SHALL BE RECTIFIED ASAP WITH COMPATIBLE AND COLOUR MATCHED PAINT SYSTEMS.
4.

INSPECTION AND THICKNESS TESTS OF ALL COATING SYSTEMS SHALL BE PERFORMED. COATING MUST ACHIEVE THE MINIMUM PREPARATION AND THICKNESSES SPECIFIED BY NZS2312. COATINGS INSPECTION REPORT TO BE FORWARDED TO DESIGNER. INSPECTION SHALL BE PERFORMED TO AS 3894 AS PER THE RECOMMENDATIONS OF SECTION 9 OF AS/NZS 2312.1:2014. THE INSPECTOR SHALL HAVE A CURRENT RELEVANT QUALIFICATION IN COATING INSPECTION RECOGNIZED BY THE AUSTRALASIAN CORROSION ASSOCIATION SUCH AS NACE INTERNATIONAL COATING INSPECTION PROGRAM AND THE NZ CBIP (NZ CERTIFICATION BOARD FOR INSPECTION PERSONNEL).
5.

NO STEELWORK GRINDING IS PERMITTED ON SITE UNLESS AGREED BY THE DESIGNER. WHERE GRINDING IS AGREED DUST SHALL BE CONTAINED, AND WHERE NECESSARY, REMOVED FROM EXISTING PAINTWORK USING AUTOMOTIVE "CUT AND POLISH" PRODUCTS (OR SIMILAR APPROVED BY DESIGNER).

GENERAL STEELWORK NOTES:

1.

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
2.

ALL STEELWORK INCLUDING (BUT NOT LIMITED TO) TOLERANCE, FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH NZS 3404.
3.

ALL STRUCTURAL STEELWORK MUST BE SEPERATED FROM TIMBER WITH AN APPROVED DAMP PROOF MEMBRANE.
4.

SHOP DRAWINGS SHALL BE PREPARED FOR ALL STEELWORK INCLUDING PRIMARY BEAMS, CROSS BEAMS, BRACING, MAST, AND BALUSTRADE, ETC.
5.

CRANES SHALL BE POSITIONED 3 METRES (45 DEGREE) FROM THE EXISTING CULVERT. REFER TO NOTE 7 OF S110.

STEEL GRADES:

1.

STEEL OPEN SECTIONS (UB, UC AND PFC) TO BE GRADE 300 MINIMUM IN ACCORDANCE WITH AS/NZS 3679.
2.

HOLLOW SECTIONS (CHS) TO BE GRADE 350 MINIMUM IN ACCORDANCE WITH AS 1163.
3.

STEEL PLATES ARE TO BE GRADE 350L15 IN ACCORDANCE WITH AS/NZS 3678.
4.

MILL CERTIFICATES FOR ALL STEELWORK ARE TO BE PROVIDED TO THE DESIGNER PRIOR TO FABRICATION.

WELDED CONNECTIONS:

1.

ALL WELDS TO BE CATEGORY SP IN ACCORDANCE WITH THE REQUIREMENTS OF NZS 3104 AND CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF NZS 3404 AND AS/NZS 1554.
2.

NO SITE WELDING IS PERMITTED UNLESS AGREED BY THE ENGINEER.
3.

ALL WELDS SHALL BE SEAL WELDS WHETHER SHOWN ON THE DRAWINGS OR NOT.
4.

ALL WELDS SHALL BE 6mm CONTINUOUS FILLET UNO. REFERENCE AS/NZS 1554.1
5.

WELDING ELECTRODES SHALL BE E49XX TO AS/NZS 4855 UNO.
6.

ALL BUTT WELDS SHALL BE CONTINUOUS FULL PENETRATION BUTT WELDS. IF WELDED FROM ONE SIDE, BACKING BAR OR FLUXED BACKING STRIP SHALL BE PROVIDED.
7.

WELDING METHODS AND ASSOCIATED WELDING QA PROCEDURES SHALL BE SUBMITTED TO DESIGNER FOR REVIEW PRIOR TO FABRICATION.
8.

AN INDEPENDENT WELDING INSPECTOR SHALL BE ENGAGED TO UNDERTAKE ALL INSPECTIONS, TESTS (INCLUDING NDT TESTING) AND REPORTS. THIS SHALL INCLUDE ANY ADDITIONAL INSPECTIONS, TESTS AND REPORTS NECESSARY DUE TO THE PRESENCE OF ANY WELDING OR RELATED WORKMANSHIP DEFECTS. THE WELDING INSPECTOR SHALL BE QUALIFIED TO AS/NZS 1554.1 SECTION 7 TO A LEVEL APPROPRIATE FOR A WELDING SUPERVISOR (AS PER AS 2214) AND SHALL OUTLINE THEIR PROPOSED INSPECTION REGIME TO BE AGREED WITH THE DESIGNER PRIOR TO FABRICATION.
9.

TESTING IS AS PER NZS3404:1997 APPENDIX D AND NZS3404:2009 TABLE 34 ASSUMING "MAJOR" CONSEQUENCE WELDS WITH "LOW" SEISMIC DEMAND. THE FOLLOWING MINIMUM TESTING ADOPTED :
- (a)

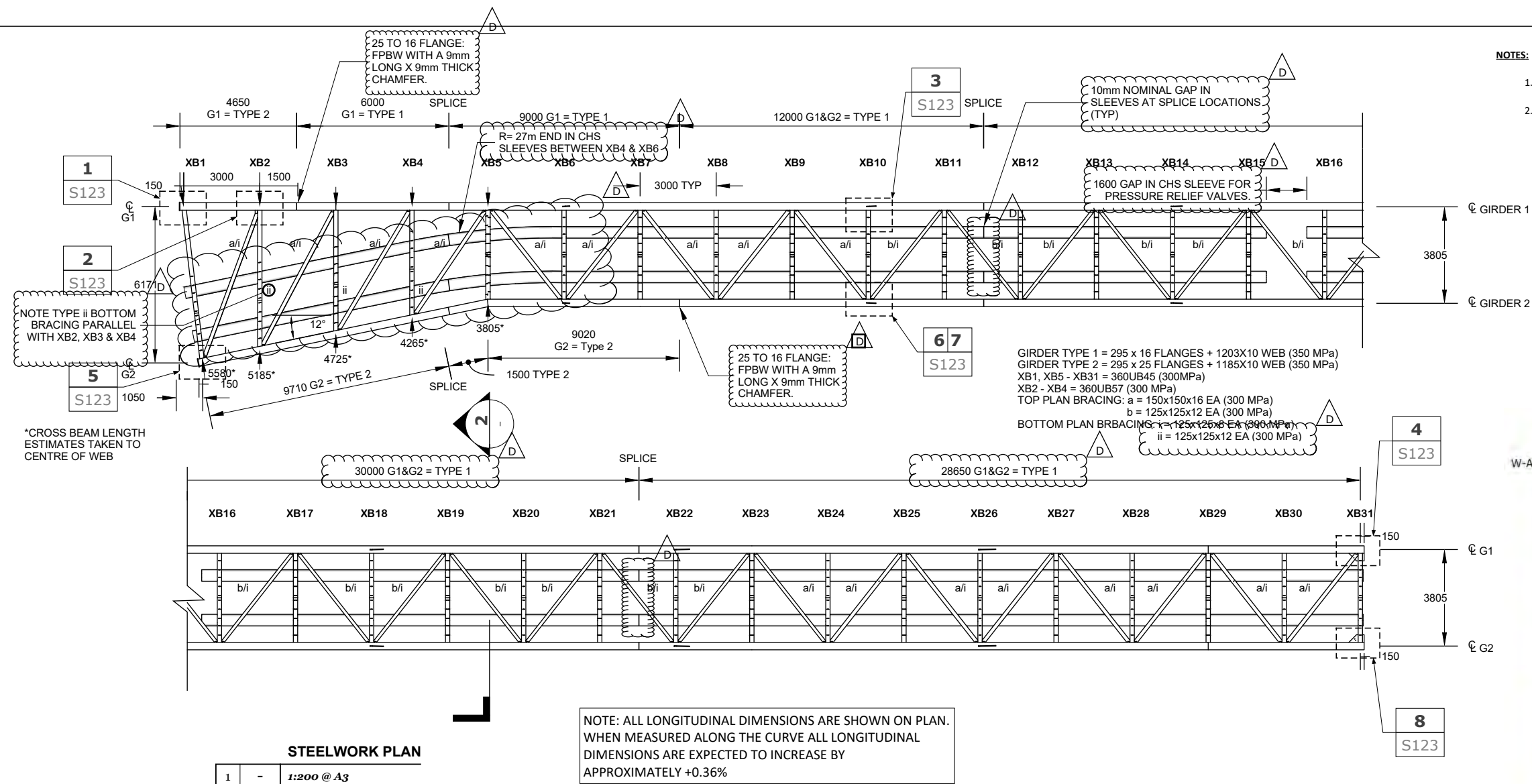
"VISUAL" 100%= VISUAL SCANNING AS PER 7.3 OF AS/NZS1554.1 AND VISUAL EXAMINATION TO TABLE 6.2.2 OF AS/NZS1554.1;
- (b)

"MT" 25%= MAGNETIC PARTICLE INSPECTION (AS PER AS/NZS1554.1 6.5) OF FILLET WELDS;
- (c)

"UT" 25% = ULTRASONIC EXAMINATION (AS PER AS/NZS1554.1 6.4) OF PENETRATION BUTT WELDS.
- (d)

100% OF ALL MAST WELDS SHOWN ON DRAWING S127 TO BE 100% UT TESTED.

REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
A	PRELIM DESIGN	NOV 19	DC	PS	DC
B	PRELIM DESIGN	NOV 19	DC	PS	DC
C	FOR PEER REVIEW	MAY 20	DC	PS	DC
D	FOR CONSTRUCTION	JUN 20	DC	PS	DC

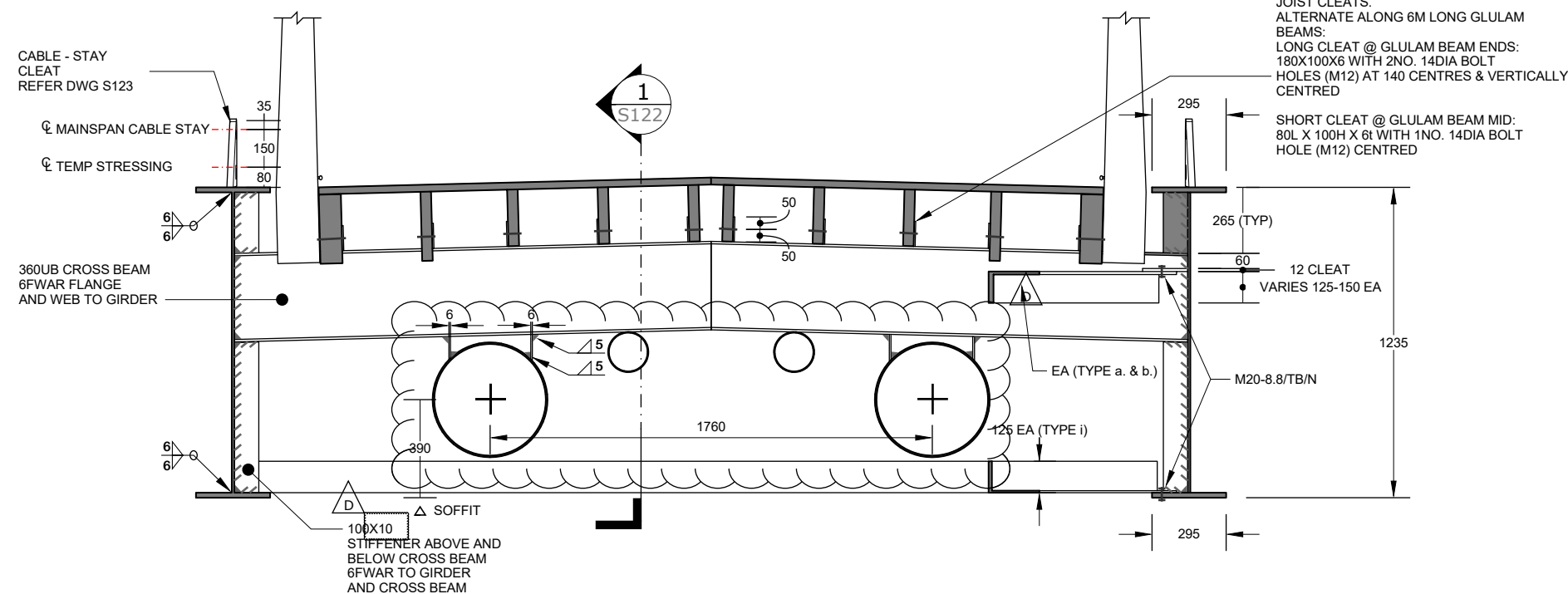


- NOTES:**
- REFER TO DRAWING S120 FOR ALL STEELWORK NOTES.
 - REFER TO DESIGNER 3D MODEL DURING SHOP DRAWING PRODUCTION FOR SET-OUT OF CLEATS ON CROSS BEAMS AT XB1 TO XB5.

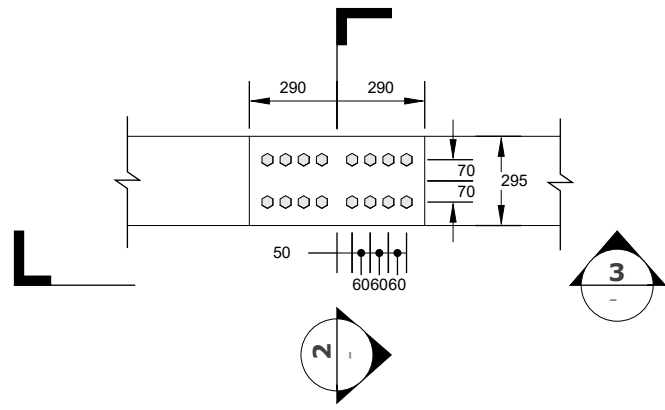
XB	Ch (m)	STEELWORK PRECAMBER, mm	
		mm	
1	0	0	
2	3	132	
3	6	242	
4	9	342	
5	12	433	
6	15	514	
7	18	586	
8	21	648	
9	24	703	
10	27	749	
11	30	787	
12	33	817	
13	36	838	
14	39	852	
15	42	860	
16	45	860	
17	48	853	
18	51	838	
19	54	816	
20	57	789	
21	60	753	
22	63	711	
23	66	661	
24	69	606	
25	72	544	
26	75	475	
27	78	397	
28	81	312	
29	84	217	
30	87	112	
31	90	0	

STEELWORK PRECAMBER

3	-	NTS
---	---	-----

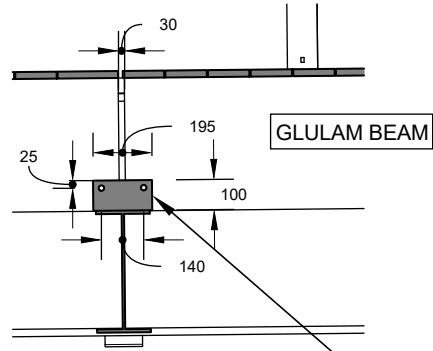


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D	FOR CONSTRUCTION	JUN 20	DC	PS	DC



SPLICE PLAN

SP - 1:25 @ A3



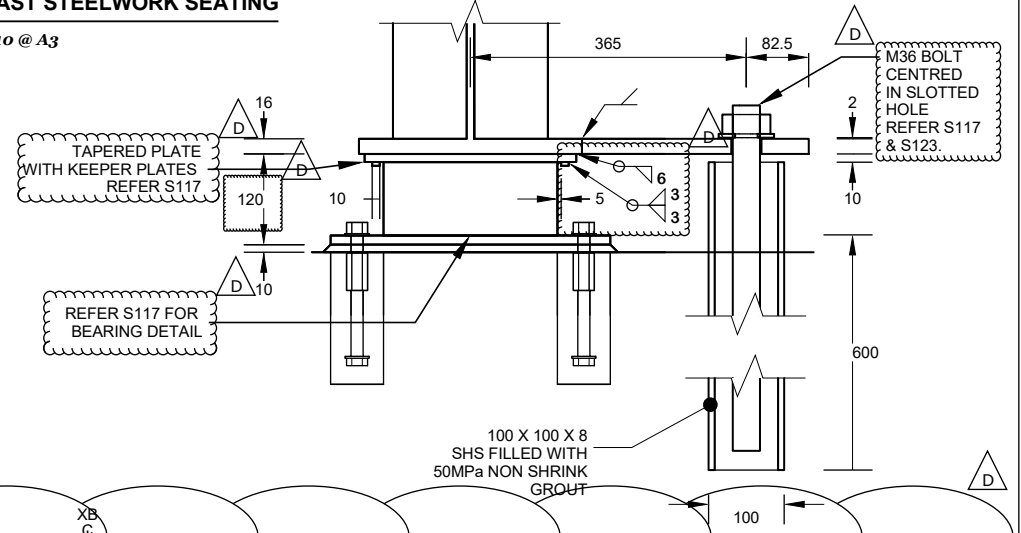
STEELWORK JOIST CLEAT

1 - 1:25 @ A3

195 X 100 X 6 CLEATS FOR GLULAM JOISTS
4 PER CROSS BEAM
14 DIA BOLT HOLES AT 140 CENTRES
4mm FWAR
FOR SS316 M12 BOLTS
REFER DWG S102 FOR MORE INFO ON SPACING

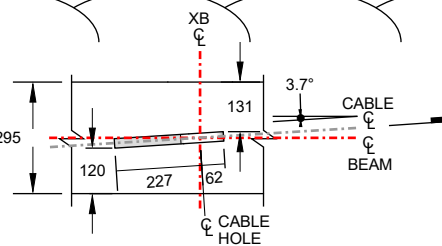
EAST STEELWORK SEATING

EB S123 1:10 @ A3



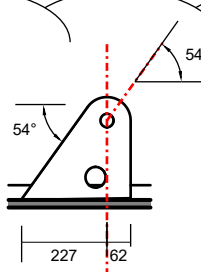
NOTES:

1. REFER TO DRAWING S120 FOR ALL STEELWORK NOTES.



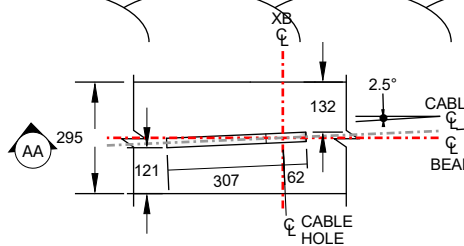
CABLE CLEAT PLAN @ CABLE #1 NORTH (SOUTH HANDED)

C1 - 1:20 @ A3



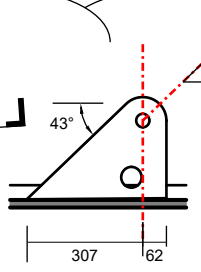
SECTION AA @ #1

1:20 @ A3



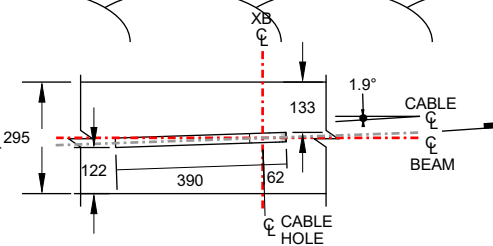
CABLE CLEAT PLAN @ CABLE #2 NORTH (SOUTH HANDED)

C2 - 1:20 @ A3



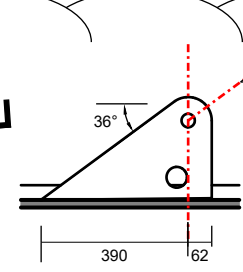
SECTION AA @ #2

1:20 @ A3



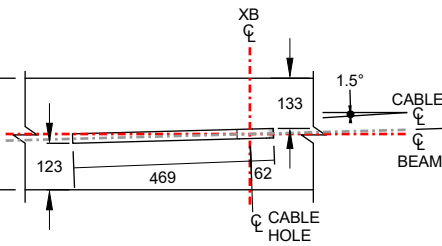
CABLE CLEAT PLAN @ CABLE #3 NORTH (SOUTH HANDED)

C3 - 1:20 @ A3



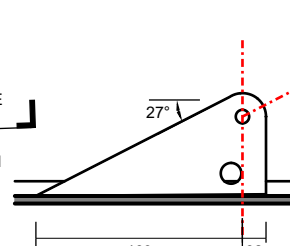
SECTION AA @ #3

1:20 @ A3



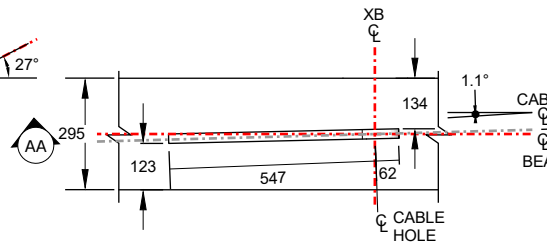
CABLE CLEAT PLAN @ CABLE #4 NORTH (SOUTH HANDED)

C4 - 1:20 @ A3



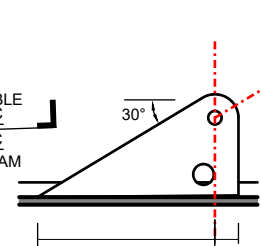
SECTION AA @ #5

1:20 @ A3



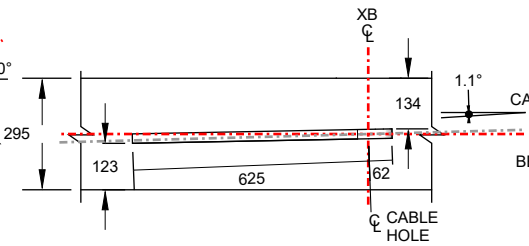
CABLE CLEAT PLAN @ CABLE #5 NORTH (SOUTH HANDED)

C5 - 1:20 @ A3



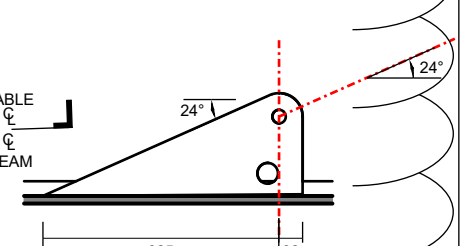
SECTION AA @ #4

1:20 @ A3



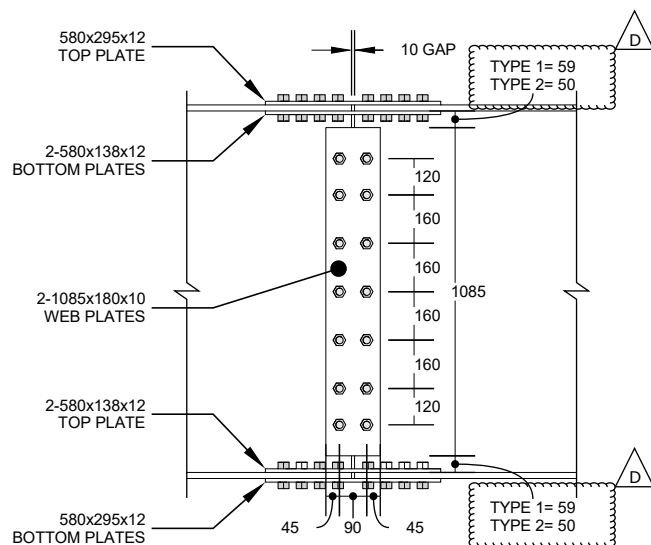
CABLE CLEAT PLAN @ CABLE #6 NORTH (SOUTH HANDED)

C6 - 1:20 @ A3



SECTION AA @ #6

1:20 @ A3

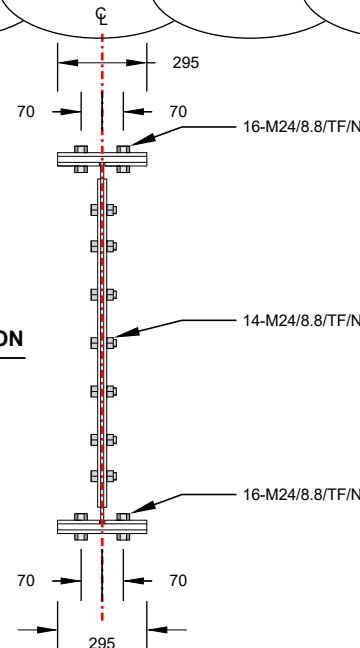


SPLICE ELEVATION

SE - 1:25 @ A3

SPLICE SECTION

SX - 1:25 @ A3



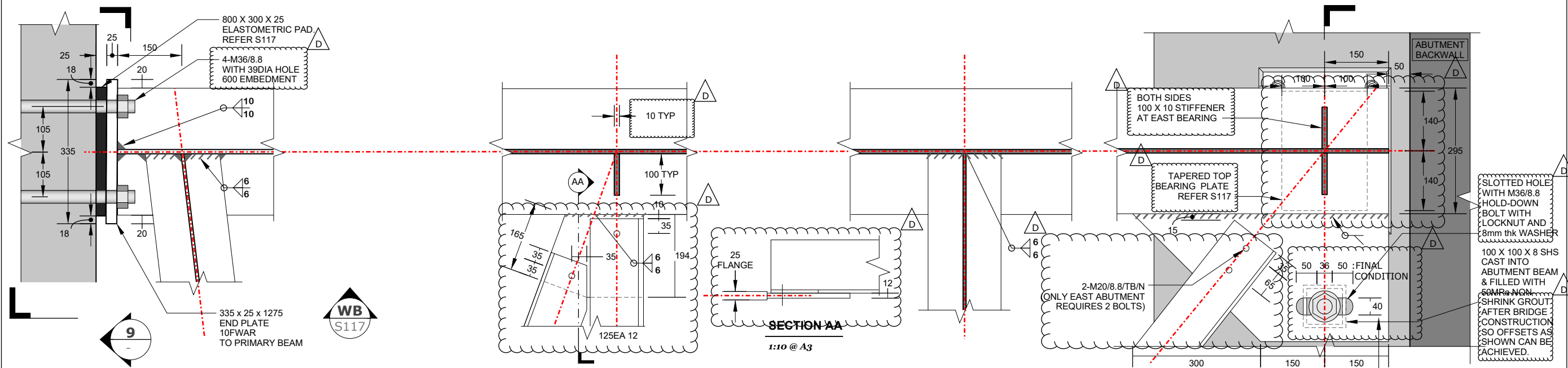
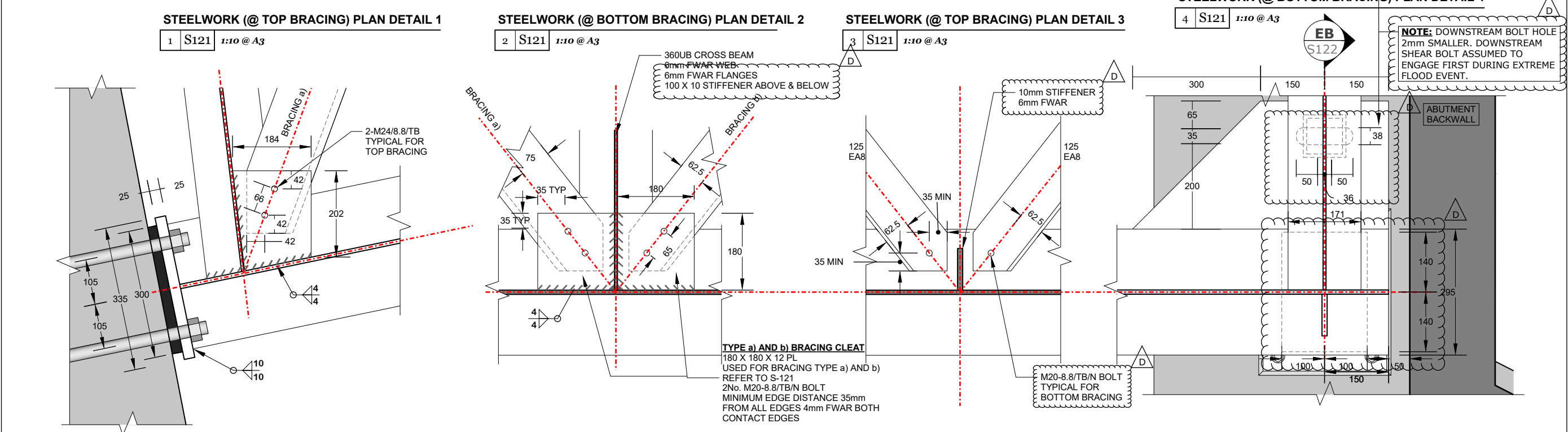
ATTENTION:

ATTENTION IS DRAWN TO THE NEED FOR FRICTION BOLTS ON SPLICE CONNECTIONS. CONSTRUCTOR AND/OR FABRICATOR SHALL DEVELOP AND SUPPLY A QUALITY ASSURANCE (QA) PROCEDURE / METHODOLOGY FOR TIGHTENING OF BOLTS. METHODOLOGY SHALL DISCUSS METHODS FOR MARKING BOLTS THAT HAVE BEEN TIGHTENED SO THAT BOLTS CAN BE VISUALLY INSPECTED FOR TIGHTENING PRIOR TO LIFTING OF STEELWORK. METHODOLOGY IS TO BE SUBMITTED TO DESIGNER FOR COMMENT 7 DAYS PRIOR TO ARRIVAL OF STEELWORK ON SITE.

CONTACT FACE OF SPLICE PLATES AND STEELWORK ARE TO BE MASKED DURING PAINTING AND SEALING. ASSUMED FRICTION COEFFICIENT > 0.35 (BARE ZINC METAL SPRAY).

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DO NOT SCALE. IF IN DOUBT ASK



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D	FOR CONSTRUCTION	JUN 20	DC	PS	DC

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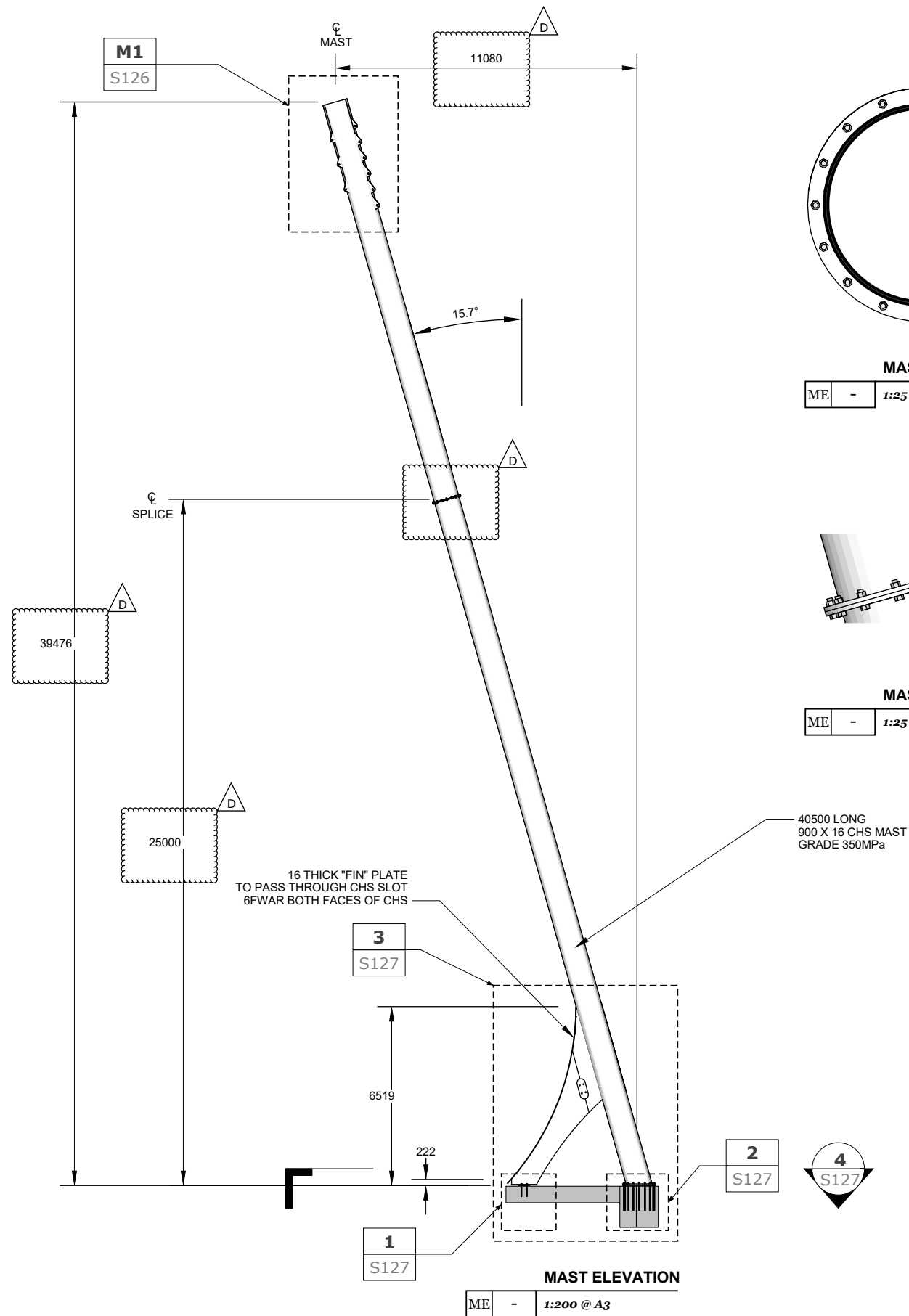
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PROJECT
LONGFORD SHARED PATH
PROJECT NO.
2019/11

LONGFORD SHARED PATH
MATAURA CYCLEBRIDGE
SUPER STEELWORK - SHEET 3

DWG: GDC_2019/11_S123

S123
Rev D

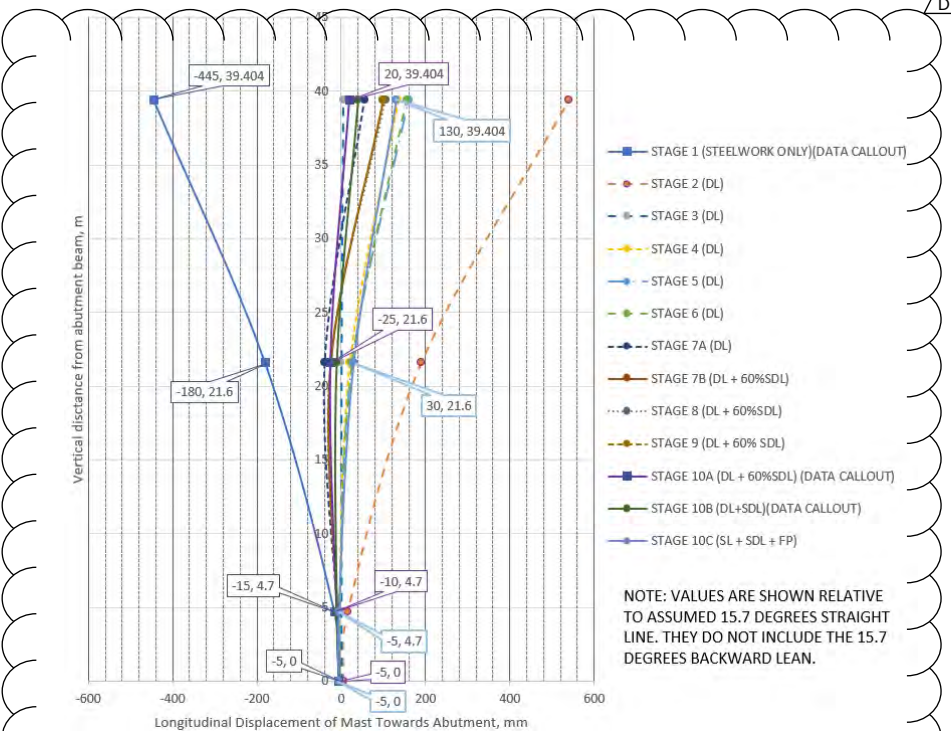


MAST TO BE SURVEYED DURING ERECTION AND STRESSING @ TOP, BASE, & 21.6m UP FROM BASE (22,250 ALONG MAST).

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
- REFER TO DRAWING S120 FOR ALL STEELWORK NOTES.
- MAST IS TO BE CONFIRMED BY SURVEY OF THE TOP OF MAST PRIOR TO LOCKING THE HOLD DOWN BOLTS. OFFSET OF TOP OF MAST RELATIVE TO BASE (PRIOR TO ANY STRESSING) = 11,535mm. IF REQUIRED SHIMS SHOULD BE USED TO GET REQUIRED LEAN AS DIRECTED BY THE DESIGNER. IF SHIMS ARE USED THEY SHOULD BE PERMANENTLY GROUTED IN USING SIKA GROUT 212 (POURABLE) WITH A MINIMUM 20mm THICKNESS. THE OFFSET IS REMOVED BY MAST DEFLECTION FOLLOWING STRESSING AND TAKE-UP OF ALL PERMANENT LOADS. REFER DEFLECTION GRAPH BELOW (REFER S132 FOR STRESSING SEQUENCE).
- HOLD DOWN BOLTS ARE TO HAVE EMBEDMENT IN ABUTMENT BEAM WITH WASHER, NUT AND LOCKNUT AT EXPOSED END.
- FOR SETTING THE PLACEMENT OF HOLD-DOWN BOLTS INTO THE ABUTMENT FORMWORK (PRIOR TO CASTING THE ABUTMENT BEAM) IT IS ASSUMED THAT THE CONSTRUCTOR WILL USE A SUITABLE JIG TO POSITION THE BOLTS E.G. 1200DIA X STEEL PLATES (SIMILAR TO THE BASE PLATE) PREDRILLED WITH BOLT HOLES. THE JIG SHOULD REMAIN FREE OF THE CAST ABUTMENT (SO IT CAN BE REMOVED) OR CAST INSIDE THE ABUTMENT BEAM WITH A COVER > 75mm.
- CONSTRUCTION SEQUENCE ASSUMED:
 - CAST ABUTMENT BEAM AND ALLOW TO ACHIEVE 30MPa PRIOR TO INSTALLING MAST. CONCRETE TEST CYLINDER RESULTS TO BE PROVIDED TO ENGINEER FOR REVIEW & CONFIRMATION.
 - ERECT BOTTOM HALF OF MAST & SURVEY.
 - INSTALL BASE GROUT AND ALLOW TO CURE TO ≥ 40 MPa .
 - INSTALL SECOND HALF OF MAST.
 - SURVEY AND TIGHTEN LOCK-NUTS.OR
AS ABOVE BUT FULLY ASSEMBLE MAST LIFTED INTO PLACE AND TEMPORARILY SUPPORTED

PRIOR TO BASE GROUT ACHIEVING ≥ 40 MPa.



ASSUMED MAST DEFLECTION BEHAVIOUR DURING STAGES OF STRESSING

REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
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PROJECT
LONGFORD SHARED PATH
PROJECT NO.
2019/11

LONGFORD SHARED PATH
MATAURA CYCLEBRIDGE
MAST STEELWORK - SHEET 1

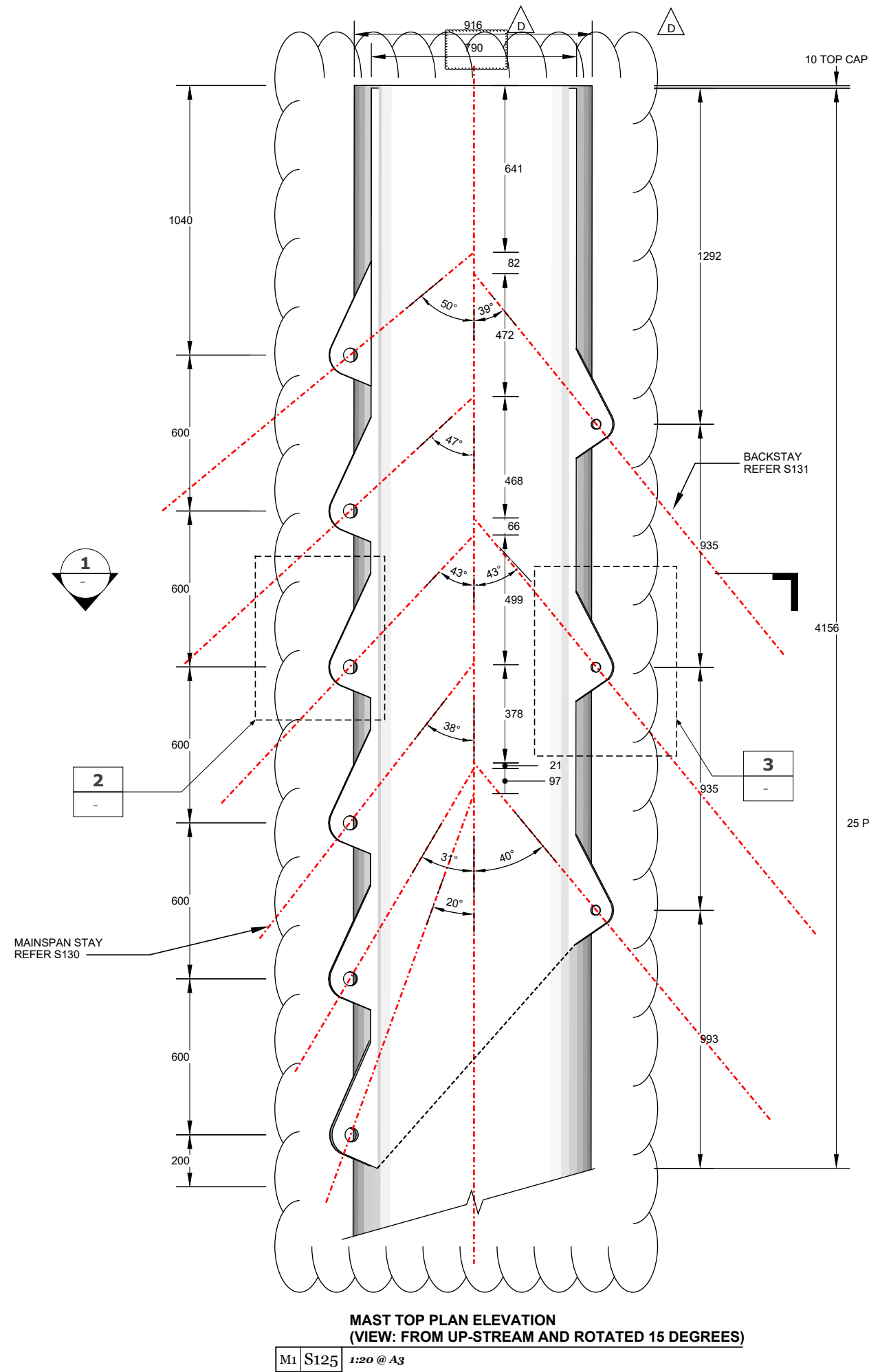
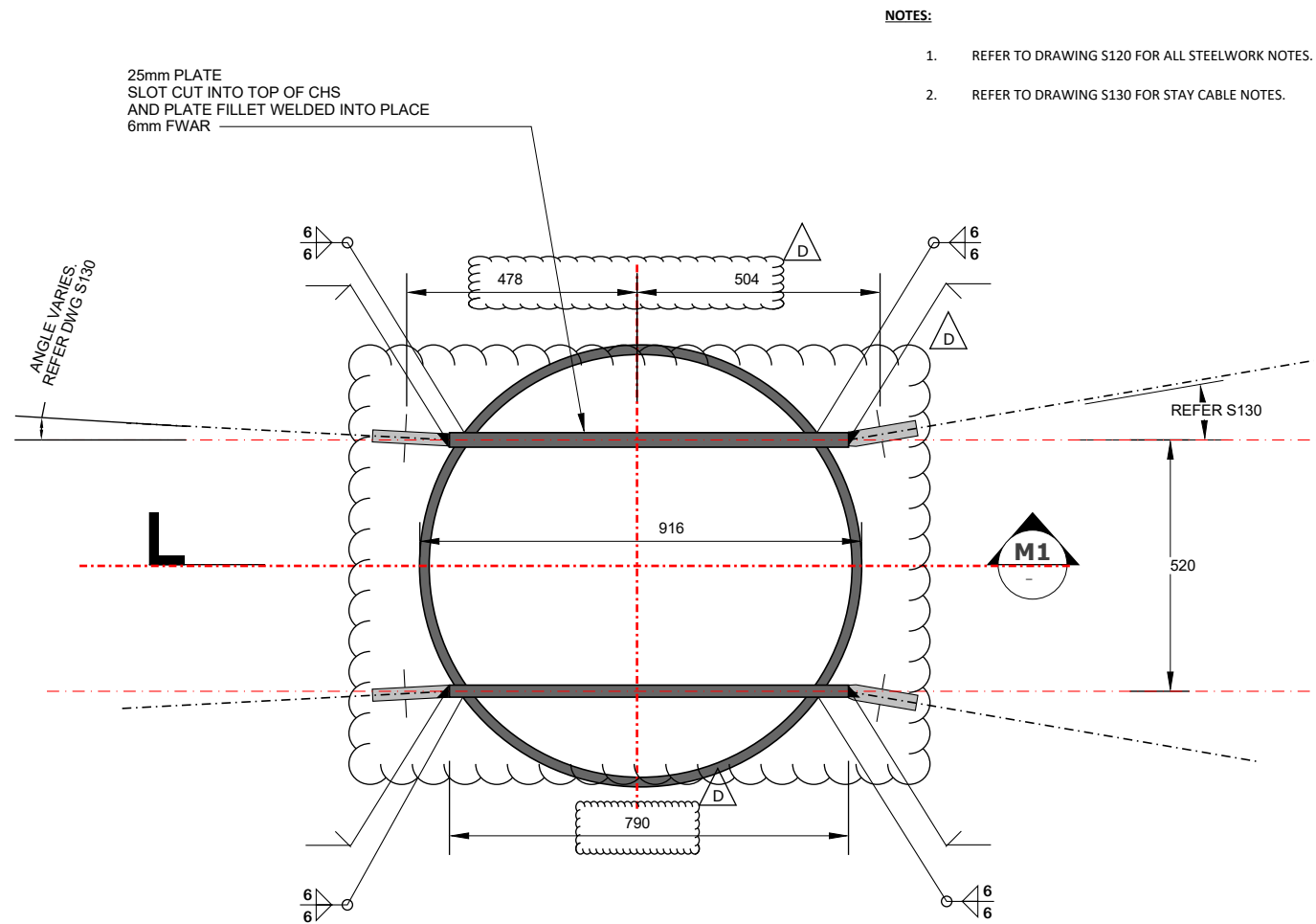
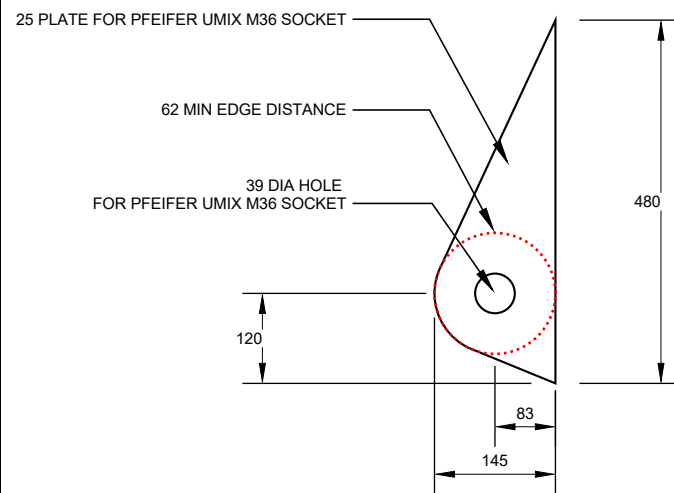
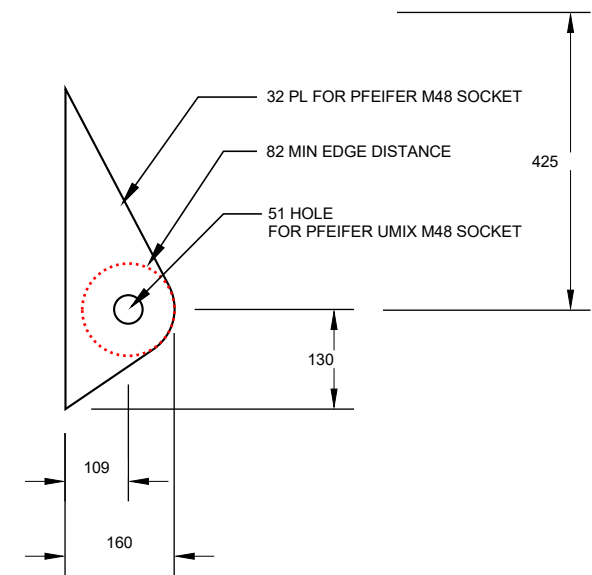
DWG: GDC_2019/11_S125

S125
Rev D

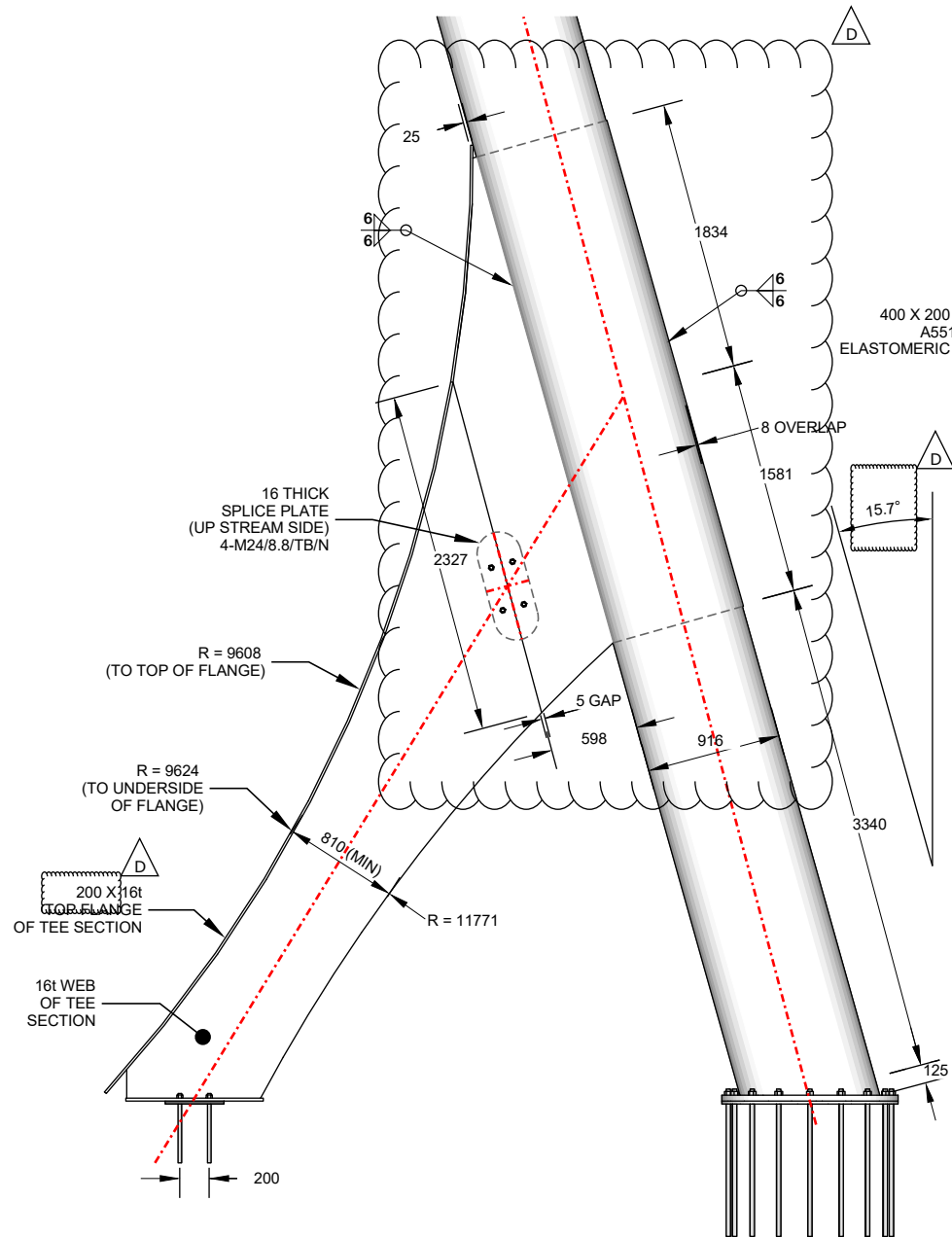
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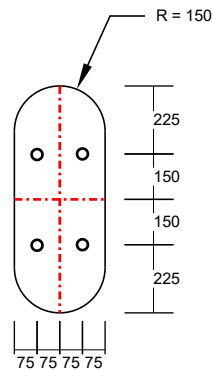


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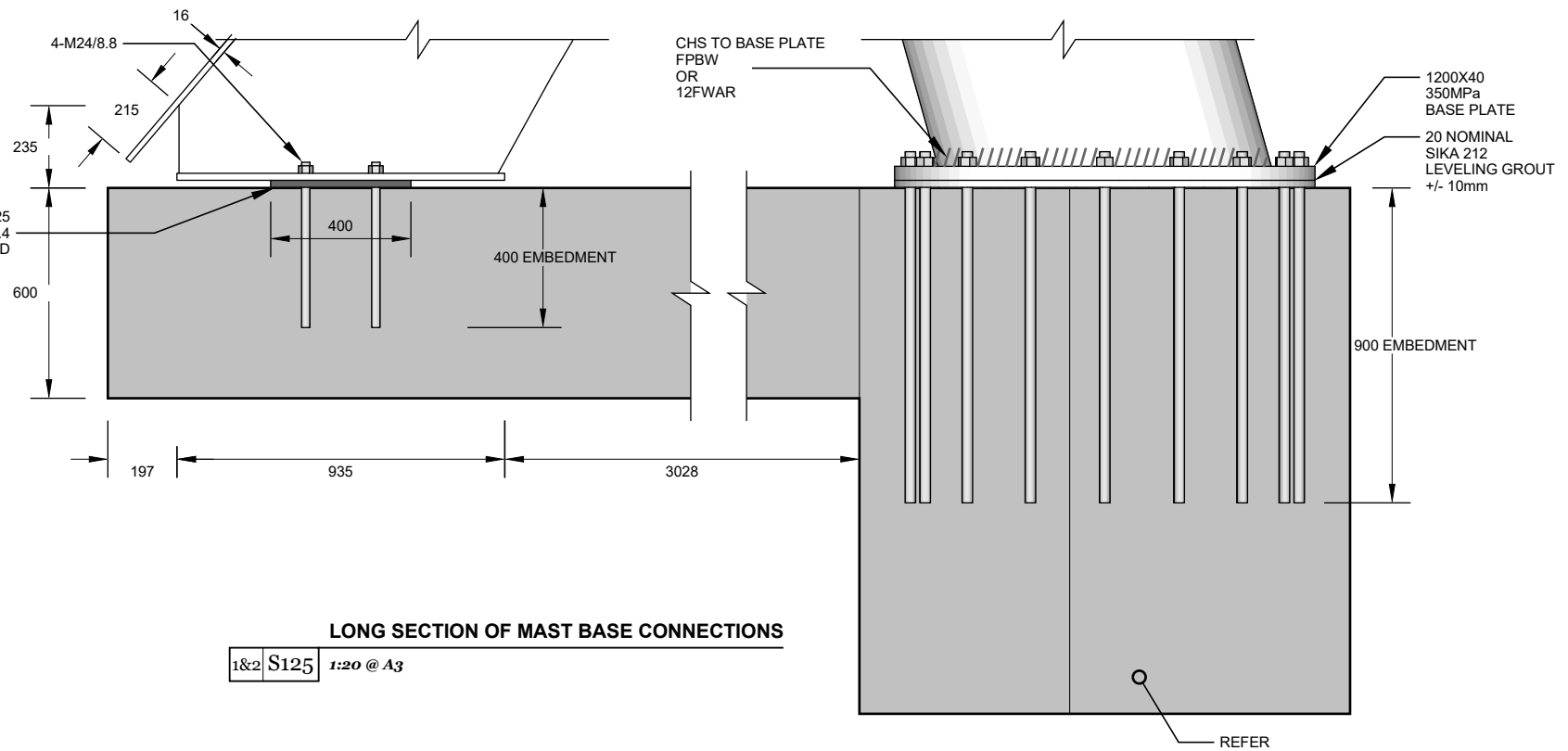
ELEVATION OF MAST STIFFENER

3 - 1:50 @ A3



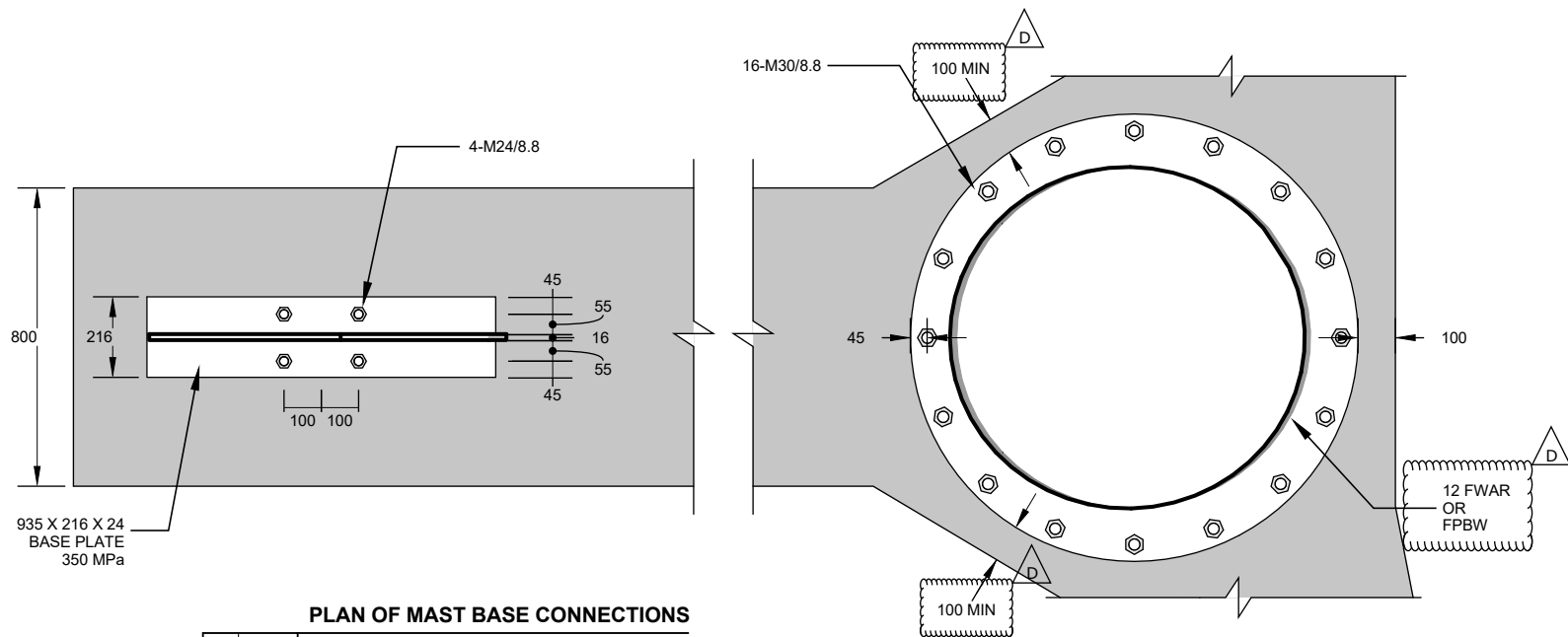
ELEVATION OF MAST STIFFENER

MS - 1:25 @ A3



LONG SECTION OF MAST BASE CONNECTIONS

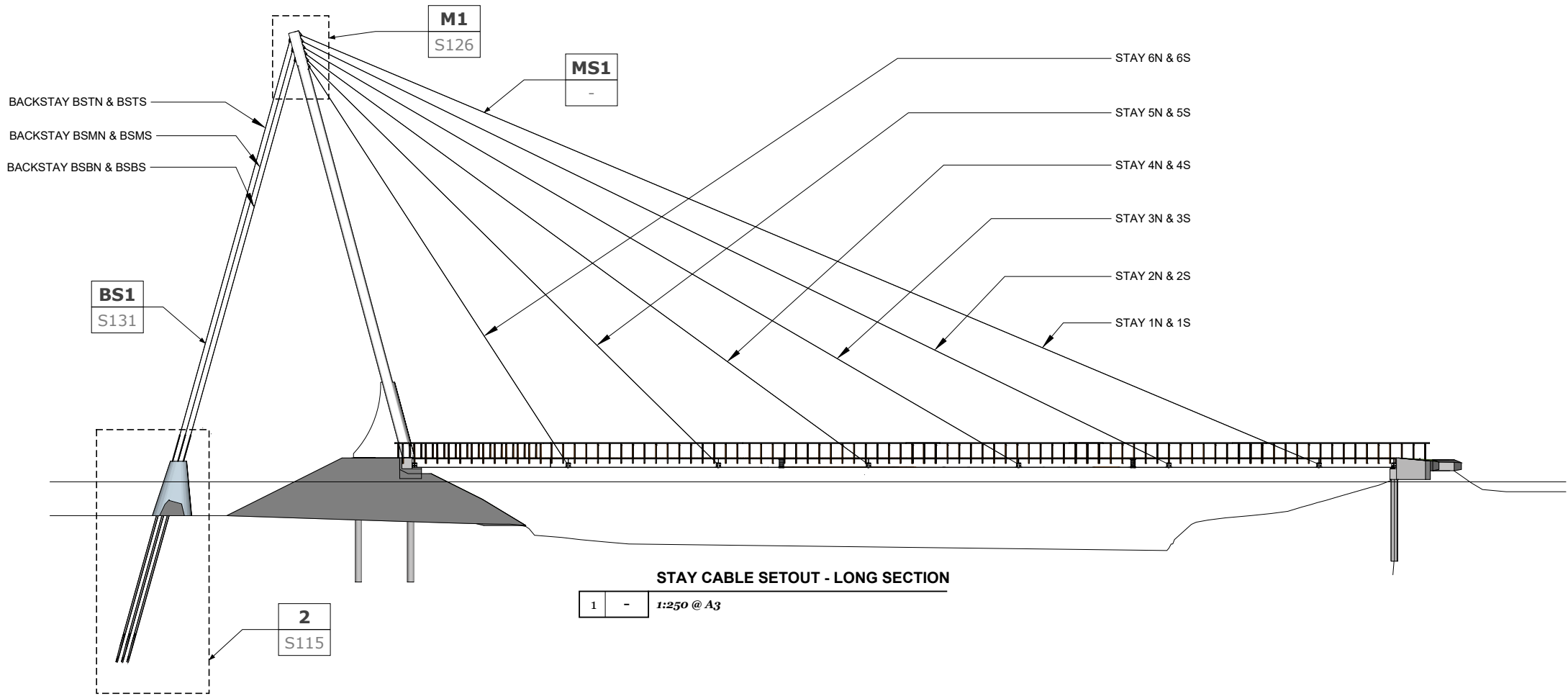
1&2 S125 1:20 @ A3



PLAN OF MAST BASE CONNECTIONS

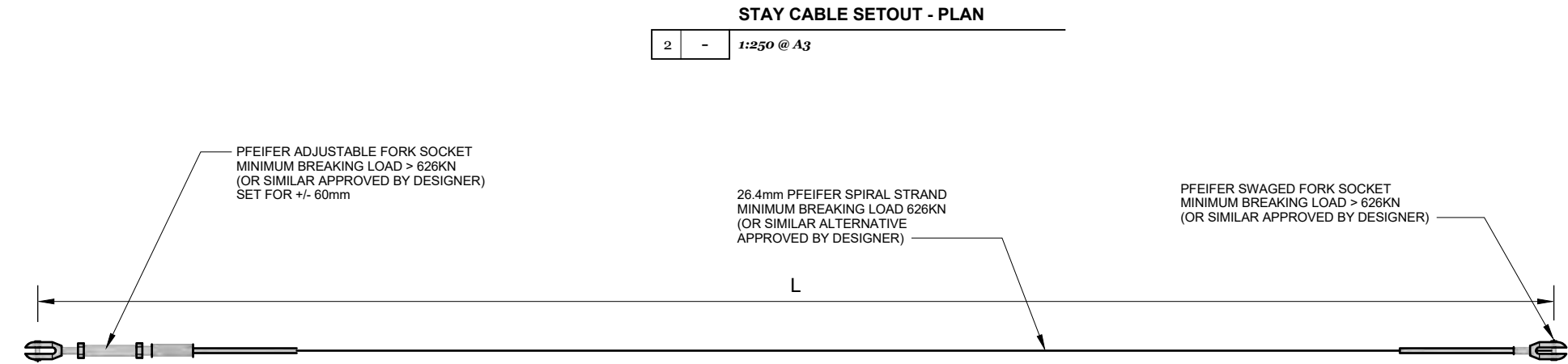
4 S125 1:20 @ A3

REV	DESCRIPTION	DATE	DESIGN	DRAWN	
A&B	(NOT USED)				
C	FOR PEER REVIEW	MAY 20	DC	PS	DC
D	FOR CONSTRUCTION	JUN 20	DC	PS	DC



STAY CABLE SETOUT - LONG SECTION

1 - 1:250 @ A3



STAY CABLE SETOUT - PLAN

2 - 1:250 @ A3



MAINSPAN STAY-CABLE

MS1 S126 1:10 @ A3

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED OTHERWISE.
- CABLES ARE CONSIDERED AS AN EXPOSED AREA AND WASHED BY RAIN TO REDUCE SALT DEPOSITS. THIS SYSTEM HAS A DESIGN LIFE OF 100 YEARS IN A C2 INLAND ENVIRONMENT.
- ALL SPIRAL CABLES TO HAVE MINIMUM 150g/m² OF 95% ZINC + 5% ALUMINIUM COATING (E.G. GALFAN™ OR BEZINEL™ SYSTEMS).
- ALL CABLE COMPONENTS (E.G. SOCKETS, REIDBAR, ETC.) TO BE COATED WITH MINIMUM 18 MICRONS OF ZINC PRIOR TO ARRIVING ON SITE. FOLLOWING STRESSING, ALL SOCKETS, EXPOSED REIDBAR, RBRACE ENDS, REID NUTS TO BE OVERCOATED WITH THE FOLLOWING PAINT SYSTEM TO ACHIEVE PUR5 SYSTEM TO AS/NZS2312:
 - DEGREASE TO REMOVE ALL SOLUBLE CONTAMINANTS, OILS, GREASES, ETC. AND MASK-OFF CABLES AND STEELWORK.
 - ABRADE (LIGHT SAND / SCOTCHBRIGHT) TO REMOVE ANY ZINC SALTS THAT MAY HAVE DEVELOPED OVER TIME ON SITE WITH EXPOSURE;
 - (COAT #1) APPLY A THINNED 30% CARBOZINC 858 AT 20 MICRONS DFT;
 - (COAT #2) APPLY A BRUSH COAT OF CARBOZINC 858 AT 55 MICRONS DFT;
 - (COATS #3 TO #5) APPLY THREE WET BRUSH COATS OF CARBOGUARD 636 TO ACHIEVE MINIMUM 200 MICRONS DFT;
 - (COAT #6) APPLY A BRUSH COAT OF CARBOTHANE 134HG AT 60 MICRONS DFT. COLOUR = WHITE.
- EN10204 TEST REPORT "TYPE 3.1" SHALL BE PROVIDED FOR THE FOLLOWING ITEMS FROM A SOURCE TO THE SATISFACTION OF THE DESIGNER:
 - CABLE BREAKING STRENGTH;
 - CABLE COATING SYSTEM (g/m²) AND % ALUMINIUM;
 - FATIGUE AT 2x10⁶ CYCLES TO 45% UTS;
- CABLES ARE TO BE PRE-STRETCHED TO 45% OF BREAKING LOAD. WHEN CUTTING DURING PRE-STRETCH, DUE ALLOWANCE SHALL BE MADE FOR ELASTIC ELONGATION DURING PRE-STRETCH.
- REFER TO DRAWING S132 FOR CABLE STRESSING INFORMATION.

REF	STAY-CABLE LENGTH, L	
	UNDEFLECTED LENGTH #, m	UNSTRESSED CABLE LENGTH ##, m
1N & 1S		
2N & 2S		
3N & 3S		
4N & 4S		
5N & 5S		
6N & 6S		

UNDEFLECTED LENGTH IS THE DISTANCE BETWEEN PINS AT ZERO SUPER AND MAST DEFLECTION AND NO STRESSING. NOTE: INITIAL SUPER DEFLECTION IS TAKEN OUT BY TIRFORS AT STAGES 1 TO 4.

UNSTRESSED CABLE LENGTH IS CABLE LENGTH BASED ON THE FINAL DEFLECTED CONDITION FOR PERMANENT LOADS (STAGE 10) MINUS THE ELONGATION DERIVED FROM AXIAL FORCE / (Ac X Ec) WHERE: AXIAL FORCE IS AS PER THE STRESSING FORCE TABLE OF DRAWING S132, "EFFECTIVE AREA OF CABLE" Ac = 288 mm² AND "EFFECTIVE ELASTIC MODULUS OF CATENARY CABLE", Ec = 160,000MPa

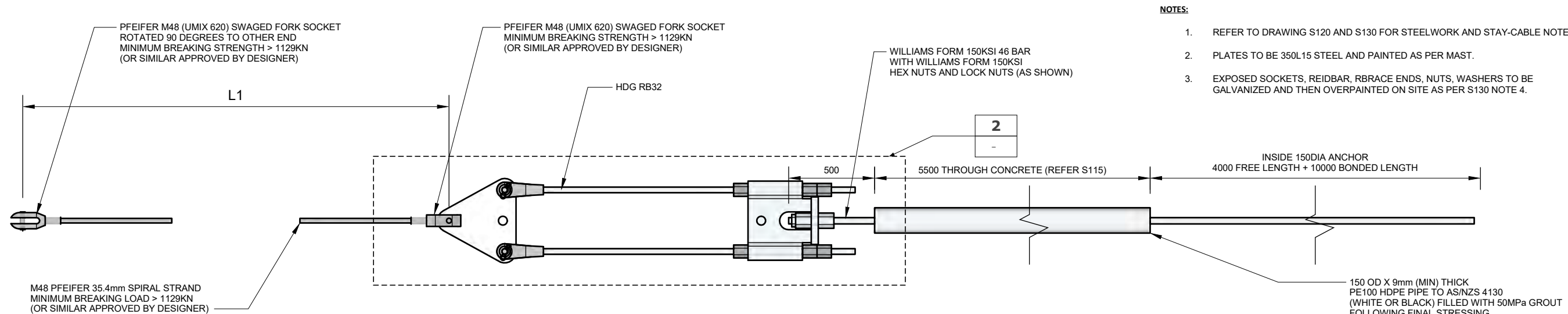
REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
A	PRELIM DESIGN	NOV 19	DC	PS	DC
B	(NOT USED)				
C	FOR PEER REVIEW	MAY 20	DC	PS	DC

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PROJECT
LONGFORD SHARED PATH
PROJECT NO.
2019/11

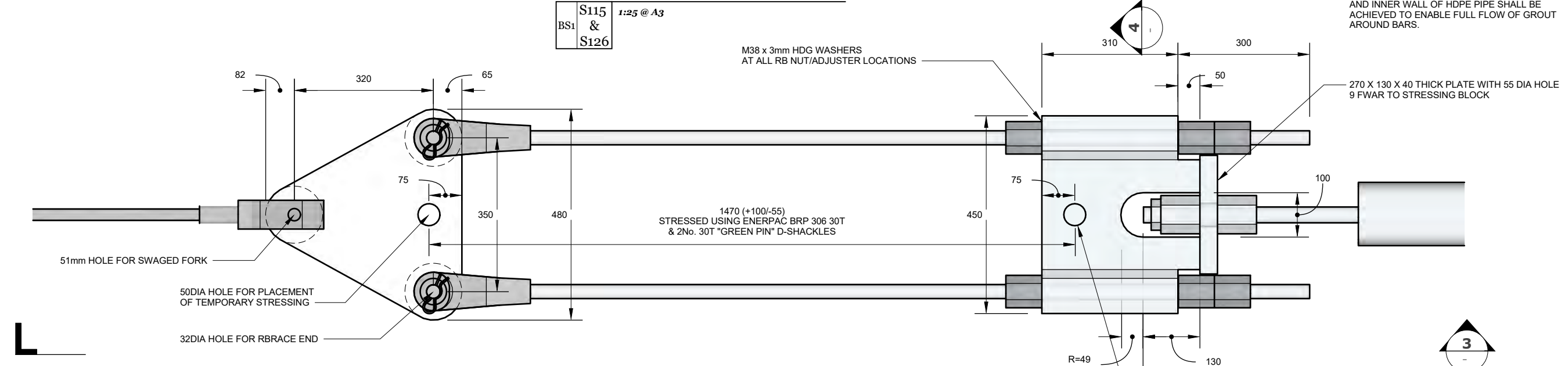
LONGFORD SHARED PATH
MATAURA CYCLEBRIDGE
STAY-CABLE DETAILS
DWG: GDC_2019/11_S130

S130
Rev C



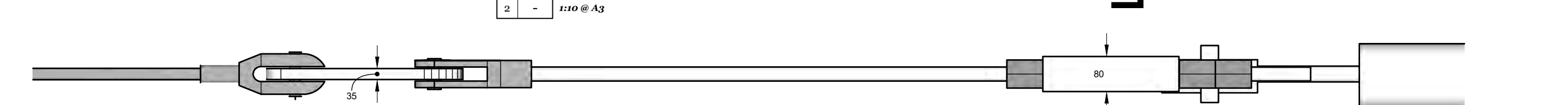
BACKSPAN STAY-CABLE ASSEMBLY

BS1	S115 & S126	1:25 @ A3
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PLAN OF BACKSPAN STAY-CABLE JOINT

2	-	1:10 @ A3
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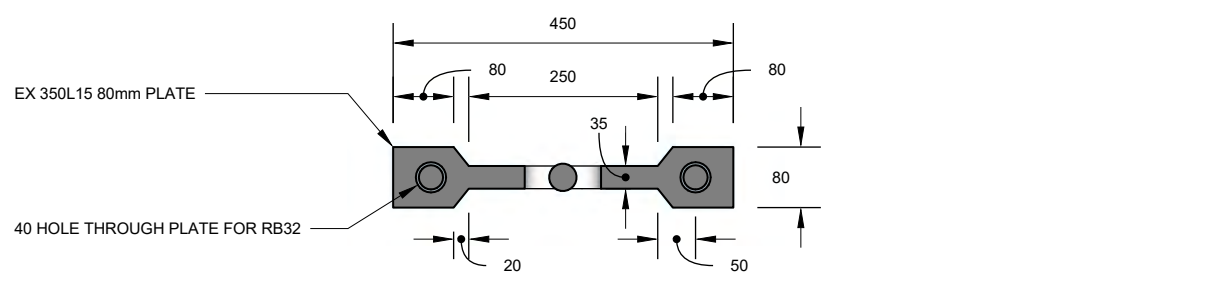
ELEVATION OF BACKSPAN STAY-CABLE JOINT

3	-	1:10 @ A3
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UNDEFLECTED LENGTH IS THE DISTANCE BETWEEN PINS AT ZERO SUPER AND MAST DEFLECTION AND NO STRESSING. NOTE: INITIAL SUPER DEFLECTION IS TAKEN OUT BY TIRFORS AT STAGES 1 TO 4.

UNSTRESSED CABLE LENGTH IS CABLE LENGTH BASED ON THE FINAL DEFLECTED CONDITION FOR PERMANENT LOADS (STAGE 10) MINUS THE ELONGATION DERIVED FROM AXIAL FORCE / (Ac X Ec) WHERE: AXIAL FORCE IS AS PER THE STRESSING FORCE TABLE OF DRAWING S132, "EFFECTIVE AREA OF CABLE" Ac = 377 mm² AND "EFFECTIVE ELASTIC MODULUS OF CATENARY CABLE", Ec = 160,000MPa

STAY-CABLE LENGTH, L1		
REF	UNDEFLECTED LENGTH #, m	UNSTRESSED CABLE LENGTH ##, m
BSBN & BSBS		
BSMN & BSMS		
BSTN & BSTS		



STRESSING BLOCK SECTION

4	-	1:10 @ A3
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REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
A	PRELIM DESIGN	NOV 19	DC	PS	DC
B	(NOT USED)				
C	FOR PEER REVIEW	MAY 20	DC	PS	DC

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PROJECT
LONGFORD SHARED PATH
PROJECT NO.
2019/11

LONGFORD SHARED PATH
MATAURA CYCLEBRIDGE
BACK-STAY CABLES

DWG: GDC_2019/11_S131

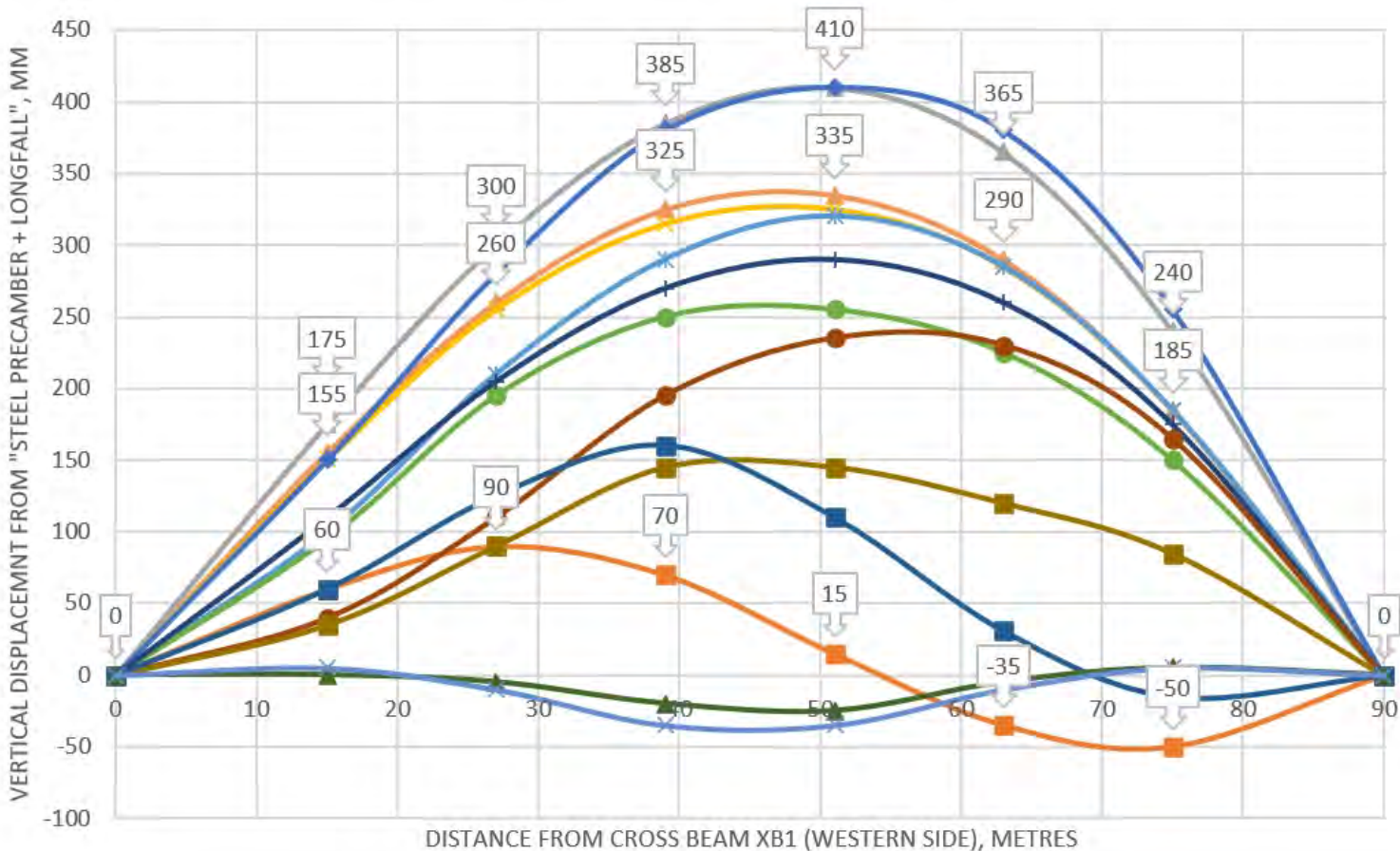
S131
Rev C

			CABLE TENSION, KN								
SEQ #	DESCRIPTION	CABLE #	BS-T	BS-M	BS-B	1	2	3	4	5	6
		CHAINAGE (FROM XB1)				15	27	39	51	63	75
1	STEELWORK ONLY	DL(STEELWORK)	0	0	0	0	0	0	0	0	0
2	INSTALL & STRESS STAY-CABLE #3	DL(STEELWORK)	0	0	0	0	0	30	0	0	0
3	INSTALL & STRESS STAY-CABLE #BS-M	DL(STEELWORK)	0	220	0	0	0	245	0	0	0
4	INSTALL & STRESS STAY-CABLE #6	DL(STEELWORK)	0	410	0	0	0	175	0	0	200
5	INSTALL & STRESS STAY-CABLE #5	DL(STEELWORK)	0	450	0	0	0	125	0	115	165
6	INSTALL & STRESS STAY-CABLE #2	DL(STEELWORK)	0	440	0	0	60	80	0	110	165
7A	INSTALL & STRESS STAY-CABLE #BS-B	DL(STEELWORK)	0	270	235	0	55	75	0	125	195
7B	INSTALL JOISTS, DECKING, BALUSTRADES.	DL(STEELWORK) + 60%SDL(ST)	0	335	300	0	105	130	0	155	200
8	INSTALL & STRESS STAY-CABLE #4	DL(STEELWORK) +60%SDL(ST)	0	340	300	0	90	100	80	130	190
9	INSTALL & STRESS STAY-CABLE #1	DL(STEELWORK) + 60%SDL(ST)	0	335	300	75	55	85	75	130	190
10A	COMPLETED STRUCTURE (INSTALL & STRESS STAY-CABLE #BS-T)	DL(STEELWORK) + 60%SDL(ST)	255	220	190	70	45	85	80	145	215
10B		DL(STEELWORK) +SDL(ST)	285	250	225	85	70	105	100	160	215
10C		DL(STEELWORK) +SDL(ST) + FP(2.6KPa)	410	375	355	155	160	210	190	215	230
10D		1.35*DL(STEELWORK) + 1.35*SDL(ST) + 1.25DL(LT) + 1.76*FP(2.6KPa)	560	525	505	230	270	325	300	285	240

- NOTES:
- 60%SDL(ST) REFLECTS THE SHORT-TERM SUPERIMPOSED DEADLOAD PRIOR TO INSTALLING THE (FULL) PE WATER PIPES INSIDE THE STEEL SLEEVES (THESE ARE ASSUMED TO BE INSTALLED AFTER BRIDGE CONSTRUCTION).
 - ALL LOADS ARE PER PRIMARY BEAM SIDE (INCLUDING THE TEMPORARY PIER VERTICAL REACTIONS)
 - VALUES IN YELLOW ARE THE ACTUAL CABLES TO BE STRESSED (REMAINING VALUES ARE THE ESTIMATE FOR LOADS IN REMAINING CABLES. IT IS NOT NECESSARY TO CHECK THESE UNLESS ANOMALIES IN ALIGNMENT OCCUR.
 - CONTRACTOR IS REPONSIBLE FOR DESIGN AND SAFE ERECTION OF TEMPORARY PIER TO SEAT THE BEAM AND SUPPORT THE LOADS INDICATED. LONGITUDINAL MOVEMENT IN THESE STAGES IS ESTIMATED AT <5mm
 - ASSUMES THE TEMPORARY SUPPORTS ARE VERTICALLY POSITIONED TO COINCIDE WITH THE STEELWORK PRECAMBER (I.E. NO NEGATIVE DEFLECTION OF THE UNSUPPORTED BEAM AT THESE LOCATIONS).

TARGET STAY-CABLE STRESSING FORCES

T1	-	-
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- FINAL: (DL + SDL + FP)
- FINAL (DL + SDL)
- FINAL (DL + 60%SDL)
- STAGE 9: (DL + 60%SDL)
- STAGE 8: (DL + 60%SDL)
- STAGE 7B: (DL + 60%SDL)
- STAGE 7A: (DL)
- STAGE 6: (DL)
- STAGE 5: (DL)
- STAGE 4: (DL)
- STAGE 3: (DL)
- STAGE 2: (DL)
- STAGE 1: STEELWORK ONLY (DL)

THESE DISPLACEMENTS ARE RELATIVE VALUES & SHOULD BE ADDED TO THE "STEELWORK PRECAMBER" + "LONGITUDINAL FALL LEVELS" WHEN COMPARING TO SURVEY RESULTS.

ASSUMED BRIDGE DEFLECTION BEHAVIOUR DURING STAGES OF STRESSING

G1	-	-
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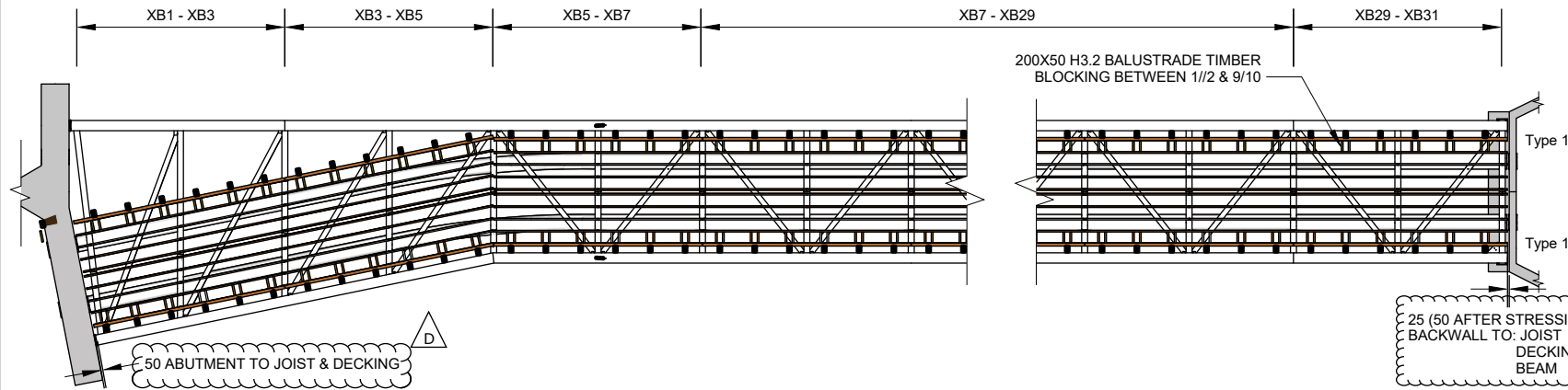
NOTES:

- REFER TO DRAWING S130 FOR STAY-CABLE NOTES.
- FORCES SHOWN IN THE TABLE OPPOSITE ARE THE ASSUMED TARGET FORCES FOR BRIDGE STAY-CABLES BASED ON THE LOADCASES AS INDICATED. ALL LOADS ARE SHOWN IN KILONEWTONS (KN). "DL" RELATES TO ALL STEELWORK (AND ASSOCIATED BRACING, BOLTS, STIFFENERS, STEEL PIPE SLEEVES, ETC.), "60%SDL" RELATES TO ALL JOISTS, DECKING AND BALUSTRADES (AND ASSOCIATED COMPONENTS & CONNECTIONS), "SDL" INCLUDES THE ABOVE ITEMS AND THE PE WATER PIPES ASSUMED FULL OF WATER, "FP" RELATES TO THE 2.6KPa NZTA PEDESTRIAN LIVE LOAD.
- ASSUMED FORCES ARE BASED ON AVERAGE SITE TEMPERATURE OF 20 DEGREES (+/- 5 DEGREES).
- MAINSpan CABLE SETS #1, #2, #3, AND #4 ARE TO BE STRESSED IN PAIRS USING A 10 TONNE (SWL) TIRFOR AND CABLE GRIP SET UP AT EACH STRAND. A LOADCELL SHALL BE USED AT EACH TIRFOR TO MEASURE THE APPLIED FORCE IN KILONEWTONS. STRANDS IN EACH PAIR SHALL BE INCREASED SEQUENTIALLY IN MAXIMUM 20KN INCREMENTS UNTIL THE LOADS SHOWN ARE ACHIEVED IN BOTH CABLES. CABLE #5 AND #6 MAY EXCEED THE LIKELY AVAILABILITY OF CABLE GRIPS AND THUS A FULL LINE FROM TOP OF MAST MIGHT BE REQUIRED.
- BACKSPAN CABLES ARE ASSUMED STRESSED USING AN ENERPAC (OR SIMILAR) HYDRAULIC CABLE PULLER RATED TO A 50 TONNE SWL. A COMPATIBLE LOADCELL SHALL BE USED TO MEASURE THE APPLIED FORCE IN KILONEWTONS. STRANDS SHALL BE INCREASED SEQUENTIALLY IN MAXIMUM 20KN INCREMENTS UNTIL THE LOADS SHOWN ARE ACHIEVED IN BOTH CABLES.
- THE APPLIED FORCE SHALL BE RECORDED WITH DATE / TIME / EXTERNAL TEMPERATURE / WEATHER CONDITIONS / STRESSING METHOD. THE INFORMATION SHALL BE SUBMITTED TO THE DESIGNER WITHIN 24 HOURS OF STRESSING. THE DESIGNER WILL PROVIDE A BLANK RECORD SHEET FOR CAPTURE OF THE REQUIRED DATA.
- THE DESIGNER IS TO BE NOTIFIED 48 HOURS PRIOR TO STRESSING THE FIRST SET OF CABLES. SAFE ACCESS AND/OR REMOTE COMMUNICATIONS ARE TO BE PROVIDED FOR THE ENGINEER TO MONITOR THE STRESSING IN REAL TIME.
- ON COMPLETION OF STAGE 1, STAGE 2, STAGE 3, STAGE 7A, STAGE 7B AND STAGE 10A A SURVEY OF THE STEELWORK AT EACH STRAND LOCATION SHALL BE PERFORMED. SURVEY CAN BE PERFORMED RELATIVE TO A STRAIGHT LASER LINE CAST DOWN THE LENGTH OF THE BRIDGE PROVIDED THE LAZER IN MAINTAINED AND NOT DISTURBED THROUGHOUT THE ERECTION. THE SURVEY INFORMATION SHALL BE FORWARDED TO THE ENGINEER FOR REVIEW 24 HOURS AFTER THE STRESSING SEQUENCE FOR REVIEW. THE ASSUMED DEFLECTION BEHAVIOUR SHOWN OPPOSITE IS ASSUMED ACCURATE WITHIN +/-20MM.

CABLE REPLACEMENT:

- A SUMMARY OF THE INSPECTION AND MAINTENANCE REQUIREMENTS FOR THE BRIDGE ARE CONTAINED ON DRAWING S101;
- FOLLOWING ANY INSPECTION RECOMMENDATION TO REPLACE CABLE(S) IT IS RECOMMENDED THAT THE "LONGFORD SHARED PATH BRIDGE DESIGN STATEMENT" IS READ PRIOR TO REPLACEMENT OF CABLE(S).
- CABLES ARE NOT EXPECTED TO NEED REPLACEMENT WITHIN THE LIFE OF THE BRIDGE. WHOEVER, IIT MAY BE REQUIRED DUE TO UNFORSEN WEAR AND TEAR AND/OR DUE TO UNFORESEEN FAILURE OR VANDALISM.
- THE BRIDGE IS DESIGNED TO RESIST A SUDDEN FAILURE OF ANY CABLE DURING THIS EXTREME EVENT IT IS ASSUMED THAT CROWD LOADING IS UNLIKELY AND A REDUCED LIVE LOAD CASE HAS BEEN ASSUMED.
- A MISSING/FAILED CABLE SHOULD BE REPLACED AS SOON AS POSSIBLE. THE BRIDGE SHOULD BE CLOSED DURING LARGE EVENTS (TO PREVENT CROWD LOADING) WHEN CABLES ARE MISSING OR SIGNIFICANTLY DAMAGED.
- REPLACEMENT CABLES SHALL BE SPIRAL STRAND CABLES HAVING BREAKING LOADS AND GALFAN COATINGS (5% ALUMINIUM + 95% ZINC) EQUAL TO OR IN EXCESS OF THOSE SHOWN ON DRAWINGS S130 AND S131. CABLE STIFFNESS SHALL BE 160,000MPa +/- 20,000MPa.
- STRESSING OF CABLES SHOULD OCCUR DURING A BRIDGE CLOSURE.
- STRESSING OF REPLACEMENT CABLES SHALL BE PERFORMED TO THE STRESSES FOR STAGE 10B SHOWN IN THE TABLE ABOVE. SUITABLE STRESSING EQUIPMENT SHOULD BE USED BY EXPERIENCED CONTRACTORS FAMILIAR TO WORKING WITH STRESSING EQUIPMENT. ALL CABLES SHOULD BE RE-CHECKED TO THE STRESSES SHOWN ON TABLE 10B FOLLOWING ANY CABLE REPLACEMENT.

REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
A	PRELIM DESIGN	NOV 19	DC	PS	DC
B	PRELIM DESIGN	NOV 19	DC	PS	DC
C	FOR PEER REVIEW	MAY 20	DC	PS	DC
D	FOR CONSTRUCTION	JUN 20	DC	PS	DC



GLULAM BEAM SET-OUT PLAN

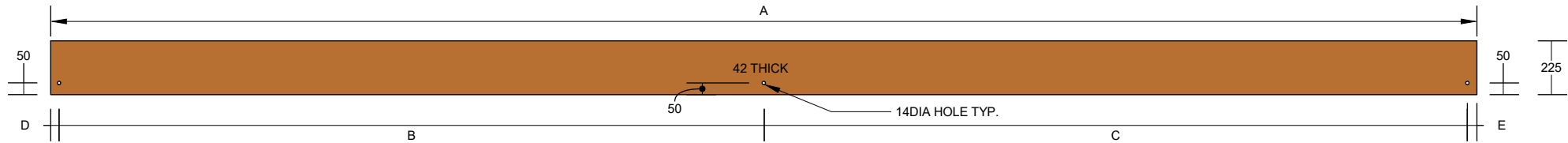
1 - 1:200 @ A3

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS.
2. REFER TO DRAWING S102 FOR BEAM SPACINGS.
3. ALL JOISTS AND BLOCKING TO BE TREATED TO H3.2.
4. 200X50 H3.2 SG8 BLOCKING TO BE USED BETWEEN JOISTS AT 1000 CENTRES. FIXED AS PER NZS3604 WITH SS316 FIXINGS.
5. ALL JOISTS TO BE GRADE 10 GLULAM TIMBER MANUFACTURED TO AS/NZS 1328 AND AS 5068. MOISTURE CONTENT TO BE 12 – 16%. PUR RESINS TO BE USED.
6. JOISTS FIXED TO STEELWORK CLEATS. REFER DRAWINGS S120 TO S123 FOR CLEATS AND S102 FOR REQUIRED BOLTS/WASHERS.
7. ALL HOLES IN TIMBER ELEMENTS SHALL BE PRE-DRILLED, INCLUDING HOLES FOR SCREWS, NAILS, BOLTS.
8. GLULAM BEAMS COATED WITH "DRYDENS WOODOIL" COLOUR = "BIRCH"

GLULAM MECHANICAL PROPERTIES:

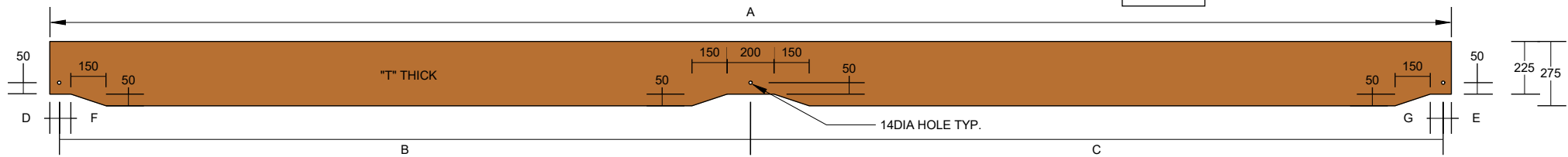
1. GLULAM BEAMS GRADE GL10.
2. DENSITY = 600 KG/M³
3. MODULUS OF ELASTICITY = 10,000 MPA FOR GL10 FROM AS/NZS 1328.2 TABLE 1.2.
4. CHARACTERISTIC BENDING = 22 MPA FOR GRADE GL10 FROM AS/NZS 1328.2 TABLE 1.2
5. CHARACTERISTIC SHEAR = 3.7 MPA FOR GRADE GL10 FROM AS/NZS 1328.2 TABLE 1.2.
6. CREEP FACTOR FOR GLULAM = 150% FROM NZS3603 8.7.4K1 = 0.8 (MEDIUM TERM LOADING FOR DEAD + LIVE);
7. NO PRECAMBER REQUIRED.



GLULAM INTERNAL BEAM

2 - 1:25 @ A3

	A	B	C	D	E	QUANTITY
XB1-XB3 Type 3	5789	2645	3018	349	25	1
XB1-XB3 Type 4	5745	2602	3018	322	25	1
XB1-XB3 Type 5	5701	2557	3018	297	25	1
XB1-XB3 Type 6	5685	2536	3016	283	35	1
XB1-XB3 Type 7	5640	2491	3016	257	34	1
XB1-XB3 Type 8	5596	2447	3016	230	34	1
XB3-XB5 Type 3-5	6093	3017	3002	34	40	3
XB3-XB5 Type 6-8	6093	3017	3012	25	39	3
XB5-XB7 Type 3-8	5980	2955	2950	35	40	6
XB7-XB29 Type 3-8	5980	2955	2955	35	35	66
XB29-XB31 Type 3-8	6090	2955	3000	35	150	6
						90



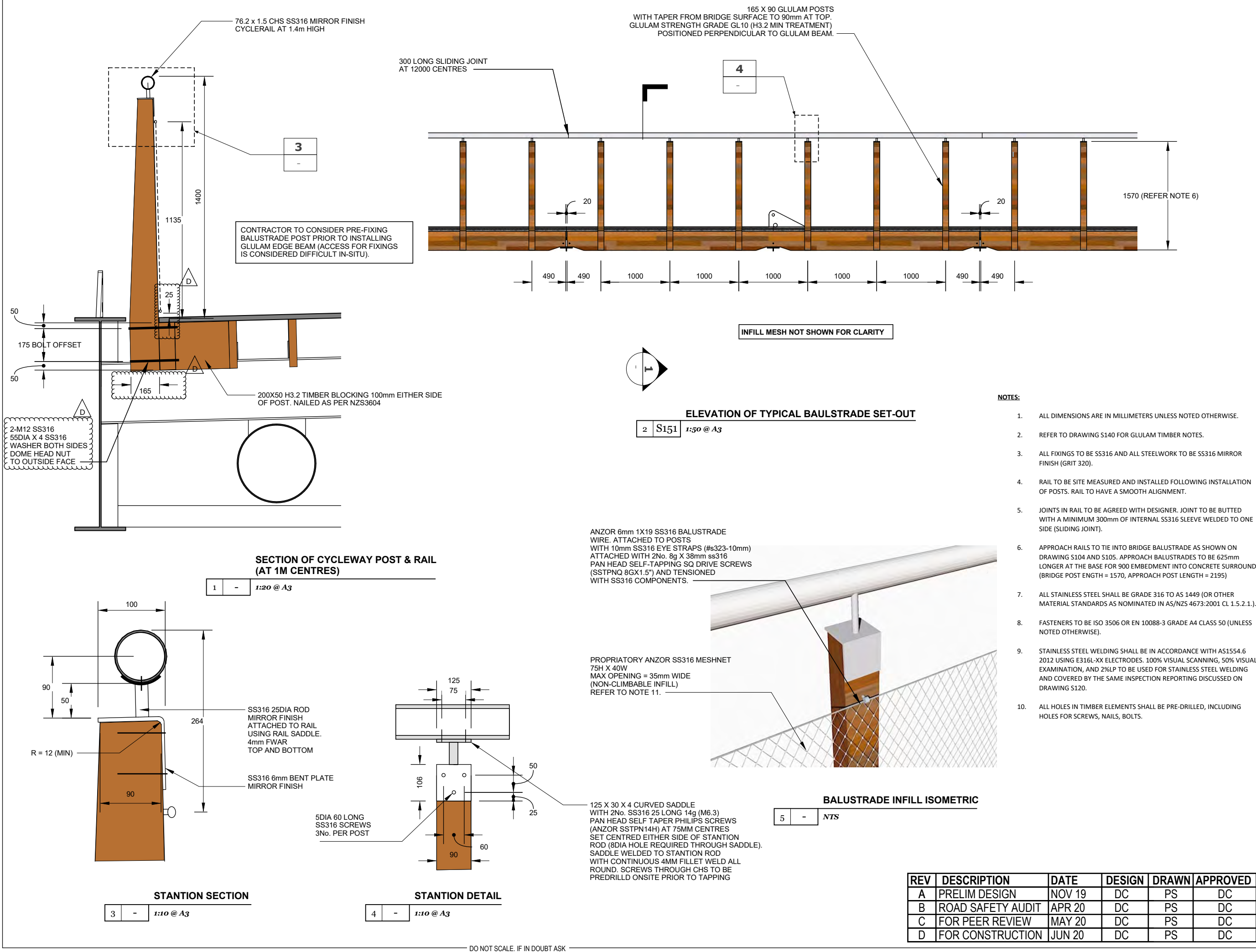
GLULAM OUTER BEAMS

3 - 1:50 @ A3

	T	A	B	C	D	E	F	G	QUANTITY
XB1-XB3 Type 1	88	5878	2725	3018	394	40	120	50	1
XB1-XB3 Type 2	42	5831	2681	3017	369	36	108	54	1
XB1-XB3 Type 9	42	5555	2411	3017	209	23	98	67	1
XB1-XB3 Type 10	88	5508	2367	3016	181	19	91	71	1
XB3-XB5 Type 1	88	6092	3017	3015	20	40	70	50	1
XB3-XB5 Type 2	42	6092	3018	3012	23	40	70	50	1
XB3-XB5 Type 9	42	6097	3017	3000	40	40	70	50	1
XB3-XB5 Type 10	88	6093	3018	2995	40	40	70	50	1
XB5-XB7 Type 1,10	88	5980	2950	2955	40	35	70	50	2
XB5-XB7 Type 2,9	42	5980	2950	2955	40	35	70	50	2
XB7-XB29 Type 1,10	88	5980	2955	2955	35	35	70	50	22
XB7-XB29 Type 2,9	42	5980	2955	2955	35	35	70	50	22
XB29-XB31 Type 1,10	88	6090	2955	3000	35	150	70	100	2
XB29-XB31 Type 2,9	42	6090	2955	3000	35	150	70	100	2
									60

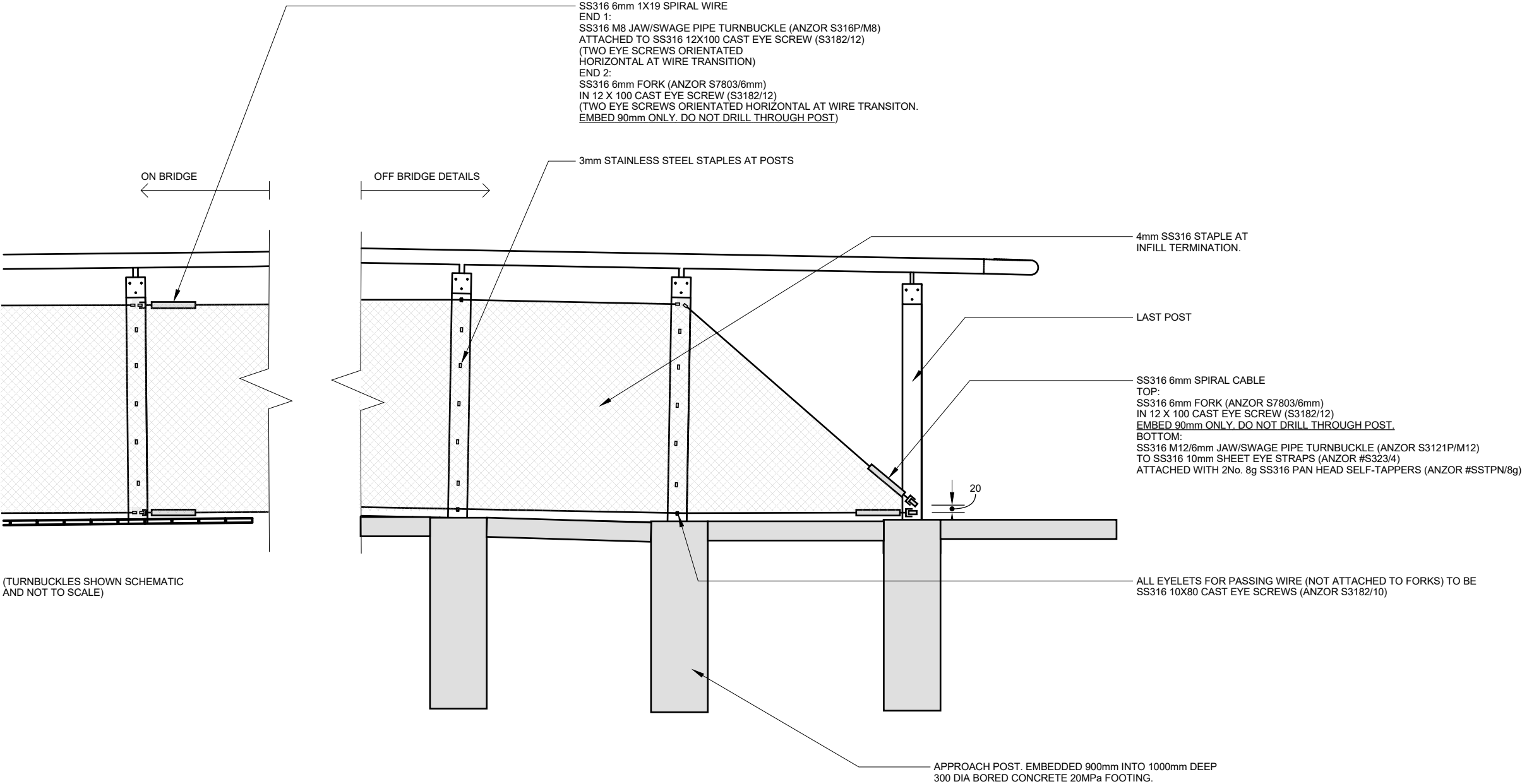
REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
A	PRELIM DESIGN	NOV 19	DC	PS	DC
B	(NOT USED)				
C	FOR PEER REVIEW	MAY 20	DC	PS	DC
D	FOR CONSTRUCTION	JUN 20	DC	PS	DC

DO NOT SCALE. IF IN DOUBT ASK



NOTES:

1. REFER TO DRAWING S150 FOR NOTES RELATING TO BALUSTRADES.



INTERMEDIATE WIRE TRANSITION
(8No. ALONG BRIDGE, EVERY 9 POSTS)

IW	-	1:25 @ A3
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APPROACH BALUSTRADE INFILL TERMINATION DETAIL
(ALL ENDS OF BRIDGE SIMILAR)

BT	-	1:25 @ A3
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REV	DESCRIPTION	DATE	DESIGN	DRAWN	APPROVED
A	PRELIM DESIGN	NOV 19	DC	PS	DC
B	ROAD SAFETY AUDIT	APR 20	DC	PS	DC
C	FOR PEER REVIEW	MAY 20	DC	PS	DC
D	FOR CONSTRUCTION	JUN 20	DC	PS	DC