

30 June 2016



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CC: [REDACTED]

38_05

Dear [REDACTED]

PIAKO BRIDGE CLIP-ON CYCLEWAY: ASSESSMENT PROFILE AND ECONOMIC EVALUATION

As discussed in [REDACTED]'s email ([REDACTED] dated 23 June 2016) we have completed an economic evaluation of the proposal for a cycle clip-on to the Piako Bridge on SH25. To assist you in completing the TIO application we have also completed a review of the project's assessment profile consistent with the 2015-2018 NLTP assessment framework.

1. Summary of Findings

We completed an evaluation of the proposed improvement in accordance with NZTA's Planning and Investment Knowledge Base 2015-2018 NLTP Investment Assessment Framework assessment methodology (<https://www.pikb.co.nz/assessment-framework/2015-18-nltp-investment-assessment-framework-overview/>). This included economic evaluation and sensitivity testing for a range of cost and benefit scenarios.

We conclude that the proposed bridge clip-on has an assessment profile of MHL-MHM as follows:

- = Strategic Fit – M – Part of the NZ Cycle Trail/Nga Haerenga.
- = Effectiveness – H – Economic benefits, affordable, timely, integrated solution.
- = Efficiency – L-M – L if 15,000 users/year, M if 36,000 users/year.

2. Project Understanding

The existing bridge is part of SH25 from SH2 to Kopu and has a span of approximately 270m across the Piako River. The carriageway across the bridge is 7m wide with no shoulders, footpath or dedicated cycle facility. SH25 is a regional arterial (ONRC classification) carrying 5,960 veh/day. The operating speed is around 95km/h.



Figure 1: Layout of existing bridge

There have been no reported cyclist crashes at the bridge in the 10 year period 2006 to 2015.

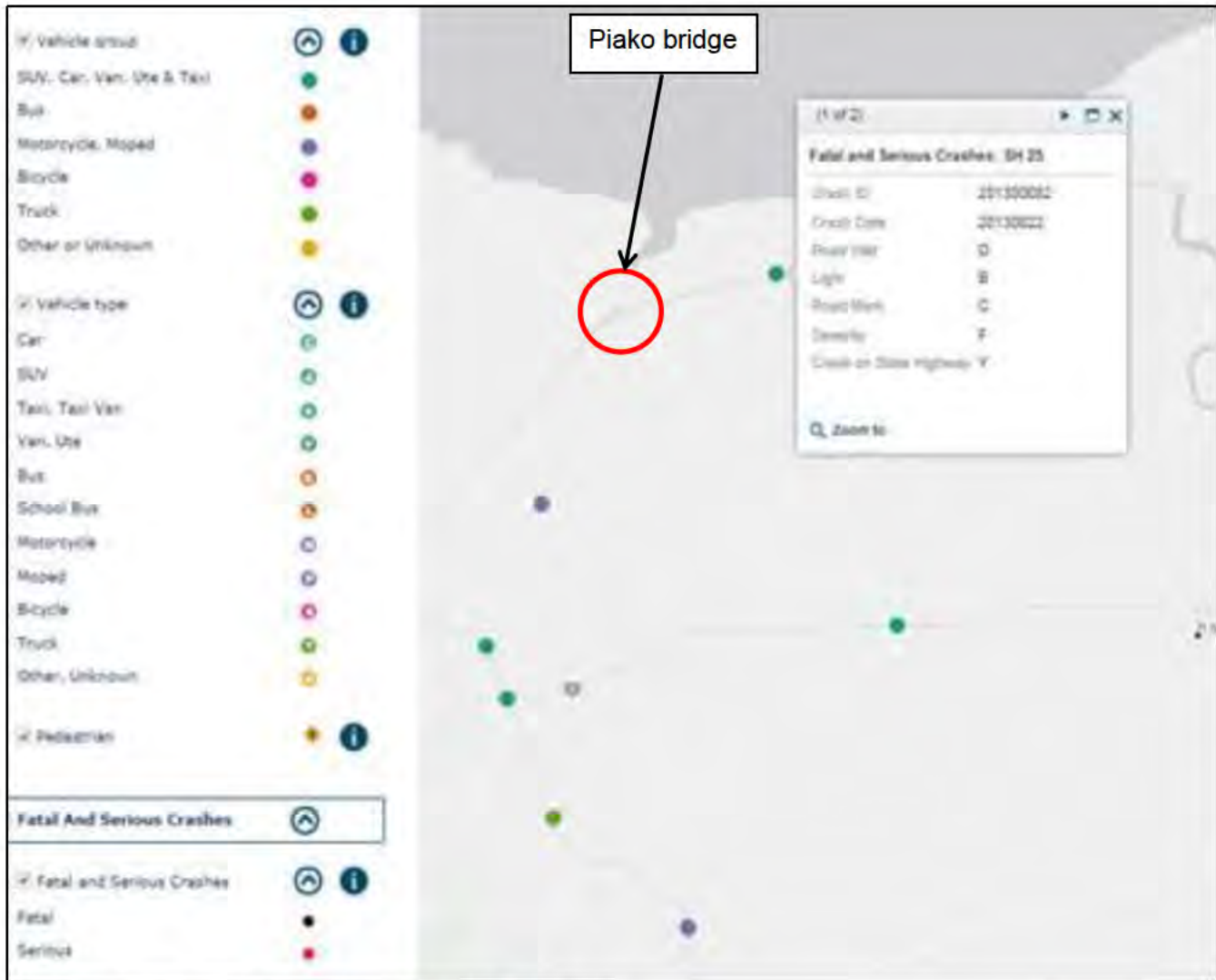


Figure 2: Crash map showing bridge location

We understand that the cycle path will form part of the Hauraki Rail Trail route from Kaiaua to Kopu¹. The Hauraki Rail Trail is part of Nga Haeranga, The New Zealand Cycle Trail² and currently attracts 21,000 visitors/year. The Hauraki Rail Trail Map is attached as Appendix A.

NZ Transport Agency and Hauraki District Council (HDC) entered into a Memorandum of Understanding (MoU) relating to roles and responsibilities in developing and maintenance of the rail trail. The MoU is attached as Appendix C.

The Piako Bridge clip-on has been designed, resource consents (APP134911.04.01 and APP134911.05.01) secured from Waikato Regional Council and certificate of compliance (COC-205.2015.00000342.001) from Hauraki DC.

3. Purpose of Assessment – Prioritisation of Improvement Investment (NLTF)

Prioritisation of activities within the NLTP uses a table of assessment profiles and assigns a priority based on:

1. Strategic Fit (relating to the problem or opportunity being addressed) and Effectiveness (how well an option delivers the desired results), and
2. Efficiency (based on the BCR – Low (1-3), Medium (3-5), High (>5)).

The key influences are Strategic Fit and Effectiveness as illustrated in Figure 3.

¹ Refer to the Hauraki Rail Trail website, <http://www.haurakirailtrail.co.nz/>; and the TCDC website outlining Stage 2-Kopu to Kaiaua of the Hauraki Rail Trail, <http://www.tcdc.govt.nz/hrt>

² www.nzcycletrail.com

Strategic fit	Effectiveness	Strategic fit and Effectiveness	Numeric benefit and cost appraisal			
			1 to 3	3 to 5	5+	
H	H	HH	Priority 3	Priority 2	Priority 1	Activities with these profiles progress to activity business cases.
H	M	HM	Priority 4	Priority 3	Priority 2	
M	H	MH	Priority 6	Priority 5	Priority 4	
M	M	MM	Priority 7	Priority 6	Priority 5	
H	L	HL	Low strategic fit does not progress beyond strategic business case. Low effectiveness does not progress beyond programme business case.			A decision gate that integrates with the business case approach.
M	L	ML				
L	H	LH				
L	M	LM				
L	L	LL				

Figure 3: Priority order of assessment table

4. Evaluation against NZ Transport Agency Investment Assessment Framework

4.1. Strategic Fit - MEDIUM

The strategic fit using the assessment framework for walking and cycling has been identified as Medium as the route is part of the Kaiaua to Kopu Cycle Trail, a nationally recognised cycle route.

Criteria for strategic fit	Assessment
A walking and cycling activity may be given a medium strategic fit rating if the problem, issue or opportunity is:	
<ul style="list-style-type: none"> part of a secondary corridor within a walking and/or cycling strategic network in a main urban area, for the purposes of utility cycling, including associated facilities to put the corridor into service; OR 	Not applicable – outside main urban area
<ul style="list-style-type: none"> a link to complete or complement an existing walking and/or cycling strategic network in a main urban area; OR 	Not applicable – outside main urban area
<ul style="list-style-type: none"> on a corridor, or site, with a medium walking and cycling crash risk; OR 	No crash history, however crash risk is likely to be Medium-High based on speed environment and high traffic volumes combined with lack of existing dedicated cycling facilities.
<ul style="list-style-type: none"> a link from a main urban area to a substantial employment centre, outside of main urban areas, which may be considered on an exception basis where high demand is demonstrated; OR 	Not applicable – outside main urban area
<ul style="list-style-type: none"> a link to complete connections to the NZ Cycle Trails. 	Medium – The Piako Bridge is on the proposed Kaiaua to Kopu route of the Hauraki Rail Trail, part of NZ Cycle Trails.
A walking and cycling activity must only be given a high strategic fit rating if the problem, issue or opportunity is:	
<ul style="list-style-type: none"> part of a primary corridor within a walking and/or cycling strategic network in a main urban area, for the purposes of utility cycling, including associated facilities to put the corridor into service; OR 	Not applicable – outside main urban area
<ul style="list-style-type: none"> on a corridor, or site, with a high walking and cycling crash risk. 	No crash history, however crash risk is likely to be Medium-High based on speed environment and high traffic volumes combined with lack of existing dedicated cycling facilities.

Table 1: Assessment of Strategic Fit

4.2. Effectiveness - HIGH

The effectiveness of the project is assessed as High as set out in Table 2.

Component	Explanation	Rating
Outcomes focused	<ul style="list-style-type: none"> tangible change in addressing the problem, issue or opportunity identified in the Strategic Fit assessment consistency with levels of service in an appropriate classification system 	High – providing dedicated facility for cyclists, that addresses the safety risk and is a vital link in the overall route.
Integrated	<ul style="list-style-type: none"> consistency with the current network and future transport plans consistency with other current and future activities consistency with current and future land use planning accommodates different needs across modes support as an agreed activity across partners 	High – Trail is managed and developed by Hauraki Rail Trail Charitable Trust, which will ensure consistency in planning. While focussed on cycling, it will also support walking. NZTA and HDC have agreed the need for the project. Their roles and responsibilities are set out in the attached MoU.
Correctly scoped	<ul style="list-style-type: none"> the degree of fit as part of an agreed strategy or business case has followed the intervention hierarchy to consider alternatives and options including low cost alternatives and options is of an appropriate scale in relation to the issue/opportunity covers and/or manages the spatial impact (upstream and downstream, network impacts) mitigates any adverse impacts on other results 	High – part of the NZ Great Trails, a nationally supported strategy for cycling.
Affordable	<ul style="list-style-type: none"> is affordable through the lifecycle for all parties has understood and traded off the best whole of life cost approach has understood the benefits and costs between transport users and other parties and sought contributions as possible the opportunity to leverage Urban Cycleway Programme funding at a project and programme level has been taken, if applicable 	High – Funding has been secured for this section of the Hauraki Rail Trail (Kaiaua to Miranda is the only part of the trail where funding is not yet secured). http://www.tcdc.govt.nz/hrt Provides opportunity for local communities to leverage off the tourism opportunities. The MoU between NZTA and HDC is attached as Appendix C.
Timely	<ul style="list-style-type: none"> delivers enduring benefits over the timeframe identified in the justified strategy or business case provides the benefits in a timely manner the programme/project will be delivered within the timing envelope of the Urban Cycleway Programme , if applicable 	High – construction began in April 2016 on the route, this application seeks funding for the bridge clip-on.
Confidence	<ul style="list-style-type: none"> manages current and future risk for results/outcomes manages current and future risk for costs 	High – construction is under way and funding is secure for the section either side, the bridge is the critical link for continuity of the cycle path. The MoU sets out the roles and responsibilities for future costs and maintenance of the structure.
Overall	<ul style="list-style-type: none"> Assessment based on lowest rating of all components 	High

Table 2: Assessment of effectiveness

Strategic fit	Effectiveness	Strategic fit and Effectiveness	Numeric benefit and cost appraisal		
			1 to 3	3 to 5	5+
H	H	HH	Priority 3	Priority 2	Priority 1
H	M	HM	Priority 4	Priority 3	Priority 2
M	H	MH	Priority 6	Priority 5	Priority 4
M	M	MM	Priority 7	Priority 6	Priority 5
H	L	HL	Low strategic fit does not progress beyond strategic business case. Low effectiveness does not progress beyond programme business case.		
M	L	ML			
L	H	LH			
L	M	LM			
L	L	LL			

BCR = 3.1 if 36,000 cyclists/year use the route.

BCR = 1.3 if 15,000 cyclists/year use the route.

Activities with these profiles progress to activity business cases.

Figure 4: BCR plotted against the priority order of assessment table

5. Conclusion

The Piako Bridge Clip-on project has an estimated construction cost of \$1M. The BCR depends on the number of users and ranges from 1.3 (15,000 cyclists/year) to 3.1 (36,000 cyclists/year). The assessment profile is MH, and is summarised below:

Strategic fit: MEDIUM

The clip-on is an important connection as part of the Kaiaua to Kopu section of the Hauraki Rail Trail which forms part of the NZ Cycle Trail/Nga Haerenga. Providing dedicated cycle facilities at the existing bridge will increase safety for vulnerable road users and promote safe use of the route. Without the clip-on the route will be incomplete and will present a significant safety risk to users of the Hauraki Rail Trail.

The bridge clip-on will complete the Hauraki Rail Trail which is currently being constructed.

Effectiveness: HIGH

Delivers increase in walking and cycling benefits, and is expected to attract economic benefits to the wider community from tourism. The 45km extension to the Hauraki Rail Trail is expected to increase opportunities for visitors to complete multi-day rides and associated overnight stays within the region contributing to the wider economy.

The project is affordable with funding secured for the sections of the Hauraki Rail Trail either side of the bridge.

Construction of the Kaiaua to Kopu section of the Hauraki Rail Trail began in April 2016. Construction of cycle facilities at the Piako Bridge would complete the connectivity of this route.

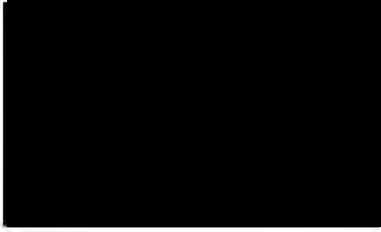
The project is supported by NZ Transport Agency, Hauraki DC, Thames-Coromandel DC and NZ Cycle Trails/Nga Haerenga, demonstrating that the project is integrated in planning of the project partners. NZ Transport Agency and Hauraki DC have entered into a MoU setting out their roles and responsibilities for implementation and operation of the Kaiaua to Kopu section of the Hauraki Rail Trail.

Efficiency: LOW (BCR 1-3 (Conservative BCR = 1.3 for 15,000 users/year)

If the number of users were 36,000, the BCR would be 3.1 and the profile MHM.

Please contact us if you have any questions.

Yours sincerely







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SP11 Walking and cycling facilities

Spreadsheet v 5 (1-Jan-16)

Worksheet 1 - Evaluation summary

Worksheet 1 provides a summary of the general data used for the evaluation as well as the results of the analysis. The information required is a subset of the information required for assessment in terms of the NZTA's *Planning and Investment Knowledge Base*.

1	Evaluator(s)	[REDACTED]		
	Reviewer(s)	[REDACTED]		
2	Activity details			
	Approved organisation name	Hauraki District Council		
	Activity name	Piako River Bridge Cycle Clip-on		
	Your reference			
	Activity description	Cycle facilities on the existing bridge across the Piako River		
	Describe the issues to be addressed	Provide cycle facilities to cross the Piako River due to increase in recreational cycling created through development of the Hauraki Rail Trail		
3	Location			
	Brief description of location	SH25 - Piako Bridge (RP12/2.8)		
4	Alternatives and options			
	Describe the do-minimum	Do nothing, any cyclist must share the lane across the bridge.		
	Summarise the options assessed	Retrofit pedestrian clip-on to existing Piako River Bridge		
5	Timing			
	Time zero (assumed construction start date)	1 July	2016	
	Expected duration of construction (months)		2	
	Period of analysis		40	
6	Economic efficiency			
	Date economic evaluation completed (mm/yyyy)		Jun-16	
	Base date for costs and benefits	1 July	2015	
	Land designation required		no	
7	Data (only fill the applicable data)			
	Existing pedestrian/cycling volumes	0	AADT in year	2016
	Estimated new pedestrian/cyclist volume	(from WS SP11-7)	41	AADT
	Estimated motor vehicle volumes		5,960	AADT
	Estimated motor vehicle speed		100.00	km/h
	Pedestrian/cyclist growth rate		1.00	%
	Width available for walking/cycling before		0.00	m
	Width available for walking/cycling after		3.00	m
	Length walked/cycled after works		0.27	km
	Length walked/cycled before works		0.27	km
	Expected reduction in private vehicle travel		0.00	km per year
8	PV cost of do-minimum		\$ 0	A
9	PV cost of the preferred option		\$ 940,000	B
10	Benefit values from worksheet 4, 5, 6			
	PV travel time cost savings	\$ 0	C x Update factor ^{TTC}	1.44 = \$ 0 X
	PV facility benefits	\$ 1,037,615	D x Update factor ^{WCB}	1.16 = \$ 1,203,633 Y
	PV crash cost savings	\$ 0	E x Update factor ^{AC}	1.00 = \$ 0 Z
11	$BCR_N = \frac{PV \text{ net benefits}}{PV \text{ economic costs}} = \frac{X + Y + Z}{B - A} = \frac{1,203,633}{940,000} = \mathbf{1.28}$			

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Worksheet 3 - Cost of the option(s)

Worksheet 3 is used for calculating the PV cost of the walking or cycling facility.

1 PV of estimated cost of proposed work (as per attached estimate sheet)

$$\text{\$ } 1,000,000 \times 0.94 = \text{\$ } 940,000 \quad \text{(a)}$$

2 PV of maintenance in year 1

$$\text{\$ } \quad \quad \quad \text{(b)}$$

3 PV of annual maintenance costs following the work

$$\text{(years 2 to 40 inclusive) } \text{\$ } \quad \quad \quad \times 14.52 = \text{\$ } 0 \quad \text{(c)}$$

4 PV of periodic maintenance costs

Time zero

1st July in the year 2016

Periodic maintenance will be required in the following years:

Year	Type of maintenance	Amount \$	SPPWF	Present Value

$$\text{Sum of PV of periodic maintenance costs} = \text{\$ } 0 \quad \text{(d)}$$

5 PV cost of additional annual maintenance

$$\text{\$ } \quad \quad \quad \times 14.52 = \text{\$ } 0 \quad \text{(e)}$$

6 PV of total cost of option

$$\text{PV total costs (a) + (b) + (c) + (d) + (e) = } \text{\$ } 940,000 \quad \text{B}$$

Transfer the PV total cost for the preferred option **B**, to **B** on worksheet 1

SP11 Walking and cycling facilities

Spreadsheet v 5 (1-Jan-16)

Worksheet 4 - Travel time cost savings

Worksheet 4 is used for calculating pedestrian and cyclist travel time cost savings.

1 Road category (Select)		Rural strategic	
2 Travel time data			
Walkers and/or cyclists average annual daily traffic current (AADT) (or volumes affected by the improvement)		0	
Walking or Cycling growth rate (per annum)		1.00%	
Travel time cost (TTC) (Table 4.1b)		\$ 23.85	
		Do-minimum	Option
Length of route (km)	L^{dm}	0.27	L^{opt} 0.27
Mean speed	VS^{dm}	100.00	VS^{opt} 100.00
Relative attractiveness	(Table SP11.1)		2.00
3 Annual TTC for the do-minimum			
		$\frac{AADT \times 365 \times L^{dm} \times TTC}{VS^{dm}} = \$ 0 \quad \text{(a)}$	
4 Annual TTC for the option			
		$\frac{AADT \times 365 \times L^{opt} \times TTC}{VS^{opt} \times RA} = \$ 0 \quad \text{(b)}$	
5 Value of annual TTC savings		(a) - (b) = \$ 0 (c)	
6 PV of travel time cost savings		DF 16.51 (c) x DF = \$ 0 C	
Transfer the PV of travel time cost savings for the preferred option C , to C on worksheet 1			

SP11 Walking and cycling facilities

Spreadsheet v 5 (1-Jan-16)

Worksheet 5 - Benefits for walking and cycling facilities

Worksheet 5 is used to calculate the walking and cycling facility benefits for the various options. Only one category for walking and one category for cycling may be used in an evaluation of a proposal. If an activity contains more categories, they must be submitted as separate evaluations.

Activities that combine walking and cycling may claim benefits for both modes but safety issues arising from pedestrian/cycle conflicts must be addressed, and if there are additional crash costs these must be accounted for in worksheet 6. Make sure the estimates of the new number of pedestrians and/or cyclists generated by the facility are realistic.

Required information:

- L Length of new facility in kilometres
- NPD Number of additional pedestrians per day
- NTD Number of additional cycle trips per day
- NSD Number of additional and existing cycle trips per day
- DF Discount factor. The discount factor may differ by mode depending on the growth rate

Health and environment benefits for walking facility

Pedestrian growth rate (per annum) 1.00%

1 Health and environment benefits for footpaths and other pedestrian facilities

Benefit = number of additional pedestrians/day x length of new facility in km x 365 x \$2.70

$$L \quad 0.27 \quad \times \text{NPD} \quad 0 \quad \times 365 \times \$2.70 \times \text{DF} \quad 16.51 \quad = \$ \quad 0 \quad \text{(a)}$$

2 Health and environment benefits from improvements at hazardous sites (provision of overbridges, underpasses, bridge widening or intersection improvements for pedestrians)

Benefit = number of additional pedestrians/day x 365 x \$2.70

$$\text{NPD} \quad 0 \quad \times 365 \times \$2.70 \times \text{DF} \quad 16.51 \quad = \$ \quad 0 \quad \text{(b)}$$

Transfer total (a) or (b) to **D** on worksheet 1.

Health and environment benefits for cycling facility

Cyclist growth rate (per annum) 1.00%

3 Health and environment benefits for cycle lanes, cycleways or increased road shoulder widths

Benefit = number of additional cycle trips/day x length of new facility in km x 365 x \$1.40

$$L \quad 0.27 \quad \times \text{NTD} \quad 0 \quad \times 365 \times \$1.40 \times \text{DF} \quad 16.51 \quad = \$ \quad 0 \quad \text{(c)}$$

4 Health and environment benefits from improvements at hazardous sites (provision of overbridges, underpasses, bridge widening or intersection improvements for cyclists)

Benefit = number of additional cycle trips/day x 365 x \$4.20

$$\text{NTD} \quad 41 \quad \times 365 \times \$4.20 \times \text{DF} \quad 16.51 \quad = \$ \quad 1,037,615 \quad \text{(d)}$$

Transfer total (c) or (d) to **D** on worksheet 1.

Safety benefits for cycling facility

5 Safety benefit for cycle lanes, cycleways or increased road shoulder widths in the absence of a specific crash analysis

Benefit = number of new and existing cycle trips/day x length of new facility in km x 365 x \$0.05

$$L \quad 0.27 \quad \times \text{NSD} \quad 0 \quad \times 365 \times \$0.05 \times \text{DF} \quad 16.51 \quad = \$ \quad 0 \quad \text{(e)}$$

6 Safety benefit from improvements at hazardous sites in the absence of a specific crash analysis (provision of overbridges, underpasses, bridge widening or intersection improvements for cyclists)

Benefit = number of new and existing cycle trips/day x 365 x \$0.15

$$\text{NSD} \quad 0 \quad \times 365 \times \$0.15 \times \text{DF} \quad 16.51 \quad = \$ \quad 0 \quad \text{(f)}$$

Transfer total (e) or (f) to **E** on worksheet 1.

SP11 Walking and cycling facilities

Spreadsheet v 5 (1-Jan-16)

Worksheet 6 - Crash cost savings

These simplified procedures are suitable only for **crash-by-crash analysis** (method A in appendix A6). There must be 5 years or more crash data for the site and the number and types of crashes must meet the specifications set out in appendix A6.1 and A6.2. If not, either the crash rate analysis or weighted crash procedure described in appendix A6.2 should be used. The annual crash cost savings determined from such an evaluation are multiplied by the appropriate discount factor and entered in worksheet 1 as total E. Evidence to support alternative analysis must be attached.

Movement category	All movements	Vehicle involvement	Push cycle		
1 Do-minimum mean speed	100	Road category	Rural strategic		
Posted speed limit	100	Traffic growth rate	2.00%		
2 Option mean speed	100				
Do-minimum		Severity			
		Fatal	Serious	Minor	Non-injury
3 Number of years of typical crash rate records		10			
4 Number of reported crashes over period		0	0	0	0
5 Fatal/serious severity ratio (tables A6.19(a) to (c))		0.21	0.79	1	1
6 Number of reported crashes adjusted by severity (4) x (5)		0	0	0	0
7 Crashes per year = (6)/(3)		0.00	0.00	0.00	0.00
8 Adjustment factor for crash trend (table A6.1(a))		1.02			
9 Adjusted crashes per year = (7) x (8)		0.000	0.000	0.000	0.000
10 Under-reporting factors (tables A6.20(a) to (b))		1	1.9	7.5	18.5
11 Total estimated crashes per year = (9) x (10)		0.000	0.000	0.000	0.000
12 Crash cost, 100km/h limit (tables A6.21(e) to (h))		3,100,000	330,000	18,000	1,200
13 Crash cost, 50km/h limit (tables A6.21(a) to (d))		3,100,000	325,000	17,000	1,000
14 Mean speed adjustment = ((1) - 50)/50		1			
15 Cost per crash = (13) + (14) x [(12) - (13)]		3,100,000	330,000	18,000	1,200
16 Crash cost per year = (11) x (15)		-	-	-	-
17 Total cost of crashes per year (sum of columns in row (16) fatal + serious + minor + non-injury)		\$0			
Option					
18 Percentage crash reduction		5	5	5	5
19 Percentage of crashes 'remaining' [100 - (18)]		95	95	95	95
20 Predicted crashes per year (11) x (19)		0.00	0.00	0.00	0.00
21 Crash cost, 100km/h limit (tables A6.21(e) to (h))		3,100,000	330,000	18,000	1,200
22 Crash cost, 50km/h limit (tables A6.21(a) to (d))		3,100,000	325,000	17,000	1,000
23 Mean speed adjustment = ((2) - 50)/50		1			
24 Cost per crash = (22) + (23) x [(21) - (22)]		3,100,000	330,000	18,000	1,200
25 Crash cost per year = (20) x (24)		-	-	-	-
26 Total cost of crashes per year (sum of columns in row (25) fatal + serious + minor + non-injury)		\$0			
27 Annual crash cost savings = (17) - (26)		\$0			
28 PV crash cost savings = (27) x DF		\$0			
Transfer PV of crash cost savings, E for the preferred option to E on worksheet 1					

E

SP11 Walking and cycling facilities

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Worksheet 7 – Cycle demand

This worksheet is used to calculate cycle demand for a new cycle facility. The new commuters section of the worksheet calculates the total new daily cyclist commuters. The new other section calculates the total daily new other cyclists. Finally the overall new cyclists is devised.

New and Existing cyclists

Buffers (km)	<0.4	0.4 to <0.8	0.8 to ≤ 1.6
1 Area (km ²)			
2 Density per square kilometre			
3 Population in each buffer (3) = (1) x (2)	0.00	0.00	0.00
4 Total population in all buffers (Sum of (3))	0.00		
5 Commute share (single value for all)	1.00%		
6 Likelihood of new cyclist multiplier	1.04	0.54	0.21
7 Row (7) = (3) x (6)	0.00	0.00	0.00
8 Sum of row (7)	0.00		
9 Cyclist rate (9) = ((5) x 0.96) + 0.32%	1.28%		
10 Total existing daily cyclists (10) = (4) x (9)	0.00		
11 Total new daily cyclists (11) = (8) x (9)	0.00		



MEMORANDUM OF UNDERSTANDING

between

THE NEW ZEALAND TRANSPORT AGENCY and the HAURAKI DISTRICT COUNCIL

PARTIES

THE CHIEF EXECUTIVE OF THE NEW ZEALAND TRANSPORT AGENCY TRANSPORT acting by and through the State Highway Manager Waikato / Bay of Plenty ("NZTA").

THE HAURAKI DISTRICT COUNCIL the local authority ("Council").

BACKGROUND

- A. The Hauraki District Council is leading development of a cycling and walking trail (the Hauraki Rail Trail) along various corridors in the Hauraki, Matamata-Piako and Thames-Coromandel Districts, as part of the New Zealand Cycle Trails, Nga Haerenga project.
- B. 77 kilometres of trail has been completed. A 45 km section of the trail is to be constructed between Kaiaua and Kopu ("K2K").
- C. The proposed trail crosses 3 State Highway bridges. Two crossings are on existing walkways and the third requires the construction of a cycleway / walkway clip-on to the Piako River Bridge ("Clip-on").

PURPOSE & JOINT OUTCOMES

The purpose of this MOU is to define roles, responsibilities and protocols for a positive future relationship between the parties; and to promote and develop that relationship in a way that will enable all Parties to meet their obligations and achieve their desired individual and joint outcomes.

The desired joint outcomes of this MOU are that a walking/cycling trail mostly along publicly owned land which connects Kaiaua, Thames, Te Aroha, Matamata, Paeroa and Waihi is developed and managed:

- to Standard NZ and National Cycleways specifications
- with the support of affected parties and the wider community
- in a manner consistent with the purpose for which the land is reserved
- and serviced by adequate infrastructure (roading, carparks, toilets) for the social and economic benefit of the Hauraki, Thames and Matamata-Piako Districts and resident communities
- with a clearly defined ongoing maintenance and operational strategy with allocated responsibility

1.0 RELATIONSHIP

- 1.1 The Parties wish to conduct their relationship (“the relationship”) on the basis of good faith and respect for each other’s views, mandates and responsibilities (statutory or otherwise).
- 1.2 Each Party may refer to the relationship in their dealing with others as ‘working with the other’.
- 1.3 The Parties acknowledge that this Memorandum does not create binding legal rights or obligations, but rather is intended to formally record the mutual intentions and understanding of the parties in good faith in order to promote public benefit and enjoyment from the Land.

2.0 MUTUAL TERMS

- 2.1 The parties agree to meet at least twice a year (April and August) to discuss issues of mutual interest, including business and work planning and new research and knowledge. This may also be by telephone conference or in a series of e-mail messages.
- 2.2 This Memorandum between the parties shall be in effect for a term of 20 years, expiring on 30 June 2036 unless it is earlier terminated due to the adoption of statutory management mechanisms or in accordance with clause 6 below.
- 2.3 Upon the expiry of this arrangement, the Parties will review the arrangement and decide whether or not they wish to continue on the same or other terms.
- 2.4 All Parties will provide each other with timely and accurate reports on progress, activities, issues and outcomes relating to this Memorandum.

3.0 ROLES & RESPONSIBILITIES

3.1 ROLE OF COUNCIL

- 3.1.1 The Council will manage the design and construction of the Clip-on on behalf of NZTA. This includes procurement, obtaining resource and building consents and construction management.
- 3.1.2 The Council will take responsibility and provide for the ongoing management and maintenance of the K2K route developed by the Hauraki Rail Trail project.

The Council will be responsible for routine maintenance. Routine maintenance is defined as required to keep the elements of the bridge functioning as originally

designed to meet safety requirements and agreed level of service requirements. This includes; tagging removal, litter and debris removal, maintenance of non-slip surfaces and wire mesh side panels infills. Structural maintenance requirements shall be reported to NZTA's Network Manager.

3.1.3 The Council may delegate all of its responsibilities relating to this agreement to the Hauraki Rail Trail Charitable Trust ("HRTCT"). To this end, any reference to "the Council" may be replaced with "the Hauraki Rail Trail Charitable Trust". This delegation will require the approval of NZTA.

3.2 **ROLE OF NZTA**

3.2.1 NZTA will fund the construction of and own the Clip-on.

3.2.2 NZTA will undertake any structural maintenance of the Clip-on and will be responsible for the inspection and maintenance of structural elements of the bridge. Structural elements are defined as elements that need specific design by a Structural Engineer to meet regulations, including support structure, deck and structural elements of the handrails. NZTA will report routine maintenance requirements to the Hauraki District Council following inspections. Inspections will be carried out in accordance with the Bridge Inspection Policy (S6).

3.2.3 By 31 May each year, NZTA will provide the Council with its proposed annual work programme (if any) for the 3 bridge structures that will have an effect on the operation of the HRT.

3.2.4 NZTA will consult with the Council prior to undertaking any works that will have an effect on this Memorandum of Understanding.

4.0 **COMMUNICATION**

4.1 If matters arise that may be of interest to any party, a contact person designated by each party is to be informed. That person should develop an effective working relationship with the other Party.

4.2 If the contact person changes in any organisation, there should be a handover process so that the new person can quickly settle into the role.

4.3 The parties will endeavour as much as possible to ensure that any publicity regarding the work programme will acknowledge the contributions of all Parties. All pamphlets, signs and any printed material containing the logo of any Party will be submitted to that party for approval before public release.

4.4 Should any Party wish to make any public statements about the other Parties in relation to the Land which is the subject of this Memorandum, then the parties will first discuss such a statement with the other for the mutual benefit of the parties.

5.0 DISPUTES

Any disputes and differences between the parties relating to the interpretation of or performance in relation to this Memorandum will be resolved in the first instance by direct meeting and negotiation in good faith between the State Highway Manager of the NZTA and the Chief Executive of the Council.

6.0 TERMINATION

Should any party find itself unable to fulfill its intentions under this memorandum, then any party may terminate this arrangement by providing one month's notice in writing to the other party.

Signed on behalf of the
Chief Executive NZTA



8/3/16

Witnessed by:

_____ Date: _____



_____ Date: 8/3/16

Signed on behalf of the
Hauraki District Council by

_____ Date: _____

Witnessed by:

_____ Date: _____



Hauraki Cycle Trail K2K

Piako River Bridge Clip-on

Schedule of Quantities / Estimate

Item	Description	Unit	Quantity	Rate	Amount
1 Preliminary and General					
1.1	Establishment	LS	1	75000	75000.00
1.2	Insurances / fees	LS	1	4000	4000.00
1.3	Contract Quality Plan includes H&S plan	LS	1	1500	1500.00
1.4	Quality Control and Testing	LS	1	1500	1500.00
1.5	On-site Measureup and Setout	LS	1	5000	5000.00
1.6	Reporting	LS	1	2500	2500.00
1.7	As-Builts	LS	1	4000	4000.00
1.8	Environmental management	LS	1	5000	5000.00
Sub-Total Preliminary & General					\$ 98,500.00
2 Traffic Management					
2.1	Preparation and Management of TMP	LS	1	500	500.00
2.2	Shoulder Closure	day	60	300	18000.00
2.3	Lane Closure	day	25	1500	37500.00
Sub-Total Traffic Management					\$ 56,000.00
3 Access / Protection of Services					
3.1	Provide access to piers as required	LS	1	75000	75000.00
3.2	Protection of services	LS	1	500	500.00
Sub-Total Access / service Protection					\$ 75,500.00
4 Site Clearance					
4.1	Clear sufficient vegetation to allow construction / remove fencing as required / local excavation at piers as required to place brackets	LS	1	1500	1500.00
Sub-Total Site Clearance					\$ 1,500.00
5 Abutments - Concrete Work					
5.1	Demolish concrete wedge and section of abutment beam	LS	1	3000	3000.00
5.2	Excavate for, supply and Place 300 thick GAP40 pad	m3	1.5	750	1125.00
5.3	Supply and place 30Mpa reinforced concrete beam and backwall	m3	1.5	1500	2250.00
5.4	Supply and install M20 HD Bolts either cast in or epoxied into existing concrete work	ea	8	200	1600.00
5.5	Supply and erect timber retaining wall adjacent to abutment	m2	5	500	2500.00
5.6	Supply, place and compact backfill behind abutment to 2m beyond backwall upto track final level	m3	8	250	2000.00
5.7	Remove, store and reposition name and BSN signage	ea	2	100	200.00
5.8	Allowance for encapsulation of service at abutments	PS	1	1000	1000.00
Sub-Total Abutments - Concrete Work					\$ 13,675.00
6 Piers - Support Steelwork					
6.1	<i>Piers B, b, C and c</i>				
6.1.1	Drill, supply and place horizontal M24 upper anchors	ea	24	50	1200.00
6.1.2	Drill, supply and place inclined M24 lower anchors	ea	32	50	1600.00
6.1.3	Fabricate and install individual support brackets	ea	8	3000	24000.00
6.1.4	Extra over 5.1.3 cost for additional length on widened bracket	ea	2	inc	
6.1.5	Fabricate and install top bracing frame	ea	4	inc	
6.2	<i>Piers D and d</i>				
6.2.1	Core, supply and place horizontal M30 upper anchors	ea	4	600	2400.00
6.2.2	Drill, supply and place horizontal M24 lower anchors	ea	8	50	400.00
6.2.3	Fabricate and install support bracket	ea	2	3000	6000.00
6.3	<i>Piers E, e, F, f, G, g, H, h, I and i</i>				
6.3.1	Drill, supply and place horizontal M24 upper anchors	ea	60	50	3000.00
6.3.2	Drill, supply and place horizontal M24 lower anchors	ea	60	50	3000.00

Hauraki Cycle Trail K2K

Piako River Bridge Clip-on

Schedule of Quantities / Estimate

Item	Description	Unit	Quantity	Rate	Amount
6.3.3	Fabricate and install individual support brackets including lower fixing bracket	ea	20	3000	60000.00
6.3.4	Extra over 5.3.3 cost for additional length on widened bracket	ea	4	inc	
6.3.5	Fabricate and install top bracing frame	ea	10	inc	
Sub-Total Piers - Support Steelwork					\$ 101,600.00
7 Cycleway Deck - Steelwork / Timber					
7.1	Supply, fabricate and install 360UB57 deck section (13.716 x 1.5) including diagonals and transom members	ea	12	13000	156000.00
7.2	Supply, fabricate and install 360UB57 deck section (13.716 x 2.0) including diagonals and transom members	ea	4	14000	56000.00
7.3	Supply, fabricate and install 530UB82 deck section (19.812 x 1.5) including diagonals and transom members	ea	1	15000	15000.00
7.4	Supply and install 150x50 H3.2 R/S spiking timbers including DPC and fixing bolts	lm	535	45	24075.00
7.5	Supply and install 200X75 H3.2 R/S timber deck planks	lm	1940	50	97000.00
7.6	Supply and fix Tensar SS20 Geogrid to deck planks	m2	390	15	5850.00
Sub-Total Cycleway Deck					\$ 353,925.00
8 Handrails - Timber / Mesh					
8.1	<i>Outer Handrail</i>				
8.1.1	Supply, trim to suit and install 200x100 H3.2 dressed timber stanchions including blockout packers	ea	191	215	41065.00
8.1.2	Supply and install 150SED H5 post on approach for top rail extension	ea	2	250	500.00
8.1.3	Supply and install 200X100 H3.2 dressed timber top rail	lm	245	90	22050.00
8.1.4	Supply and install 150x50 H3.2 dressed timber mid and toe rail	lm	705	35	24675.00
8.1.5	Supply and install 37.5mm diamond PVC coated Chainlink mesh to handrail	lm	242	35	8470.00
8.1.6	Modified fixing arrangement for end posts on passing bay	ea	8	500	4000.00
8.2	<i>Inner Handrail</i>				
8.2.1	Supply, trim to suit and install 150x75 H3.2 dressed timber stanchions to existing concrete barrier posts	ea	214	120	25680.00
8.2.2	Supply and install 150X100 H3.2 dressed timber top rail	lm	240	85	20400.00
8.2.3	Supply and install 150x50 H3.2 dressed timber mid and toe rail	lm	580	35	20300.00
8.2.4	Supply and install 37.5mm diamond PVC coated Chainlink mesh to handrail	lm	240	30	7200.00
Sub-Total Handrails					\$ 174,340.00
9 Corrosion Protection					
9.1	Corrosion Protection to all steel work - HDG or metal thermal spray	LS	1	80000	80000.00
Sub-Total Corrosion Protection					\$ 80,000.00
10 Approach Paths					
10.1	Remove vegetation and excavate topsoil and other unsuitable material dispose off site	LS	1	1500	1500.00
10.2	Undercut to form bench for widening material	m3	120	15	1800.00
10.3	Supply, place and compact brown rock subgrade	m3	300	40	12000.00
10.4	Supply and place 75mm of blinding sand beneath slab	m3	30	40	1200.00
10.5	Supply, place and cure 125mm thick polypropylene reinforced 20MPa Concrete path	m3	38	450	17100.00
10.6	Retaining wall over culvert - as directed by Engineer	PS	1	5000	5000.00
					\$ 38,600.00

Hauraki Cycle Trail K2K Piako River Bridge Clip-on Schedule of Quantities / Estimate

Item	Description	Unit	Quantity	Rate	Amount
Summary					
1	Preliminary and General				98500.00
2	Traffic Management				56000.00
3	Access / Protection of Services				75500.00
4	Site Clearance				1500.00
5	Abutments - Concrete Work				13675.00
6	Piers - Support Steelwork				101600.00
7	Cycleway Deck - Steelwork / Timber				353925.00
8	Handrails - Timber / Mesh				174340.00
9	Corrosion Protection				80000.00
10	Approach Paths				38600.00
Total - Engineers Estimate :					\$ 993,640.00

APPENDIX E: TENDER DRAWINGS

(Opus Ref 2-9Z270.02, Sheet 1-6, 10-12, October 2014)

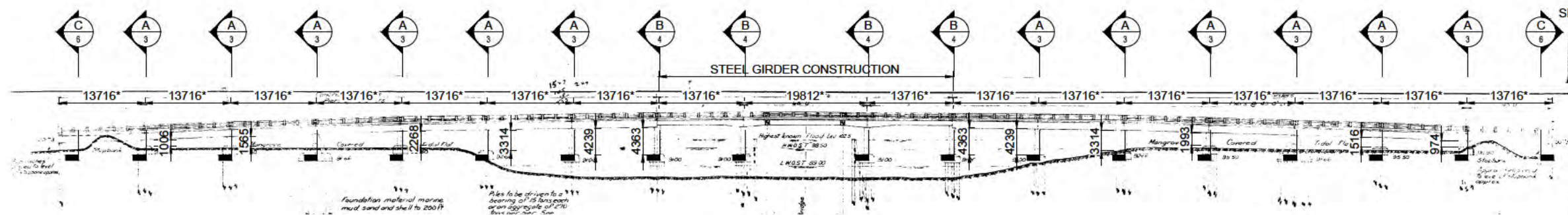




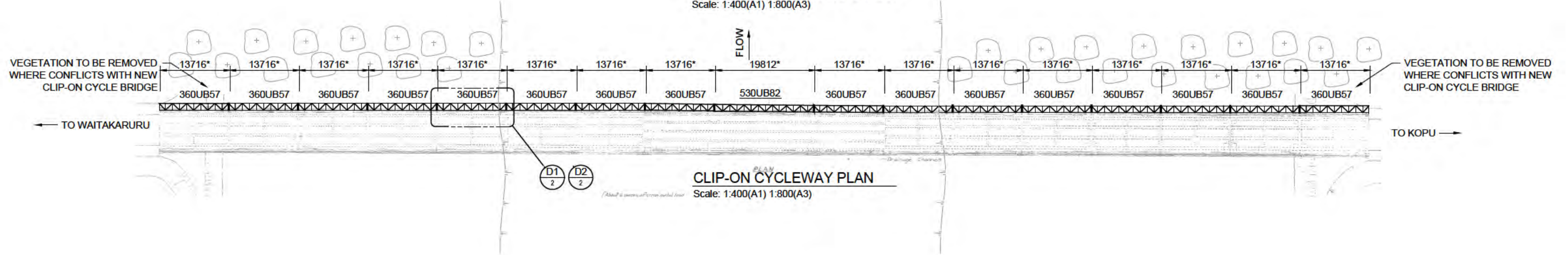
AERIAL OF LOCALITY PLAN
N.T.S



AERIAL OF EXISTING BRIDGE
N.T.S



EXISTING ELEVATION & PLAN
Scale: 1:400(A1) 1:800(A3)



CLIP-ON CYCLEWAY PLAN
Scale: 1:400(A1) 1:800(A3)

NOTES

1. ALL ROUGH SAWN/DRESSED TIMBER ABOVE GROUND TO BE H3.2 TREATED.
2. ALL ROUGH SAWN/DRESSED TIMBER IN CONTACT WITH GROUND TO BE H5 TREATED.
3. ALL ROUND POLES TO BE H5 TREATED.
4. ALL FIXINGS TO BE GALVANISED, BOLTS 8.8 GRADE UNLESS OTHERWISE SPECIFIED.
5. WHERE BOLTS ARE PASSING THROUGH TREATED TIMBER, APPLY A THICK COAT OF GREASE THOROUGHLY TO SHANK AND HEAD OF BOLT.
6. ALL STRUCTURAL STEELWORK TO BE COATED WITH IZS3-INORGANIC ZINC SILICATE 150 MICRONS MINIMUM THICKNESS TO AS/NZS 3750.15

* D MENSIONS TO BE VERIFIED ON SITE PRIOR TO FABRICATION.

RECOMMENDED CONSTRUCTION SEQUENCE:

1. CONSTRUCT APPROACHES AND RETAINING STRUCTURE FOR OUTSIDE OF TRACK.
2. ACCURATELY MEASURE SPANS & CREATE SHOP DRAWINGS FOR STEELWORK TO BE REVIEWED BY ENGINEER.
3. INSTALL CANTILEVER SUPPORT BRACKET.
4. FABRICATE STEELWORK STRUCTURE AND LIFT INTO PLACE.
5. CONSTRUCT TIMBER DECK & HANDRAILS ONCE STEEL STRUCTURE IS IN PLACE.
6. REMOVE ALL SURPLUS & TEMPORARY MATERIALS FROM SITE ON COMPLETION OF WORK.
7. ENGINEERS FINAL INSPECTION.

DESIGN ASSUMPTIONS

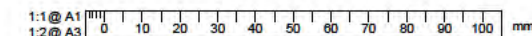
STANDARDS USED: BRIDGE MANUAL 3rd EDITION, SNZ HB 8630; 2004

1. BARRIER DESIGN LOAD 1.75kN/m (HORIZ. OR VERT.), OR 1.5kPa INFILL
2. DECK DESIGN LIVE LOAD 5.0kPa
3. LATERAL LOAD 0.1 x LIVE LOAD

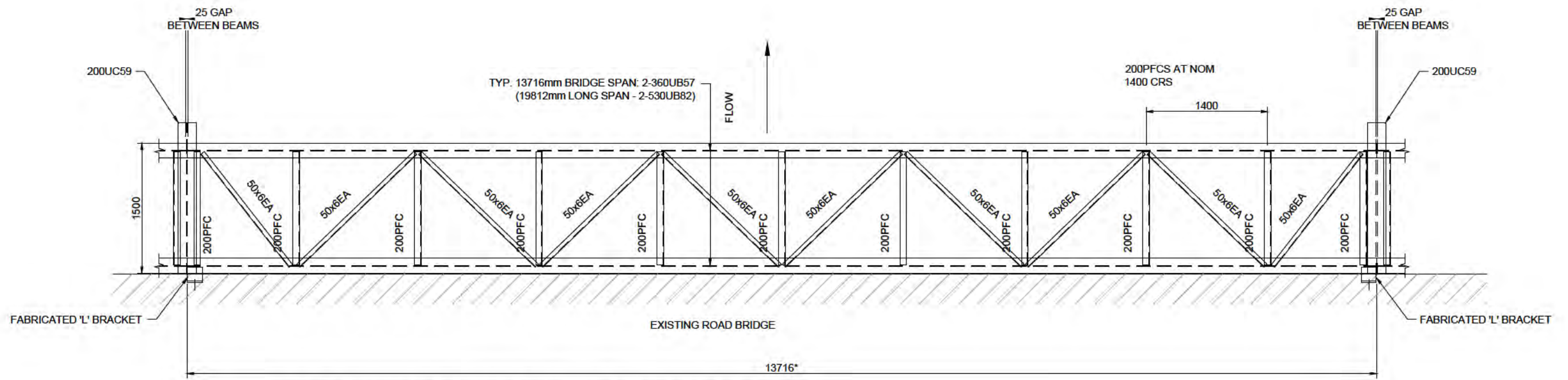
FOR TENDER

Revision	Amendment	Approved	Revision Date
R1	TENDER ISSUE	J.C	23/10/2014

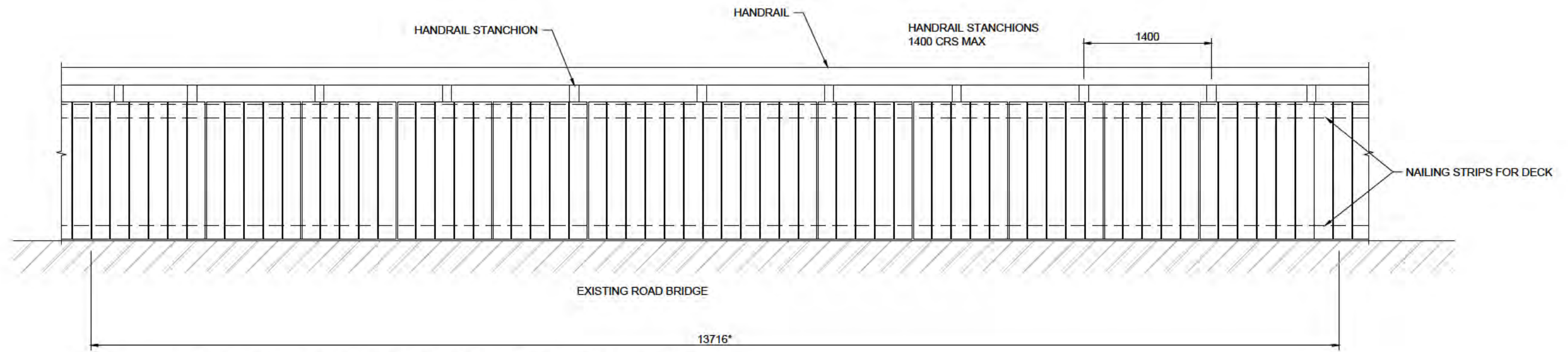
		Project HAURAKI DISTRICT COUNCIL HAURAKI RAIL TRAIL K2K THAMES TO KAIUA SECTION PIAKO BRIDGE CLIP-ON CYCLEWAY	
		Sheet A16 - PIAKO BRIDGE CLIP-ON PLAN, ELEVATION	
Drawn [Redacted]	Designed [Redacted]	Approved [Redacted]	Revision Date 23/10/2014
Project No. 2-9Z270.02	Scale AS SHOWN	Drawing No. 2-9Z270.02	Sheet No. 1
		Revision R1	



300 mm
200
100
50
0 10 mm



D1 CLIP-ON CLYCLE BRIDGE PLAN (STEEL STRUCTURE) TYP. SPAN
Scale: 1:25(A1) 1:50(A3)



D2 CLIP-ON CLYCLE BRIDGE PLAN (TIMBER STRUCTURE) TYP. SPAN
Scale: 1:25(A1) 1:50(A3)

FOR TENDER

Revision	Amendment	Approved	Revision Date
R1	TENDER ISSUE	J.C.	23/10/2014

OPUS
Hamilton Office
64 7 838 9344

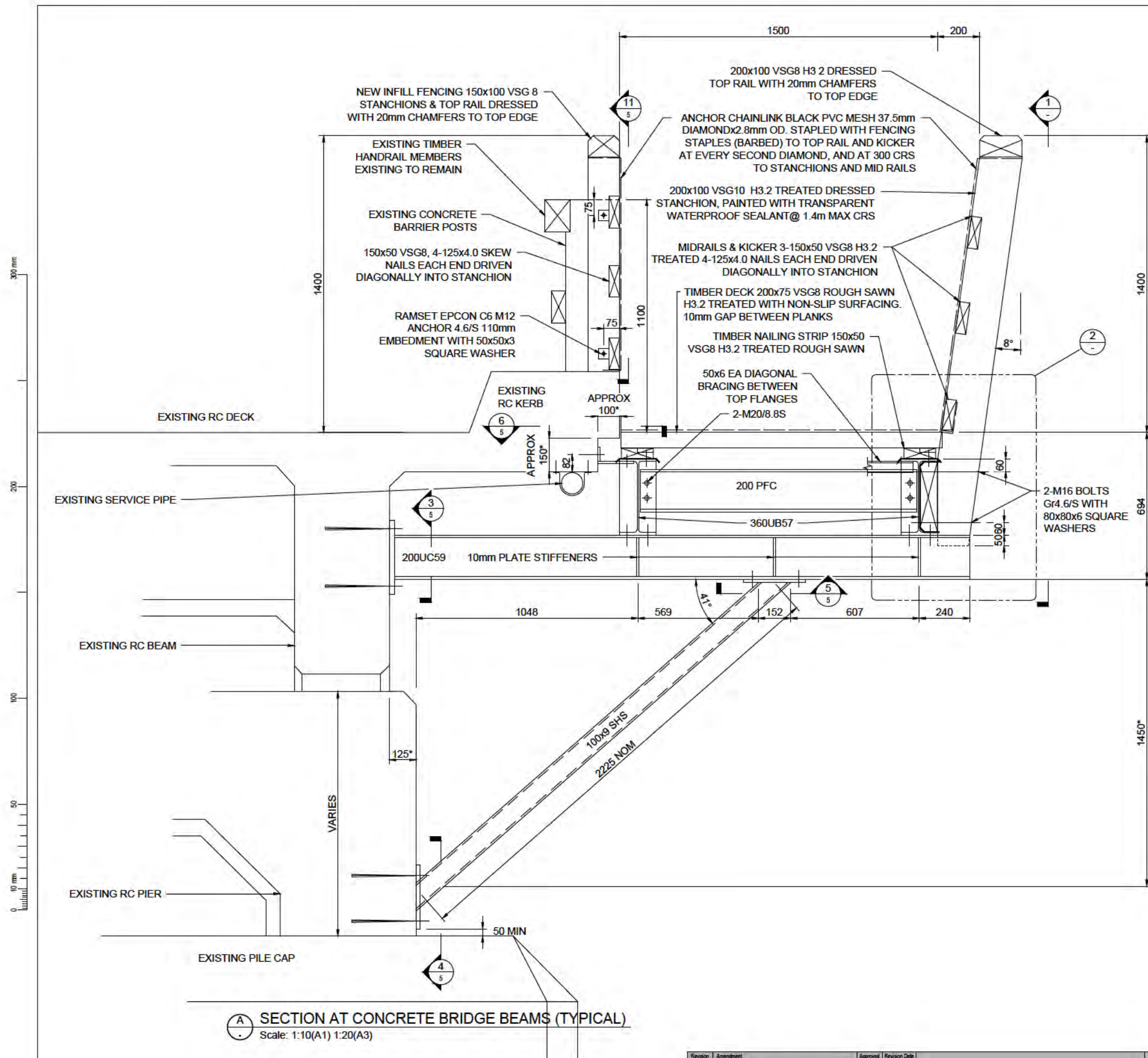
Private Bag 3057
Waikato Mail Centre
Hamilton 3240

Drawn: [Redacted] Designed: [Redacted] Approved: [Redacted] Revision Date: 23/10/2014

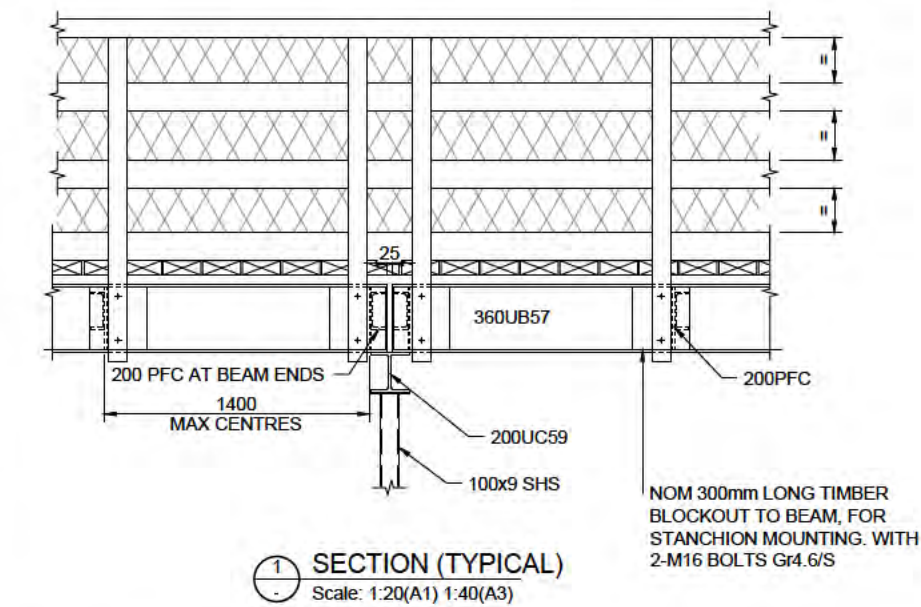
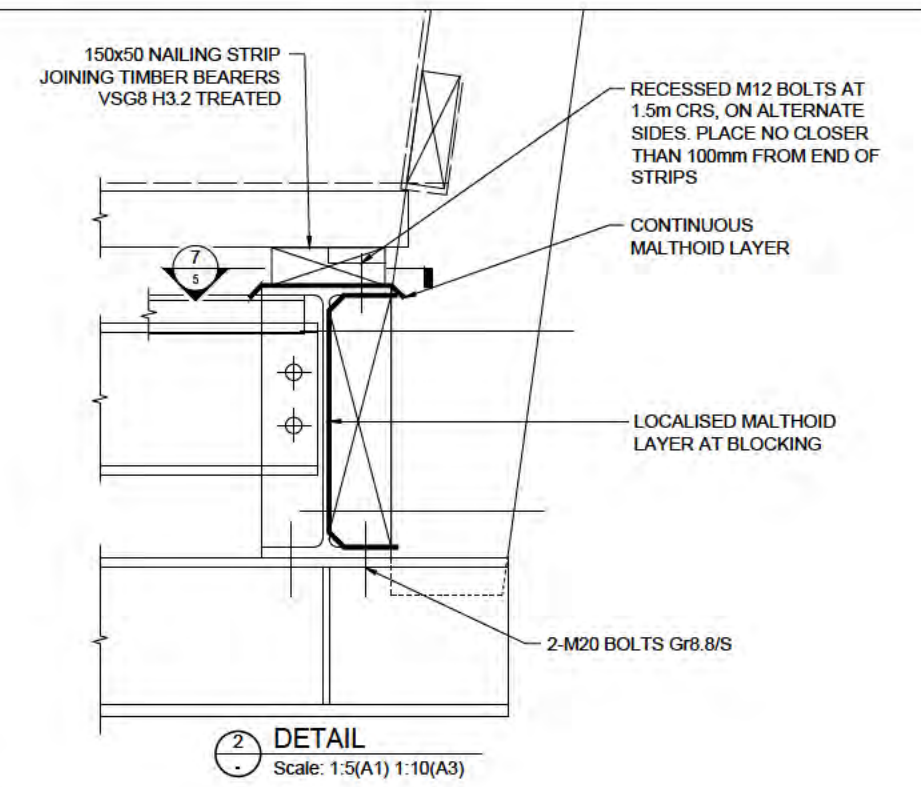
Project No: 2-9Z270.02 Scale: AS SHOWN

Project		Sheet	
HAURAKI DISTRICT COUNCIL HAURAKI RAIL TRAIL K2K THAMES TO KAIUA SECTION PIAKO BRIDGE CLIP-ON CYCLEWAY		A16 - PIAKO BRIDGE CLIP-ON STEEL PLAN, TIMBER PLAN, TYP. SPAN	
Project No:	2-9Z270.02	Sheet No:	2
Scale:	AS SHOWN	Revision:	R1

1:1 @ A1
1:2 @ A3
0 10 20 30 40 50 60 70 80 90 100 mm



A SECTION AT CONCRETE BRIDGE BEAMS (TYPICAL)
Scale: 1:10(A1) 1:20(A3)



NOTE:
ALL DIMENSIONS TO BE VERIFIED ON SITE PRIOR TO FABRICATION.

FOR CENTRAL SPAN 19812mm LONG, USE 2-530UB82

CONTRACTOR TO LOCATE EXISTING REINFORCING PRIOR TO DRILLING AND NOTIFY ANY DISCREPANCIES. REFER TO THE ORIGINAL CONSTRUCTION DRAWINGS FOR THE EXISTING BRIDGE.

CONTRACTOR TO DRILL, NOT CORE INTO BRIDGE ABUTMENTS.

ALL STRUCTURAL STEELWORK TO BE COATED WITH IZS3-INORGANIC ZINC SILICATE 150 MICRONS MINIMUM THICKNESS TO AS/NZS 3750.15

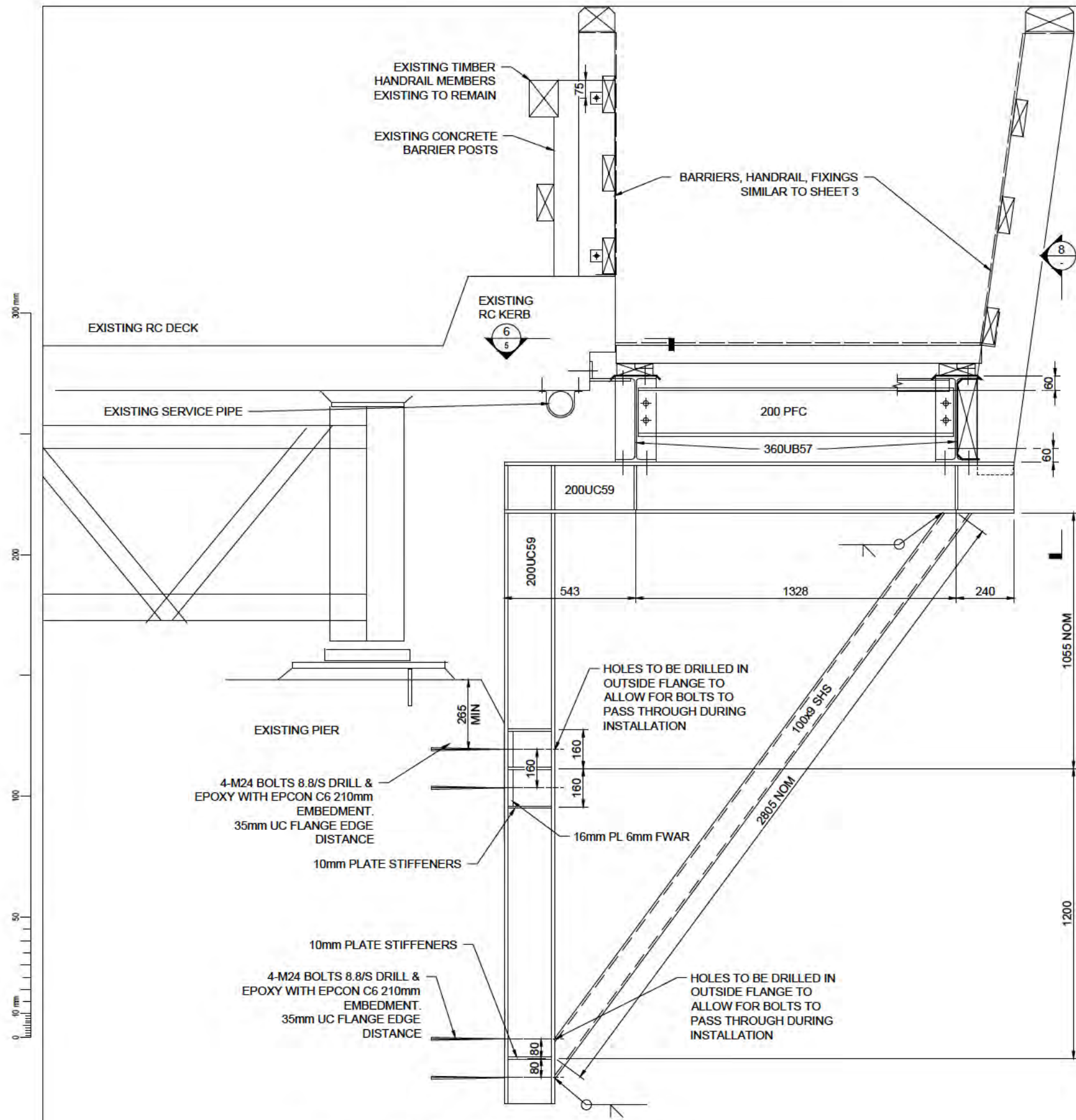
ALL BUTT WELDS TO BE FULL PENETRATION BUTT WELDS.

NON-SLIP SURFACING TO DECK TO BE 1500 WIDE TENSAR SS20 GEOGRID MESH FIXED WITH 19mm GALV STAPLES @ 100 CRS ON EDGES AND 200 CRS INTERNALLY

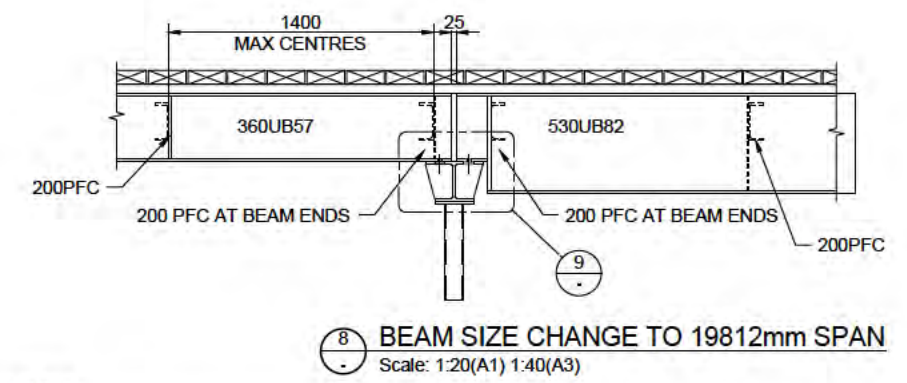
FOR TENDER

Revision	Amendment	Approved	Revision Date
R1	TENDER ISSUE	J.C.	23/10/2014

<p>Hamilton Office 64 7 838 9344</p>		Private Bag 3057 Waikato Mail Centre Hamilton 3240	
		Project HAURAKI DISTRICT COUNCIL HAURAKI RAIL TRAIL K2K THAMES TO KAIUA SECTION PIAKO BRIDGE CLIP-ON CYCLEWAY	Sheet A16 - PIAKO BRIDGE CLIP-ON CLIP-ON SECTION FOR MAIN BRIDGE CONCRETE SPANS
Drawn [Redacted]	Designed [Redacted]	Approved [Redacted]	Revision Date 23/10/2014
Project No. 2-9Z270.02	Scale AS SHOWN	Drawing No. 2-9Z270.02	Sheet No. 3
		Revision R1	

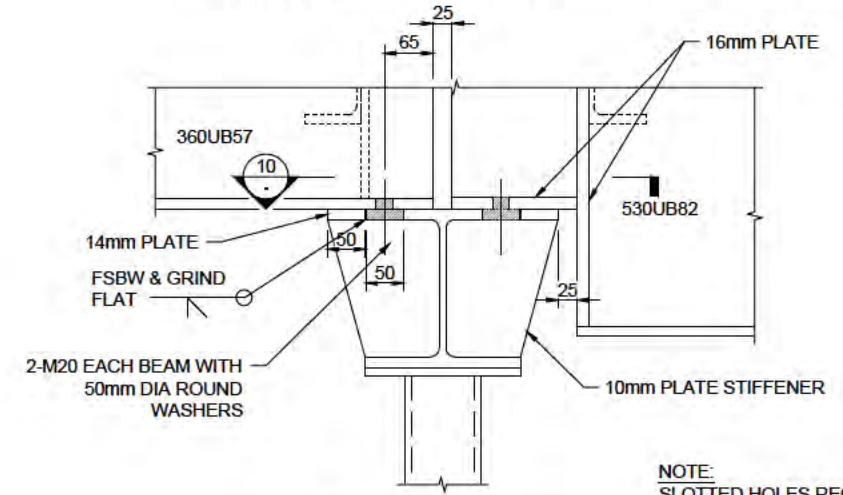


B SECTION AT STEEL BRIDGE GIRDERS (TYP.)
Scale: 1:10(A1) 1:20(A3)



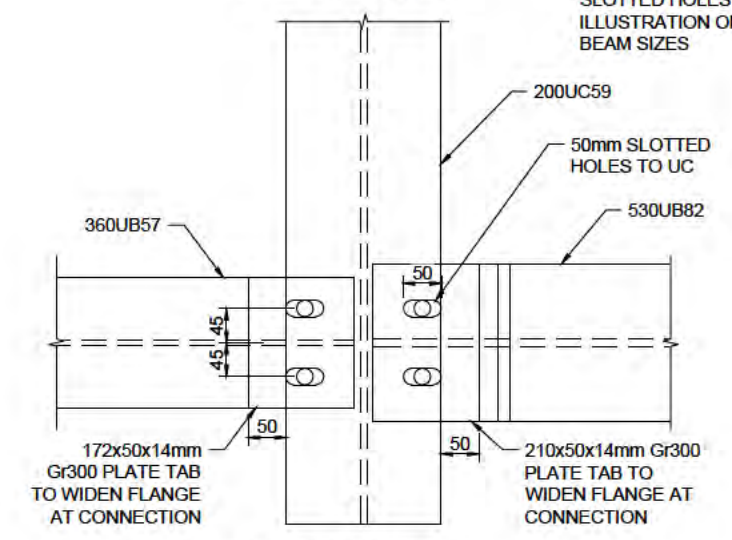
8 BEAM SIZE CHANGE TO 19812mm SPAN
Scale: 1:20(A1) 1:40(A3)

NOTES:
HANDRAIL NOT SHOWN HERE - SIMILAR TO SHEET 2
FOR CENTRAL SPAN 19812mm LONG, USE 2-530UB82
ALL STRUCTURAL STEELWORK TO BE COATED WITH IZS3-INORGANIC ZINC SILICATE 150 MICRONS MINIMUM THICKNESS TO AS/NZS 3750.15



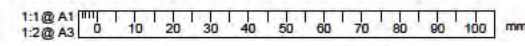
9 DETAIL
Scale: 1:5(A1) 1:10(A3)

NOTE:
SLOTTED HOLES REQUIRED TO ONE END OF EACH BEAM ONLY IN ROAD BRIDGE STEEL SPANS - TYPICALLY AT EACH UC SUPPORT THERE WILL BE NORMAL HOLES TO ONE SPAN, AND SLOTTED HOLES TO OTHER SPAN.
SLOTTED HOLES ON BOTH SPANS SHOWN HERE FOR ILLUSTRATION ONLY TO SHOW THE APPLICATION TO DIFFERENT BEAM SIZES



10 SECTION
Scale: 1:5(A1) 1:10(A3)

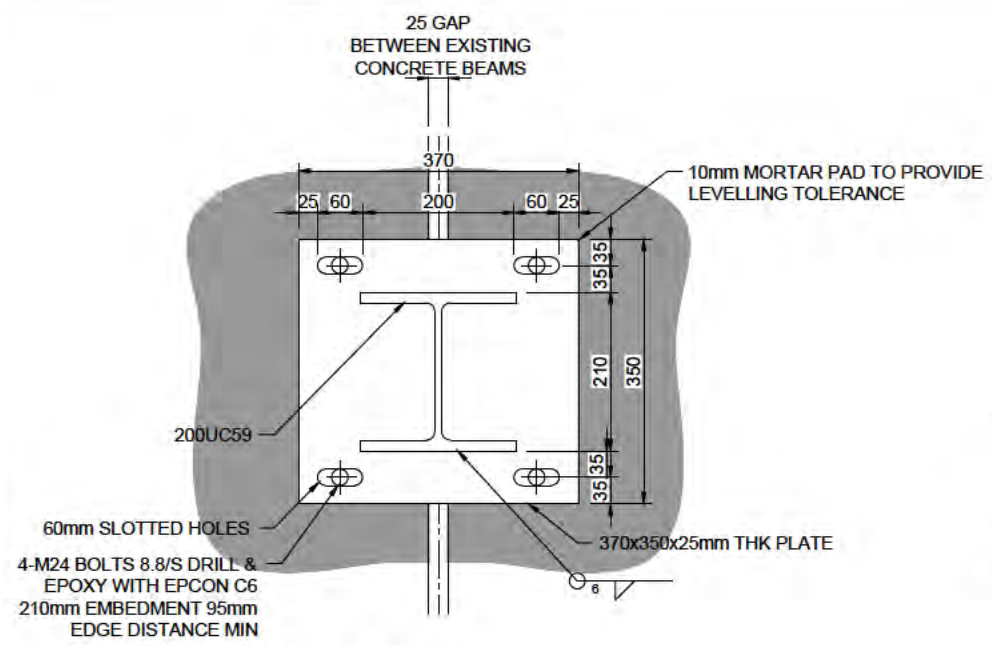
FOR TENDER



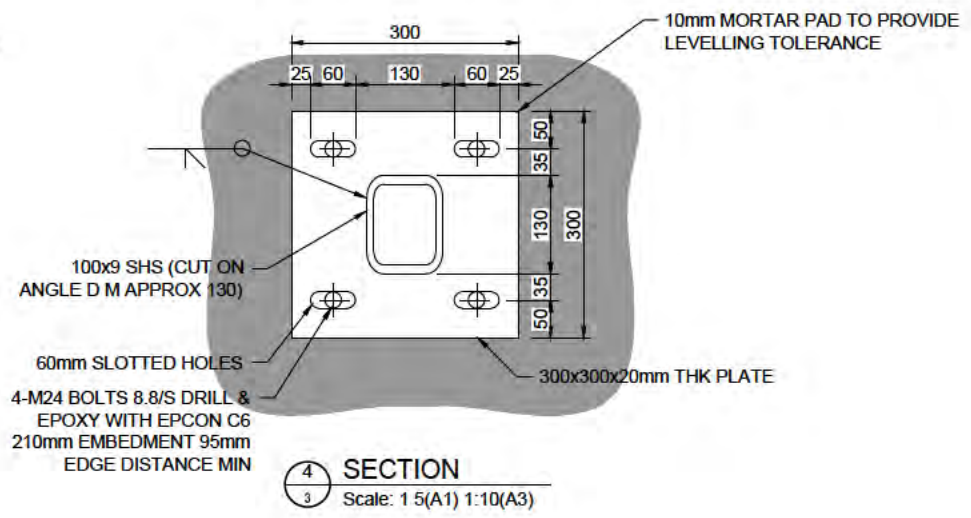
Revision	Amendment	Approved	Revision Date
R1	TENDER ISSUE	J.C.	23/10/2014

		Private Bag 3057 Walkato Mail Centre Hamilton 3240		
		Project No: 2-9Z270.02	Scale: AS SHOWN	Project: HAURAKI DISTRICT COUNCIL HAURAKI RAIL TRAIL K2K THAMES TO KAIUA SECTION PIAKO BRIDGE CLIP-ON CYCLEWAY
Drawing No: 2-9Z270.02	Revision Date: 23/10/2014	Drawing No: 2-9Z270.02	Sheet No: 4	Revision: R1

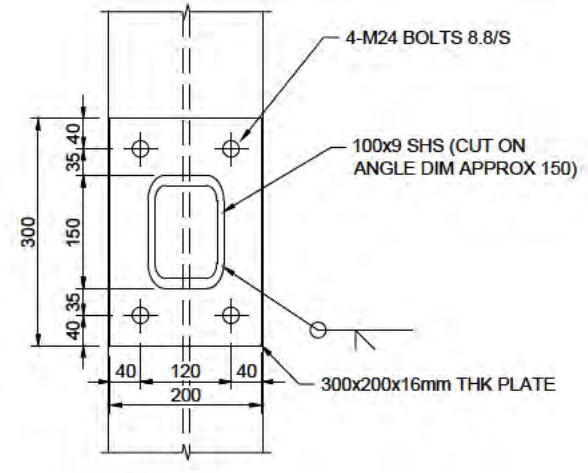
300 mm
200
100
50
0 10 mm



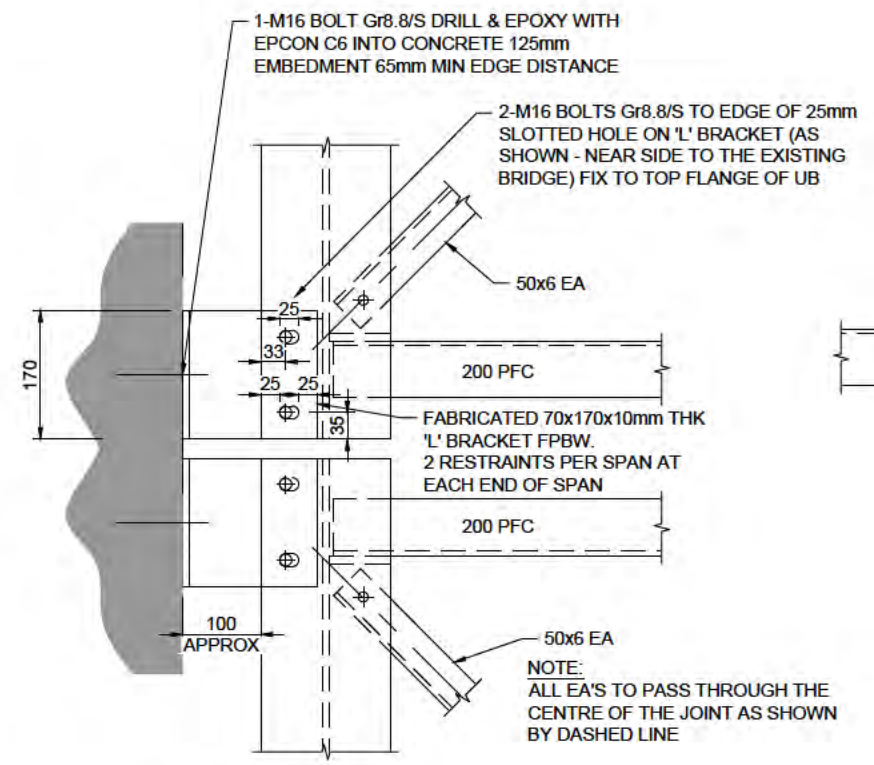
SECTION 3
Scale: 1:5(A1) 1:10(A3)



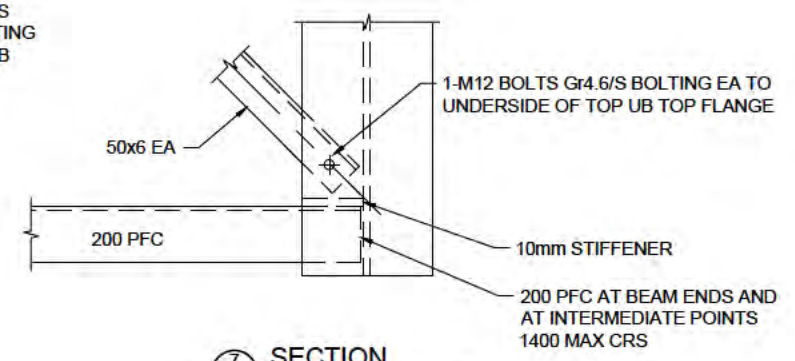
SECTION 4
Scale: 1:5(A1) 1:10(A3)



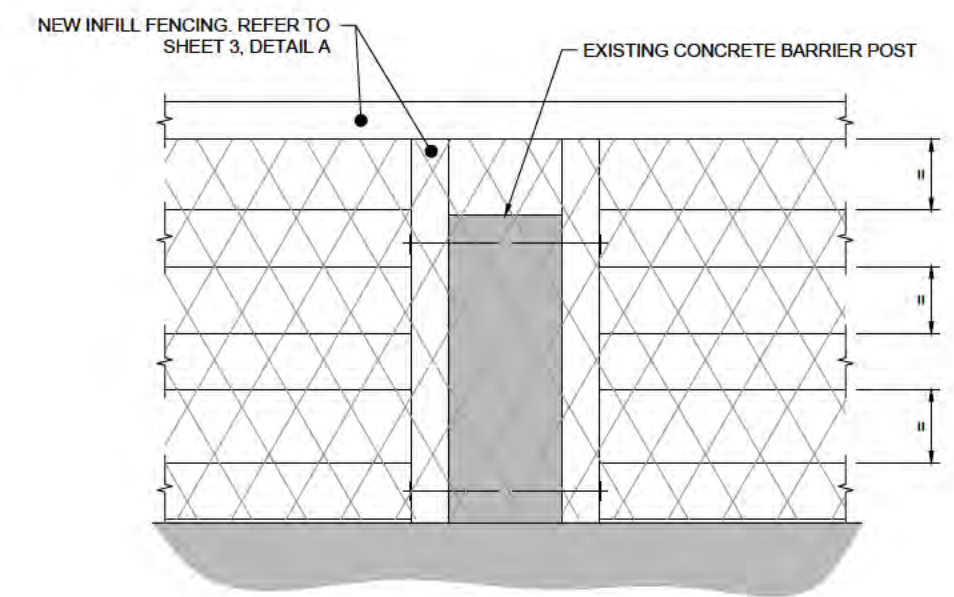
SECTION 5
Scale: 1:5(A1) 1:10(A3)



SECTION 6
Scale: 1:5(A1) 1:10(A3)



SECTION 7
Scale: 1:5(A1) 1:10(A3)



SECTION 11 - INFILL FENCING TO ROADSIDE
Scale: 1:10(A1) 1:20(A3)

NOTE:
EXISTING T MBER HANDRAIL MEMBERS ON ROAD BARRIER TO REMAIN (NOT SHOWN HERE FOR CLARITY)

FOR TENDER

1:1 @ A1
1:2 @ A3
0 10 20 30 40 50 60 70 80 90 100 mm

Revision	Amendment	Approved	Revision Date
R1	TENDER ISSUE	J.C.	23/10/2014



Private Bag 3057
Waikato Mail Centre
Hamilton 3240

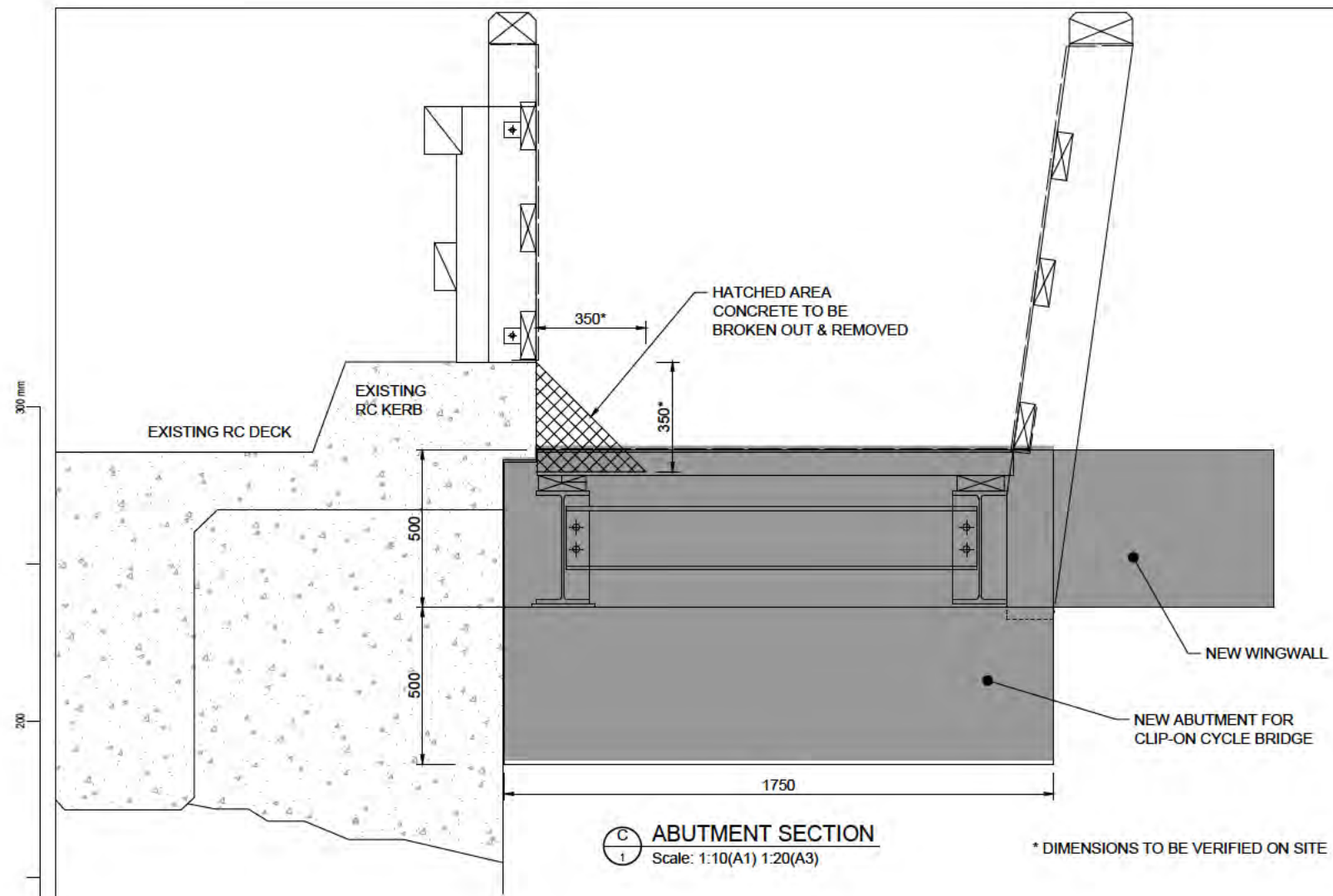
Project
HAURAKI DISTRICT COUNCIL
HAURAKI RAIL TRAIL K2K THAMES TO KAIUA SECTION
PIAKO BRIDGE CLIP-ON CYCLEWAY

Drawn: [Redacted] Designed: [Redacted] Approved: [Redacted] Revision Date: 23/10/2014

Project No: 2-9Z270.02 Scale: AS SHOWN

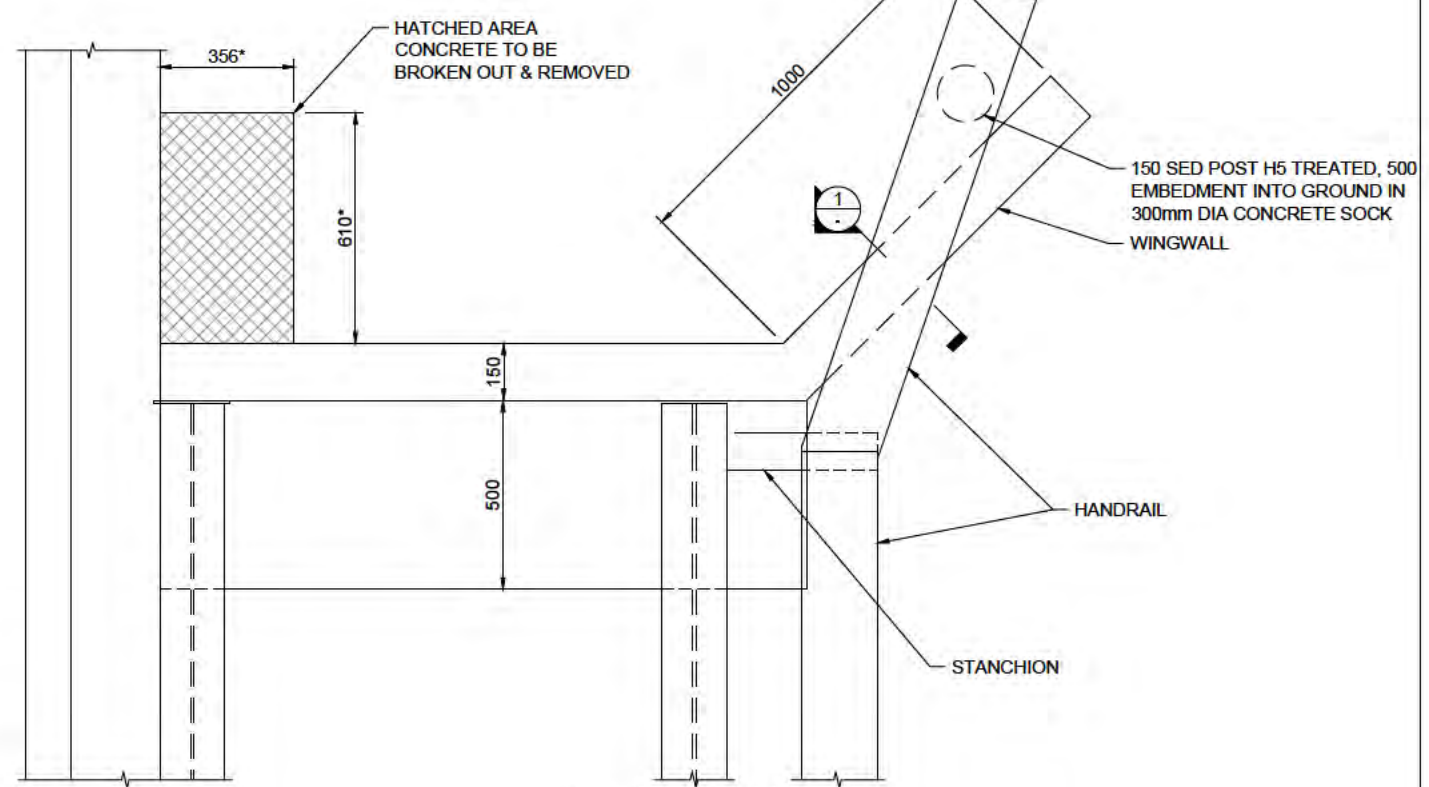
Sheet
A16 - PIAKO BRIDGE CLIP-ON
STEELWORK DETAILS

Drawing No: 2-9Z270.02 Sheet No: 5 Revision: R1



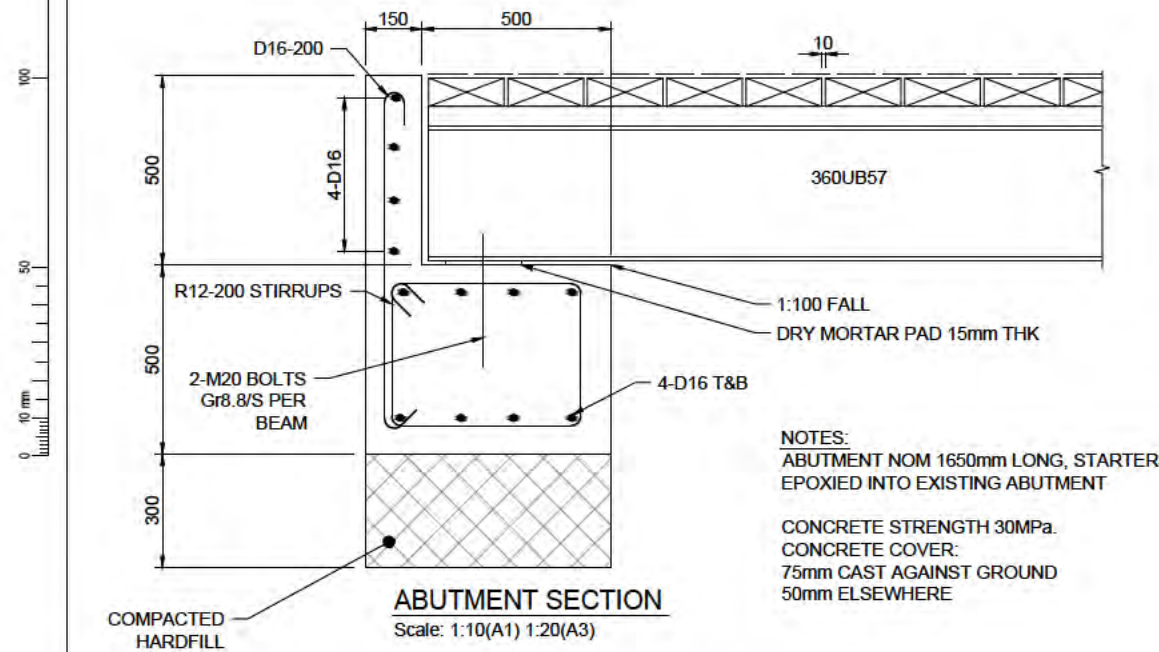
ABUTMENT SECTION
Scale: 1:10(A1) 1:20(A3)

* DIMENSIONS TO BE VERIFIED ON SITE



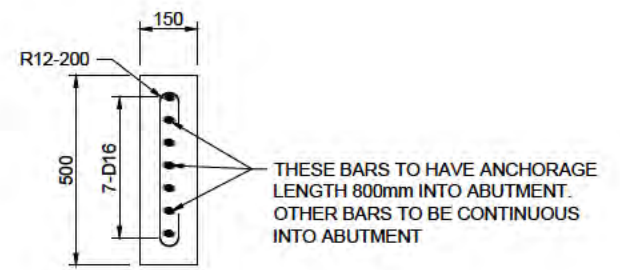
ABUTMENT PLAN
Scale: 1:10(A1) 1:20(A3)

DECK, PFC AT END & DIAGONAL EA BRACING, NOT SHOWN FOR CLARITY



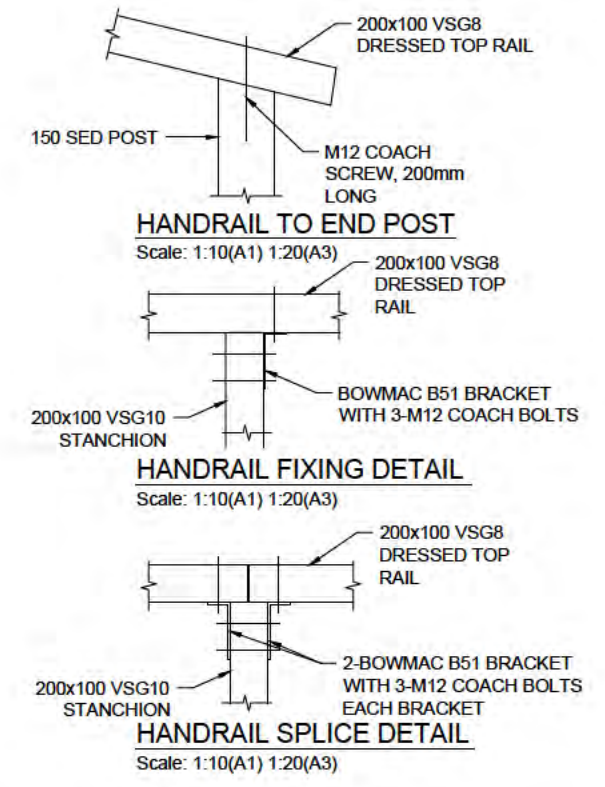
ABUTMENT SECTION
Scale: 1:10(A1) 1:20(A3)

NOTES:
ABUTMENT NOM 1650mm LONG, STARTERS EPOXIED INTO EXISTING ABUTMENT
CONCRETE STRENGTH 30MPa.
CONCRETE COVER:
75mm CAST AGAINST GROUND
50mm ELSEWHERE



WINGWALL SECTION
Scale: 1:10(A1) 1:20(A3)

THESE BARS TO HAVE ANCHORAGE LENGTH 800mm INTO ABUTMENT. OTHER BARS TO BE CONTINUOUS INTO ABUTMENT



HANDRAIL TO END POST
Scale: 1:10(A1) 1:20(A3)

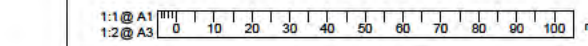
HANDRAIL FIXING DETAIL
Scale: 1:10(A1) 1:20(A3)

HANDRAIL SPLICE DETAIL
Scale: 1:10(A1) 1:20(A3)

FOR TENDER

Revision	Amendment	Approved	Revision Date
R1	TENDER ISSUE	J.C	23/10/2014

		Private Bag 3057 Waikato Mail Centre Hamilton 3240	
		Project: HAURAKI DISTRICT COUNCIL HAURAKI RAIL TRAIL K2K THAMES TO KAIUA SECTION PIAKO BRIDGE CLIP-ON CYCLEWAY	
Drawing No: 2-9Z270.02		Scale: AS SHOWN	
Project No: 2-9Z270.02		Revision Date: 23/10/2014	
Drawing No: 2-9Z270.02		Sheet No: 6	
Drawing No: 2-9Z270.02		Revision: R1	



GENERAL:

1. READ STRUCTURAL DRAWINGS WITH ALL OTHER CONTRACT DOCUMENTS. NOTIFY ANY DISCREPANCY AND OBTAIN INSTRUCTION BEFORE PROCEEDING.
2. CONTRACTOR TO CONFIRM LOCATION AND LEVEL OF UNDERGROUND SERVICES PRIOR TO FOUNDATION PILING/EXCAVATION WORKS. NOTIFY ANY CONFLICTS WITH THE DESIGNED WORKS AND OBTAIN INSTRUCTION BEFORE PROCEEDING.
3. CHECK AND VERIFY EXISTING DIMENSIONS AND LEVELS ON-SITE BEFORE COMMENCING CONSTRUCTION OR OFF-SITE FABRICATION.
4. DEMOLISH EXISTING WORK AS INDICATED BUT OTHERWISE TO THE MINIMUM EXTENT NECESSARY TO CONSTRUCT NEW WORK. DEMOLITION OF EXISTING CONCRETE TO BE DELINEATED BY STRAIGHT AND REGULAR SAWCUT LINES. MAKE GOOD ON COMPLETION OF NEW WORK, APPLY 2 COATS OF EPOXY COATING TO EXPOSED REINFORCING (BRUSH APPLIED) PROVIDE TEMPORARY PROPPING/BRACING OF EXISTING AS NECESSARY.
5. REFER TO STRUCTURAL STANDARD DETAIL DRAWINGS FOR COMMON CONSTRUCTION DETAILS, REQUIREMENTS, NOTES, INTERPRETATIVE INFORMATION ETC.
6. ALL EXISTING WORK TO BE MADE GOOD ON COMPLETION OF STRUCTURAL WORK.

TIMBER

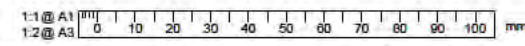
1. ALL TIMBER TO BE VSG8 GRADE RADIATA PINE COMPLYING WITH NZS 3602 AND GRADED TO NZS 3631.
2. TIMBER TREATMENT SHALL COMPLY WITH THE REQUIREMENTS OF THE NZ TIMBER PRESERVATION COUNCIL INCORPORATING – MP 3640.
3. UNLESS SHOWN OTHERWISE GENERAL CONSTRUCTION DETAILS SHALL COMPLY WITH REQUIREMENTS OF NZS 3604.
4. PROVIDE WASHERS FOR BOLTED CONNECTIONS IN LOCATIONS AND TO SIZES REQUIRED BY NZS 3603. RE-TIGHTEN NUTS PRIOR TO ENCLOSURE OF JOINTS.
5. TIMBER-TO-TIMBER AND TIMBER-TO-STEEL/CONCRETE/CONCRETE BLOCK CONNECTIONS, INDICATED ON STRUCTURAL DRAWINGS, HAVE BEEN SUBJECT TO SPECIFIC STRUCTURAL DESIGN. CONNECTIONS OTHERWISE SHALL CONFORM TO NZS 3604 REQUIREMENTS.
6. ALL TIMBER ABOVE GROUND TO BE VSG8 H3.2 ROUGH SAWN UNLESS STATED OTHERWISE. HANDRAIL TO BE DRESSED AND CHAMFERED.
7. ALL TIMBER IN CONTACT WITH THE GROUND TO BE H5 TREATED.

STRUCTURAL STEELWORK:

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH NZS 3404 SUBJECT TO RELEVANT SECTIONS OF THE SPECIFICATION.
2. READ STRUCTURAL STEELWORK DRAWINGS IN CONJUNCTION WITH ALL OTHER CONTRACT DRAWINGS. ALLOW FOR ALL HOLES, CLEATS, FIXINGS, ETC. AND INDICATE ON SHOP FABRICATION DRAWINGS.
3. STRUCTURAL STEELWORK DRAWINGS SHOW THE STRUCTURAL DESIGN INTENT. SHOP FABRICATION DRAWINGS ARE THE CONTRACTORS RESPONSIBILITY.
4. ALL BOLTS TO BE HIGH STRENGTH STEEL CLASS 8.8/S TO SPECIFICATION UNLESS NOTED OTHERWISE.
5. ALL STEELWORK, EXCEPT FOUNDATION PILES, SHALL BE SURFACE PROTECTIVE TREATED AFTER FABRICATION. REFER TO SPECIFICATION.
6. ALL BOLTS, NUTS AND WASHERS, INCLUDING HOLDING-DOWN BOLTS, SHALL BE HOT DIP GALVANISED UNLESS SPECIFICALLY NOTED OTHERWISE.
7. ALL STRUCTURAL STEEL WELDING SHALL COMPLY WITH AS/NZS 1554 CLASS S.P. ALL WELDS TO BE 6mm MINIMUM CONTINUOUS FILLET WELDS, UNLESS NOTED OTHERWISE.
8. ALL HOLLOW SECTIONS TO BE CAPPED AND SEAL WELDED ALL ROUND TO DETAILS.
9. HOLLOW STEEL SECTIONS:
ALL SQUARE AND RECTANGULAR HOLLOW SECTIONS SHALL BE GRADE 350 UNLESS OTHERWISE INDICATED. CIRCULAR HOLLOW SECTIONS 114. O.D. AND LESS SHALL BE GRADE 250 UNLESS OTHERWISE INDICATED. CIRCULAR HOLLOW SECTIONS BETWEEN 139.7 O.D. AND 457.0 O.D. INCLUSIVE SHALL BE GRADE 350 UNLESS OTHERWISE INDICATED. REFER TO SPECIFICATION.
10. HOT ROLLED OPEN SECTIONS, FLATS, PLATES AND FABRICATED SECTIONS SHALL BE GRADE 300 UNLESS OTHERWISE INDICATED. REFER TO SPECIFICATION.
11. REFER TO STANDARD STEELWORK DRAWING SHEET FOR BASE PLATE/HOLDING DOWN BOLTING DETAILS.

SURFACE PROTECTION OF STEELWORK:

1. ALL STRUCTURAL STEELWORK TO BE COATED WITH IZS3-INORGANIC ZINC SILICATE 150 MICRONS MINIMUM THICKNESS TO AS/NZS3750.15 (PAINT SHALL BE TAKEN ON SITE TO REPAIR ANY DAMAGE TO COATING OCCURING DURING CONSTRUCTION) TABLE 14 SNZ HB8630.



FOR TENDER

Revision	Description	Approved	Revision Date
R1	TENDER ISSUE	J.C.	23/10/2014

<p>Hamilton Office 64 7 838 9344</p>	<p>Private Bag 3057 Waikato Mail Centre Hamilton 3240</p>	<p>Project HAURAKI DISTRICT COUNCIL HAURAKI RAIL TRAIL K2K THAMES TO KAIUA SECTION PIAKO BRIDGE CLIP-ON CYCLEWAY</p>				
		<p>Sheet STANDARD GENERAL NOTES</p>				
<p>Drawn: [Redacted] Designed: [Redacted] Approved: [Redacted]</p>	<p>Revision Date: 23/10/2014</p>	<p>Project No: 2-9Z270.02</p>	<p>Scale: AS SHOWN</p>	<p>Drawing No: 2-9Z270.02</p>	<p>Sheet No: 10</p>	<p>Revision: R1</p>

1 SYMBOLS TIMBER FASTENERS and MEMBERS

SYMBOLS FOR BOLTS, NAILS, SCREWS AND CONNECTORS - REFER NZS 5902

	PLAN	SECTION
BOLTS		
SHEAR PLATE CONNECTOR (SPC)		
SPLIT RING CONNECTOR (SRC)		
SINGLE SIDED TOOTH PLATE CONNECTOR (SSTPC)		
DOUBLE SIDED TOOTH PLATE CONNECTOR (DSTPC)		
NAILS AND SCREWS		

BRACING ANCHORAGE (NOT IN NZS 5902)

	PLAN	SECTION
NAIL PLATES (PRE-DRILLED METAL PLATES) (NOT IN NZS 5902)		
PRESSED METAL PLATE CONNECTOR (NOT IN NZS 5902)		

SYMBOLS FOR TIMBER MEMBERS IN SECTION

CONTINUOUS MEMBER	
DRESSED	
NON-CONTINUOUS MEMBER OR PACKING	

2 WASHERS

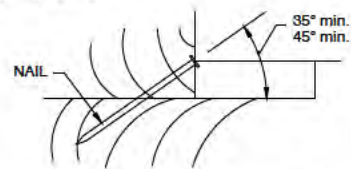
PROVIDE MILD STEEL WASHERS BETWEEN BOLT HEAD AND NUT AND CONTACT TIMBER SURFACE

MAX. DIA mm	MIN. WASHER SIZE	EQUIV dia. (min) *
8	25x25x1.5mm	28mm
12	50x50x3 mm	56mm
20	65x65x5 mm	74mm
GREATER THAN 20	75x75x8 mm	85mm

* NOT NECESSARILY STANDARD SIZES
WASHER HOLE DIAMETER MUST EQUAL BOLT DIA. +2mm

3 PENETRATION OF NAILS and SCREWS

- ALL NAILS SHALL BE FLATHEAD UNLESS OTHERWISE SHOWN
- NAILS SHALL BE FULLY DRIVEN
- SKREW NAILS



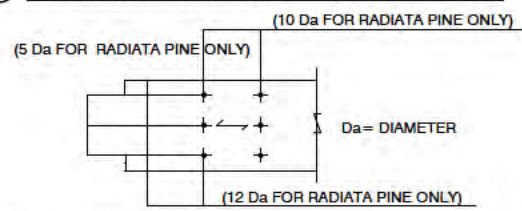
- UNLESS OTHERWISE SHOWN THE MINIMUM PENETRATION OF A NAIL INTO THE PIECE OF TIMBER RECEIVING THE POINT OF THE NAIL IS TO BE 0.5 TIMES THE LENGTH OF THE NAIL
- UNLESS OTHERWISE SHOWN THE PENETRATION OF A SCREW INTO THE PIECE OF TIMBER RECEIVING THE SCREW POINT IS TO BE 7 TIMES THE SHANK DIAMETER.

4 UNUSED

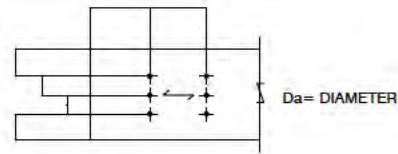
UNLESS OTHERWISE SHOWN OR SPECIFIED ON THE DRAWINGS, THESE NOTES AND DETAILS SHALL APPLY, BUT INCLUSION OF THIS SHEET DOES NOT IMPLY THAT ALL DETAILS OCCUR IN THIS CONTRACT.

DO NOT SCALE OFF DRAWINGS. CONTRACTOR TO ENSURE HE HAS ADEQUATE INFORMATION FOR CONSTRUCTION

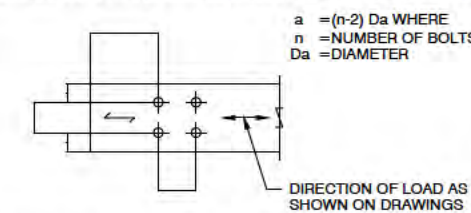
5 EDGE DISTANCES (MIN): NAILS/SCREWS/BOLTS



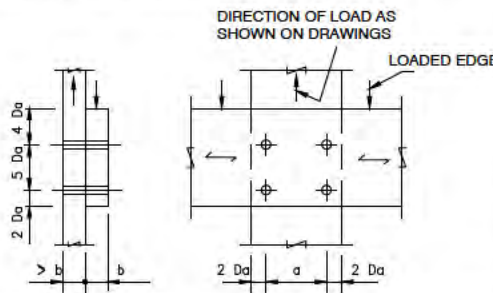
a MIN. SPACING OF NAILS (NOT SKEW NAILS)



b MIN. SPACING OF NAILS/SCREWS (HOLES PREBORED = 0.8mm DIA)



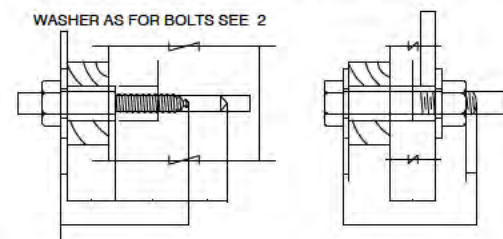
c MIN. SPACING OF BOLTS (LOAD PARALLEL TO GRAIN)



d MIN. SPACING OF BOLTS (LOAD PERPENDICULAR TO GRAIN)

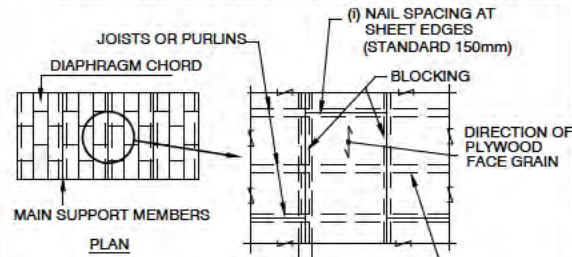
SPACING OF BOLTS (mm)					
12mm DIAMETER		16mm DIAMETER		20mm DIAMETER	
THICKNESS(b)	SPACING(a)	THICKNESS(b)	SPACING(a)	THICKNESS(b)	SPACING(a)
47	45	47	48	47	54
69-144	60	69	65	69	68
		94-144	80	94	82
				119-144	100

6 COACH SCREWS and BOLT INSTALLATION

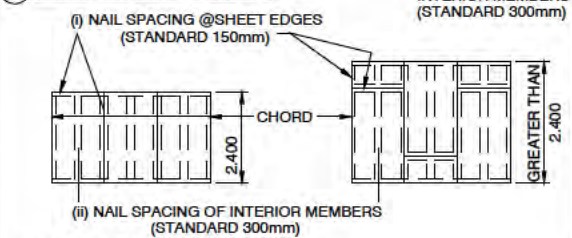


	METRIC COACH SCREW (AS:1393)	BOLT (AS:1111)
DIMENSIONS	A SHANK Da IS NOMINAL CALL SIZE B THREAD ROOT Da (max) C THREAD LENGTH = 0.6xL(MIN)+3mm(max.) D WASHER THICKNESS	
PRE-DRILLED HOLE DIMENSIONS	E SHANK Da(MIN)+1.5mm(max.) F 2xB(min.) G SHANK LENGTH LESS D	

7 LAYOUT/NAILING OF SHEET MATERIALS FLOOR/ROOF DIAPHRAGMS-SHEET BRACED WALLS



a FLOOR and ROOF DIAPHRAGM

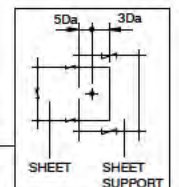


b SHEET BRACED WALLS

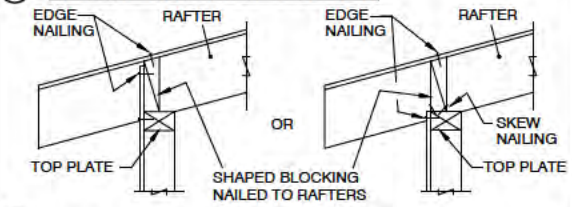
- NOTES FOR SHEET MATERIALS
- SPACING BETWEEN SHEETS TO BE 3mm UOS BY MANUFACTURER.
 - ALL FREE SHEETS EDGES SHALL BE BLOCKED.

NOTES FOR NAILING

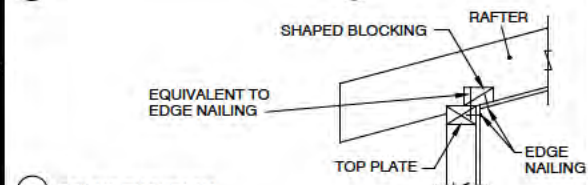
- NAILS SHALL BE FLATHEAD UOS RAS
- LENGTH OF NAIL SHALL BE AT LEAST 5 TIMES THE SHEET THICKNESS.
- MINIMUM NAIL EDGE DISTANCES SHALL BE



8 BRACING WALL/ROOF JUNCTION



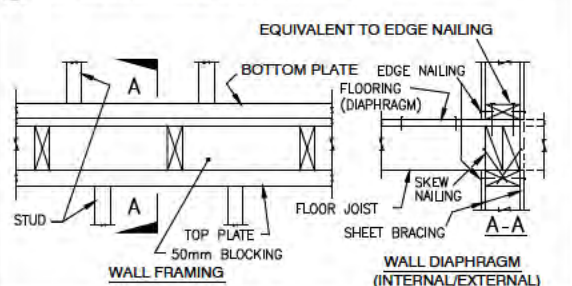
a ROOF DIAPHRAGM



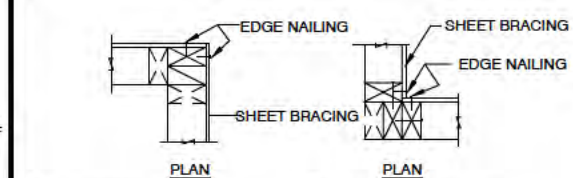
b ROOF DIAPHRAGM

c CEILING DIAPHRAGM

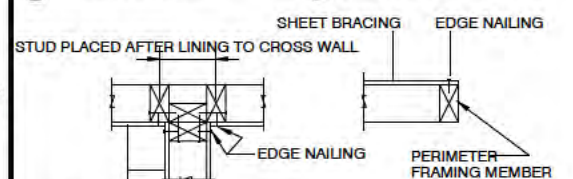
9 BRACING WALL/FLOOR JUNCTION



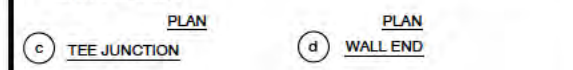
10 SHEET BRACING WALL JUNCTIONS



a EXTERNAL CORNER



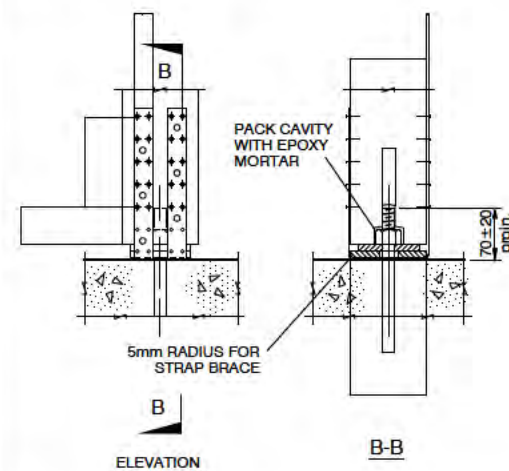
b INTERNAL CORNER



c TEE JUNCTION

d WALL END

11 CAST-IN HOLD DOWN FIXING



12 TOLERANCES

a GLUE LAMINATED TIMBER (NZS 3606)

- WIDTH STANDARD FINISH +3mm, -2mm PREMIUM FINISH ±1mm
- DEPTH ±10mm PER 1 000mm OF BEAM DEPTH
- LENGTH ±1mm PER 1 000mm WHEN LENGTH IS A CRITICAL FACTOR
- SQUARENESS ±10mm PER 1 000mm OF DEPTH, RELATIVE TO TOP OR BOTTOM FACE
- STRAIGHTNESS MAXIMUM DEVIATION OF THE AXIS OF THE MEMBER FROM ITS SPECIFIED SHAPE L/800 WHERE L IS THE LENGTH OF THE MEMBER

b GREEN GAUGED AND DRY DRESSED TIMBER (NZS:3601/NZS:3631)

- WIDTH 'B' ±0.5mm
- DEPTH 'D' ±0.5mm
- LENGTH 'L' ±1.5mm PER METRE WHEN LENGTH IS A CRITICAL FACTOR

FOR BOW, CROOK, TWIST AND CUP TOLERANCES, REFER TO TABLES 2, 3, 4 AND 5 OF NZS 3631

THE AVERAGE WIDTH OF THE MEMBER SHALL BE WITHIN ±3 PERCENT OF THE SPECIFIED WIDTH

13 ABBREVIATIONS

BN	BRACKET NAIL	IP	INTERSECTION POINT
CB	COACH BOLT	JH	JOLT HEAD NAIL
c/c	CENTRE TO CENTRE	proj.	PROJECTION
CS	COACH SCREW	rad.	RADIUS
csk. hd.	COUNTERSUNK HEAD	RAS	REFER TO ARCH. SHTS
dia.	DIAMETER (NZ 5902)	SFL	STRUCTURAL FLOOR LEVEL
Da	DIAMETER (NZ 3603) OF NAIL OR BOLT	SK	SKEW NAIL
DPC	DAMP PROOF COURSE	SOP	SETTING OUT POINT
DPM	DAMP PROOF MEMBRANE	SR	SPIRAL ROLLED NAIL
extg.	EXISTING	ST	STAPLE
FH	FLAT HEAD NAIL	tr.	TREATED
HD bolt	HOLDING DOWN BOLT	UOS	UNLESS OTHERWISE SHOWN
		↔	DIRECTION OF GRAIN

14 GENERAL NOTES (STANDARD)

- DRAWING INTERPRETATIONS TO COMPLY WITH NZS 5902 EXCEPT WHERE MODIFIED HEREIN.
- DRAWINGS TO BE READ IN CONJUNCTION WITH OTHER DISCIPLINES (eg ARCHITECTURAL, BUILDING SERVICES, MECHANICAL, ELECTRICAL ETC.) TOGETHER WITH THE SPECIFICATION.
- WHERE PROPRIETARY ITEMS ARE SHOWN ON THE DRAWINGS, OTHER ALTERNATIVES APPROVED AS EQUAL, MAY BE USED.
- WHERE ALTERNATIVES ARE SHOWN ON STANDARDS AND ARE NOT CALLED UP, THE CONTRACTOR MUST OBTAIN APPROVAL TO USE ONE OF THESE.
- THE ARCHITECT MUST BE NOTIFIED OF ANY DISCREPANCY BETWEEN STRUCTURAL AND OTHER CONTRACT DOCUMENTS BEFORE AFFECTED WORK COMMENCES
- CHECK ALL DIMENSIONS ON SITE BEFORE FABRICATING OFF SITE WORK.

FOR TENDER

Revision	Amendment	Approved	Revision Date
R1	TENDER ISSUE	J.C.	23/10/2014



Drawn	Designed	Approved	Revision Date
			23/10/2014
Project No.	Scale	Revision No.	Revision Date
2-9Z270.02	AS SHOWN		

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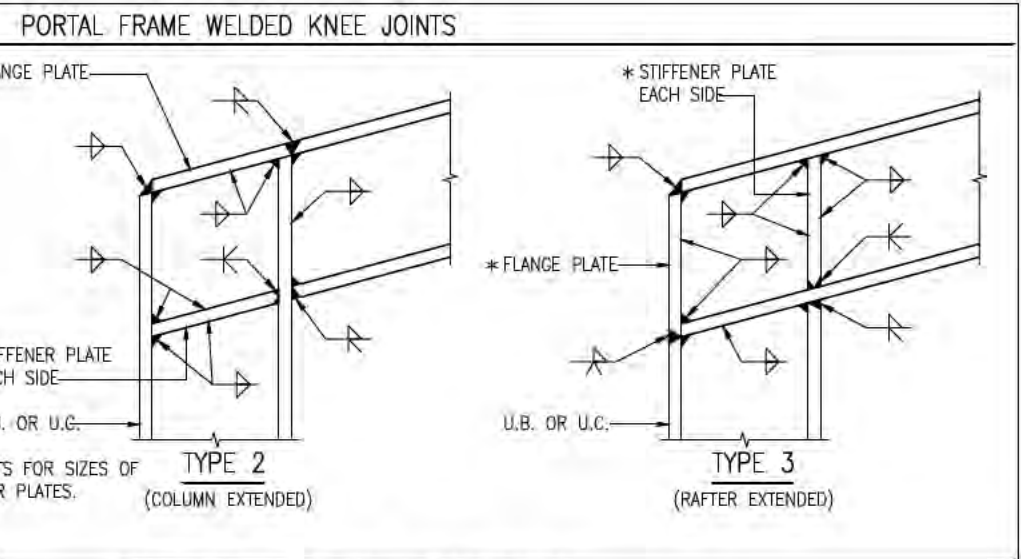
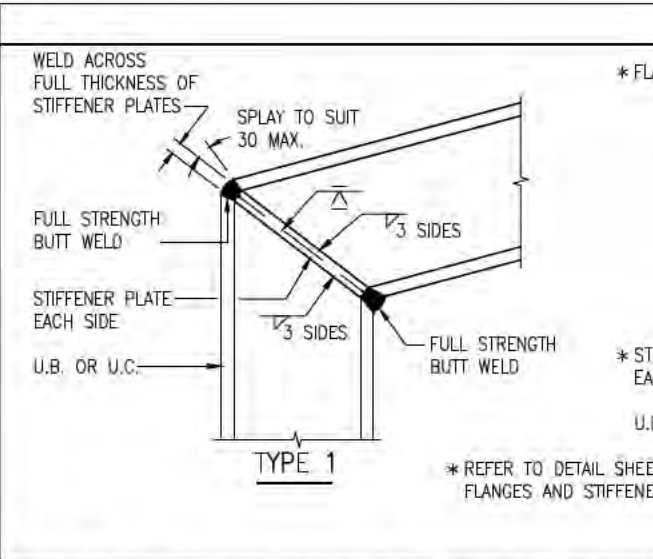
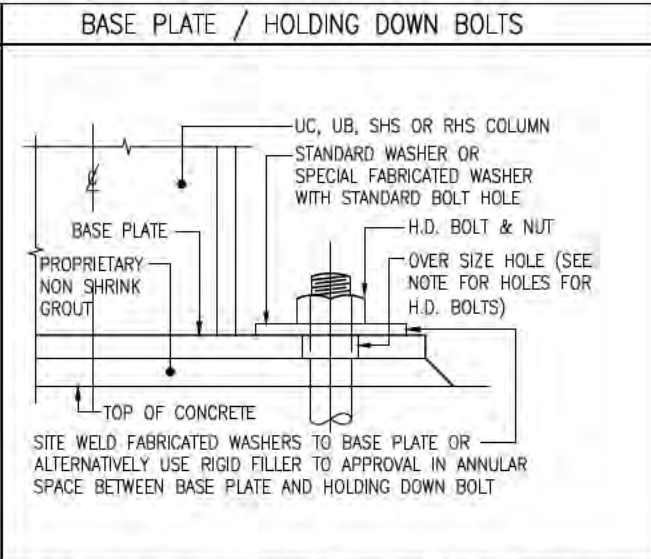
Project
HAURAKI DISTRICT COUNCIL
HAURAKI RAIL TRAIL K2K THAMES TO KAIUA SECTION
PIAKO BRIDGE CLIP-ON CYCLEWAY

Sheet
STANDARD TIMBER NOTES

Drawing No.	Sheet No.	Revision
2-9Z270.02	11	R1

GENERAL NOTES

- CHECK AND VERIFY SETOUT DIMENSIONS AND LEVELS ON-SITE BEFORE COMMENCING CONSTRUCTION.
- UNLESS SHOWN OTHERWISE, ALL BASE PLATES SHALL BEAR DIRECTLY ON 20 ± 5mm NON SHRINK GROUT.
- WASHERS - SPECIFIED WASHERS, TAPERED WHERE NECESSARY, ARE TO BE USED UNDER NUTS AND/OR TURNING BOLT HEADS.
- UNLESS SHOWN OTHERWISE, ALL FILLET WELDS ARE TO BE 6mm. MINIMUM S.P. CONTINUOUS AROUND THE CONNECTED PIECES.
- ALL HOLLOW SECTION MEMBERS ARE TO BE CAPPED AND ALL JOINTS SEALED.
- THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL OTHER CONTRACT DRAWINGS (e.g. ARCHITECTURAL, STRUCTURAL, BUILDING SERVICES, CIVIL etc.) AND THE SPECIFICATION.



WELDING NOTES

THE 'ALL ROUND' SYMBOL TAKES PRECEDENCE AND REQUIRES THAT THE WELD IS CONTINUOUS AROUND THE CONNECTED COMPONENTS.

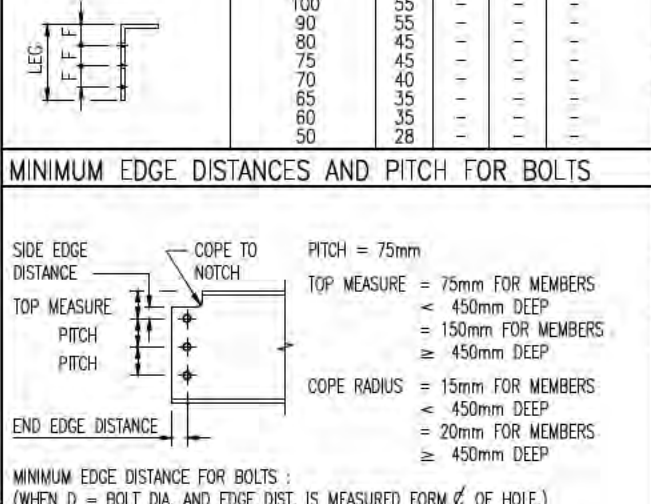
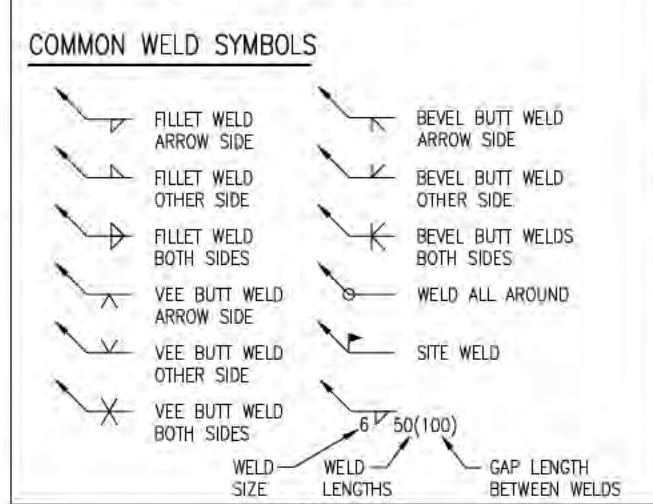
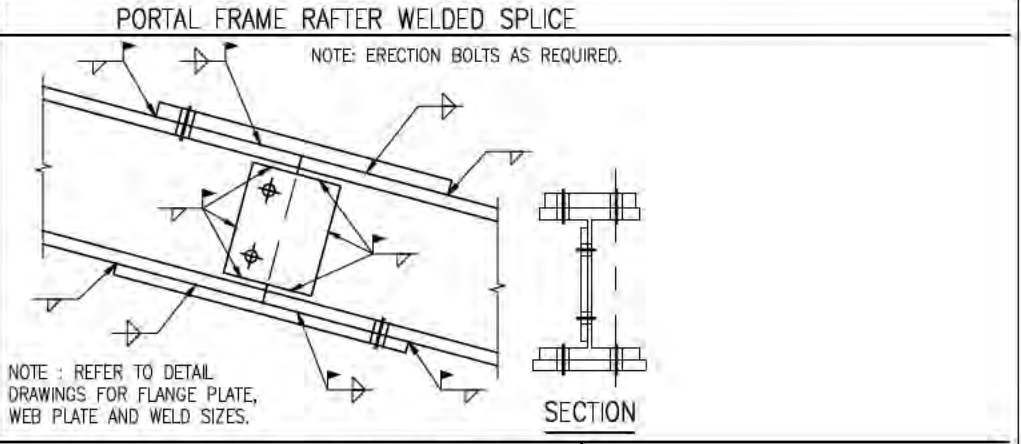
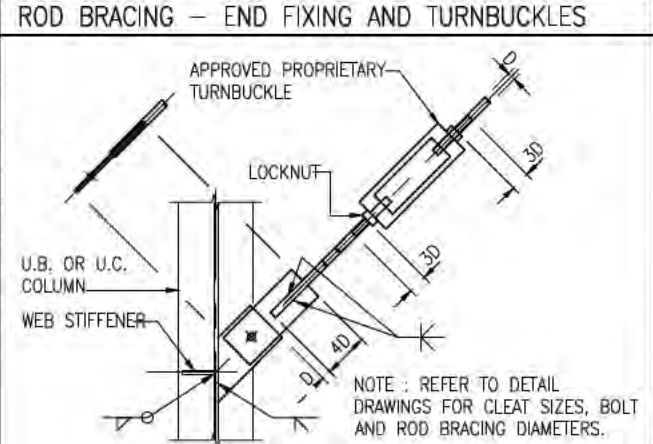
F.S.B.W. FULL STRENGTH BUTT WELD: COMPLETE PENETRATION BUTT WELD WITH SEALING RUN OR BACKING STRIP IF SEALING RUN IS NOT POSSIBLE.

- ALL WELD SYMBOLS SHOWN ON THIS SHEET AND ON THE STRUCTURAL DWGS. ARE IN ACCORDANCE WITH AS 1101.3:1987.
- REFER TO SPECIFICATION FOR WELD CLASS.
- ALL WELDING SHALL COMPLY WITH AS 1554.

BACK MARKS AND CROSS CENTRES OF SECTIONS

FLANGE WIDTH mm	XCRS. OR GAUGE		FLANGE WIDTH mm
	A	B	
228 TO 320	140	55	100
165 TO 209	90	55	90
135 TO 154	70	45	75
		35	65

LEG LENGTH mm	ANGLES			
	SPACING mm			
	C	D	E	F
200	120	75	75	55
150	90	55	55	-
125	75	45	50	-
120	75	45	50	-
100	55	-	-	-
90	55	-	-	-
80	45	-	-	-
75	45	-	-	-
70	40	-	-	-
65	35	-	-	-
60	35	-	-	-
50	28	-	-	-



HOLE AND BOLT SYMBOLS

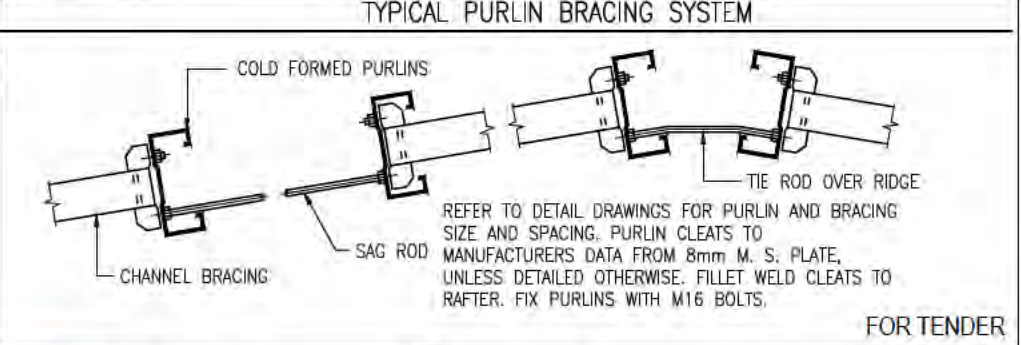
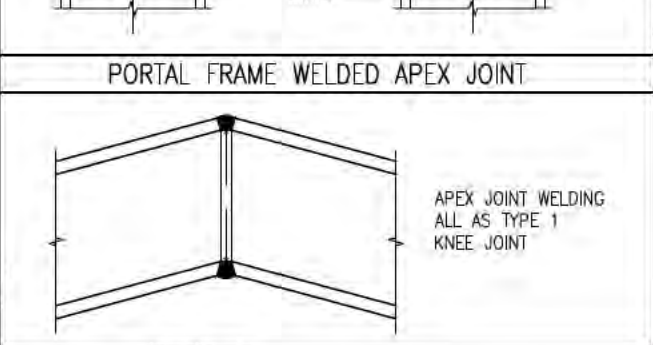
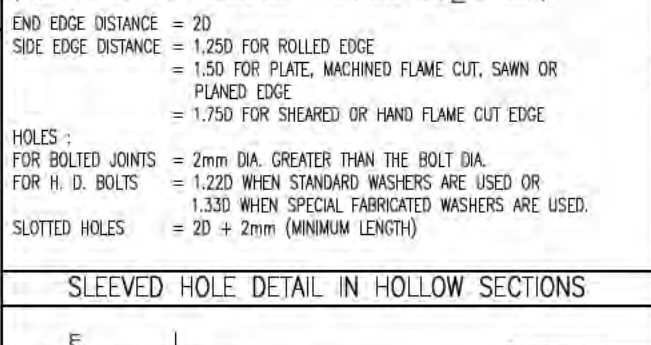
HOLES	PLAN SECTION	COUNTERSUNK NEAR SIDE	COUNTERSUNK FAR SIDE
		PLAN SECTION	PLAN SECTION
HOLES	PLAN SECTION		
BOLTS	PLAN SECTION		
SLOTTED HOLES	PLAN SECTION		

DESIGNATION OF STEELWORK SECTIONS

SYMBOL OR ABBREVIATION	DESCRIPTION	EXAMPLE
U.B.	UNIVERSAL BEAM	200UB30
U.C.	UNIVERSAL COLUMN	200UC46
TFB.	TAPER FLANGE BEAM	125 TFB.
TFC.	TAPER FLANGE CHANNEL	100 TFC.
PFC.	PARALLEL FLANGE CHANNEL	180 PFC.
EA	EQUAL ANGLE	80x10 EA
EA	UNEQUAL ANGLE	100x75x6UA
RHS.	RECTANGULAR HOLLOW SECTION	75x50x5 RHS.
SHS.	SQUARE HOLLOW SECTION	75x5 SHS.
CHS.	CIRCULAR HOLLOW SECTION	76 O.D. x 4 CHS.
PL.	PLATE	375x185x10 PL.
FL.	FLAT	80x10 FL.

ABBREVIATIONS

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
C/C	CENTRE TO CENTRE	No.	NUMBER
XCRS.	CROSS CENTRES	O.D.	OUTSIDE DIAMETER
CSK.	COUNTERSUNK	O/A	OVERALL
DIA.	DIAMETER	P.C.D.	PITCH CIRCLE DIAMETER
Ø	DIA. (M.S. ROD ONLY)	PROJN.	PROJECTION
EXTG.	EXISTING	RAD.	RADIUS
G.P.	GENERAL PURPOSE	S.O.P.	SETTING OUT POINT
H.D. GALV.	HOT DIPPED GALVANISED	S.P.	SPECIAL PURPOSE
HEX.	HEXAGON	S.S.	STAINLESS STEEL
H.D.	HOLDING DOWN (BOLTS)	THK.	THICK
I.D.	INSIDE DIAMETER	U/S	UNDERSIDE
LEV.	LEVEL	U/N	UNLESS NOTED
M.S.	MILD STEEL		



NOTE:
UNLESS OTHERWISE SPECIFIED OR DETAILED ON THE DRAWINGS, THESE STANDARD DETAILS AND NOTES SHALL APPLY. INCLUSION OF THIS SHEET DOES NOT IMPLY THAT ALL THE DETAILS OCCUR IN THIS CONTRACT.

Revision	Approved	Approved	Revision/Date
R1	TENDER ISSUE	J.C.	23/10/2014

Revision	Approved	Approved	Revision/Date
R1	TENDER ISSUE	J.C.	23/10/2014

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STANDARD STEEL NOTES

Project No.	Scale	Revision/Date	Sheet No.	Revision
2-9Z270.02	AS SHOWN	23/10/2014	12	R1