1. GENERAL NOTES:

- THE STRUCTURAL DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE SPECIFICATION AND ALL OTHER PROJECT DRAWINGS. ANY DISCREPANCIES SHALL BE REFERRED TO THE DESIGNER FOR RESOLUTION.
- THE PRESENCE, LOCATION AND DETAILS OF NIBS, UPSTANDS, RECESSES, PLINTHS, PENETRATIONS, INSERTS, SLEEVES, CHASES, REBATES, CAST-IN FIXINGS, BRACKETS, HOLES, FLASHINGS, DAMP-PROOFING AND WATERPROOFING etc are not necessarily shown on the structural drawings. Refer to other project drawings for these items.
- THE LOCATION, SIZE AND DETAILS OF ALL PENETRATIONS, RECESSES, SLEEVES, HOLES etc IN STRUCTURAL MEMBERS, MUST BE APPROVED BY THE DESIGNER PRIOR TO CONSTRUCTION UNLESS SHOWN ON THE STRUCTURAL DRAWINGS. THESE ITEMS SHALL BE CAST-IN, FORMED, OR SHOP FABRICATED AND SHALL NOT BE CUT OR CORED ON SITE, UNLESS NOTED OTHERWISE OR APPROVED BY
- SUBSTITUTION FOR OR AMENDMENT OF SPECIFIED DETAILS OR MATERIALS SHALL NOT BE CARRIED OUT WITHOUT APPROVAL OF THE DESIGNER.
- NOTE REQUIREMENTS FOR:
- PROPPING DOCUMENTATION
- MATERIAL SPECIFICATION
- TOLERANCES
- ARE INCLUDED IN THE SPECIFICATION
- STANDARDS LISTED REFER TO THEIR LATEST ISSUE INCLUDING AMENDMENTS THAT ARE CURRENT AT THE TIME OF PREPARING THESE DRAWINGS

DIMENSIONS:

- VERIFY ALL DIMENSIONS WITH SERVICES AND ALL OTHER PROJECT DRAWINGS PRIOR TO CONSTRUCTION COMMENCING. ANY DISCREPANCIES SHALL BE REFERRED TO THE DESIGNER FOR RESOLUTION.
- ALL DIMENSIONS ARE IN MILLIMETRES. UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS TO EXISTING WORK SHALL BE VERIFIED BY SITE MEASUREMENTS PRIOR TO FABRICATION.

ALTERNATE BAR REVERSED MS MILD STEEL

3. ABBREVIATIONS:

ABR	ALTERNATE BAR REVERSED	MS	MILD STEEL
ALT	ALTERNATE	(N)	NEW
APPROX	APPROXIMATE	NA	NOT APPLICABLE
ADDNL	ADDITIONAL	NB	NOMINAL BORE
В	BOTTOM	NDT	NON DESTRUCTIVE TESTING
BBW	BACK OF BACK WALL	NF	NEAR FACE
BEL	BULK ELEVATION LEVEL	NTS	NOT TO SCALE
BLKG	BLOCKING	O/A	OVERALL
BM	BEAM	O/H	OVERHEAD
C	COVER	OD	OUTSIDE DIAMETER
	CONCRETE BLOCK	OPP	OPPOSITE
CB		PC	
CAR	COVER ALL ROUND		PRECAST CONCRETE
C/C	CENTRE TO CENTRE	PCD	PITCH CIRCLE DIAMETER
CHS	CIRCULAR HOLLOW SECTION	PFC	PARALLEL FLANGED CHANNEL
CJ .	CONSTRUCTION JOINT	PL, ₽	PLATE
CL, Œ	CENTRELINE	PSC	PRESTRESSED CONCRETE
COL	COLUMN	R	PLAIN BAR GRADE 300E
CONC	CONCRETE	RAD	RADIUS
CONN	CONNECTION	R.A.D.	REFER ARCHITECTS DRAWINGS
CONT	CONTINUOUS	RC	REINFORCED CONCRETE
COS	CHECK ON SITE	REBAR	REINFORCEMENT
CRS	CENTRES	REF	REFER, REFERENCE
D	DEFORMED BAR GRADE 300E	REINF	REINFORCEMENT
DET	DETAIL DETAIL	RH	PLAIN BAR GRADE 500E
DH	DEFORMED BAR GRADE 500E	RB	REID BAR GRADE 500E
		RHS	
DIA	DIAMETER	RL	RECTANGULAR HOLLOW SECTION
DIAG	DIAGONAL		REDUCED LEVEL
DIM	DIMENSION	DOC E	ROLLED STEEL ANGLE
DOS	DETERMINE ON SITE		ROLLED STEEL CHANNEL
DP	DOWNPIPE	SHS	SQUARE HOLLOW SECTION
DPC	DAMP PROOF COURSE	SIM	SIMILAR
DWG	DRAWING	SJ	SAW CUT JOINT
EA	EQUAL ANGLE	SQ	SQUARE
EF	EACH FACE	S/S	STAINLESS STEEL
EL, ELEV	ELEVATION	STA	STARTER
EW	EACH WAY	STD	STANDARD
EX	OUT OF	STG	STAGGER
EXTG (E)	EXISTING	STIFF	STIFFENER
FDN	FOUNDATION	STRP	STIRRUP
FF	FAR FACE	SYMM	SYMMETRICAL
FFL	FINISHED FLOOR LEVEL	T	TOP
FIG #	FIGURE	TFB	TAPER FLANGE BEAM
FL,	FLAT	TFC	TAPER FLANGE CHANNEL
FLG	FLANGE	THK	THICK
FRR	FIRE RESISTANCE RATING	TO	TOP OF
FW	FILLET WELD	TOC	TOP OF CONCRETE
FWAR	FILLET WELD ALL ROUND	TOG	TOP OF GRATING
GA	GAUGE	TORC	
		TOS	TOP OF ROUGH CONCRETE
GL	GROUND LEVEL	TRM	TOP OF STEEL
GPC	GROUT-PROOF COURSE		TRIMMER
	HOT DIPPED GALVANISED	UA	UNEQUAL ANGLE
HORIZ	HORIZONTAL	UB	UNIVERSAL BEAM
ID	INSIDE DIAMETER	UC	UNIVERSAL COLUMN
IL	INVERT LEVEL	UNO	UNLESS NOTED OTHERWISE
IP	INTERSECTION POINT	U/S	UNDERSIDE
LAR	LAP AT RANDOM	VERT	VERTICAL
Ld	DEVELOPMENT LENGTH	WB	WELDED BEAM
LG	LONG	WC	WELDED COLUMN
MAX	MAXIMUM	WP	WORK POINT
MIN	MINIMUM	JL	DOUBLE RSA BACK TO BACK

4. REINFORCED CONCRETE:

CONCRETE STRENGTHS ARE SPECIFIED 28 DAY COMPRESSIVE STRENGTHS AS DEFINED IN NZS3109 CONCRETE STRENGTHS ARE GENERALLY SPECIFIED ON INDIVIDUAL DRAWINGS WHERE NOT SPECIFIED CONCRETE STRENGTH SHALL BE 40MPa.

4.2 CONCRETE SURFACE FINISHES

SURFACE FINISHES ARE GENERALLY SPECIFIED ON INDIVIDUAL DRAWINGS. WHERE NOT SPECIFIED, SURFACE FINISHES SHALL BE AS FOLLOWS: (REFER NZS 3114 FOR DEFINITIONS)

a) FORMED FOUNDATION SURFACES:	-F1
b) CONCEALED FORMED SURFACES OF : BEAMS, COLUMNS, WALLS, PANELS AND SLAB EDGES	-F1
c) EXPOSED FORMED SURFACES OF: BEAMS, COLUMNS, WALL, PANELS AND SLAB EDGES	-F5
d) EXPOSED UNFORMED SURFACES	-U2
e) CONCEALED UNFORMED SURFACES.	-U1
f) TOP SURFACE OF BRIDGE DECKS, SUBWAY FLOORS AND CYCLEWAYS	-U5

4.3 CONCRETE COVERS TO REINFORCEMENT

h) 20x20 FILLETS AND CHAMFERS TO BE USED ON CORNERS UNO.

MINIMUM CONCRETE COVERS ARE GENERALLY SPECIFIED ON INDIVIDUAL DRAWINGS, WHERE NOT SPECIFIED, MINIMUM CONCRETE COVER SHALL BE AS FOLLOWS:

EXPOSED SITUATION	MIN COVER (mm)
CAST AGAINST AND EXPOSED TO EARTH	75
CAST AGAINST DPC OR SITE CONCRETE	50
EXPOSED TO EARTH OR WEATHER	50
NOT EXPOSED TO EARTH OR WEATHER	35

NOTES:

- a) TOLERANCES ON COVERS SHALL BE
 - FOR 20mm BAR DIAMETER & UNDER +10. -0
- FOR BAR DIAMETER LARGER THAN 20mm: +15,-0
 b) THE CONSTRUCTOR'S ATTENTION IS DRAWN TO THE ZERO TOLERANCE SPECIFIED FOR COVERS. IT IS RECOMMENDED THAT ALL REINFORCEMENT IS BENT, FABRICATED AND SUPPORTED TO PROVIDE A +5mm TOLERANCE OVER AND ABOVE THE SPECIFICED MINIMUM COVERS TO ENSURE COMPLIANCE WITH SPECIFIED MINIMUM COVER.

4.4 PLACING AND SPACING OF REINFORCEMENT - GENERAL

- a) GRADE 500 REINFORCEMENT MAY BE MANUFACTURED BY THE MICROALLOY OR QUENCHED AND TEMPERED PROCESS. BUT NOTE THE RESTRICTIONS ON THE USE OF QUENCHED AND TEMPERED STATED IN THE SPECIFICATION
- b) SPLICING OF REINFORCEMENT, WHETHER BY LAPPING, WELDING OR MECHANICAL SPLICE, SHALL ONLY BE CARRIED OUT AS SHOWN ON THE DRAWINGS OR AS SPECIFICALLY APPROVED BY DESIGNER, EXCEPT AS NOTED BELOW:
- WELDED WIRE MESH SHALL BE SPLICED AS REQUIRED, BUT NOT THROUGH SLAB JOINTS REINFORCEMENT IN SLABS ON GRADE AND IN TOPPINGS SHALL BE SPLICED AS REQUIRED, BUT NOT THROUGH SLAB JOINTS.
- c) LAYERS OF BEAM REINFORCEMENT SHALL BE SEPARATED WITH R32 BARS AT 1500mm CENTRES. ALL HOOKS ON STIRRUPS & TIES MUST FIT CLOSELY AROUND MAIN BARS U.N.O; FIRST STIRRUP TO BE PLACED NOT FURTHER THAN THE LESSER OF HALF THE STIRRUP SPACING OR 50mm FROM SUPPORT FACE.

4.5 LAP SPLICES IN REINFORCEMENT

a) WELDED WIRE MESH MADE UP OF SMOOTH WIRES SHALL BE LAP SPLICED WITH A MINIMUM 200mm OVERLAP BETWEEN OUTERMOST CROSS WIRES THUS:



- b) WELDED MESH MADE UP OF DEFORMED BARS SHALL BE LAP SPLICED
- c) LAP LENGTHS FOR DEFORMED BARS WHERE NOT SHOWN ON THE DRAWINGS SHALL BE AS SHOWN IN THE FOLLOWING TABLES WHERE SPACING OF ADJACENT BARS ARE EQUAL TO OR GREATER THAN 2.5 db
- d) LAP LENGTHS FOR PLAIN ROUND BARS SHALL BE TWICE THOSE SHOWN IN THE FOLLOWING TABLES
- e) ALL BEAM AND COLUMN MAIN REINFORCEMENT LAP SPLICES SHALL HAVE CRANKED LAPS UNO.

CRANKED LAPS SHALL BE THUS:	_LAP LENGTH_	l	12db MIN. WITH
	REFER TABLE		9db MIN. RADIUS

LAP LENGTHS ARE IN ACCORDANCE WITH NZS 3101.

- NOTE, RE: USE OF FOLLOWING TABLES:
- TOP BAR FACTOR IS 1.0 FOR ALL VERTICAL BARS (COLUMNS, WALLS) AND FOR HORIZONTAL BARS WITH LESS THAN 300mm OF FRESH CONCRETE CAST BENEATH BAR (TYPICALLY BEAM BOTTOM BARS AND SLAB BARS).
- TOP BAR FACTOR IS 1.3 FOR ALL HORIZONTAL BARS WITH MORE THAN 300mm OF FRESH CONCRETE CAST BENEATH THE BAR (TYPICALLY BEAM |

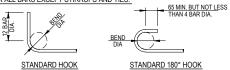
TOP BARS AND HORIZONTAL WALL BARS).				BAR DIAMETER					
TOT BAILD AND HORIZONTAL WALL BAILD).			10	12	16	20	25	32	
CONCRETE	30 MPa	TOP BAR FACTOR = 1.3	360	430	570	715	895	1140	
STEEL GRADE	300 MPa	TOP BAR FACTOR = 1	300	330	440	550	685	880	
CONCRETE	40 MPa	TOP BAR FACTOR = 1.3	310	370	495	620	775	990	
STEEL GRADE 300 MPa		TOP BAR FACTOR = 1	300	300	380	475	595	760	
CONCRETE	50 MPa	TOP BAR FACTOR = 1.3	300	335	445	555	690	885	
STEEL GRADE	300 MPa	TOP BAR FACTOR = 1	300	300	340	425	530	680	
CONCRETE	30 MPa	TOP BAR FACTOR = 1.3	595	715	950	1190	1485	1900	
STEEL GRADE	500 MPa	TOP BAR FACTOR = 1	460	550	735	915	1145	1465	
CONCRETE	40 MPa	TOP BAR FACTOR = 1.3	515	620	825	1030	1285	1645	
STEEL GRADE	500 MPa	TOP BAR FACTOR = 1	400	475	635	795	990	1265	
CONCRETE	50 MPa	TOP BAR FACTOR = 1.3	460	555	735	920	1150	1475	
STEEL GRADE	500 MPa	TOP BAR FACTOR = 1	355	425	570	710	885	1135	

h) SPIRAL SPLICES AND TERMINATIONS

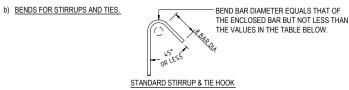
SPLICING OF ADJACENT LENGTHS OF SPIRAL SHALL BE FITHER BY PROVIDING 135° STIRRUP HOOKS AS FOR CIRCULAR HOOPS, OR BY WELDED LAP SPLICES. ANCHORAGE OF A SPIRAL BAR AT THE TERMINATION OF THE LENGTH OF SPIRAL SHALL BE PROVIDED BY AN EXTRA ONE-HALF TURN OF THE SPIRAL PLUS EITHER A 135° STIRRUP HOOK OR A WELDED LAP SPLICE TO THE PREVIOUS TURN. WELDED SPLICES IN SPIRALS SHALL COMPLY WITH AS/NZS 1554.3 ALL WELDS SHALL BE CLASS SP.

4.6 BENDING OF REINFORCEMENT

a) BENDS FOR ALL BARS EXCEPT STIRRUPS AND TIES



STEEL GRADE	BAR DIAMETER	MINIMUM BEND DIAMETER
GRADE 300	6 TO 20	5 BAR DIAMETERS
GRADE 500 FOR CONCRETE STRENGTH EQUAL TO OR MORE THAN 40 MPa	25 TO 40	6 BAR DIAMETERS
GRADE 500	6 TO 20	8 BAR DIAMETERS
OR CONCRETE STRENGTH ESS THAN 40 MPa	25 TO 40	10 BAR DIAMETERS

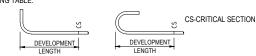


STEEL GRADE	BAR DIAMETER	MINIMUM BE	ND DIAMETER
STEEL GRADE	BAR DIAWETER	PLAIN BARS	DEFORMED BARS
GRADE 300/500	6 TO 20	2 BAR DIAMETERS	4 BAR DIAMETERS
GRADE 300/500	25 TO 32	3 BAR DIAMETERS	6 BAR DIAMETERS

- c) BARS PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE SITE BENT & BARS SHALL NOT BE RE-BENT UNLESS SHOWN ON THE DRAWINGS OR SPECIFICALLY APPROVED BY THE DESIGNER.
- d) THE ABOVE BEND DIAMETERS DO NOT APPLY TO GALVANISED REINFORCEMENT

$\underline{\text{4.7 REINFORCEMENT ANCHORAGE WITH STANDARD HOOKS.}}$

- a) DEVELOPMENT LENGTH PAST CRITICAL SECTION (SHOWN CS ON DRAWING) FOR DEFORMED BARS SHALL BE AS PER TABLE BELOW.
- b) DEVELOPMENT LENGTH FOR PLAIN ROUND BARS SHALL BE TWICE THOSE SHOWN IN THE



NOTES: STANDARD HOOK STANDARD 180° HOOF

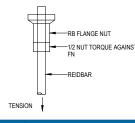
SIDE COVER FACTOR = 0.7 FOR SIDE COVER EQUAL TO OR GREATER THAN 60mm WITH HOOK COVER NOT LESS THAN 40mm

SIDE COVER FACTOR = 1.0 IN ALL OTHER SITUATIONS.

		BAR DIAMETER					
		10	12	16	20	25	32
30 MPa	COVER FACTOR = 1	135	160	215	265	330	425
300 MPa	COVER FACTOR = 0.7	95	115	150	185	235	295
40 MPa	COVER FACTOR = 1	115	140	185	230	285	365
300 MPa	COVER FACTOR = 0.7	80	100	130	160	200	260
50 MPa	COVER FACTOR = 1	105	125	165	205	255	330
300 MPa	COVER FACTOR = 0.7	75	90	115	145	180	230
30 MPa	COVER FACTOR = 1	220	265	355	440	550	705
500 MPa	COVER FACTOR = 0.7	155	185	250	310	385	495
40 MPa	COVER FACTOR = 1	190	230	305	380	475	610
500 MPa	COVER FACTOR = 0.7	135	160	215	270	335	430
50 MPa	COVER FACTOR = 1	170	205	275	340	425	545
500 MPa	COVER FACTOR = 0.7	120	145	195	240	300	385
	300 MPa 40 MPa 300 MPa 50 MPa 300 MPa 300 MPa 500 MPa 40 MPa 500 MPa 500 MPa	300 MPa COVER FACTOR = 0.7 40 MPa COVER FACTOR = 1 300 MPa COVER FACTOR = 0.7 50 MPa COVER FACTOR = 1 300 MPa COVER FACTOR = 0.7 30 MPa COVER FACTOR = 1 500 MPa COVER FACTOR = 0.7 40 MPa COVER FACTOR = 1 500 MPa COVER FACTOR = 0.7 50 MPa COVER FACTOR = 1 50 MPa COVER FACTOR = 1	30 MPa COVER FACTOR = 1 135 300 MPa COVER FACTOR = 0.7 95 40 MPa COVER FACTOR = 1 115 300 MPa COVER FACTOR = 0.7 80 50 MPa COVER FACTOR = 1 105 300 MPa COVER FACTOR = 0.7 75 30 MPa COVER FACTOR = 1 220 500 MPa COVER FACTOR = 0.7 155 40 MPa COVER FACTOR = 1 190 500 MPa COVER FACTOR = 0.7 135 50 MPa COVER FACTOR = 1 170 50 MPa COVER FACTOR = 1 170	30 MPa 300 MPa COVER FACTOR = 1 135 160 160 MPa COVER FACTOR = 0.7 95 115 140 MPa COVER FACTOR = 0.7 80 100 MPa COVER FACTOR = 0.7 80 100 MPa COVER FACTOR = 0.7 75 90 MPa COVER FACTOR = 0.7 75 90 MPa COVER FACTOR = 1 220 265 500 MPa COVER FACTOR = 0.7 155 185 40 MPa COVER FACTOR = 1 190 230 MPa COVER FACTOR = 1 190 230 MPa COVER FACTOR = 0.7 135 160 MPa COVER FACTOR = 0.7 135 160 MPa COVER FACTOR = 1 170 205 MPa COVER FACTOR = 1 170 205	10 12 16 16 17 16 17 16 17 16 17 17	30 MPa	10

4.8 ANCHORAGE BY REIDBAR FLANGE NUTS

WHEN A FLANGE NUT IS REQUIRED TO DEVELOP FULL BREAKING STRENGTH OF BAR, TORQUE BY ROTATION BEYOND HAND TIGHT SHALL BE AS GIVEN IN TABLE

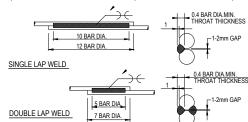


or approval or to fulfil a legal requirement.

TORQUE ROTATION				
RB12	2 FLATS OF THE NUT			
RB16	1 ½ FLAT OF THE NUT			
RB20	1 1/4 FLATS OF THE NUT			
RB25	1 FLAT OF THE NUT			
RB32	½ FLAT OF THE NUT			

4.9 WELDING OF REINFORCEMENT

- a) WELDING OF REINFORCEMENT SHALL ONLY BE CARRIED OUT WITH THE EXPRESS APPROVAL OF THE DESIGNER
- b) WELDING SHALL COMPLY WITH PACIFIC STEEL LIMITED PRODUCT TECHNICAL DATA 'PACIFIC STEEL SEISMIC REINFORCING BAR WELDING AND BENDING PROCEDURE' AND AS/NZS 1554.3 WELDING OF REINFORCING STEEL.
- c) WELDED SPLICES SHALL BE CLASS SP.
- d) WELDING ELECTRODES SHALL BE TO AS/NZS 1554.3.
- e) QUENCHED AND TEMPERED BARS SHALL NOT BE WELDED.
- f) WELDED SPLICES MAY BE EITHER: (GRADE 300 E OR GRADE 500 E).



5. STRUCTURAL STEEL NOTES

5.1 MATERIALS

a) ALL STEEL MEMBERS SHALL CONFORM TO AS/NZS 3678, AS/NZS 3679.1 OR EQUIVALENT. FOR STEEL GRADES, REFER DETAIL DRAWINGS.

ALL GUSSET PLATES, CLEATS & STIFFENERS SHALL BE 10mm THICK UNO, & GRADE 250 STEEL TO AS1204 OR EQUIVALENT UNO.

5.2 FABRICATION SHALL COMPLY WITH NZS 3404, (AS MODIFIED BELOW)

a) STRAIGHTNESS OF MEMBERS AFTER FABRICATION & BEFORE ERECTION UNO SHALL NOT DEVIATE MORE THAN:

OTHER MEMBERS = L/600

b) LENGTH SHALL NOT DEVIATE FROM THE TRUE LENGTH BY:

STRUTS WITH END BEARING OTHER MEMBERS UP TO L = 9.0m = +Omm. -3mm OTHER MEMBERS OVER L = 9.0m = +Omm, -5mm

c) PLUMBNESS OF STRUTS/COLUMNS SHALL BE WITHIN L/1000 OF TRUE

5.3 BOLTING

- a) ALL HOLES SHALL BE DRILLED & SHALL BE 2mm LARGER THAN THE BOLT DIAMETER FOR BOLTS UNDER 30mm DIA, AND 3mm LARGER FOR M30 BOLTS & LARGER UNO. HOLES IN BASEPLATES MAY BE 6mm LARGER THAN THE BOLT DIAMETER UNO.
- b) ALL BOLTS SHALL HAVE AT LEAST ONE THREAD PROJECTING THROUGH BOTH SIDES OF NUT.
- c) ALL BOLTS SHALL BE M20-8.8/S UNO.
- d) ALL BOLTS, NUTS & WASHERS (EXCEPT VSL STRESS-BARS) SHALL BE HOT DIP GALVANISED BY THE MANUFACTURER TO CONFORM TO AS
- e) TIGHTENING PROCEDURE SHALL COMPLY WITH AS 1511 BOLTING ABBREVIATIONS ARE TO AS 1511

5.4 BENDING OF FLAT OR PLATE

a) BENT FLAT OR PLATE SHALL BE BENT AROUND A ROUND FORMER OF MINIMUM RADIUS OF 2.5xPLATE OR FLAT THICKNESS.

5.5 WELDING SHALL COMPLY WITH AS/NZS 1554

- a) ALL WELDS SHALL BE 5mm CONTINUOUS FILLET UNO. REFERENCE AS/NZS 1554.1
- b) WELDING ELECTRODES SHALL BE E48XX TO AS/NZS 1553 UNO.
- c) FOR WORK EXPOSED TO THE WEATHER, SEAL WELDS SHALL BE MADE WHETHER SHOWN ON THE DRAWINGS OR NOT, UNLESS SPECIFICALLY NOT REQUIRED.

5.6 CORROSION PROTECTION

ALL STEELWORK TO BE HOT DIP GALVANISED TO HDG600 IN ACCORDANCE WITH AS/NZS 2312 UNLESS NOTED OTHERWISE ON THE

FOR CONSENT

0	FOR CONSENT	AF	DGA	GAP	29.08.
No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date



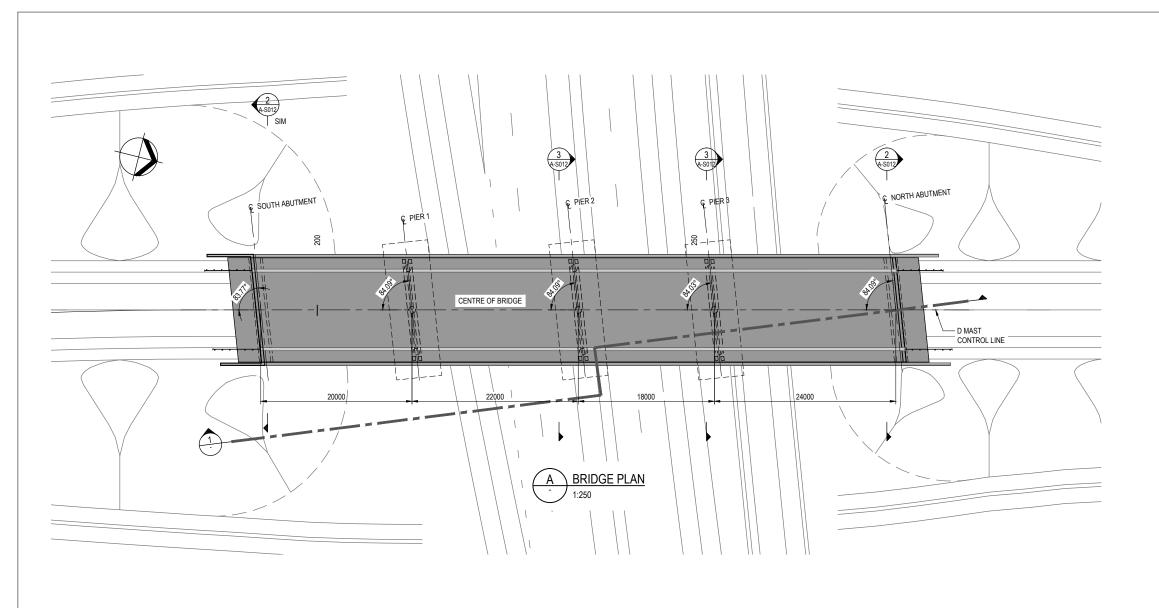




DO NOT SCALE	Drawn JRO	Designed VWL	Client
This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any	Drafting VWL	Design NLS	Project
employee or sub-consultant of these companies with respect to its use by any other	Approved GARY PAYNE		
person. This disclaimer shall apply notwithstanding	Date 29.08.12		Title
that the drawing may be made available to	A1 Scale	This Drawing must not be	

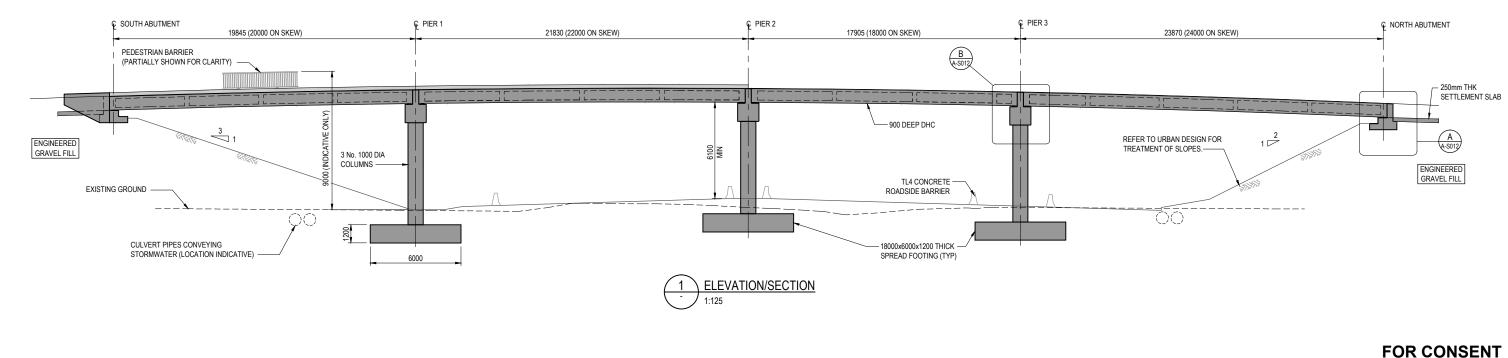
NEW ZEALAND TRANSPORT AGENCY SH1 REGION 11 RP350/3.92 TO RP365/2.11 MAIN SOUTH ROAD FOUR LANING STRUCTURAL - GENERAL NOTES

Drawing No: 62236-A-S000





WEEDONS ROAD UNDERPASS				
62236-A-S011	GENERAL ARRANGEMENT			
62236-A-S012	ELEVATION & DETAIL			



0 FOR CONSENT

No Revision Note: 'indicates signatures on original issue of drawing or last revision of drawing Drawn Checked Approved Date



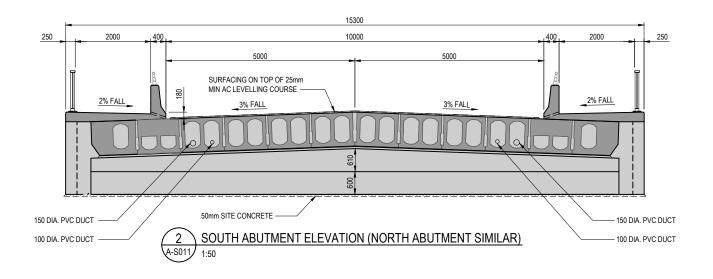


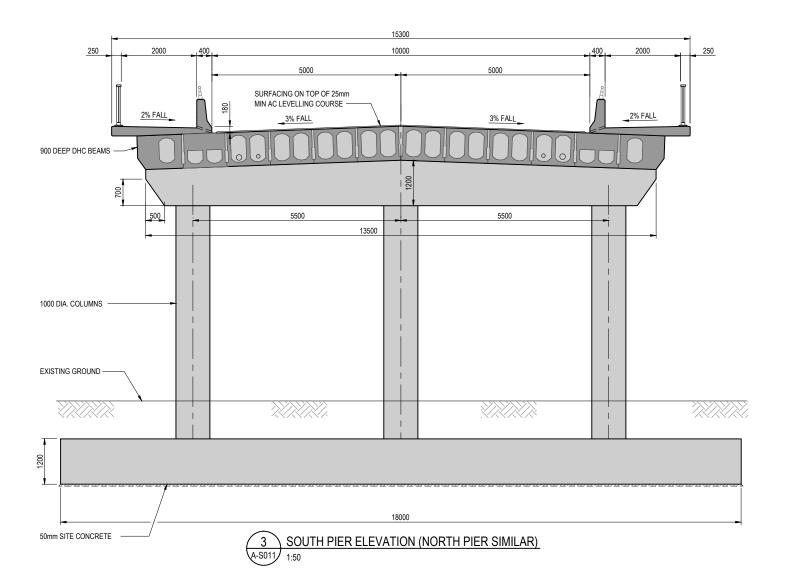


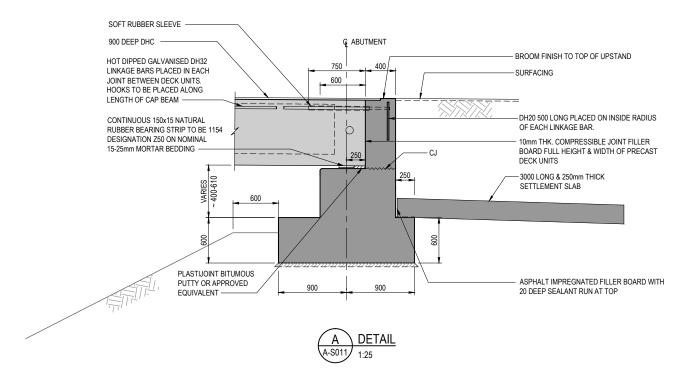
DO NOT SCALE	Drawn JRO	Designed VWL	Clien
	Drafting VWL	Design Check NLS	Proje
employee or sub-consultant of these	Approved GARY PAYNE		
	Date 29.08.12		Title
that the drawing may be made available to other persons for an application for permission	A1 Scale AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	
		This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person. Approved GARY PAYNE Date 29.08.12 Approved GARY PAYNE Date 29.08.12 At Scale As SHOWN	This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any employee or sub-consultant of these companies with respect to its use by any other person. Approved GARY PAYNE Date 29.08.12 This Drawing must not be used for Construction unless used for Construction unless used for Construction unless.

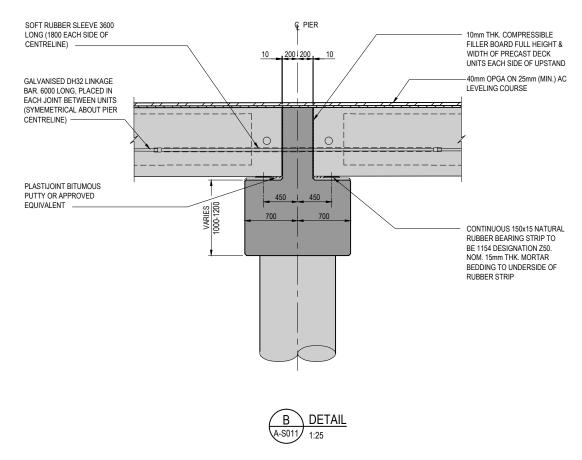
ent NEW ZEALAND TRANSPORT AGENCY
SH1 REGION 11 RP350/3.92 TO RP365/2.11
MAIN SOUTH ROAD FOUR LANING
G.A. - WEEDONS ROAD UNDERPASS

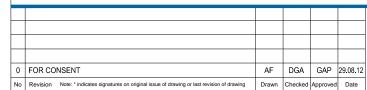
Drawing No: 62236-A-S011

















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employee or sub-consultant of these companies with respect to its use by any other	Approved	GARY PAYNE	•		
erson.	Date	29.08.12			Title
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NEW ZEALAND TRANSPORT AGENCY SH1 REGION 11 RP350/3.92 TO RP365/2.11 MAIN SOUTH ROAD FOUR LANING ELEV. & DETAIL - WEEDONS ROAD UNDERPASS

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- THE PRESENCE, LOCATION AND DETAILS OF NIBS, UPSTANDS, RECESSES, PLINTHS, PENETRATIONS, INSERTS, SLEEVES, CHASES, REBATES, CAST-IN FIXINGS, BRACKETS, HOLES, FLASHINGS, DAMP-PROOFING AND WATERPROOFING etc are not necessarily shown on the structural drawings. Refer to other project drawings for these items.
- THE LOCATION, SIZE AND DETAILS OF ALL PENETRATIONS, RECESSES, SLEEVES, HOLES etc IN STRUCTURAL MEMBERS, MUST BE APPROVED BY THE DESIGNER PRIOR TO CONSTRUCTION UNLESS SHOWN ON THE STRUCTURAL DRAWINGS. THESE ITEMS SHALL BE CAST-IN, FORMED, OR SHOP FABRICATED AND SHALL NOT BE CUT OR CORED ON SITE, UNLESS NOTED OTHERWISE OR APPROVED BY
- SUBSTITUTION FOR OR AMENDMENT OF SPECIFIED DETAILS OR MATERIALS SHALL NOT BE CARRIED OUT
- WITHOUT APPROVAL OF THE DESIGNER. NOTE - REQUIREMENTS FOR:
- PROPPING DOCUMENTATION
- INSPECTION AND TESTING DOCUMENTS
- MATERIAL SPECIFICATION
- TOLERANCES
- ARE INCLUDED IN THE SPECIFICATION
- STANDARDS LISTED REFER TO THEIR LATEST ISSUE INCLUDING AMENDMENTS THAT ARE CURRENT AT THE TIME OF PREPARING THESE DRAWINGS

DIMENSIONS:

- VERIFY ALL DIMENSIONS WITH SERVICES AND ALL OTHER PROJECT DRAWINGS PRIOR TO CONSTRUCTION COMMENCING. ANY DISCREPANCIES SHALL BE REFERRED TO THE DESIGNER FOR RESOLUTION.
- ALL DIMENSIONS ARE IN MILLIMETRES. UNLESS NOTED OTHERWISE.
- ALL DIMENSIONS TO EXISTING WORK SHALL BE VERIFIED BY SITE MEASUREMENTS PRIOR TO FABRICATION.

3. ABBREVIATIONS:

ABR	ALTERNATE BAR REVERSED	MS	MILD STEEL
ALT	ALTERNATE	(N)	NEW
APPROX	APPROXIMATE	NA	NOT APPLICABLE
ADDNL	ADDITIONAL	NB	NOMINAL BORE
В	BOTTOM	NDT	NON DESTRUCTIVE TESTING
BBW	BACK OF BACK WALL	NF	NEAR FACE
BEL	BULK ELEVATION LEVEL	NTS	NOT TO SCALE
BLKG	BLOCKING	O/A	OVERALL
BM	BEAM	O/H	OVERHEAD
С	COVER	OD	OUTSIDE DIAMETER
CB	CONCRETE BLOCK	OPP	OPPOSITE
CAR	COVER ALL ROUND	PC	PRECAST CONCRETE
C/C	CENTRE TO CENTRE	PCD	PITCH CIRCLE DIAMETER
CHS	CIRCULAR HOLLOW SECTION	PFC	PARALLEL FLANGED CHANNEL
CJ	CONSTRUCTION JOINT	PL, P	PLATE
CL, &	CENTRELINE	PSC R	PRESTRESSED CONCRETE
COL	COLUMN	RAD	PLAIN BAR GRADE 300E
CONC	CONCRETE	R.A.D.	RADIUS
CONN	CONNECTION	R.A.D.	REFER ARCHITECTS DRAWINGS
CONT	CONTINUOUS		REINFORCED CONCRETE
COS	CHECK ON SITE	REF	REINFORCEMENT
CRS	CENTRES	REINF	REFER, REFERENCE
D	DEFORMED BAR GRADE 300E DETAIL	RH	REINFORCEMENT PLAIN BAR GRADE 500E
DET		RB	REID BAR GRADE 500E
DH	DEFORMED BAR GRADE 500E DIAMETER	RHS	
DIA	DIAGONAL	RL	RECTANGULAR HOLLOW SECTION REDUCED LEVEL
DIAG DIM	DIMENSION		ROLLED STEEL ANGLE
DOS	DETERMINE ON SITE		ROLLED STEEL CHANNEL
DP DOS	DOWNPIPE	SHS	SQUARE HOLLOW SECTION
DPC	DAMP PROOF COURSE	SIM	SIMILAR
DWG	DRAWING	SJ	SAW CUT JOINT
EA	EQUAL ANGLE	SQ	SQUARE
EF	EACH FACE	S/S	STAINLESS STEEL
EL, ELEV		STA	STARTER
EW EW	EACH WAY	STD	STANDARD
EX	OUT OF	STG	STAGGER
EXTG (E)	EXISTING	STIFF	STIFFENER
FDN	FOUNDATION	STRP	STIRRUP
FF	FAR FACE	SYMM	SYMMETRICAL
FFL	FINISHED FLOOR LEVEL	T	TOP
FIG #	FIGURE	TFB	TAPER FLANGE BEAM
FL,	FLAT	TFC	TAPER FLANGE CHANNEL
FLG	FLANGE	THK	THICK
FRR	FIRE RESISTANCE RATING	TO	TOP OF
FW	FILLET WELD	TOC	TOP OF CONCRETE
FWAR	FILLET WELD ALL ROUND	TOG	TOP OF GRATING
GA	GAUGE	TORC	TOP OF ROUGH CONCRETE
GL	GROUND LEVEL	TOS	TOP OF STEEL
GPC	GROUT-PROOF COURSE	TRM	TRIMMER
H.D.GALV	HOT DIPPED GALVANISED	UA	UNEQUAL ANGLE
HORIZ	HORIZONTAL	UB	UNIVERSAL BEAM
ID	INSIDE DIAMETER	UC	UNIVERSAL COLUMN
IL	INVERT LEVEL	UNO	UNLESS NOTED OTHERWISE
IP	INTERSECTION POINT	U/S	UNDERSIDE
LAR	LAP AT RANDOM	VERT	VERTICAL
Ld	DEVELOPMENT LENGTH	WB	WELDED BEAM
LG	LONG	WC	WELDED COLUMN
MAX	MAXIMUM	WP	WORK POINT
MIN	MINIMUM	JL	DOUBLE RSA BACK TO BACK

4. REINFORCED CONCRETE:

CONCRETE STRENGTHS ARE SPECIFIED 28 DAY COMPRESSIVE STRENGTHS AS DEFINED IN NZS3109 CONCRETE STRENGTHS ARE GENERALLY SPECIFIED ON INDIVIDUAL DRAWINGS WHERE NOT SPECIFIED CONCRETE STRENGTH SHALL BE 40MPa.

4.2 CONCRETE SURFACE FINISHES

SURFACE FINISHES ARE GENERALLY SPECIFIED ON INDIVIDUAL DRAWINGS. WHERE NOT SPECIFIED, SURFACE FINISHES SHALL BE AS FOLLOWS: (REFER NZS 3114 FOR DEFINITIONS)

a) FORMED FOUNDATION SURFACES:	-F
b) CONCEALED FORMED SURFACES OF : BEAMS, COLUMNS, WALLS, PANELS AND SLAB EDGES	-F
c) EXPOSED FORMED SURFACES OF: BEAMS, COLUMNS, WALL, PANELS AND SLAB EDGES	-F
d) EXPOSED UNFORMED SURFACES	-U
e) CONCEALED UNFORMED SURFACES.	-U
f) TOP SURFACE OF BRIDGE DECKS, SUBWAY FLOORS AND CYCLEWAYS	-U

4.3 CONCRETE COVERS TO REINFORCEMENT

h) 20x20 FILLETS AND CHAMFERS TO BE USED ON CORNERS UNO.

MINIMUM CONCRETE COVERS ARE GENERALLY SPECIFIED ON INDIVIDUAL DRAWINGS, WHERE NOT SPECIFIED, MINIMUM CONCRETE COVER SHALL BE AS FOLLOWS:

EXPOSED SITUATION	MIN COVER (mm)
CAST AGAINST AND EXPOSED TO EARTH	75
CAST AGAINST DPC OR SITE CONCRETE	50
EXPOSED TO EARTH OR WEATHER	50
NOT EXPOSED TO EARTH OR WEATHER	35

NOTES:

- a) TOLERANCES ON COVERS SHALL BE
 - FOR 20mm BAR DIAMETER & UNDER +10. -0
- FOR BAR DIAMETER LARGER THAN 20mm: +15, -0

 b) THE CONSTRUCTOR'S ATTENTION IS DRAWN TO THE ZERO TOLERANCE SPECIFIED FOR COVERS. IT IS RECOMMENDED THAT ALL REINFORCEMENT IS BENT, FABRICATED AND SUPPORTED TO PROVIDE A +5mm TOLERANCE OVER AND ABOVE THE SPECIFICED MINIMUM COVERS TO ENSURE COMPLIANCE WITH SPECIFIED MINIMUM COVER.

4.4 PLACING AND SPACING OF REINFORCEMENT - GENERAL

- a) GRADE 500 REINFORCEMENT MAY BE MANUFACTURED BY THE MICROALLOY OR QUENCHED AND TEMPERED PROCESS. BUT NOTE THE RESTRICTIONS ON THE USE OF QUENCHED AND TEMPERED STATED IN THE SPECIFICATION
- b) SPLICING OF REINFORCEMENT, WHETHER BY LAPPING, WELDING OR MECHANICAL SPLICE, SHALL ONLY BE CARRIED OUT AS SHOWN ON THE DRAWINGS OR AS SPECIFICALLY APPROVED BY DESIGNER, EXCEPT AS NOTED BELOW:
- WELDED WIRE MESH SHALL BE SPLICED AS REQUIRED, BUT NOT THROUGH SLAB JOINTS REINFORCEMENT IN SLABS ON GRADE AND IN TOPPINGS SHALL BE SPLICED AS REQUIRED. BUT NOT THROUGH SLAB JOINTS.
- c) LAYERS OF BEAM REINFORCEMENT SHALL BE SEPARATED WITH R32 BARS AT 1500mm CENTRES. ALL HOOKS ON STIRRUPS & TIES MUST FIT CLOSELY AROUND MAIN BARS U.N.O; FIRST STIRRUP TO BE PLACED NOT FURTHER THAN THE LESSER OF HALF THE STIRRUP SPACING OR 50mm FROM SUPPORT FACE.

4.5 LAP SPLICES IN REINFORCEMENT

a) WELDED WIRE MESH MADE UP OF SMOOTH WIRES SHALL BE LAP SPLICED WITH A MINIMUM 200mm OVERLAP BETWEEN OUTERMOST CROSS WIRES THUS:



- b) WELDED MESH MADE UP OF DEFORMED BARS SHALL BE LAP SPLICED
- c) LAP LENGTHS FOR DEFORMED BARS WHERE NOT SHOWN ON THE DRAWINGS SHALL BE AS SHOWN IN THE FOLLOWING TABLES WHERE SPACING OF ADJACENT BARS ARE EQUAL TO OR GREATER THAN 2.5 db
- d) LAP LENGTHS FOR PLAIN ROUND BARS SHALL BE TWICE THOSE SHOWN IN THE
- FOLLOWING TABLES. e) ALL BEAM AND COLUMN MAIN REINFORCEMENT LAP SPLICES SHALL HAVE CRANKED LAPS UNO.
- f) CRANKED LAPS SHALL BE THUS

LAP LENGTHS ARE IN ACCORDANCE WITH NZS 3101.

- NOTE, RE: USE OF FOLLOWING TABLES: - TOP BAR FACTOR IS 1.0 FOR ALL VERTICAL BARS (COLUMNS, WALLS) AND FOR HORIZONTAL BARS
- WITH LESS THAN 300mm OF FRESH CONCRETE CAST BENEATH BAR (TYPICALLY BEAM BOTTOM BARS AND SLAB BARS)
- TOP BAR FACTOR IS 1.3 FOR ALL HORIZONTAL BARS WITH MORE THAN 300mm OF FRESH

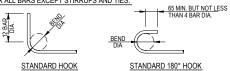
TOP BARS AND HORIZONTAL WALL BARS).		BAR DIAMETER						
TOP BARS AND HORIZONTAL WALL BARS).			10	12	16	20	25	32
CONCRETE	30 MPa	TOP BAR FACTOR = 1.3	360	430	570	715	895	1140
STEEL GRADE	300 MPa	TOP BAR FACTOR = 1	300	330	440	550	685	880
CONCRETE	40 MPa	TOP BAR FACTOR = 1.3	310	370	495	620	775	990
STEEL GRADE	300 MPa	TOP BAR FACTOR = 1	300	300	380	475	595	760
CONCRETE	50 MPa 300 MPa	TOP BAR FACTOR = 1.3	300	335	445	555	690	885
STEEL GRADE		TOP BAR FACTOR = 1	300	300	340	425	530	680
CONCRETE	30 MPa	TOP BAR FACTOR = 1.3	595	715	950	1190	1485	1900
STEEL GRADE	500 MPa	TOP BAR FACTOR = 1	460	550	735	915	1145	1465
CONCRETE	40 MPa	TOP BAR FACTOR = 1.3	515	620	825	1030	1285	1645
STEEL GRADE	500 MPa	TOP BAR FACTOR = 1	400	475	635	795	990	1265
CONCRETE	50 MPa	TOP BAR FACTOR = 1.3	460	555	735	920	1150	1475
STEEL GRADE	500 MPa	TOP BAR FACTOR = 1	355	425	570	710	885	1135

h) SPIRAL SPLICES AND TERMINATIONS

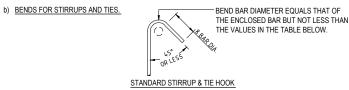
SPLICING OF ADJACENT LENGTHS OF SPIRAL SHALL BE FITHER BY PROVIDING 135° STIRRUP HOOKS AS FOR CIRCULAR HOOPS, OR BY WELDED LAP SPLICES. ANCHORAGE OF A SPIRAL BAR AT THE TERMINATION OF THE LENGTH OF SPIRAL SHALL BE PROVIDED BY AN EXTRA ONE-HALF TURN OF THE SPIRAL PLUS EITHER A 135° STIRRUP HOOK OR A WELDED LAP SPLICE TO THE PREVIOUS TURN. WELDED SPLICES IN SPIRALS SHALL COMPLY WITH AS/NZS 1554.3 ALL WELDS SHALL BE CLASS SP.

4.6 BENDING OF REINFORCEMENT

a) BENDS FOR ALL BARS EXCEPT STIRRUPS AND TIES



STEEL GRADE	BAR DIAMETER	MINIMUM BEND DIAMETER
GRADE 300	6 TO 20	5 BAR DIAMETERS
GRADE 500 FOR CONCRETE STRENGTH EQUAL TO OR MORE THAN 40 MPa	25 TO 40	6 BAR DIAMETERS
GRADE 500 FOR CONCRETE STRENGTH LESS THAN 40 MPa	6 TO 20 25 TO 40	8 BAR DIAMETERS 10 BAR DIAMETERS

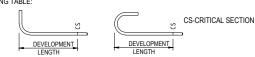


STEEL GRADE	BAR DIAMETER	MINIMUM BEND DIAMETER				
	BAR DIAWETER	PLAIN BARS	DEFORMED BARS			
GRADE 300/500	6 TO 20	2 BAR DIAMETERS	4 BAR DIAMETERS			
GRADE 300/500	25 TO 32	3 BAR DIAMETERS	6 BAR DIAMETERS			

- c) BARS PARTIALLY EMBEDDED IN CONCRETE SHALL NOT BE SITE BENT & BARS SHALL NOT BE RE-BENT UNLESS SHOWN ON THE DRAWINGS OR SPECIFICALLY APPROVED BY THE DESIGNER.
- d) THE ABOVE BEND DIAMETERS DO NOT APPLY TO GALVANISED REINFORCEMENT

$\underline{\text{4.7 REINFORCEMENT ANCHORAGE WITH STANDARD HOOKS.}}$

- a) DEVELOPMENT LENGTH PAST CRITICAL SECTION (SHOWN CS ON DRAWING) FOR DEFORMED BARS SHALL BE AS PER TABLE BELOW.
- b) DEVELOPMENT LENGTH FOR PLAIN ROUND BARS SHALL BE TWICE THOSE SHOWN IN THE



NOTES: STANDARD HOOK STANDARD 180° HOOF

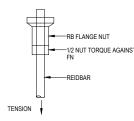
SIDE COVER FACTOR = 0.7 FOR SIDE COVER EQUAL TO OR GREATER THAN 60mm, WITH HOOK COVER NOT LESS THAN 40mm.

SIDE COVER FACTOR = 1.0 IN ALL OTHER SITUATIONS.

			B/	AR DIAN	1ETER		
		10	12	16	20	25	32
30 MPa	COVER FACTOR = 1	135	160	215	265	330	425
300 MPa	COVER FACTOR = 0.7	95	115	150	185	235	295
40 MPa	COVER FACTOR = 1	115	140	185	230	285	365
300 MPa	COVER FACTOR = 0.7	80	100	130	160	200	260
50 MPa E 300 MPa	COVER FACTOR = 1	105	125	165	205	255	330
	COVER FACTOR = 0.7	75	90	115	145	180	230
30 MPa 500 MPa	COVER FACTOR = 1	220	265	355	440	550	705
	COVER FACTOR = 0.7	155	185	250	310	385	495
40 MPa	COVER FACTOR = 1	190	230	305	380	475	610
500 MPa	COVER FACTOR = 0.7	135	160	215	270	335	430
50 MPa	COVER FACTOR = 1	170	205	275	340	425	545
500 MPa	COVER FACTOR = 0.7	120	145	195	240	300	385
	300 MPa 40 MPa 300 MPa 50 MPa 300 MPa 300 MPa 500 MPa 40 MPa 500 MPa 500 MPa	300 MPa COVER FACTOR = 0.7 40 MPa COVER FACTOR = 1 300 MPa COVER FACTOR = 0.7 50 MPa COVER FACTOR = 1 300 MPa COVER FACTOR = 0.7 30 MPa COVER FACTOR = 1 500 MPa COVER FACTOR = 0.7 40 MPa COVER FACTOR = 1 500 MPa COVER FACTOR = 0.7 50 MPa COVER FACTOR = 1 50 MPa COVER FACTOR = 1	30 MPa COVER FACTOR = 1 135 300 MPa COVER FACTOR = 0.7 95 40 MPa COVER FACTOR = 1 115 300 MPa COVER FACTOR = 0.7 80 50 MPa COVER FACTOR = 1 105 300 MPa COVER FACTOR = 0.7 75 30 MPa COVER FACTOR = 1 220 500 MPa COVER FACTOR = 0.7 155 40 MPa COVER FACTOR = 1 190 500 MPa COVER FACTOR = 0.7 135 50 MPa COVER FACTOR = 1 170 300 MPa COVER FACTOR = 1 170	30 MPa 300 MPa COVER FACTOR = 1 135 160 160 MPa COVER FACTOR = 0.7 95 115 140 MPa COVER FACTOR = 0.7 80 100 MPa COVER FACTOR = 0.7 80 100 MPa COVER FACTOR = 0.7 75 90 MPa COVER FACTOR = 0.7 75 90 MPa COVER FACTOR = 1 220 265 500 MPa COVER FACTOR = 0.7 155 185 40 MPa COVER FACTOR = 1 190 230 MPa COVER FACTOR = 1 190 230 MPa COVER FACTOR = 0.7 135 160 MPa COVER FACTOR = 0.7 135 160 MPa COVER FACTOR = 1 170 205 MPa COVER FACTOR = 1 170 205	10 12 16 16 17 16 17 16 17 16 17 17	30 MPa COVER FACTOR = 1 135 160 215 265 300 MPa COVER FACTOR = 0.7 95 115 150 185 40 MPa COVER FACTOR = 1 115 140 185 230 300 MPa COVER FACTOR = 0.7 80 100 130 160 50 MPa COVER FACTOR = 1 105 125 165 205 300 MPa COVER FACTOR = 0.7 75 90 115 145 30 MPa COVER FACTOR = 1 220 265 355 440 500 MPa COVER FACTOR = 0.7 155 185 250 310 40 MPa COVER FACTOR = 1 190 230 305 380 50 MPa COVER FACTOR = 0.7 135 160 215 270 50 MPa COVER FACTOR = 1 170 205 275 340	10

4.8 ANCHORAGE BY REIDBAR FLANGE NUTS

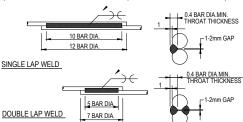
WHEN A FLANGE NUT IS REQUIRED TO DEVELOP FULL BREAKING STRENGTH OF BAR, TORQUE BY ROTATION BEYOND HAND TIGHT SHALL BE AS GIVEN IN TABLE



TORQUE ROTATION							
RB	12	2 FLATS OF THE NUT					
RB	16	1 ½ FLAT OF THE NUT					
RB	20	$1\frac{1}{4}$ FLATS OF THE NUT					
RB	25	1 FLAT OF THE NUT					
RB	32	½ FLAT OF THE NUT					

4.9 WELDING OF REINFORCEMENT

- a) WELDING OF REINFORCEMENT SHALL ONLY BE CARRIED OUT WITH THE EXPRESS APPROVAL OF THE DESIGNER
- b) WELDING SHALL COMPLY WITH PACIFIC STEEL LIMITED PRODUCT TECHNICAL DATA 'PACIFIC STEEL SEISMIC REINFORCING BAR WELDING AND BENDING PROCEDURE' AND AS/NZS 1554.3 WELDING OF REINFORCING STEEL.
- c) WELDED SPLICES SHALL BE CLASS SP.
- d) WELDING ELECTRODES SHALL BE TO AS/NZS 1554.3.
- e) QUENCHED AND TEMPERED BARS SHALL NOT BE WELDED.
- f) WELDED SPLICES MAY BE EITHER: (GRADE 300 E OR GRADE 500 E).



5. STRUCTURAL STEEL NOTES

5.1 MATERIALS

a) ALL STEEL MEMBERS SHALL CONFORM TO AS/NZS 3678, AS/NZS 3679.1 OR EQUIVALENT. FOR STEEL GRADES, REFER DETAIL DRAWINGS.

ALL GUSSET PLATES, CLEATS & STIFFENERS SHALL BE 10mm THICK UNO, & GRADE 250 STEEL TO AS1204 OR EQUIVALENT UNO

5.2 FABRICATION SHALL COMPLY WITH NZS 3404, (AS MODIFIED BELOW)

a) STRAIGHTNESS OF MEMBERS AFTER FABRICATION & BEFORE ERECTION UNO SHALL NOT DEVIATE MORE THAN:

OTHER MEMBERS = L/600

b) LENGTH SHALL NOT DEVIATE FROM THE TRUE LENGTH BY:-

STRUTS WITH END BEARING OTHER MEMBERS UP TO L = 9.0m = +Omm. -3mm OTHER MEMBERS OVER L = 9.0m = +Omm, -5mm

c) PLUMBNESS OF STRUTS/COLUMNS SHALL BE WITHIN L/1000 OF TRUE

5.3 BOLTING

- a) ALL HOLES SHALL BE DRILLED & SHALL BE 2mm LARGER THAN THE BOLT DIAMETER FOR BOLTS UNDER 30mm DIA, AND 3mm LARGER FOR M30 BOLTS & LARGER UNO. HOLES IN BASEPLATES MAY BE 6mm LARGER THAN THE BOLT DIAMETER UNO.
- b) ALL BOLTS SHALL HAVE AT LEAST ONE THREAD PROJECTING THROUGH BOTH SIDES OF NUT.
- c) ALL BOLTS SHALL BE M20-8.8/S UNO.
- d) ALL BOLTS, NUTS & WASHERS (EXCEPT VSL STRESS-BARS) SHALL BE HOT DIP GALVANISED BY THE MANUFACTURER TO CONFORM TO AS
- e) TIGHTENING PROCEDURE SHALL COMPLY WITH AS 1511 BOLTING ABBREVIATIONS ARE TO AS 1511

5.4 BENDING OF FLAT OR PLATE

a) BENT FLAT OR PLATE SHALL BE BENT AROUND A ROUND FORMER OF MINIMUM RADIUS OF 2.5xPLATE OR FLAT THICKNESS.

5.5 WELDING SHALL COMPLY WITH AS/NZS 1554

- a) ALL WELDS SHALL BE 5mm CONTINUOUS FILLET UNO. REFERENCE AS/NZS 1554.1
- b) WELDING ELECTRODES SHALL BE E48XX TO AS/NZS 1553 UNO.
- c) FOR WORK EXPOSED TO THE WEATHER, SEAL WELDS SHALL BE MADE WHETHER SHOWN ON THE DRAWINGS OR NOT, UNLESS SPECIFICALLY NOT REQUIRED.

5.6 CORROSION PROTECTION

ALL STEELWORK TO BE HOT DIP GALVANISED TO HDG600 IN ACCORDANCE WITH AS/NZS 2312 UNLESS NOTED OTHERWISE ON THE

FOR CONSENT

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	No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date



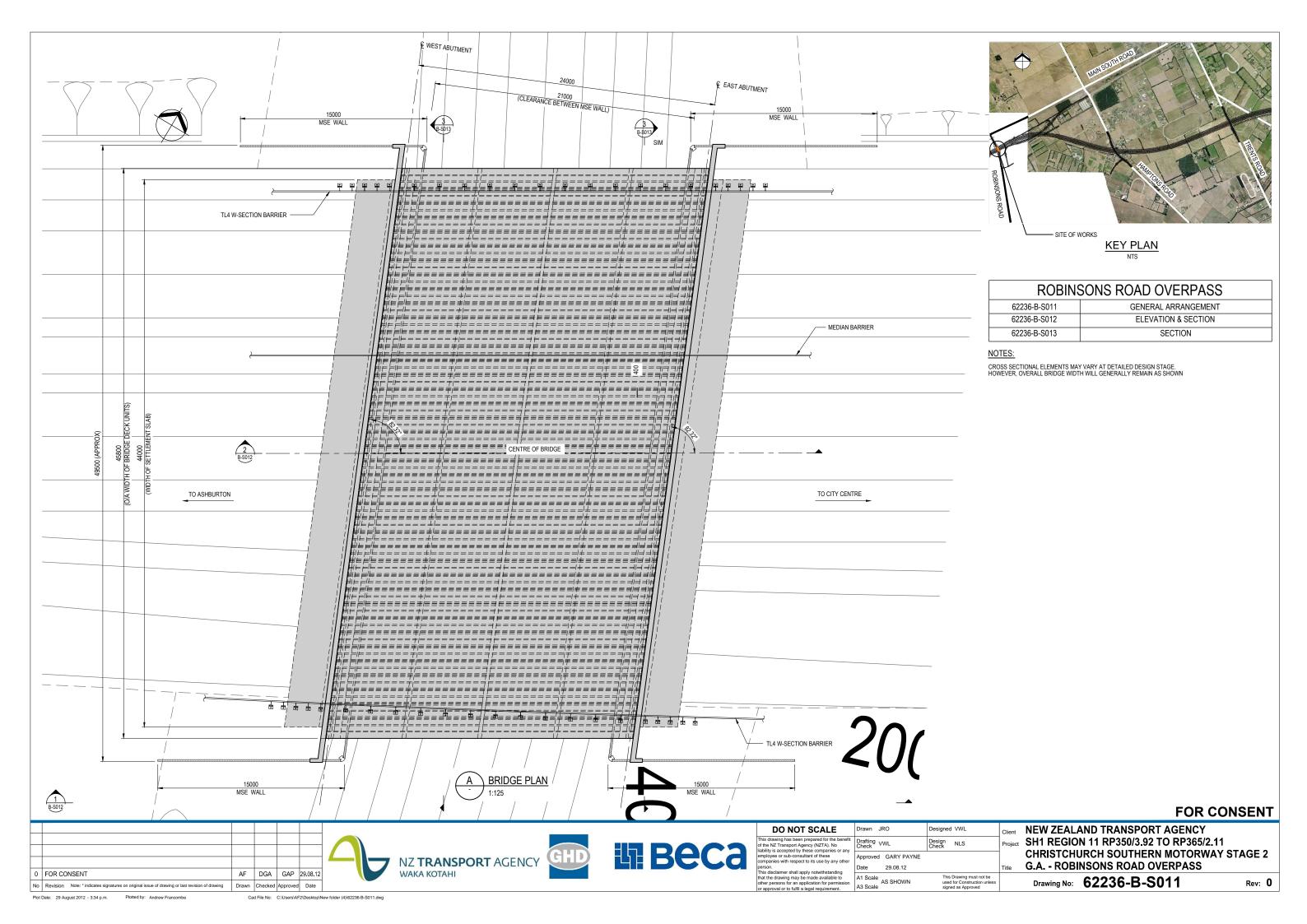


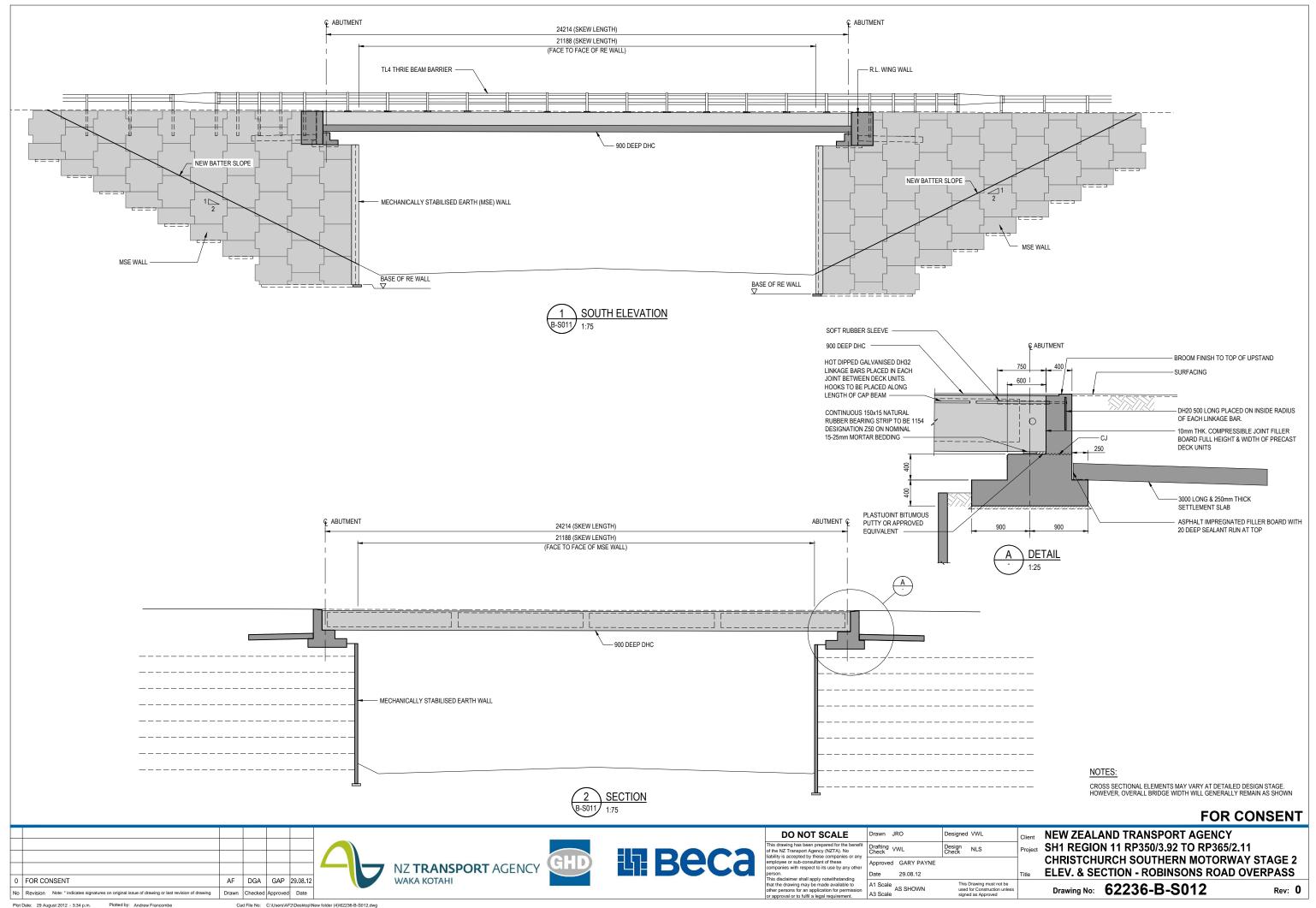


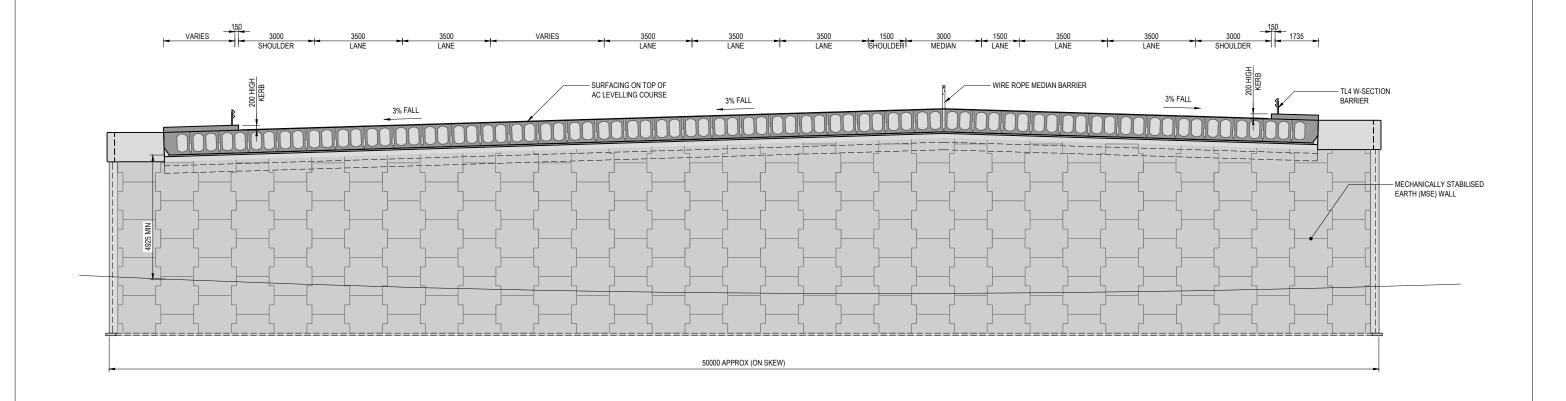
	DO NOT SCALE	Drawn J	RO	Designed	VWL	Clier
	This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any	Drafting VWL		Design Check	NLS	Proje
	employee or sub-consultant of these companies with respect to its use by any other	Approved	GARY PAYNE			
	person. This disclaimer shall apply notwithstanding	Date	29.08.12			Title
		A1 Scale		This	Drawing must not be	

NEW ZEALAND TRANSPORT AGENCY SH1 REGION 11 RP350/3.92 TO RP365/2.11 **CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2** STRUCTURAL - GENERAL NOTES

Drawing No: 62236-B-S000







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SECTION - ROBINSONS ROAD OVERPASS Date 29.08.12 A1 Scale A3 Scale AS SHOWN Drawing No: 62236-B-S013

Designed VWL

CROSS SECTIONAL ELEMENTS MAY VARY AT DETAILED DESIGN STAGE. HOWEVER, OVERALL BRIDGE WIDTH WILL GENERALLY REMAIN AS SHOWN

FOR CONSENT

Rev: 0

WEST ABUTMENT ELEVATION (EAST ABUTMENT ELEVATION SIMILAR)

1:75

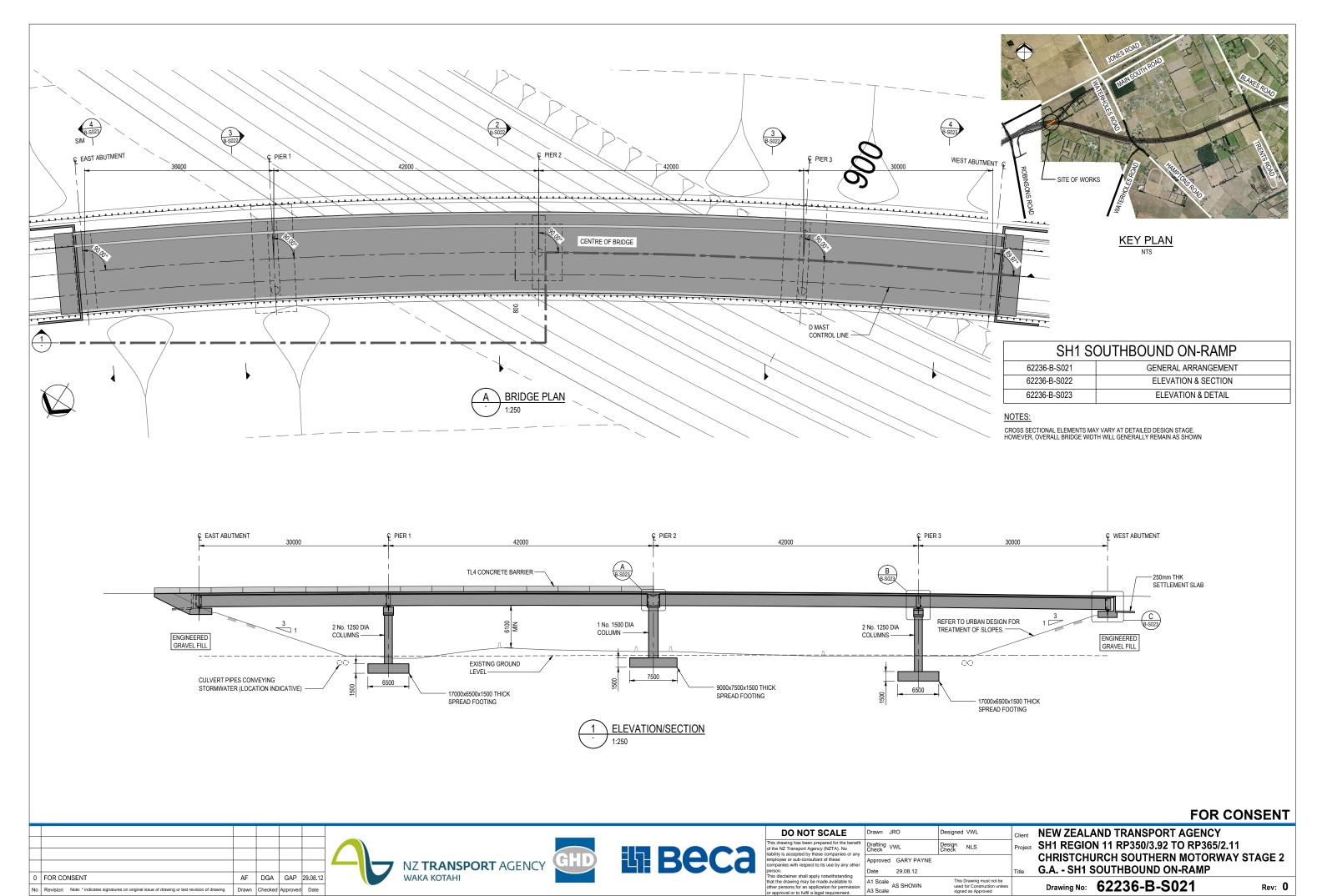
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AF DGA GAP 29.08.12

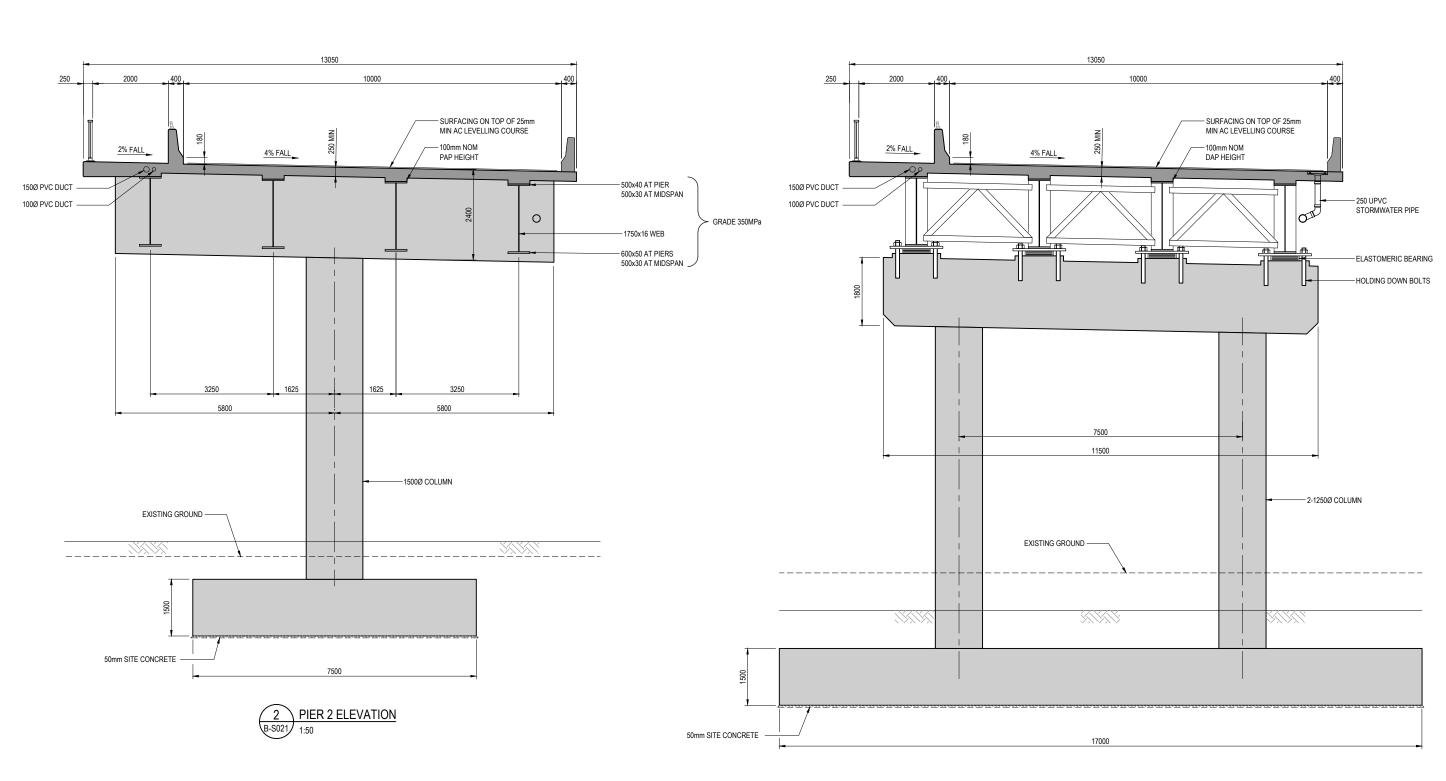
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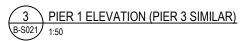
Plot Date: 29 August 2012 - 3:35 p.m.

WAKA KOTAHI



Plot Date: 29 August 2012 - 3:36 p.m.





NOTES:

CROSS SECTIONAL ELEMENTS MAY VARY AT DETAILED DESIGN STAGE. HOWEVER, OVERALL BRIDGE WIDTH WILL GENERALLY REMAIN AS SHOWN

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No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date

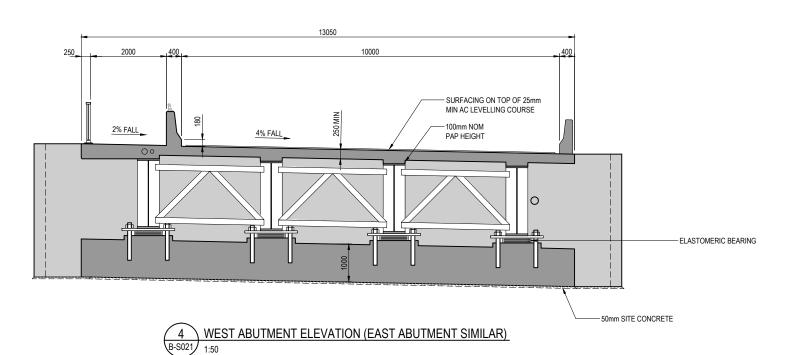


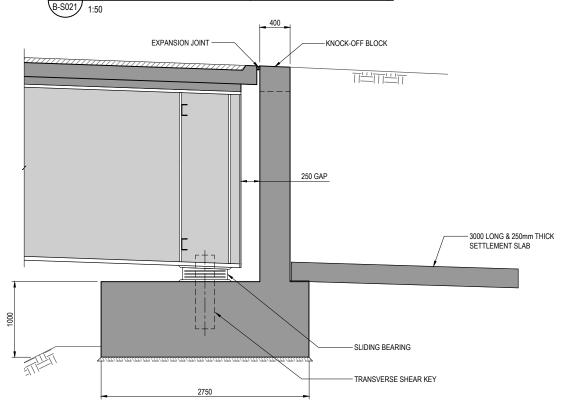




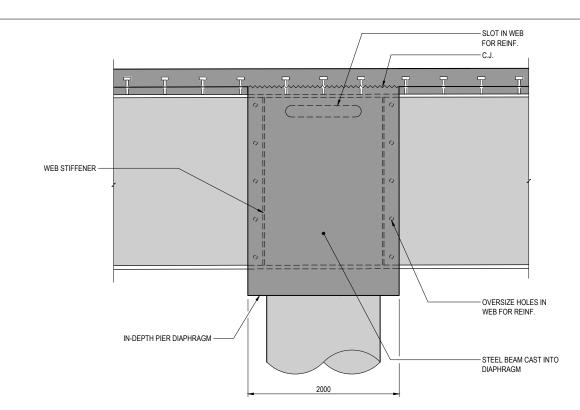
DO NOT SCALE	Drawn JRO	Designed VWL	Client
This drawing has been prepared for the benefit of the NZ Transport Agency (NZTA). No liability is accepted by these companies or any	Drafting VWL	Design Check NLS	Project
employee or sub-consultant of these companies with respect to its use by any other	Approved GARY PAYNE		
person. This disclaimer shall apply notwithstanding	Date 29.08.12		Title
that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.	A1 Scale A3 Scale AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

NEW ZEALAND TRANSPORT AGENCY
SH1 REGION 11 RP350/3.92 TO RP365/2.11
CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2
ELEV. & SECTION - SH1 SOUTHBOUND ON-RAMP

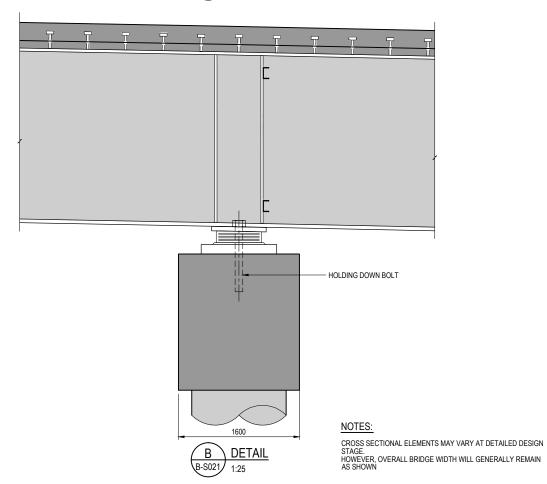


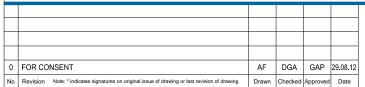












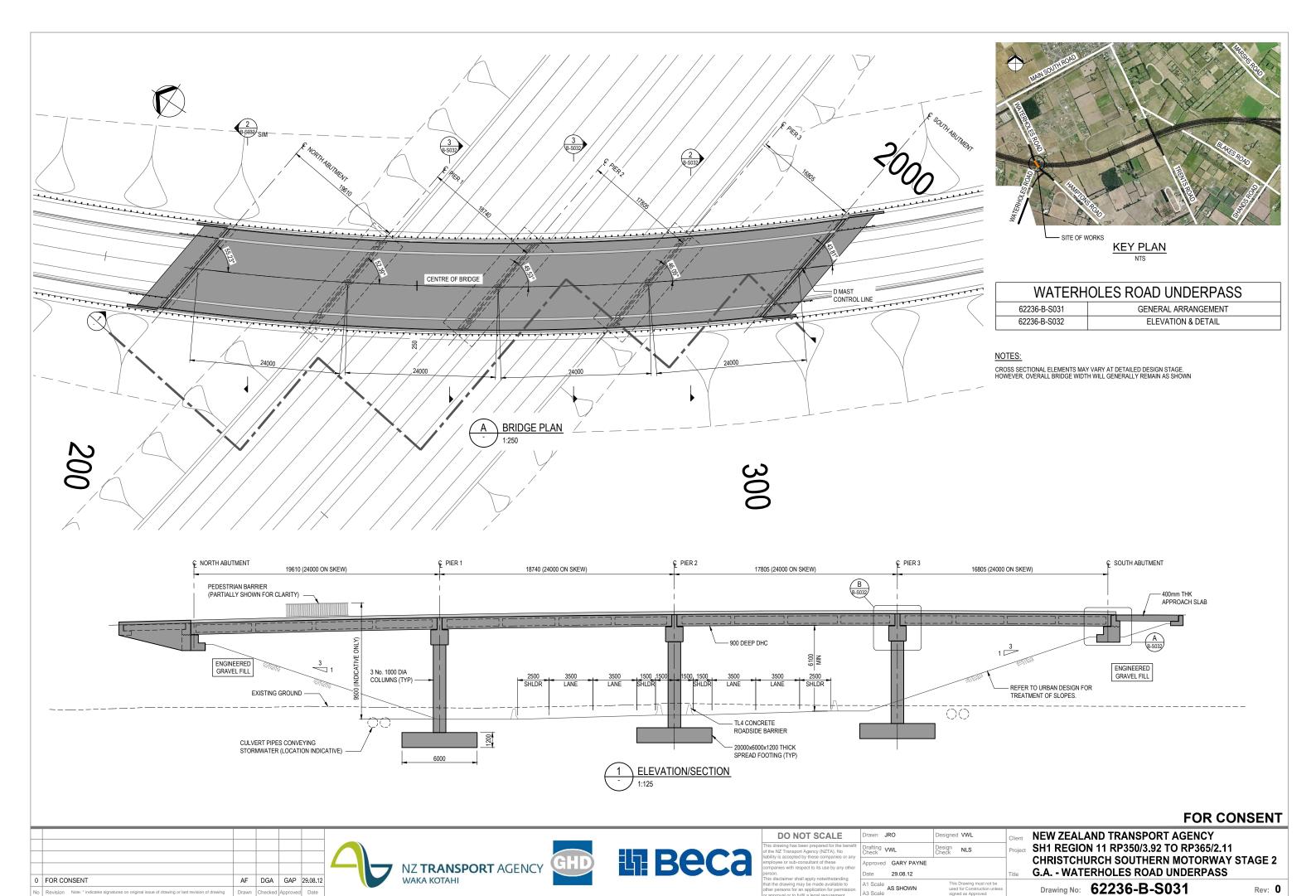


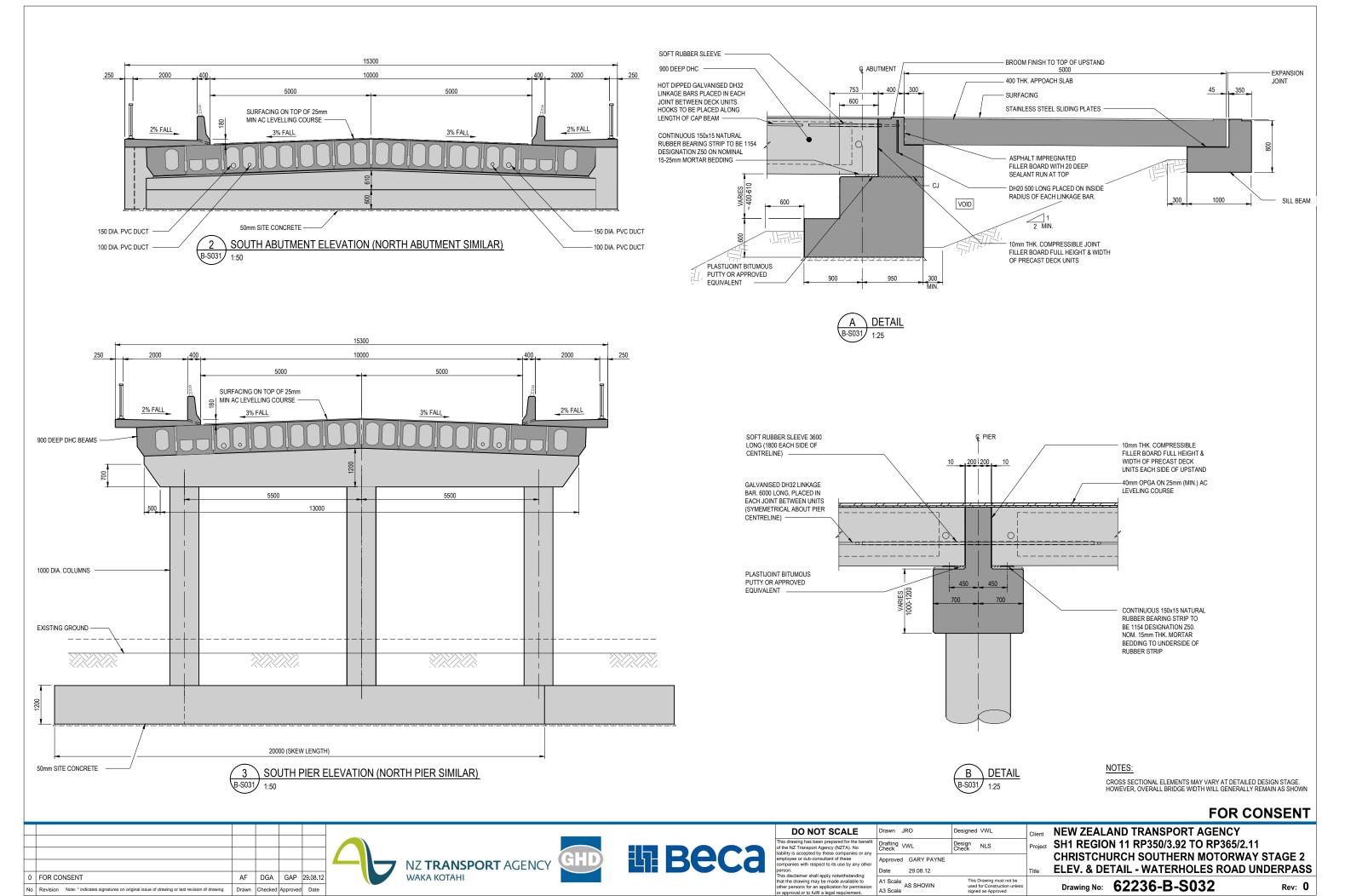


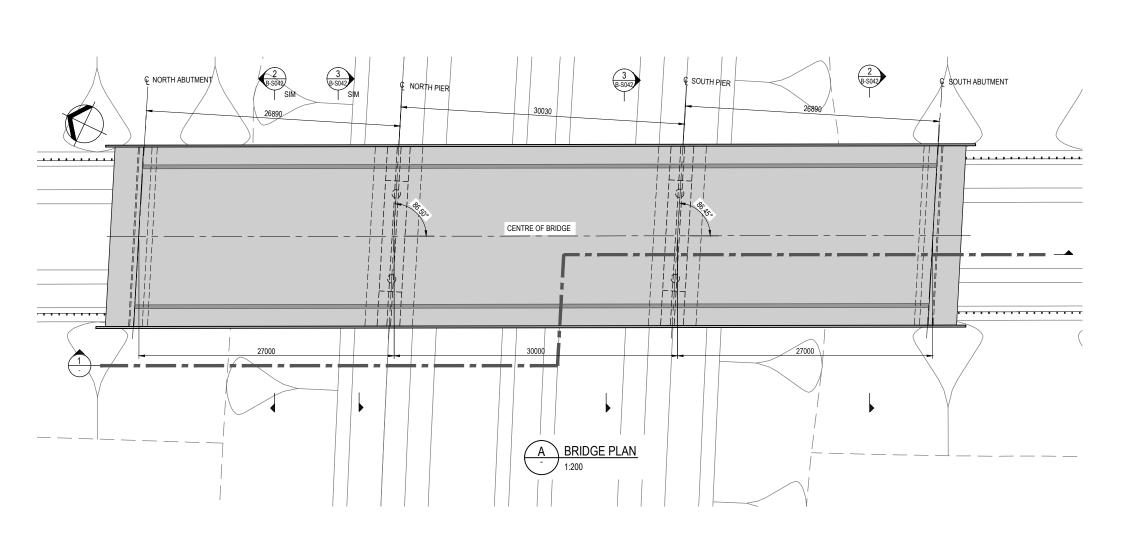


DO NOT SCALE	Drawn JRO	Designed VWL	Client
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employee or sub-consultant of these companies with respect to its use by any other	Approved GARY PAYNE		
person. This disclaimer shall apply notwithstanding	Date 29.08.12		Title
this disclaimer shall apply flowinistanding that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.	A1 Scale A3 Scale AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

NEW ZEALAND TRANSPORT AGENCY
SH1 REGION 11 RP350/3.92 TO RP365/2.11
CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2
ELEV. & DETAIL - SH1 SOUTHBOUND ON-RAMP







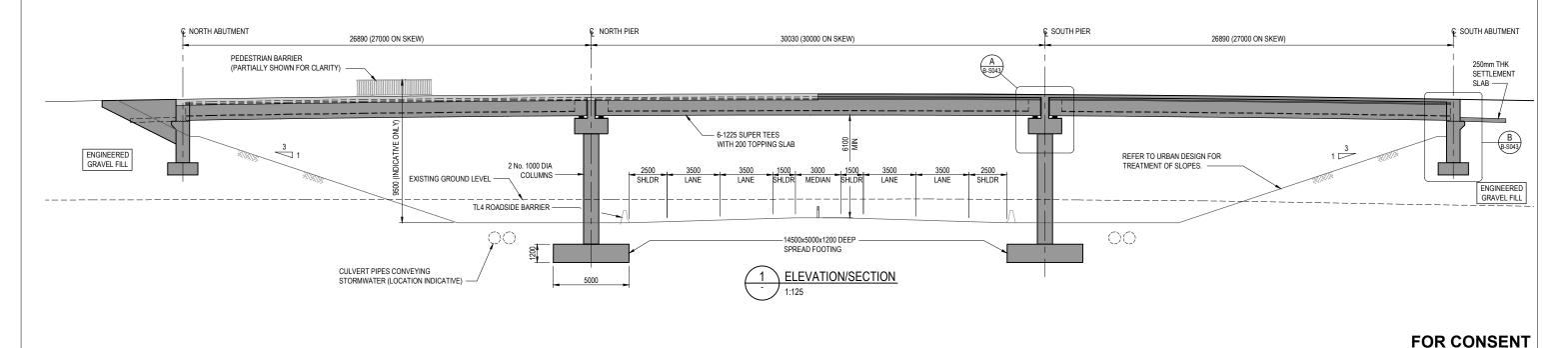


TRENTS ROAD UNDERPASS GENERAL ARRANGEMENT 62236-B-S041 ELEVATION 62236-B-S042 62236-B-S043 DETAIL

NOTES:

CROSS SECTIONAL ELEMENTS MAY VARY AT DETAILED DESIGN STAGE. HOWEVER, OVERALL BRIDGE WIDTH WILL GENERALLY REMAIN AS SHOWN

DURING DETAILED DESIGN THE 2 x 2m WIDE FOOTPATHS MAY BE REPLACED WITH A SINGLE SHARED USE PATH.



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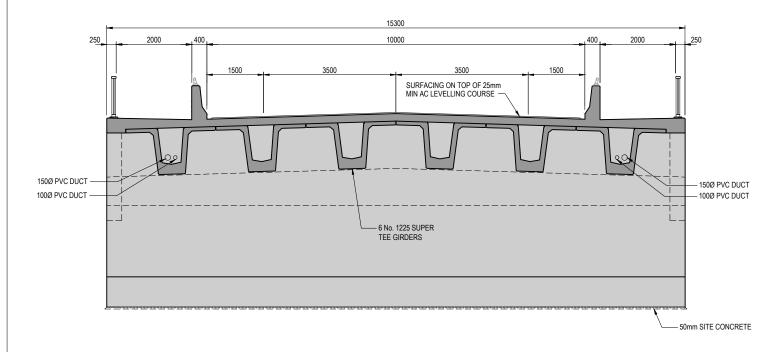
NEW ZEALAND TRANSPORT AGENCY SH1 REGION 11 RP350/3.92 TO RP365/2.11 **CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2 G.A. - TRENTS ROAD UNDERPASS**

Drawing No: 62236-B-S041

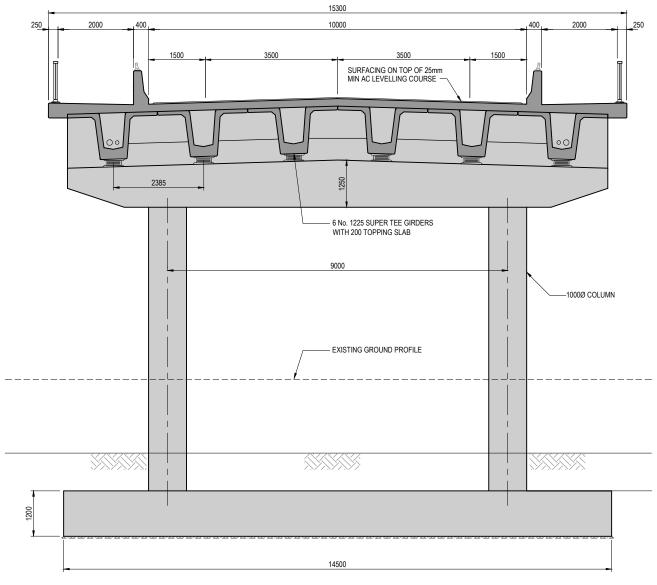
NOTES:

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DURING DETAILED DESIGN THE 2 x 2m WIDE FOOTPATHS MAY BE REPLACED WITH A SINGLE SHARED USE PATH.



2 SOUTH ABUTMENT ELEVATION (NORTH ABUTMENT SIMILAR)



3 SOUTH PIER ELEVATION (NORTH PIER SIMILAR) 1:50

FOR CONSENT

0	FOR CONSENT	AF	DGA	GAP	29.08.12

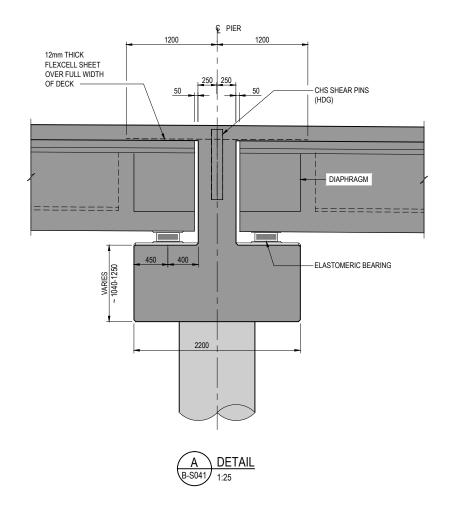


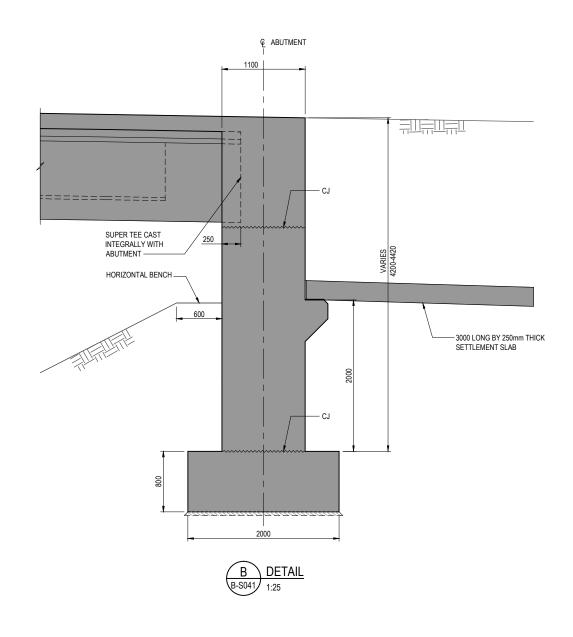




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NEW ZEALAND TRANSPORT AGENCY
SH1 REGION 11 RP350/3.92 TO RP365/2.11
CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2
ELEVATION - TRENTS ROAD UNDERPASS





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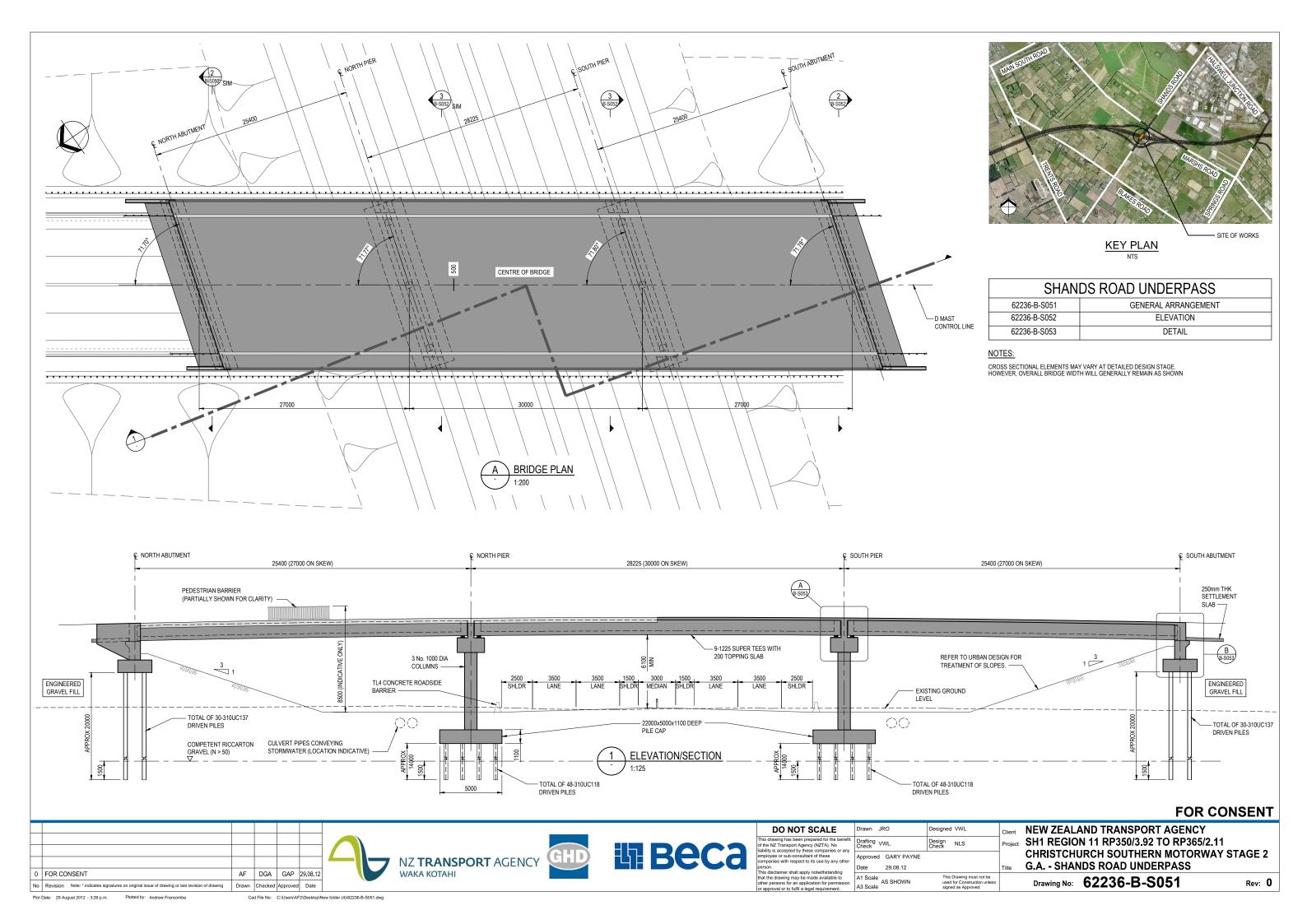


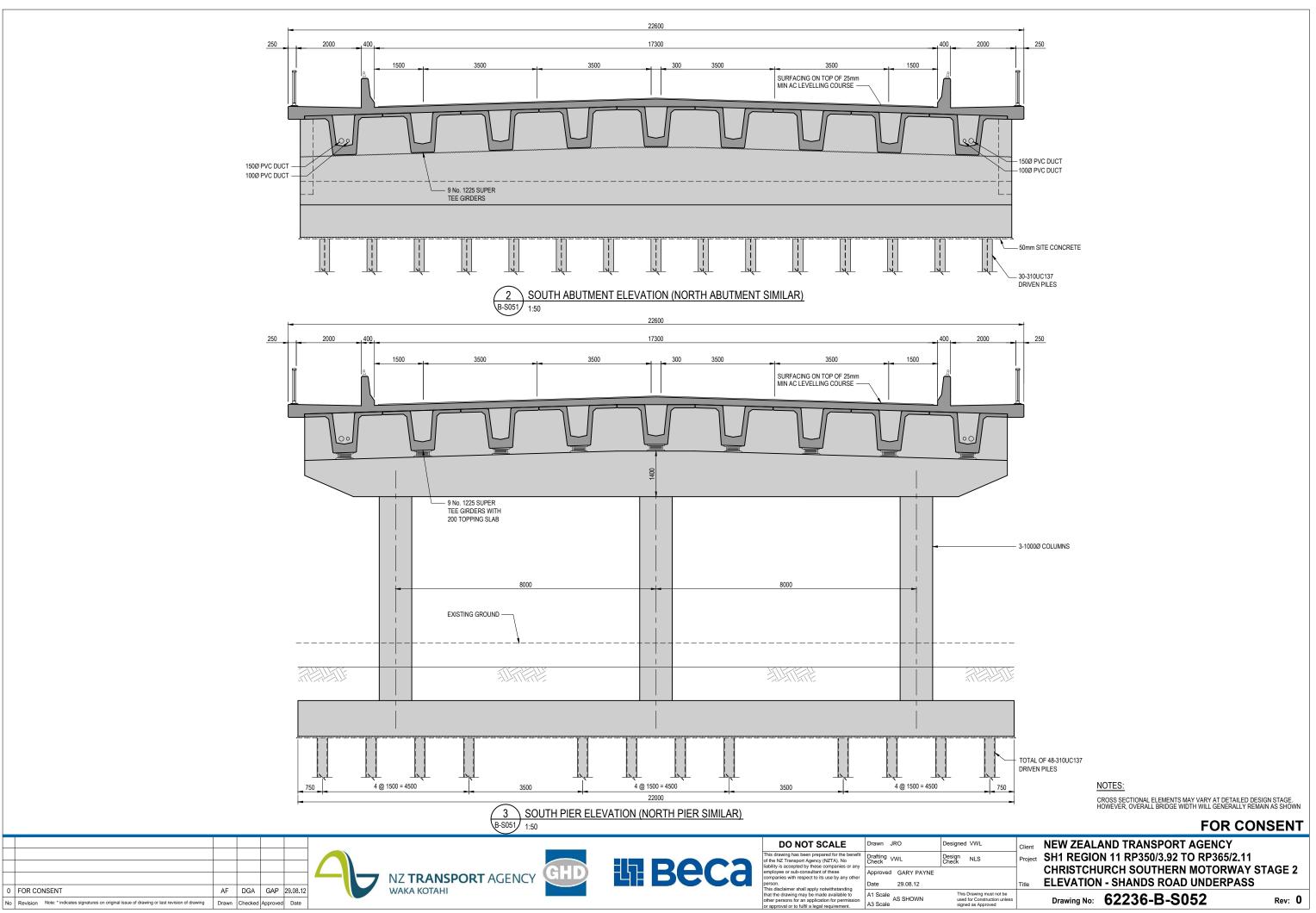


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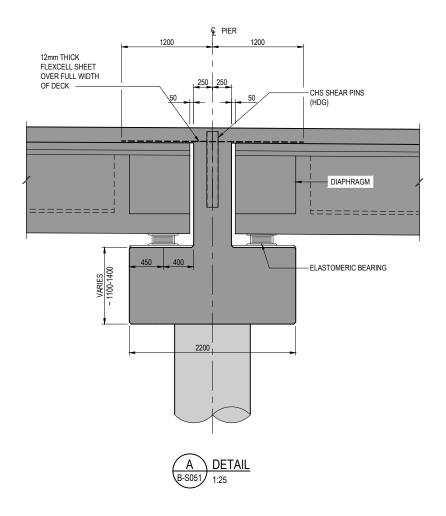
NEW ZEALAND TRANSPORT AGENCY SH1 REGION 11 RP350/3.92 TO RP365/2.11
CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2
DETAIL - TRENTS ROAD UNDERPASS

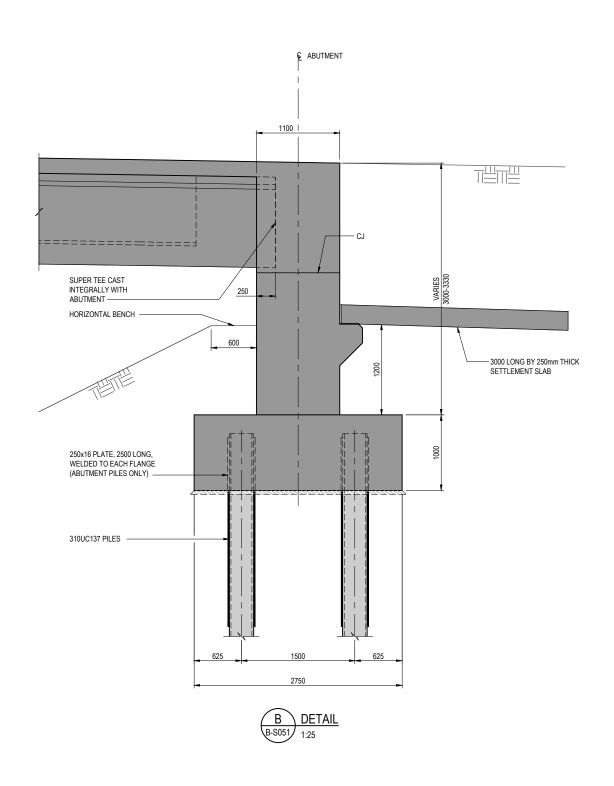
Drawing No: 62236-B-S043





Plot Date: 29 August 2012 - 3:39 p.m. Plotted by: Andrew Francombe





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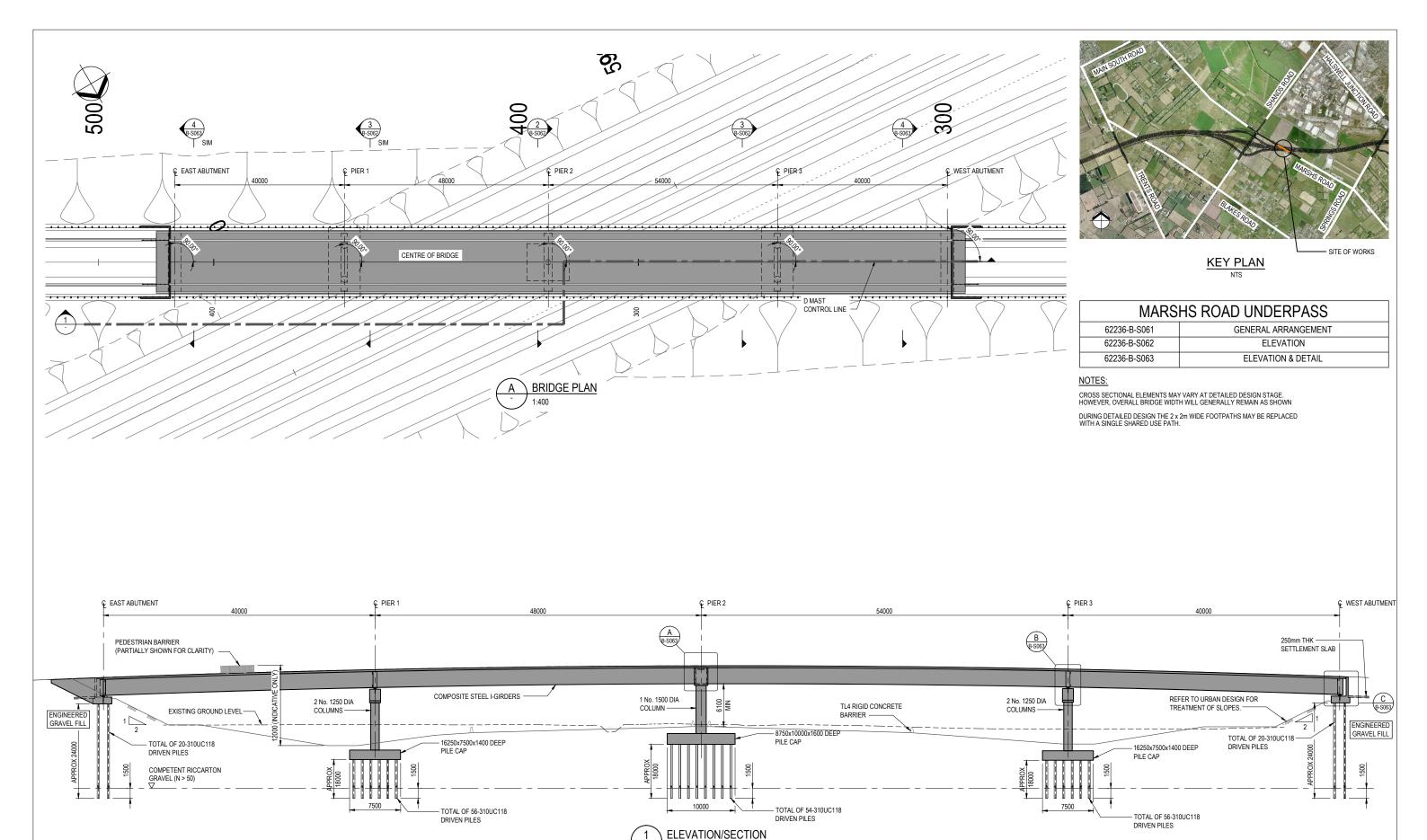




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NEW ZEALAND TRANSPORT AGENCY SH1 REGION 11 RP350/3.92 TO RP365/2.11 CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2 DETAIL - SHANDS ROAD UNDERPASS

Drawing No: 62236-B-S053



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employee or sub-consultant of these companies with respect to its use by any other	Approved GARY PAYNE		
person. This disclaimer shall apply notwithstanding	Date 29.08.12		Title
that the drawing may be made available to	A1 Scale	This Drawing must not be	

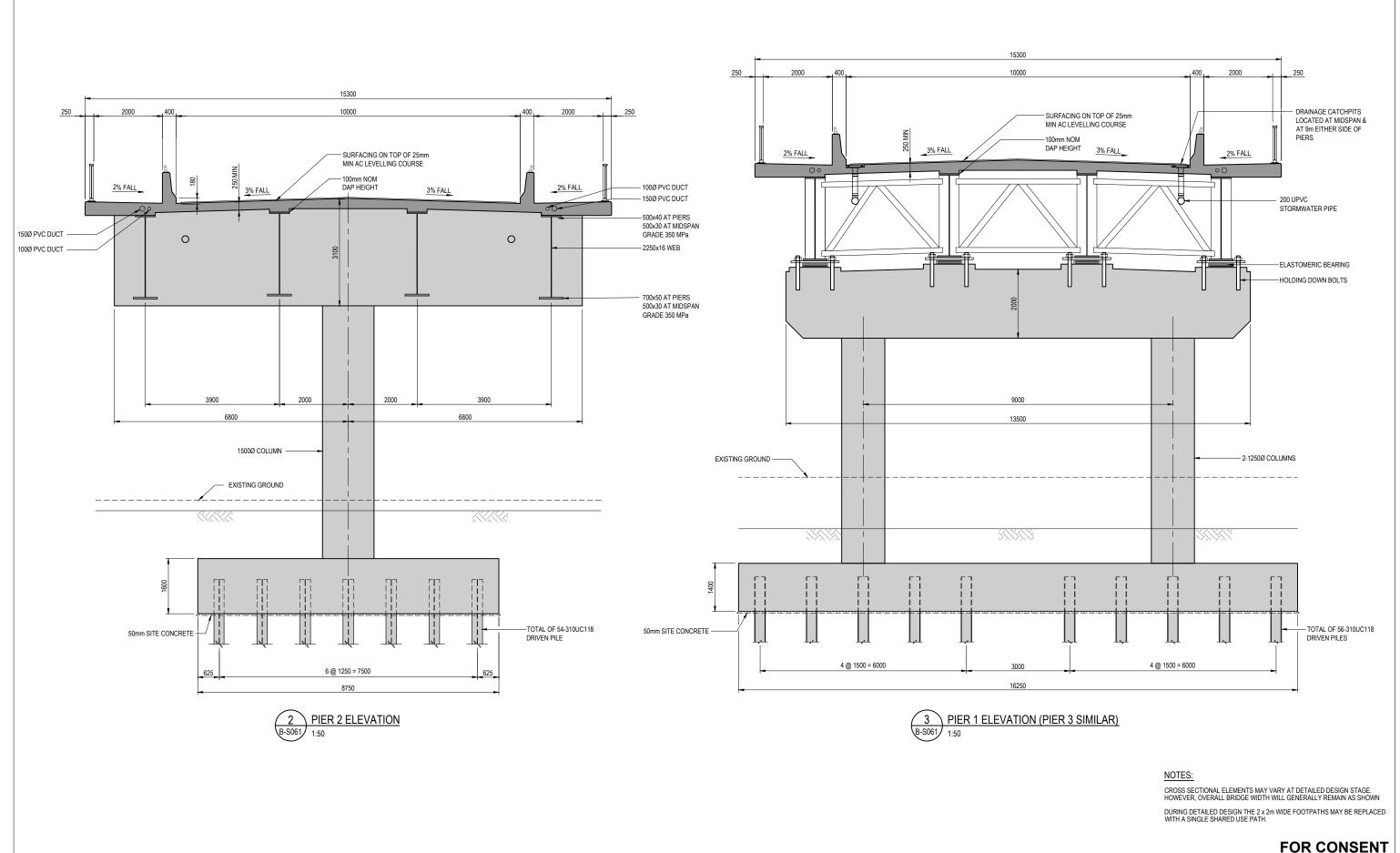
or approval or to fulfil a legal requirement.

NEW ZEALAND TRANSPORT AGENCY SH1 REGION 11 RP350/3.92 TO RP365/2.11 CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2 G.A. - MARSHS ROAD UNDERPASS

Drawing No: 62236-B-S061

Rev: 0

FOR CONSENT



AF DGA GAP 29.08.12







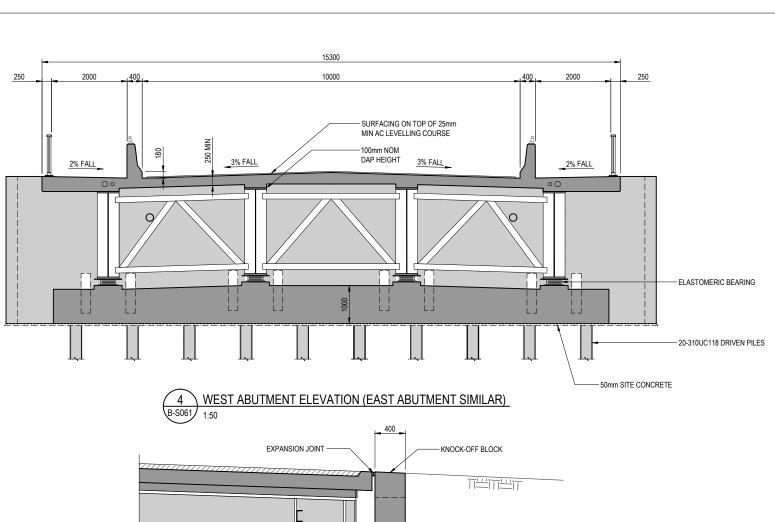
DO NOT SCALE	Drawn JRO	Designed VWL	Client
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employee or sub-consultant of these companies with respect to its use by any other	Approved GARY PAYNE		
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that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.	A1 Scale AS SHOWN	This Drawing must not be used for Construction unless signed as Approved	

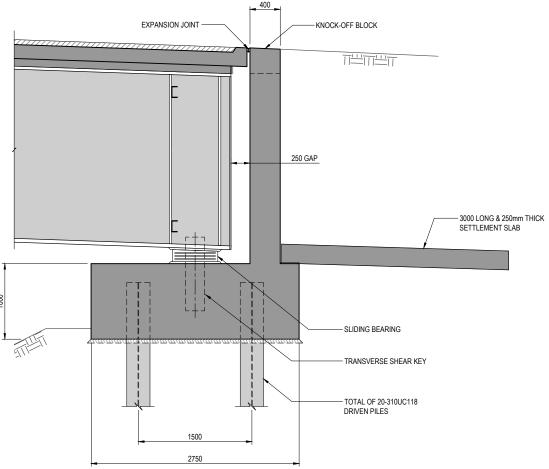
NEW ZEALAND TRANSPORT AGENCY SH1 REGION 11 RP350/3.92 TO RP365/2.11 **CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2 ELEVATION - MARSHS ROAD UNDERPASS**

Drawing No: 62236-B-S062

Rev: 0

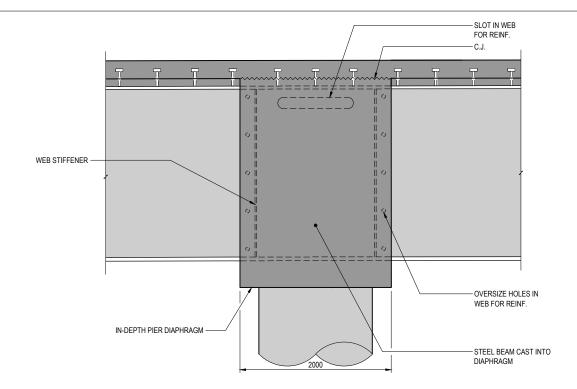
0 FOR CONSENT



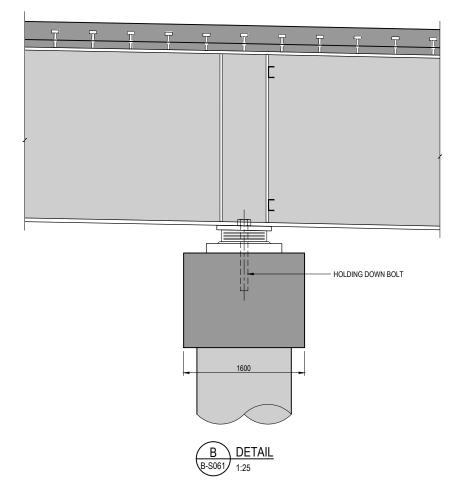


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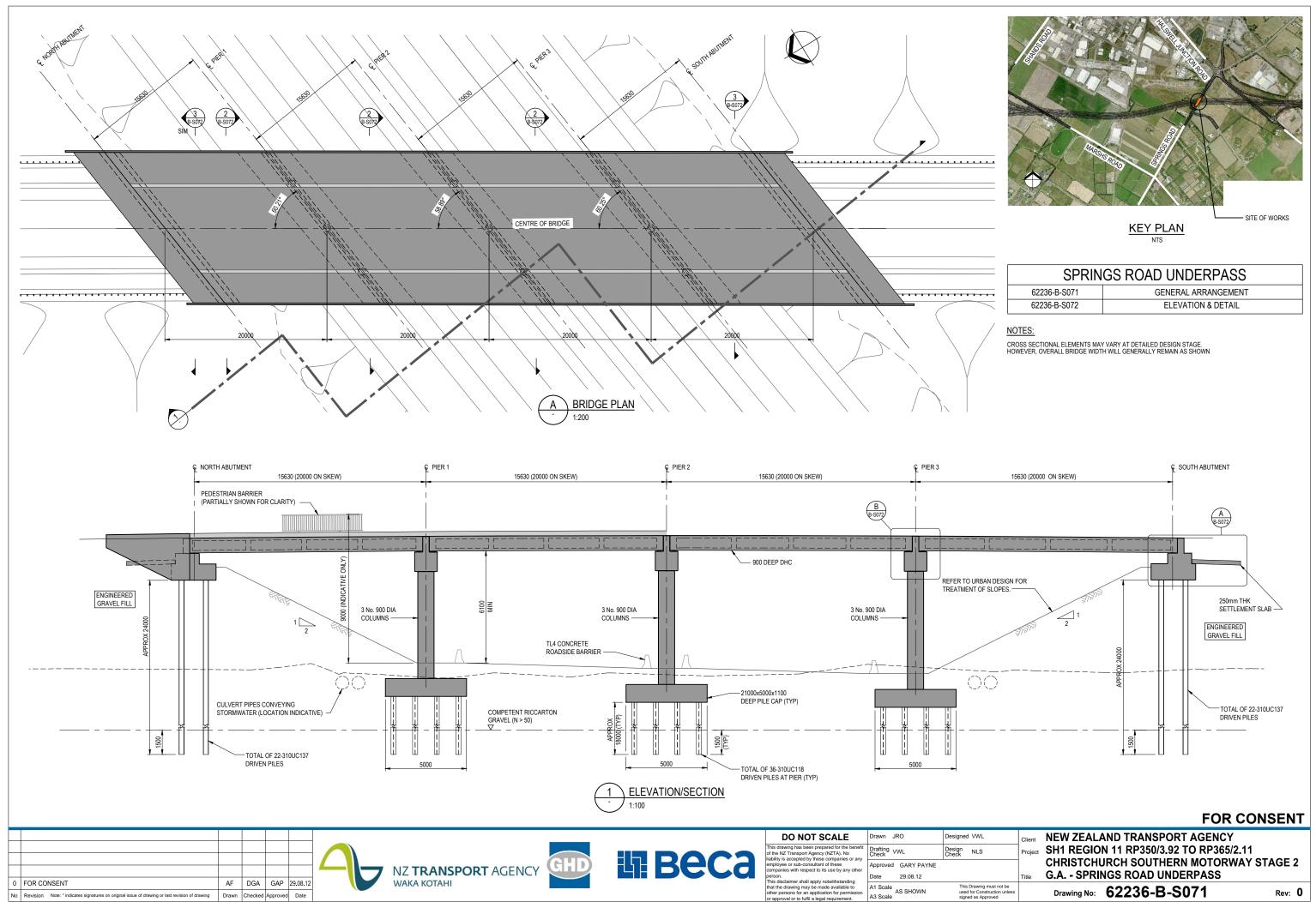




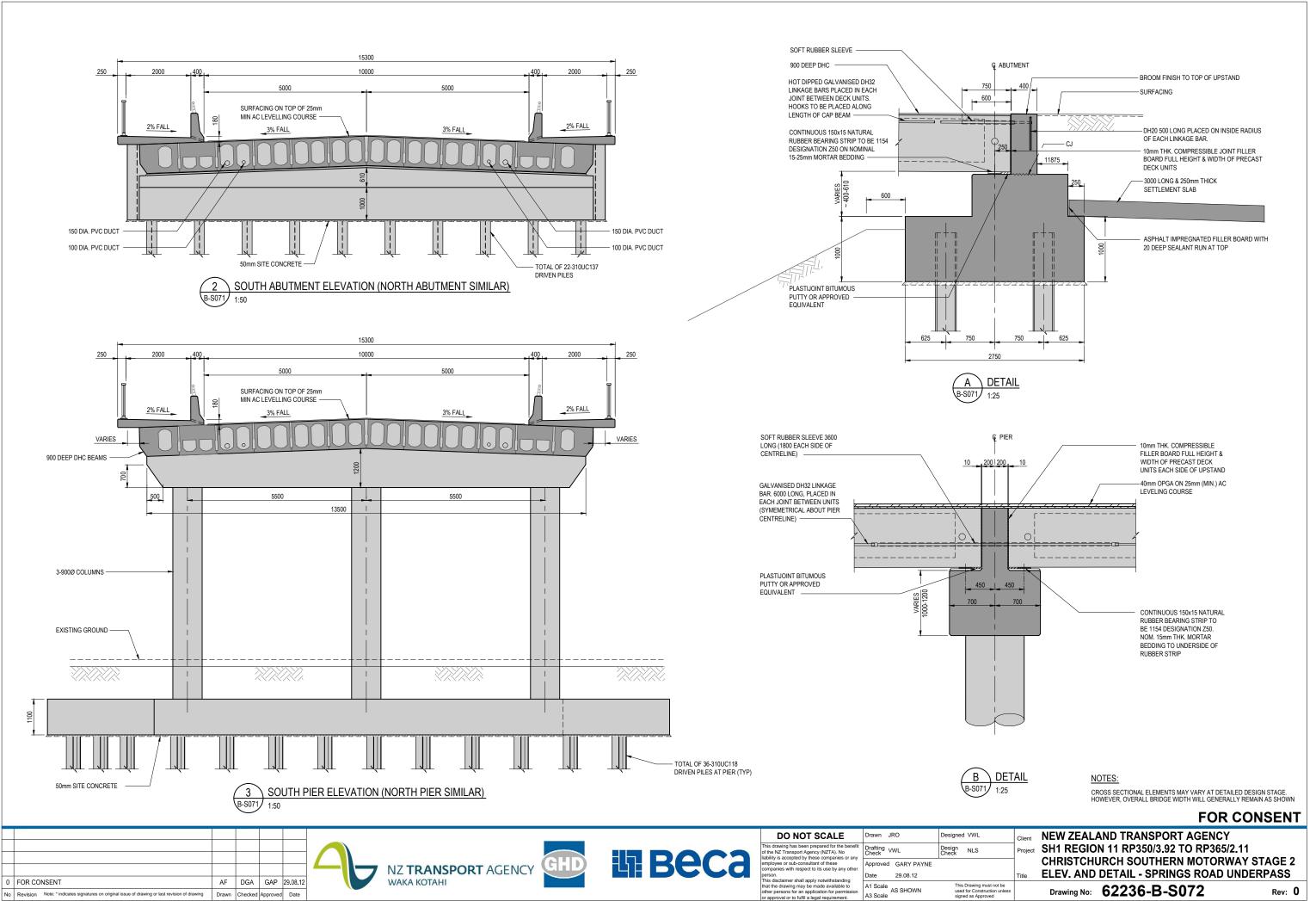
Drawn JRO	Designed VWL	Client
Drafting VWL	Design NLS	Project
Approved GARY PAYNE		
Date 29.08.12		Title
A1 Scale A3 Scale	This Drawing must not be used for Construction unless signed as Approved	
	Drafting VWL Approved GARY PAYNE Date 29.08.12 A1 Scale AS SHOWN	Praffing VWL Design Check NLS Approved GARY PAYNE Date 29.08.12 A1 Scale AS SHOWN This Drawing must not be used for Construction unless

NEW ZEALAND TRANSPORT AGENCY SH1 REGION 11 RP350/3.92 TO RP365/2.11 **CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2 ELEVATION & DETAIL - MARSHS ROAD UNDERPASS**

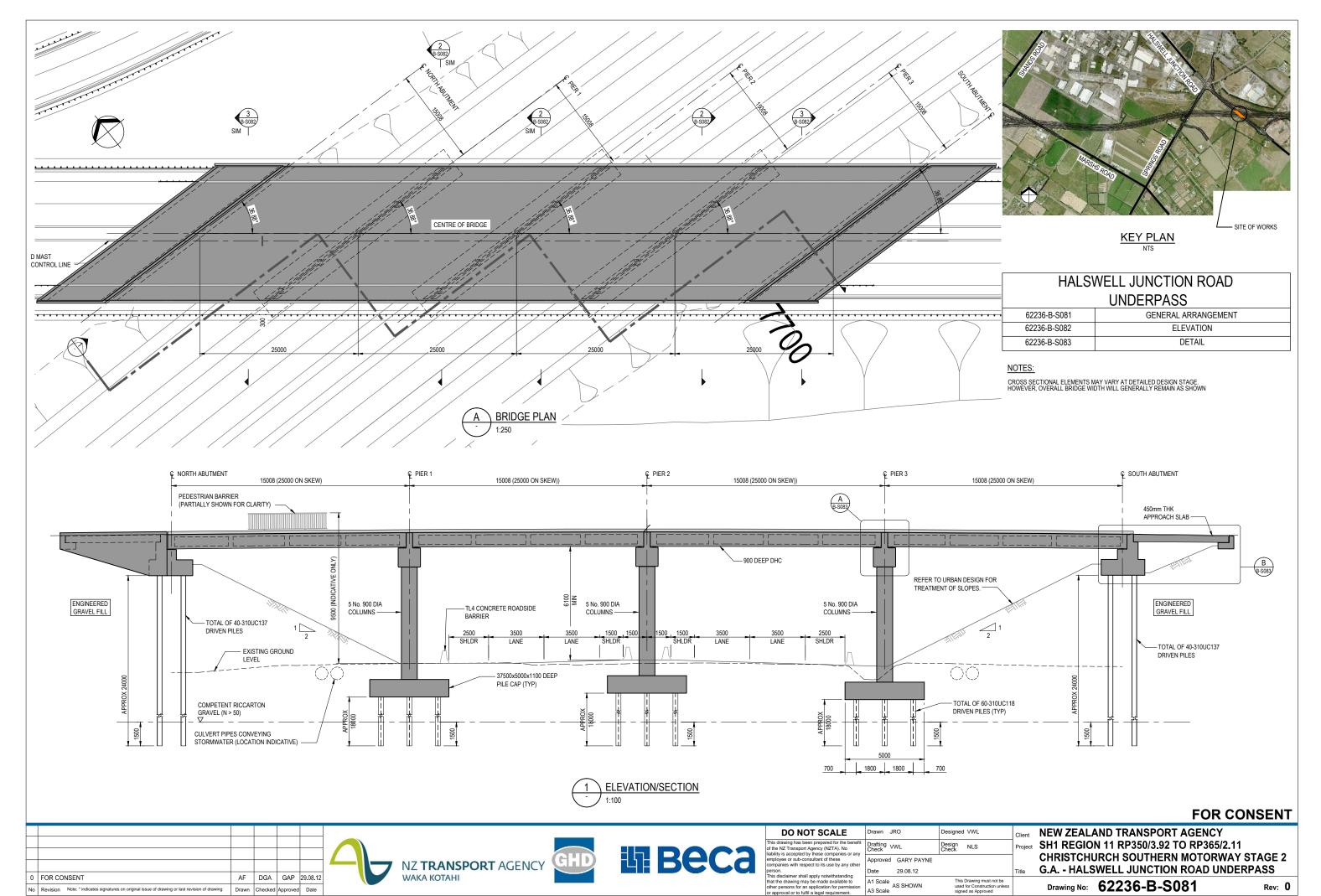
Drawing No: 62236-B-S063

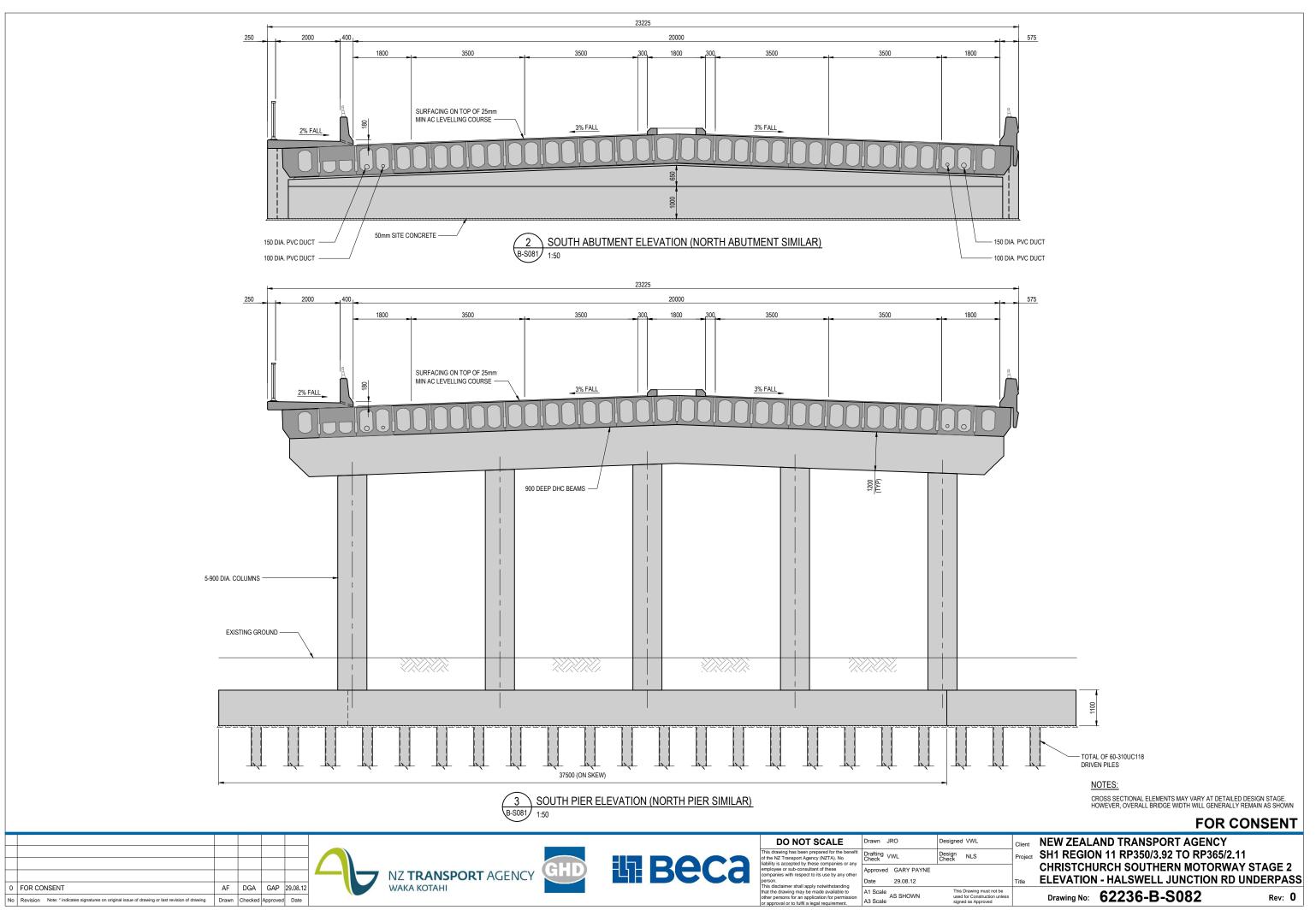


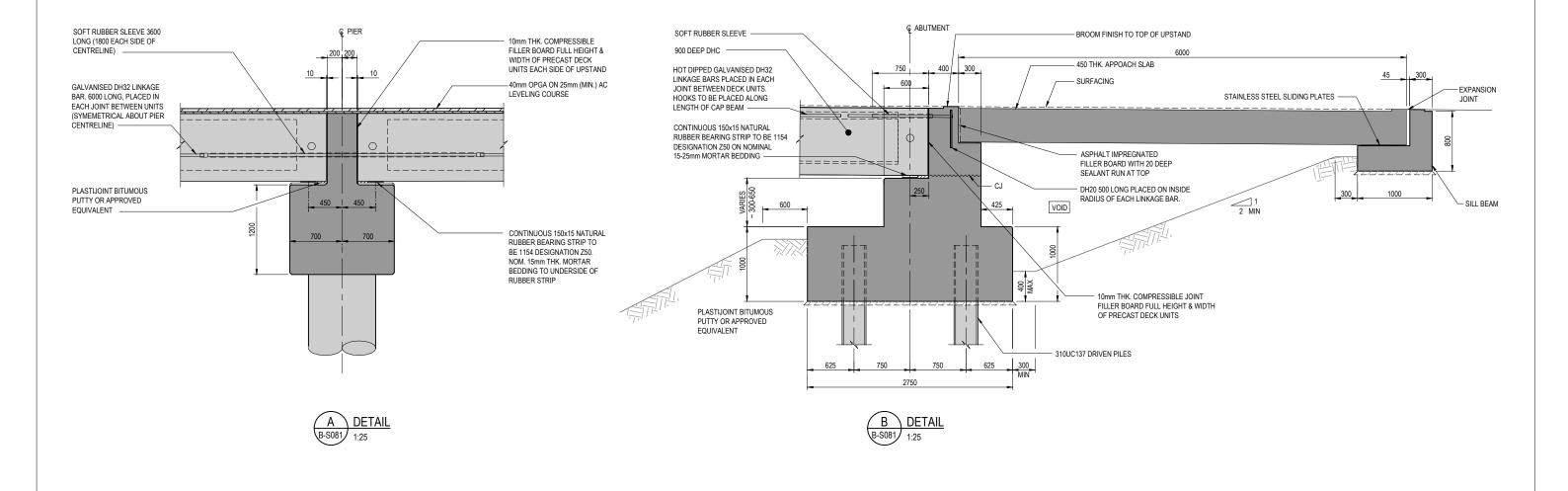
Plot Date: 29 August 2012 - 3:42 p.m.



Plot Date: 29 August 2012 - 3:42 p.m. Plotted by: Andrew Francombe Cad File No: C:\Users\AF2\Desktop\New folder (4)\62236-B-S072.dwg







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No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Checked	Approved	Date







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employee or sub-consultant of these companies with respect to its use by any other	Approved	GARY PAYNE			
person. This disclaimer shall apply notwithstanding	Date	29.08.12			Title
that the drawing may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.	A1 Scale A3 Scale	AS SHOWN	This used signe		

NEW ZEALAND TRANSPORT AGENCY SH1 REGION 11 RP350/3.92 TO RP365/2.11 CHRISTCHURCH SOUTHERN MOTORWAY STAGE 2 DETAIL - HALSWELL JUNCTION RD UNDERPASS

Drawing No: 62236-B-S083