

Figure 19: Ruataniwha Road typical pavement section used outside the floodway

Figure 17 below shows the proposed pavement design for Ruataniwha Road in the floodway, where wet conditions during its service life are anticipated. Cement-stabilised layers will help reopen the road quickly after flooding and reduce the pavement area needing reinstatement.

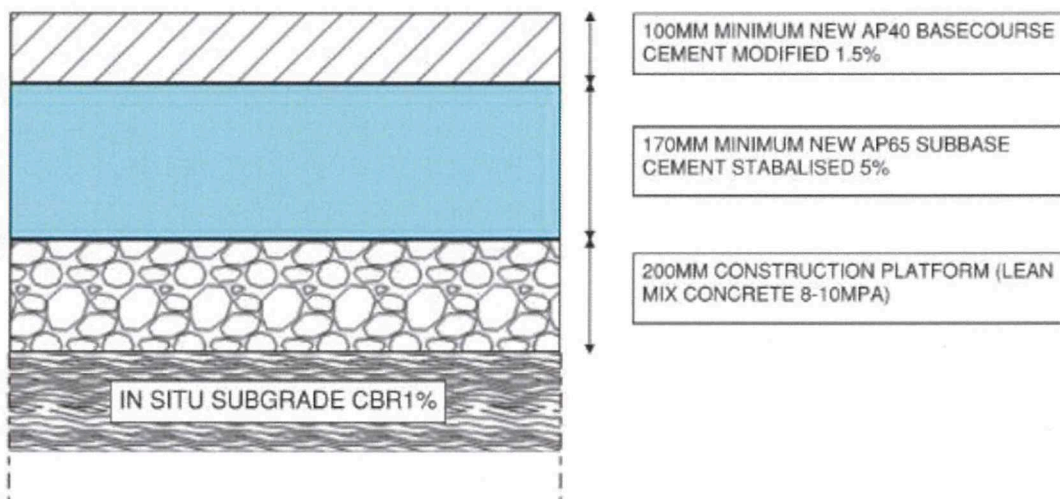


Figure 20: Ruataniwha Road typical pavement section used within the floodway

WAIHIRERE ROAD - PAVEMENT TYPICAL SECTIONS

Figure 18 shows the proposed pavement design for Waihirere Road in the floodway, where wet conditions during its service life are anticipated. Cement-stabilised layers will help reopen the road quickly after flooding

and reduce the pavement area needing reinstatement.

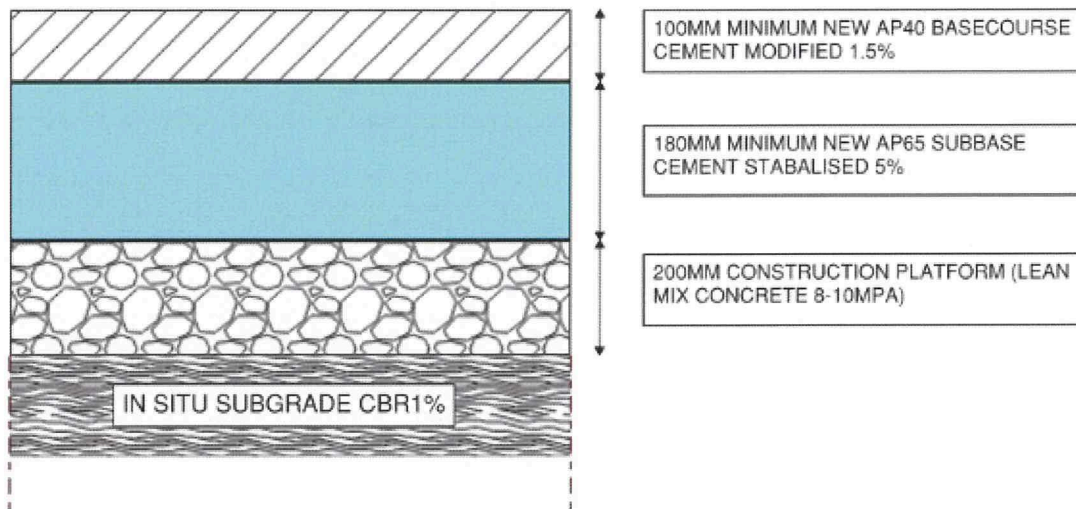


Figure 21: Waihirere Road typical pavement section used within the floodway works

11 FLOODWAY DRAINAGE

11.1 DESIGN PHILOSOPHY AND APPROACH

- The proposed floodway intersects groundwater. There is a shallow groundwater table of between 0.3 m and 0.6 m deep.
- The groundwater table will be permanently lowered 1 m below the finished floodway floor level.
- Our groundwater model estimates that the flow rate required to draw down the groundwater table to 1 m below the finished floodway floor are:
 - 1,300 m³/day shortly after the drains are installed (if installed and activated all at once),
 - 150 m³/day one year after the drains are installed.

11.2 TEMPORARY GROUNDWATER TABLE DRAW DOWN

During the construction phase, we propose to draw down the groundwater by installing cut off drains one month ahead of the earthworks phase. The drains will be 1 m to 2 m deep, and daylight at the floodway lowest point (the floodway outlet).

This methodology will be discussed and confirmed with the contractor and further described within their Sediment Control and Environmental Management Plan.

11.3 PERMANENT GROUNDWATER TABLE DRAW DOWN

We propose to permanently draw down the groundwater table by installing subsoil drains along the entire length of the floodway, at an approximate depth of 1 m below the finish surface level.

The drains will likely be installed via mole ploughing methodology. We expect approximately 10 to 20 drains to be installed. This methodology will be further refined with the contractor during the details design phase.

The drains will discharge into the scour protection zone at the outlet of the floodway (RipRap or similar). Refer to the concept drawings Rev2 for the indicative subsoil drains extents, outlets and depths.

12 OTHER SERVICES

12.1 DESIGN PHILOSOPHY AND APPROACH

Other services that will need consideration during the detailed design phase are:

- Wastewater pipe crossing the proposed townside stopbank: it has been assumed at this stage that the pipe will not be affected by the proposed stopbank, and will not need to be deepened. It may require some form of protection that will be assessed during the detailed design phase (due to the extra weight and risk of settlement).
- Fibreoptic lines across the floodway: ducts will be allowed for at detailed design within the same trench as the watermains.
- Power lines run parallel to both Ruataniwha Road and Waihirere Road (Firstlight Network). Two options are available that will need to be discussed with stakeholders and the service provider: span the power lines across the floodway as per the current alignments or bury the power lines below the base of the floodway. This will be decided during the detailed design phase. Initial conversations with Firstlight Network indicate that it may be possible to span the floodway, but this will need to be checked, especially with respect to vertical clearance from the stopbanks.

13 SAFETY IN DESIGN

A Safety in Design workshop was held on 30 July 2025 and was attended by representatives from HBRC and WSP. Refer to the Safety in Design Register (Appendix B). Further Safety in Design workshops will be held during the detailed design phase. A Safety in Design workshop is planned in the near future with the newly-appointed contractor.

14 DEPARTURES

The following departures have been identified to date and will be discussed during detailed design; they will be formally requested if required:

- Stopbank – steeper batter at Churchill Avenue, using MSE wall or similar.
- Townside stopbank at private properties on Mitchell Avenue – steeper batter and narrower crest
- Modified freeboard
- Steeper verge slopes on Ruataniwha Road (steeper than 5H:1V).
- Climate change was not incorporated in the flood modelling.

15 FUTURE CONSIDERATIONS FOR DETAILED DESIGN

15.1 GEOTECHNICAL

- Refine all geotechnical modelling and assessments upon processing the 1C+ field and laboratory data.
 - More detailed liquefaction (particularly lateral spreading) analysis will be undertaken in order to refine the areas at risk and predicted levels of damage that can be expected.
 - The proposed northern floodway inlet location has experienced recent failures and continued land loss (refer to Section 1.1 – previous reports). The memo suggests rapid drawdown being the cause of failure. Geotechnical assessment of this area will be undertaken in detailed design to evaluate the risks in this area and how this affects the proposed earthworks, sill performance, and erosion protection elements in this area.
 - The moisture sensitivity of the soils will be a key issue to manage during construction. This factor should be raised during a workshop with the physical works contractor to discuss methods and machinery that can be used to manage the soils and discuss possible contingency methodologies for any wetter-than-anticipated site conditions. Should the contractor have concerns on their ability to handle the soils, additional small-scale compaction trialling in summer conditions may be warranted to mitigate the risk of any delays during construction. This would also give the contractor an opportunity to witness the behaviour of the local soils with their specific machinery.
 - Consider the effects of open drainage channels in proximity to stopbank. Minimise risk of destabilising stopbanks due to the drainage channels, particularly for lateral spreading.
-

15.2 GEOMETRIC

Geometric design components that will be considered during the detailed design phase are:

- Design speed limit.
 - Driver sightlines along and over the stopbank transitions.
 - Truck design vehicle tracking path used to develop lane widening along new alignments.
 - Super elevation and design warp rates.
 - Horizontal and vertical geometry coordination adjustments.
 - Vertical transitions in relation to the design speed limit.
 - Cross-section formation refined to match WDC design standards.
 - Longitudinal road drainage.
-

15.3 SCOUR PROTECTION

Future scour protection design that will be considered during future design stages are:

- Assessment of localised critical scour events which may occur due to the build-up of sediment within the floodway as it drops out of suspensions. Once the floodway configuration is finalised an assessment of these critical events to infrastructure within the floodway will be completed (stopbanks, roads, retaining walls etc.)

- The current 2D hydraulic modelling shows high turbulence around the downstream end of both stop banks and retaining walls at the interface for the proposed Waihirere Road flood gates. During detailed design it is expected that the transition from stop bank to retaining will include a smoother taper transition. Any additional localised scour protection required for this transition will be confirmed during detailed design.
- Any additional localised scour protection required around the stop banks and earth embankments that turn to proposed flood gates at Ruataniwha Road will be confirmed during detailed design.
- Ruataniwha and Waihirere Road carriageways that cross the floodway will be designed during detailed design including any necessary scour protection and inputs into the geometry.
- The stop bank alignment will be further assessed and optimised to improve the influence on flow direction and available floodway width for conveyance
- A hydraulic model scenario will be created to assess the loss of material at the floodway inlet and the exposure of the grade control sill to determine increased erosion risk and potential outflanking.
- The floodway outlet slab geometry and baffle configuration, including any additional energy dissipation measures, will be further optimised
- Consideration for additional areas that could benefit from willow pole planting or other vegetation buffer planting flanking the sides of the inlet area
- A whole of life cost analysis will be completed for treatment options to confirm the best option for areas that require a high level of scour protection.

15.4 FLOOD GATES

- The proposed design requires two flood gates on Waihirere Road where the road intersects the floodway with concrete walls. The flood gates will be designed, supplied and installed by a specialist contractor. The geotechnical and structural requirements to install the flood gates are unknown at this stage and will need to be further investigated during the detailed design phase.

15.5 ROAD SWALES

- Road swales along Ruataniwha and Waihirere Roads will need further considerations.

16 PROPOSED CONSTRUCTION METHODOLOGY

A detailed construction methodology will be prepared during the detailed design phase of the project. As soon as a physical works contractor is appointed, input from them will be sought through workshops.

Key requirements known at this stage of the design are:

- The working area is a floodplain, and the contractor should consider a construction sequence that minimises risks from flooding.
- The groundwater table will need to be lowered before earthworks can commence. The proposed methodology is detailed in section 11.2.
- The silt proposed to form the stopbanks is a material that is very sensitive to water and should be handled with care.
 - The contractor should sequence the work to minimise the exposed silt layer by removing the very minimum amount of topsoil at each stage of construction.
 - The contractor should sequence the earthworks to minimise heavy vehicle loading on the silt before and during excavations. Heavy loading may ‘pump’ groundwater into the silt from below which will require drying back the material or alternative remediation before being suitable for compaction to form the stopbanks.
- Once the floodway floor is reached, the cut should be grassed as soon as practicable and not tracked to prevent damaging it.
- The stopbanks should not be used to track heavy machinery once built. They should be grassed as soon as possible to prevent any risk of erosion/degradation.
- Sequencing should consider the location of cut and fill areas.

17 RISK

17.1 RISK REGISTER

The project risk register was reviewed by HBRC and WSP on 30 October 2025. It is in Appendix C.

17.2 SUMMARY OF TOP SIX RISKS

There are six risks that are rated “high” after mitigation has been applied. These risks are summarised in Table 12.

Table 12: Summary of risks with "high" residual risk

Risk	Mitigation
<p>There is a risk that landowners decline to make the required land available for the floodway. The consequences are adverse publicity, unknown future for the project because there are no other alignments that haven't already been discounted, and inability of affected properties to get insurance.</p>	<p>Understanding landowner concerns and mitigating where possible with the design</p> <p>Keep landowners informed</p> <p>Adjusting alignment where/if possible</p>
<p>Project is completed successfully but flooding still occurs because a rain event is higher than the design rain event.</p>	<p>Clearly define the design event at the outset and communicate to stakeholders to manage expectations; consider other possible mitigation options such as freeboard and secondary flow paths; accept the residual risk.</p>
<p>Design rework because design assumptions are found to be invalid because the concept design was carried out before all landowner approval was received, before the hydraulic model was fully refined, and before the CFD modelling is complete. The consequence is extra time and cost.</p>	<p>Mitigate for specific risks by using conservative design where appropriate.</p> <p>Accept the residual risk.</p>
<p>Pricing by tenderers is inaccurate because they have priced on a concept design only. The consequence is that tenderers may price extra risk into their rates, and there are likely to be a lot of variation requests during the contract.</p>	<p>Allow sufficient contingency in cost estimate.</p> <p>Allow for variations during the contract.</p> <p>Set up regular collaborative workshops between HBRC and the contractor to agree variations – reducing the administrative burden and encouraging relationship building.</p> <p>Accept the residual risk.</p>
<p>Floodway alignment changes during detailed design (i.e. once detailed design has started) because landowners decline to make the concept design alignment land available. The consequence is rework (hydraulic modelling, 3D CAD modelling, other design work) which will cause extra costs and programme delays.</p>	<p>Good, consistent communications with landowners.</p> <p>Address potential landowner concerns.</p> <p>Accept the residual risk.</p>
<p>Waihirere Road cannot cross the floodway due to physical constraints because the appropriate road geometry and alignment cannot be met.</p>	<p>Consider relaxing design parameters (e.g. reducing posted speed limit).</p> <p>Consider using flood gates (note: this is the current design).</p> <p>Consider connecting Waihirere Road to Ruataniwha Road.</p>

17.3 OPPORTUNITIES

An opportunities register has not yet been developed for this project. However, there are likely to be benefits associated with the project, such as enhancing the local environment through planting; protecting the riverbanks by strengthening them as part of this project; and a net positive ecological outcome through

offsetting or mitigation that may be required. There are also other opportunities such as reducing construction cost through design; considering constructability by holding workshops with the contractor; and producing a fast and efficient design by close collaboration through workshops with HBRC, WDC, the contractor and the designers throughout the design period.

18 PROJECT COST ESTIMATE

HBRC commissioned WT Infrastructure (WT) to provide a developed concept design cost estimate. Table 13 summarises the cost estimate.

Table 13: Project cost estimate summary

Item	Amount (excluding GST)
Base estimate	\$44,411,000
Contingency (P50)	\$52,865,000
Project expected estimate	\$57,877,000

The cost estimate report and breakdown are in Appendix D.

19 LIMITATIONS

This report ('Report') has been prepared by WSP exclusively for Hawke's Bay Regional Council ('Client') in relation to the Wairoa Flood Alleviation Design project ('Purpose') and in accordance with the Proposal letter dated 9 July 2025 and accepted on 18 July 2025. ('Agreement').

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APPENDIX A – Drawings



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CIV-710	RETAINING WALL PLAN	
CIV-711	STRUCTURAL SECTIONS	
CIV-712	RETAINING WALL DETAILS	
CIV-800	EARTHWORKS PLAN	

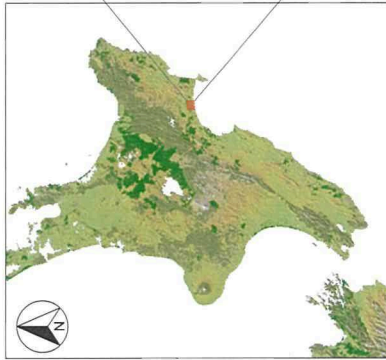
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CIVIL
DEVELOPED CONCEPT DESIGN

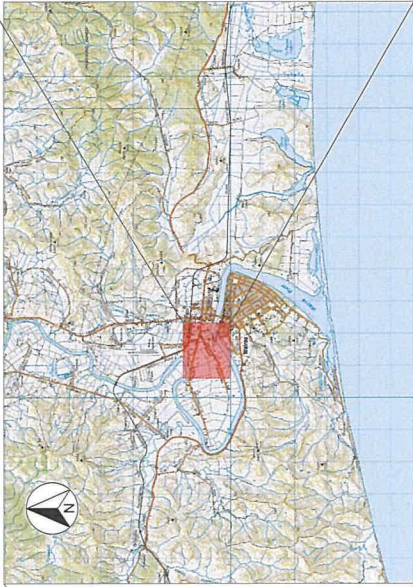
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Date: 2025-12-01

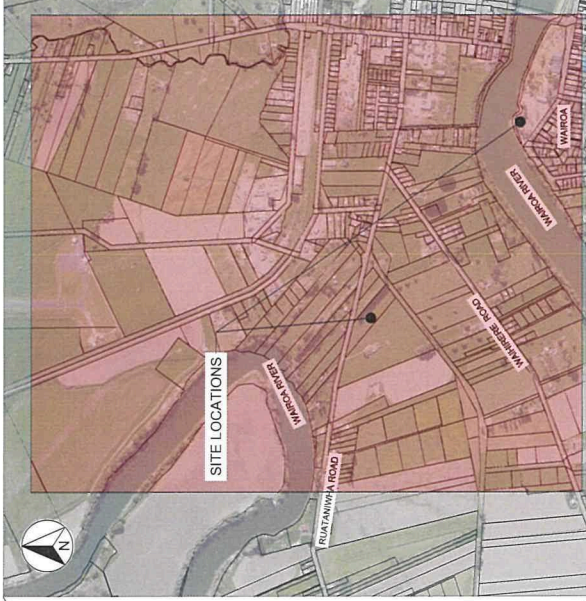
HAWKE'S BAY REGIONAL COUNCIL WAIROA, HAWKE'S BAY WAIROA FLOOD MITIGATION PROJECT



NZ-LOCATION MAP
NTS



LOCALITY MAP
NTS



LOCATION PLAN
N.T.S

REVISION	AMENDMENT	APPROVED	DATE
A	ISSUE FOR TENDER	A.S.	2025-08-06
B	DEVELOPED CONCEPT DESIGN	A.S.	2025-11-21



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 Nelson Office
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 Private Bag 36
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SCALES	ORIGINAL SIZE
N.T.S	A1

DRAWN	DESIGNED	APPROVED
N.AUDEA	C.PRENGIA	A.SOWERSBY

DRAWING CHECKED	DESIGN CHECKED	APPROVED DATE
P.FIEBER	A.MOHAMMADINA	2025-11-21

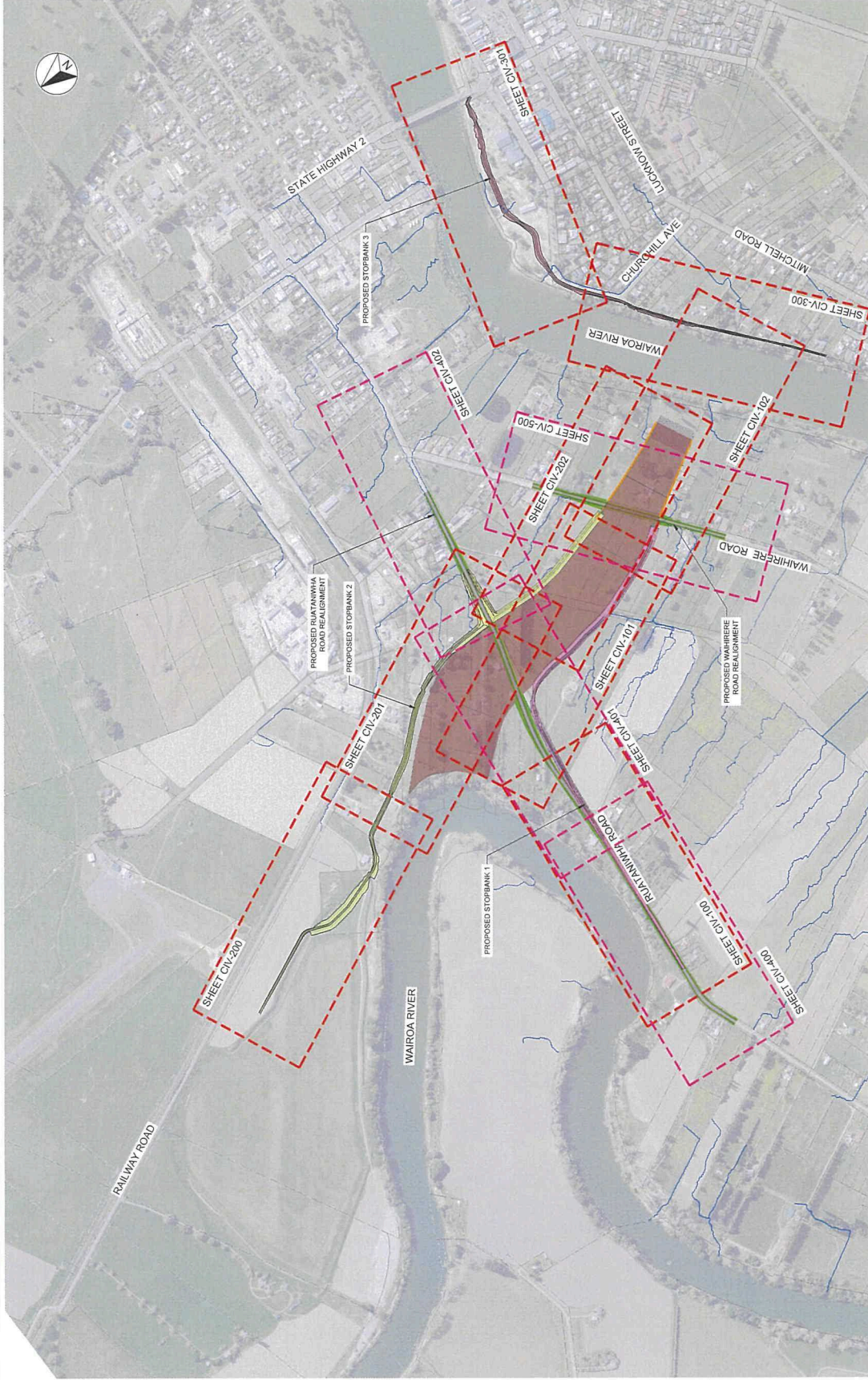
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TITLE	LOCALITY MAP AND PLAN
WSP PROJECT NO.	2-14441-WSP-03-DR
SHEET NO.	CIV-001
REVISION	B

NOTE

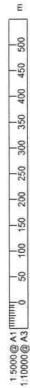
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2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
3. AERIALS AND RELIEFS SOURCED FROM GROMAP.
4. DRAINS WILL BE REQUIRED WITHIN THE FLOODWAY TO PERMANENTLY DROP THE GROUND WATER TABLE.

LEGEND

- EXISTING BOUNDARY
- EXISTING FLOW PATHS
- PROPOSED STOPBANK 1
- PROPOSED STOPBANK 2
- PROPOSED STOPBANK 3
- PROPOSED FLOODWAY
- PROPOSED RIATANWHA ROAD & WAHIRE ROAD REALIGNMENT
- CONCRETE REINFORCED
- PROPOSED CONCRETE WALL
- PROPOSED RETAINING WALL
- PROPOSED FLOODGATE
- STOPBANK SHEETS
- ROAD REALIGNMENT SHEETS



OVERALL PLAN VIEW
SCALE: 1:5000(A1); 1:10000(A3)



REVISION	AMENDMENT	DATE
A	ISSUE FOR TENDER	2025-08-08
B	DEVELOPED CONCEPT DESIGN	2025-11-21
C	DEVELOPED CONCEPT DESIGN	2025-12-01



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44-554-1099
New Zealand

SCALES	ORIGINAL SIZE
1:5000(A1); 1:10000(A3)	A1

DRAWN	DESIGNED	APPROVED
NAUDEA	C. CRENCIA	A. SOWERSBY

DRAWN CHECKED	DESIGN CHECKED	APPROVED DATE
P. FIEBER	A. O'HANIMANUA	2025-12-01

CIVIL

DEVELOPED CONCEPT DESIGN

PROJECT: HAWKES BAY REGIONAL COUNCIL
WAIROA, HAWKES BAY
WAIROA FLOOD MITIGATION PROJECT
TITLE: OVERALL PLAN VIEW
WSP PROJECT NO.: 2-14441-WSP-03-DR
SHEET NO.: CIV-002
REVISION: C

NOTE

- COORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR (NZTM) PROJECTION.
- EXISTING AND PROPOSED STOPBANKS ARE SHOWN AS BOUNDARIES SOURCED FROM GIS/PAK.
- EXISTING SERVICES CROSSING THE STOPBANK ALIGNMENTS WILL NEED TO BE RELOCATED. DETAILS WILL BE PROVIDED AT DETAILED DESIGN.

LEGEND

- EXISTING BOUNDARY
- EXISTING 6/611V OH CONDUCTOR
- EXISTING 400V OH CONDUCTOR
- PROPOSED STOPBANK
- EXISTING BOUNDARY
- EXISTING FIBRE
- EXISTING WATER
- EXISTING SEWER
- EXISTING STORMWATER
- EXISTING 6/611V POLE
- EXISTING 400V POLE
- EXISTING STREET LIGHT
- EXISTING TRANSFORMER
- PROPOSED STOPBANK
- PROPOSED STOPBANK ROAD & WAHIRE ROAD REALIGNMENT
- PROPOSED FLOODWAY
- PROPOSED REINFORCED CONCRETE SLAB
- PROPOSED CONCRETE WALL
- PROPOSED RETAINING WALL
- PROPOSED FLOODGATE



EXISTING SERVICES PLAN
SCALE: 1:5000 (A1)

1:5000 @ A1 (mm) 0 50 100 150 200 250 300 350 400 450 500
1:10000 @ A3 (mm) 0 50 100 150 200 250 300 350 400 450 500

REVISION	AMENDMENT	DATE
A	ISSUE FOR TENDER	2025-05-06
B	DEVELOPED CONCEPT DESIGN	2025-11-21
C	DEVELOPED CONCEPT DESIGN	2025-12-01



WSP
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New Zealand

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New Zealand

CIVIL

SCALES	DIRECTIONAL SIZE
1:5000 (A1), 1:10000 (A3)	A1
DRAWN N.AUREA	APPROVED A.SOWERSBY
DRAWN'S VERIFIED P.FIEBERG	APPROVED DATE 2025-12-01
DESIGNED C.CRENCIA	AUTHOR/MANAGER A.MOHAMMADINA

DEVELOPED CONCEPT DESIGN

PROJECT: HAWKES BAY REGIONAL COUNCIL
WAIROA, HAWKE'S BAY
WAIROA FLOOD MITIGATION PROJECT
TITLE: EXISTING SERVICES PLAN
WSP PROJECT NO: 2-14441-WSP-03-DR

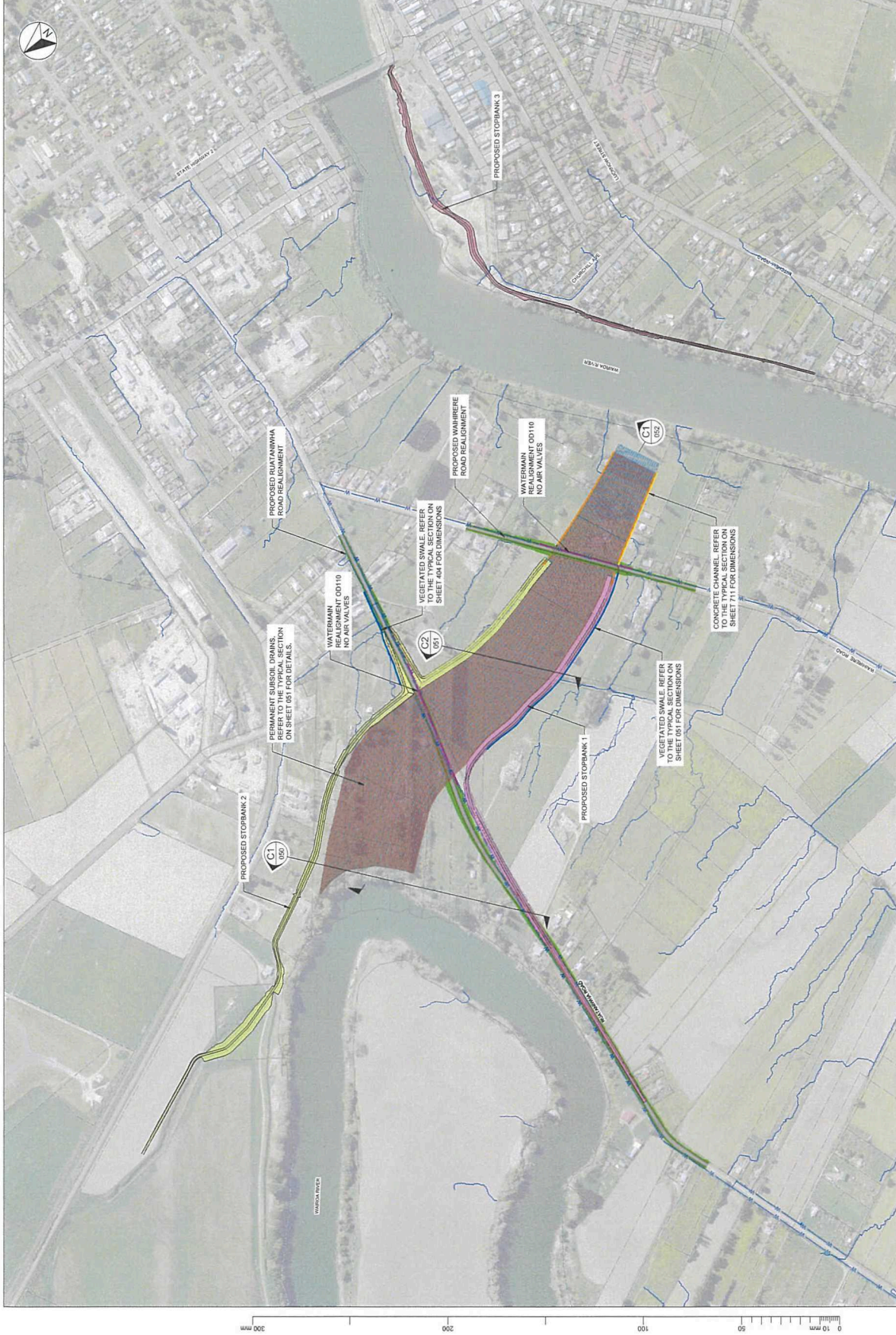
SHEET NO: CIV-003
REVISION: C

NOTE

1. COORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR (NZTM) PROJECTION.
2. ALL PROPOSED FLOOD MITIGATION MEASURES, SWALES AND REINFORCEMENTS SOURCED FROM GRAMP.
3. DRAINS WILL BE REQUIRED WITHIN THE FLOODWAY TO PERMANENTLY DROP THE GROUND WATER TABLE.

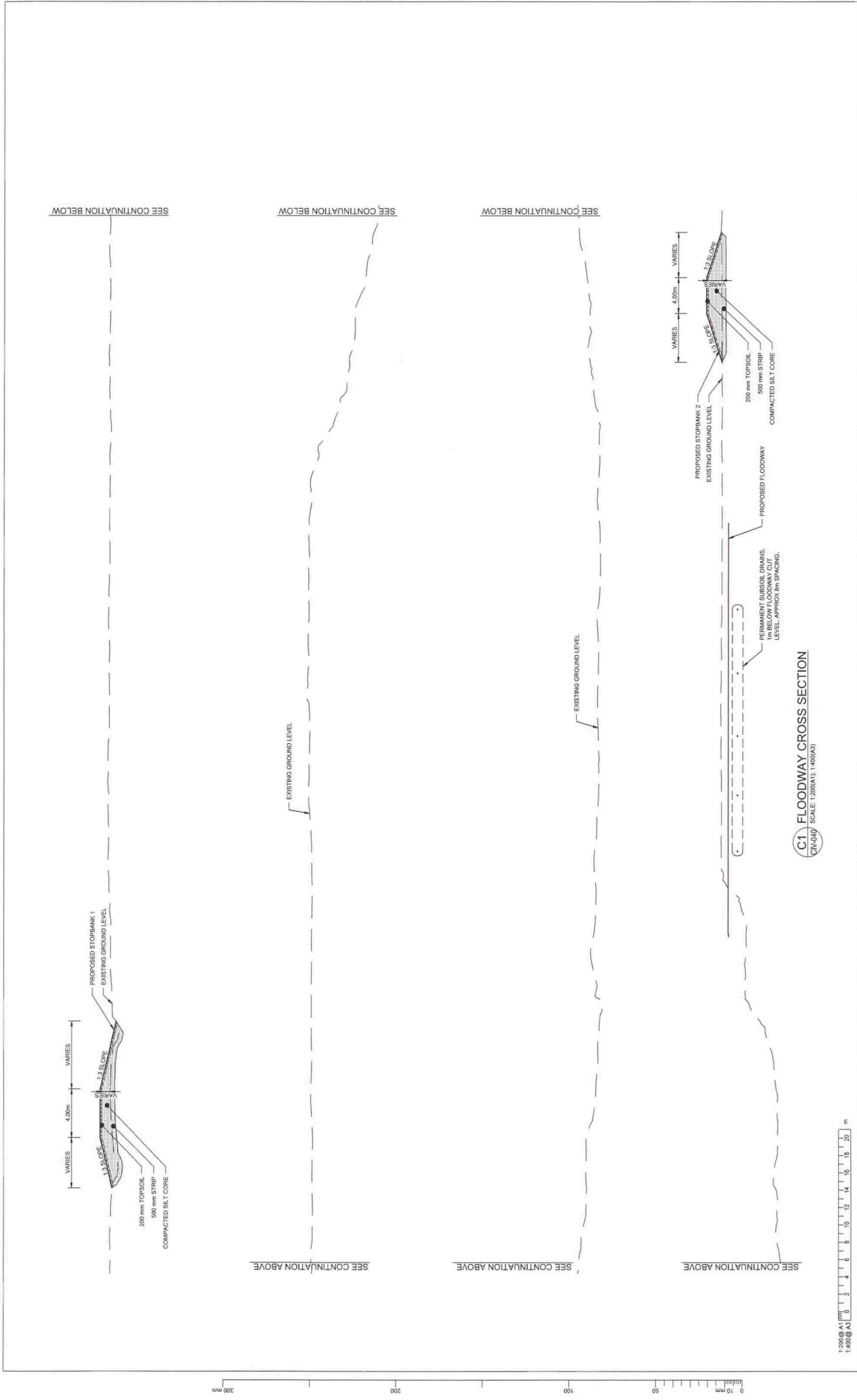
LEGEND

- EXISTING WATER
- EXISTING BOUNDARY
- FLOW PATHS
- PROPOSED STOPBANK 1
- PROPOSED STOPBANK 2
- PROPOSED FLOODWAY
- PROPOSED REINFORCED CONCRETE SLAB
- PROPOSED CONCRETE WALL
- PROPOSED VEGETATED SWALE
- PROPOSED CULVERT
- PROPOSED CONCRETE CHANNEL
- PROPOSED WATERMANN
- PROPOSED SUBSOL DRAIN



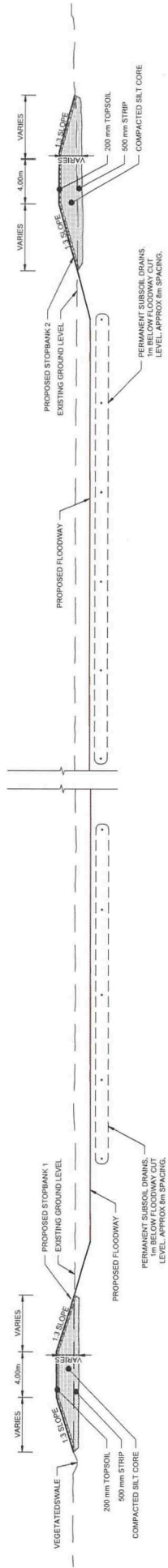
OVERALL PLAN VIEW
SCALE: 1:4000 (A1), 1:8000 (A3)

<p>Nelson Office 44 J St 099 New Zealand</p>		<p>HAWKES BAY REGIONAL COUNCIL TE KAUNIHĀRA Ā-IOHĒ O TE MATAU-A-MĀUI</p>	
<p>Private Bay 36 New Zealand</p>		<p>DEVELOPED CONCEPT DESIGN</p>	
<p>Project: HAWKES BAY REGIONAL COUNCIL WAIROA, HAWKE'S BAY WAIROA FLOOD MITIGATION PROJECT</p>		<p>Original Size: A1</p>	
<p>Scale: 1:4000 (A1), 1:8000 (A3)</p>		<p>Drawn: NAUDEA Designed: C.CREENIA Checked: P.FIEBER Approved: A.SOMERBY Design Date: 2025-12-01</p>	
<p>Revision: CIVIL</p>		<p>Sheet No: CIV-040 Revision: B</p>	



REVISION	AMENDMENT	APPROVED	DATE
A	DEVELOPED CONCEPT DESIGN	A.S.	2025-11-21

 HAWKES BAY REGIONAL COUNCIL TE KAUNIHĀRA A-ROHE O TE MATAU-A-MĀUI		 Nelson Office +64 3 548 1059 Private Bag 38 New Zealand	CIVIL
DEVELOPED CONCEPT DESIGN		SCALES 1:200(A1): 1:400(A3) DRAWN: N.AUDEA CHECKED: P.FRIECK DESIGN VERIFIED: A.MCHAMBERLAIN APPROVED DATE: 2025-11-21	ORIGINAL SIZE: A1 APPROVED: A.SOWERSBY WSP PROJECT NO: 2-14441-WSP-03-DR
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SHEET NO: CIV-050		REVIEWER: A	



C2 FLOODWAY CROSS SECTION
 CIV-051 SCALE: 1:200(A1), 1:400(A3)



REVISION	AMENDMENT	APPROVED	DATE
A	DEVELOPED CONCEPT DESIGN	A.S.	2025-11-21



wsp
 Nelson Office
 44 Lisle Street
 Nelson, New Zealand
 Phone: 051 348 1599

CIVIL

SCALE	ORIGINAL SIZE
1:200(A1), 1:400(A3)	A1

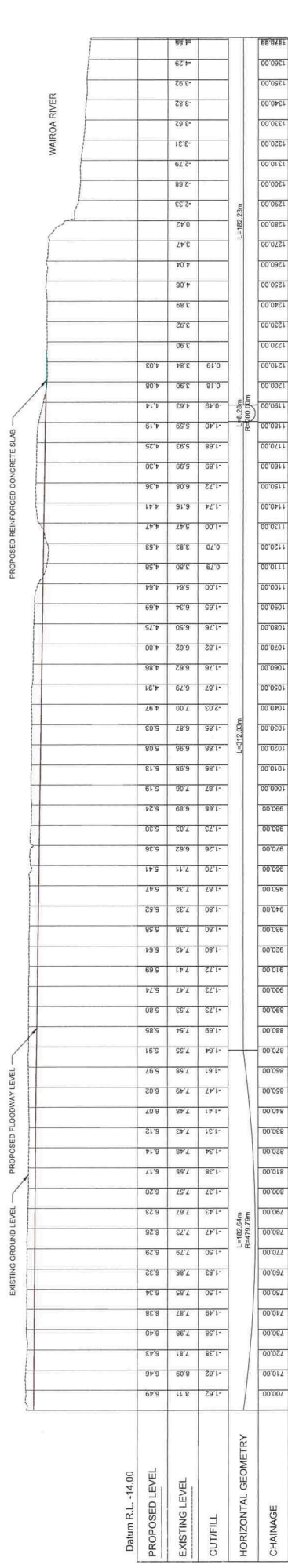
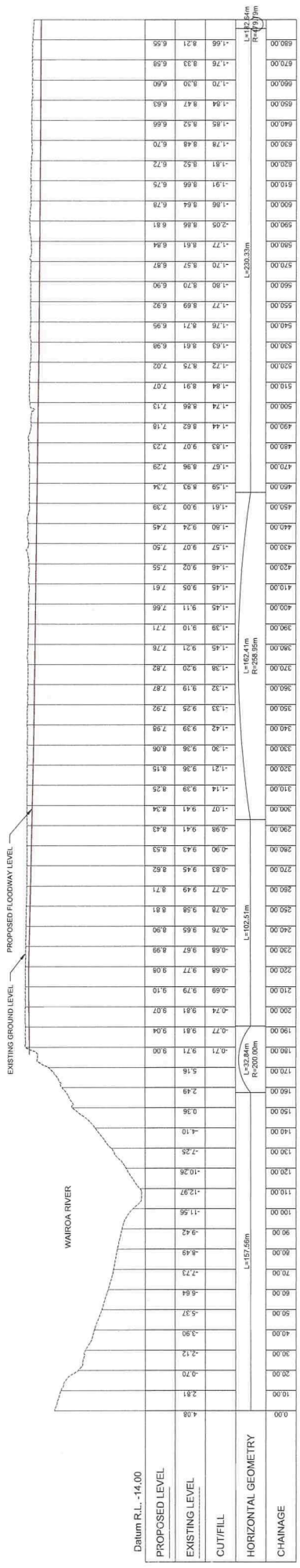
DESIGNED	APPROVED
C. PRENCIA	A. SOWERSBY

DESIGNED BY	APPROVED DATE
M. MOHAMMADINA	2025-11-21

DEVELOPED CONCEPT DESIGN

PROJECT
 HAWKES BAY REGIONAL COUNCIL
 WAIROA, HAWKES BAY
 WAIROA FLOOD MITIGATION PROJECT
 TITLE
 FLOODWAY CROSS SECTION
 SHEET 2 OF 2
 WSP PROJECT NO.
 2-14441-WSP-03-DR

SHEET NO.
 CIV-051
 REVISION
 A



C3 FLOODWAY LONGSECTION
 SCALE: H=1:1000 V=1:200 @ A1



REVISION / AMENDMENT A DEVELOPED CONCEPT DESIGN		DATE 2025-11-21
APPROVED A.S.		DATE 2025-11-21

SCALES 1:1000(A1), 1:2000(A3)	ORIGINAL SIZE A1
DRAWN NAUDEA	APPROVED A.SOWERBY
DESIGNED C.CRENCIA	DESIGN DATE 2025-11-21
DESIGNED BY P.PIEREK	APPROVED DATE 2025-11-21

PROJECT HAWKE'S BAY REGIONAL COUNCIL WAIROA, HAWKE'S BAY WAIROA FLOOD MITIGATION PROJECT	TITLE FLOODWAY LONG SECTION
WIP PROJECT NO. 2-14441-WSP-03-DR	

	CIVIL
--	--------------

	DEVELOPED CONCEPT DESIGN
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NOTE

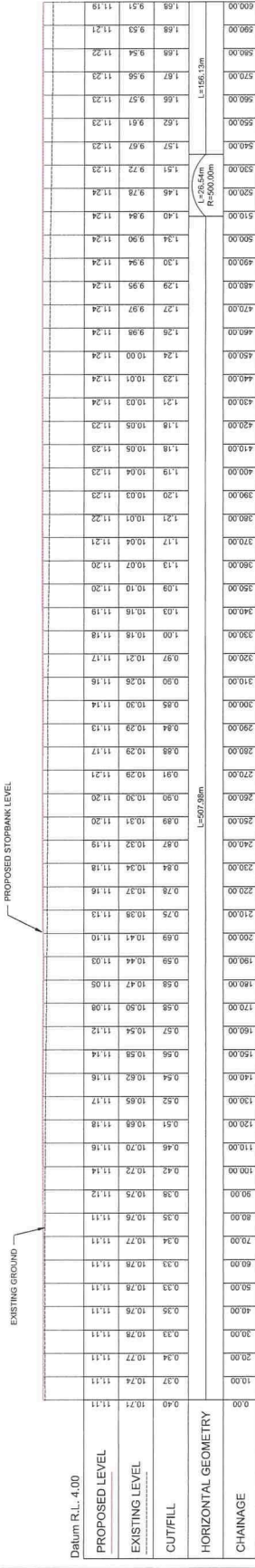
- COORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR (NZTM) PROJECTION.
- VERTICAL LEVELS ARE IN TERMS OF NZVD00 DATUM.
- BOUNDARIES AND BOUNDARIES SOURCED FROM GRIPMAP.

LEGEND

- EXISTING BOUNDARY
- MAJOR CONTOUR (1m)
- MINOR CONTOUR (50m)
- PROPOSED STOPBANK 1
- PROPOSED STOPBANK 2
- PROPOSED RIUATANIWAHIA ROAD & WAHIRE ROAD REALIGNMENT
- PROPOSED FLOODWAY
- PROPOSED REINFORCED CONCRETE SWALE
- PROPOSED CONCRETE WALL
- PROPOSED RETAINING WALL
- PROPOSED FLOODGATE
- PROPOSED VEGETATED SWALE
- PROPOSED CONCRETE CHANNEL



STOPBANK 1 - PLAN VIEW
SCALE: 1:1000(A1) 1:2000(A3)



STOPBANK 1 - PROFILE VIEW
SCALE: H=1:1000 V=1:200 @ A1



REVISION	AMENDMENT	DATE
A	ISSUE FOR TENDER	2025-08-05
B	DEVELOPED CONCEPT DESIGN	2025-11-21
C	DEVELOPED CONCEPT DESIGN	2025-11-27



WSP
Nelson Office
463 548 1099
Phone Bay 36
Nelson 0602
New Zealand

SCALES
DRAWN: NAUREA
DESIGNED: C.PREERDA
DESIGN VERIFIED: A.MOHAMMADINA
DRAWING VERIFIED: P.FIERER
APPROVED: A.SOWERSBY
APPROVED DATE: 2025-11-27

PROJECT: HAWKE'S BAY REGIONAL COUNCIL
WAIROA, HAWKE'S BAY
WAIROA FLOOD MITIGATION PROJECT
TITLE: STOPBANK 1
PLAN AND PROFILE - SHEET 1 OF 3
WSP PROJECT NO: 2-14441-WSP-03-DR

ORIGINAL SIZE: A1
DEVELOPED CONCEPT DESIGN
CIVIL
SHEET NO: CIV-100
REVISION: C

NOTE

1. CO-ORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR (NZTM) PROJECTION.
2. VERTICAL LEVELS ARE IN TERMS OF NZVD2016 DATUM.
3. AREALS AND BOUNDARIES SOURCED FROM GISMAP.

LEGEND

- EXISTING BOUNDARY
- MAJOR CONTOUR (1m)
- MINOR CONTOUR (5m)
- PROPOSED STOPBANK 1
- PROPOSED STOPBANK 2
- PROPOSED RUATANIWA ROAD & WAHIRE ROAD REALIGNMENT
- PROPOSED FLOODWAY
- PROPOSED REINFORCED STOPBANK
- PROPOSED CONCRETE WALL
- PROPOSED RETAINING WALL
- PROPOSED FLOODGATE
- PROPOSED VEGETATED SWALE
- PROPOSED CONCRETE CHANNEL



STOPBANK 1 - PLAN VIEW

SCALE: 1:1000(A1) 1:2000(A3)



STOPBANK 1 - PROFILE VIEW

SCALE: 1H:100V (V:1:200 @ A1)

Station	Proposed Stopbank Level	Existing Ground Level	Cut/Fill
600.00	9.51	11.19	-1.68
610.00	9.50	11.16	-1.66
620.00	9.48	11.15	-1.67
630.00	9.46	11.14	-1.68
640.00	9.44	11.13	-1.69
650.00	9.41	11.09	-1.68
660.00	9.36	11.02	-1.66
670.00	9.32	11.02	-1.70
680.00	9.26	10.97	-1.71
690.00	9.20	10.91	-1.71
700.00	9.20	10.85	-1.64
710.00	9.19	10.78	-1.60
720.00	9.09	10.72	-1.63
730.00	9.02	10.66	-1.64
740.00	9.01	10.60	-1.59
750.00	8.96	10.54	-1.58
760.00	8.95	10.48	-1.53
770.00	8.94	10.42	-1.48
780.00	8.93	10.36	-1.43
790.00	8.92	10.30	-1.38
800.00	8.91	10.24	-1.33
810.00	8.90	10.18	-1.28
820.00	8.89	10.12	-1.23
830.00	8.88	10.06	-1.18
840.00	8.87	10.00	-1.13
850.00	8.86	9.94	-1.08
860.00	8.85	9.88	-1.03
870.00	8.84	9.82	-0.98
880.00	8.83	9.76	-0.93
890.00	8.82	9.70	-0.88
900.00	8.81	9.64	-0.83
910.00	8.80	9.58	-0.78
920.00	8.79	9.52	-0.73
930.00	8.78	9.46	-0.68
940.00	8.77	9.40	-0.63
950.00	8.76	9.34	-0.58
960.00	8.75	9.28	-0.53
970.00	8.74	9.22	-0.48
980.00	8.73	9.16	-0.43
990.00	8.72	9.10	-0.38
1000.00	8.71	9.04	-0.33
1010.00	8.70	8.98	-0.28
1020.00	8.69	8.92	-0.23
1030.00	8.68	8.86	-0.18
1040.00	8.67	8.80	-0.13
1050.00	8.66	8.74	-0.08
1060.00	8.65	8.68	-0.03
1070.00	8.64	8.62	0.02
1080.00	8.63	8.56	0.07
1090.00	8.62	8.50	0.12
1100.00	8.61	8.44	0.17
1110.00	8.60	8.38	0.22
1120.00	8.59	8.32	0.27
1130.00	8.58	8.26	0.32
1140.00	8.57	8.20	0.37
1150.00	8.56	8.14	0.42
1160.00	8.55	8.08	0.47
1170.00	8.54	8.02	0.52
1180.00	8.53	7.96	0.57
1190.00	8.52	7.90	0.62
1200.00	8.51	7.84	0.67
1210.00	8.50	7.78	0.72
1220.00	8.49	7.72	0.77
1230.00	8.48	7.66	0.82
1240.00	8.47	7.60	0.87
1250.00	8.46	7.54	0.92
1260.00	8.45	7.48	0.97
1270.00	8.44	7.42	1.02
1280.00	8.43	7.36	1.07
1290.00	8.42	7.30	1.12
1300.00	8.41	7.24	1.17
1310.00	8.40	7.18	1.22
1320.00	8.39	7.12	1.27
1330.00	8.38	7.06	1.32
1340.00	8.37	7.00	1.37
1350.00	8.36	6.94	1.42
1360.00	8.35	6.88	1.47
1370.00	8.34	6.82	1.52
1380.00	8.33	6.76	1.57
1390.00	8.32	6.70	1.62
1400.00	8.31	6.64	1.67
1410.00	8.30	6.58	1.72
1420.00	8.29	6.52	1.77
1430.00	8.28	6.46	1.82
1440.00	8.27	6.40	1.87
1450.00	8.26	6.34	1.92
1460.00	8.25	6.28	1.97
1470.00	8.24	6.22	2.02
1480.00	8.23	6.16	2.07
1490.00	8.22	6.10	2.12
1500.00	8.21	6.04	2.17
1510.00	8.20	5.98	2.22
1520.00	8.19	5.92	2.27
1530.00	8.18	5.86	2.32
1540.00	8.17	5.80	2.37
1550.00	8.16	5.74	2.42
1560.00	8.15	5.68	2.47
1570.00	8.14	5.62	2.52
1580.00	8.13	5.56	2.57
1590.00	8.12	5.50	2.62
1600.00	8.11	5.44	2.67
1610.00	8.10	5.38	2.72
1620.00	8.09	5.32	2.77
1630.00	8.08	5.26	2.82
1640.00	8.07	5.20	2.87
1650.00	8.06	5.14	2.92
1660.00	8.05	5.08	2.97
1670.00	8.04	5.02	3.02
1680.00	8.03	4.96	3.07
1690.00	8.02	4.90	3.12
1700.00	8.01	4.84	3.17
1710.00	8.00	4.78	3.22
1720.00	7.99	4.72	3.27
1730.00	7.98	4.66	3.32
1740.00	7.97	4.60	3.37
1750.00	7.96	4.54	3.42
1760.00	7.95	4.48	3.47
1770.00	7.94	4.42	3.52
1780.00	7.93	4.36	3.57
1790.00	7.92	4.30	3.62
1800.00	7.91	4.24	3.67
1810.00	7.90	4.18	3.72
1820.00	7.89	4.12	3.77
1830.00	7.88	4.06	3.82
1840.00	7.87	4.00	3.87
1850.00	7.86	3.94	3.92
1860.00	7.85	3.88	3.97
1870.00	7.84	3.82	4.02
1880.00	7.83	3.76	4.07
1890.00	7.82	3.70	4.12
1900.00	7.81	3.64	4.17
1910.00	7.80	3.58	4.22
1920.00	7.79	3.52	4.27
1930.00	7.78	3.46	4.32
1940.00	7.77	3.40	4.37
1950.00	7.76	3.34	4.42
1960.00	7.75	3.28	4.47
1970.00	7.74	3.22	4.52
1980.00	7.73	3.16	4.57
1990.00	7.72	3.10	4.62
2000.00	7.71	3.04	4.67

REVISION

REVISION	AMENDMENT	DATE
A	ISSUE FOR TENDER	2025-03-06
B	DEVELOPED CONCEPT DESIGN	2025-11-21
C	DEVELOPED CONCEPT DESIGN	2025-11-27

APPROVED

APPROVED	DATE
A.S.	2025-03-06
A.S.	2025-11-21
A.S.	2025-11-27

HAWKES BAY REGIONAL COUNCIL
TE KAUNIHĀRA A-ROHE O TE AHTAU-A-MĀUI

WSP
Nelson Office
441 548 1099
Private Bag 38
New Zealand

PROJECT: HAWKES BAY REGIONAL COUNCIL
WAIROA, HAWKE'S BAY
WAIROA FLOOD MITIGATION PROJECT

TITLE: STOPBANK 1
PLAN AND PROFILE - SHEET 2 OF 3

WSP PROJECT NO.: 2-14441-WSP-03-DR

ORIGINAL SIZE: A1

DESIGNED: C.REENGIA
CHECKED: A.ROHMANN
APPROVED: A.SOMERSBY
APPROVED DATE: 2025-11-27

SCALE: 1:1000(A1) 1:2000(A3)

SCALE: 1H:100V (V:1:200 @ A1)

DEVELOPED CONCEPT DESIGN

CIVIL

SHEET NO: CIV-101

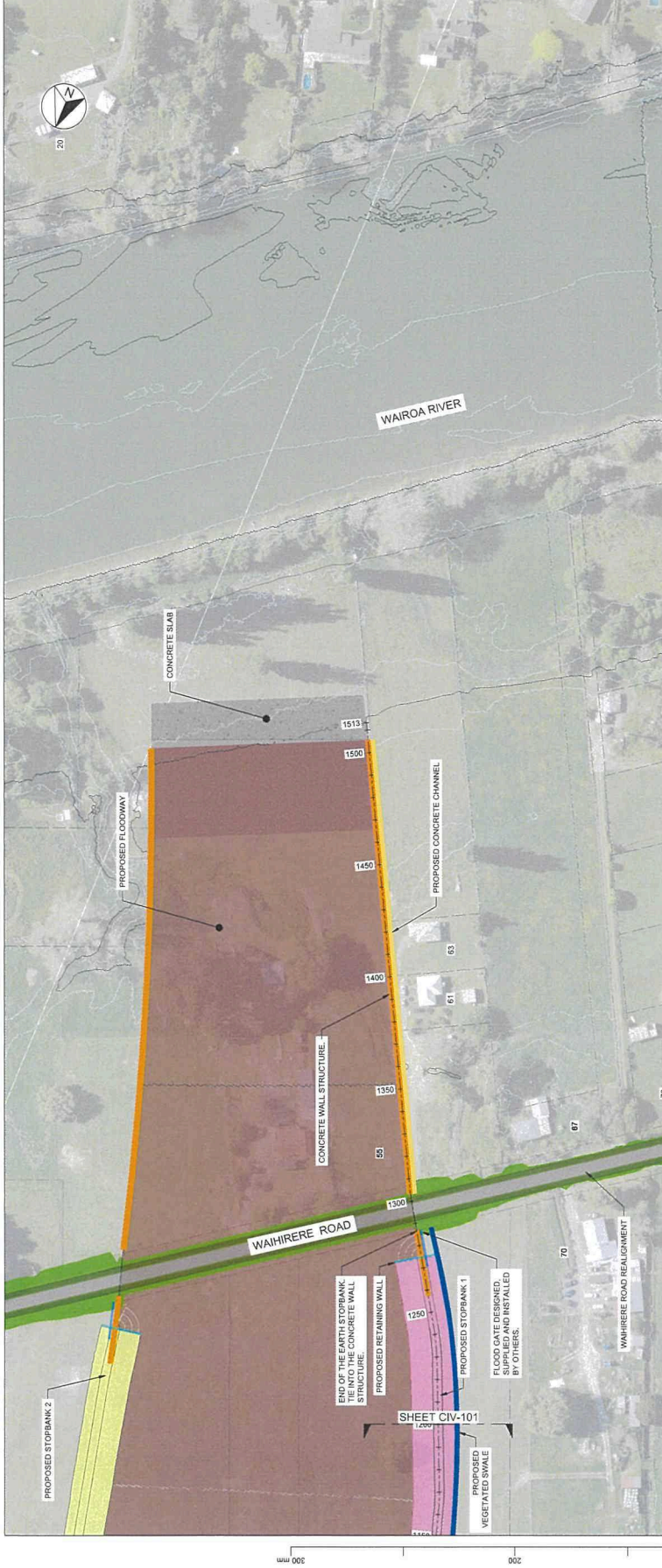
REVISION: C

NOTE

1. CO-ORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR (NZTM) PROJECTION.
2. VERTICAL LEVELS ARE IN TERMS OF NZVD2016 DATUM.
3. AERIALS AND BOUNDARIES SOURCED FROM GIPMAP.

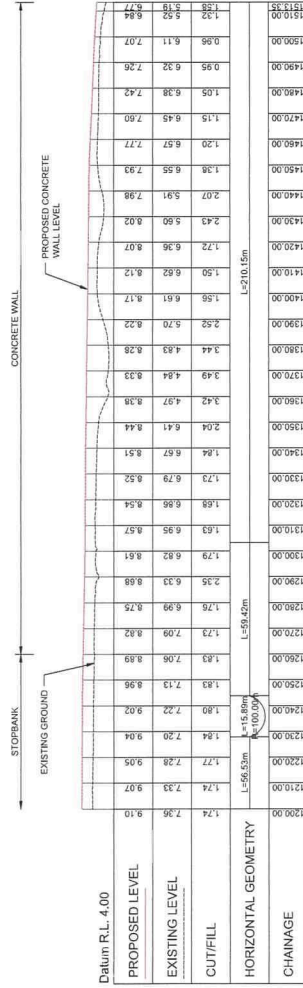
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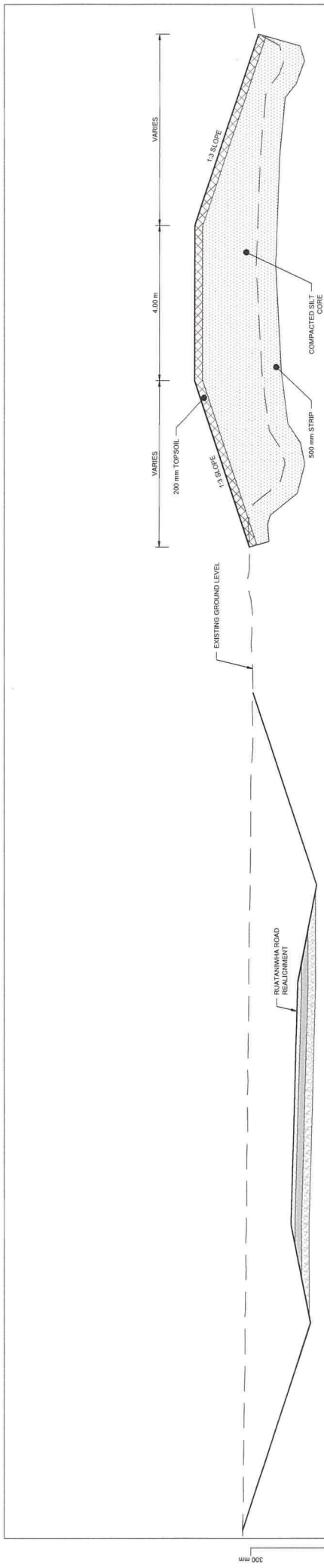
- EXISTING BOUNDARY
- MAJOR CONTOUR (1m)
- MINOR CONTOUR (5m)
- PROPOSED STOPBANK 1
- PROPOSED STOPBANK 2
- PROPOSED RUA/TANHUA ROAD & WAHIRERE ROAD REALIGNMENT
- PROPOSED FLOODWAY
- PROPOSED REINFORCED CONCRETE WALL
- PROPOSED RETAINING WALL
- PROPOSED FLOODGATE
- PROPOSED VEGETATED SWALE
- PROPOSED CONCRETE CHANNEL



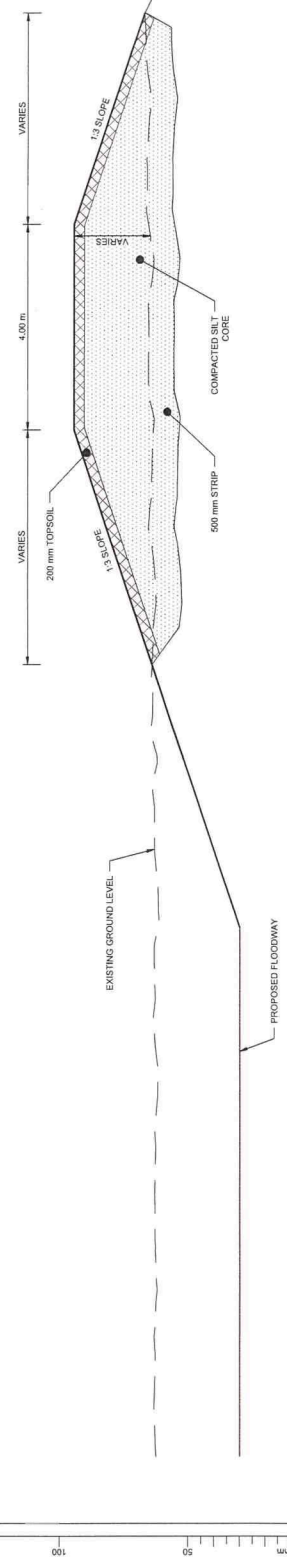
STOPBANK 1 - PLAN VIEW

SCALE: 1:1000(A1), 1:2000(A3)

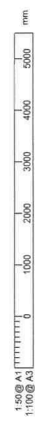




STOPBANK 1 - TYPICAL CROSS SECTION AT INDICATIVE CH. 700
SCALE: 1:50 (A1)



STOPBANK 1 - TYPICAL CROSS SECTION AT INDICATIVE CH. 1000
SCALE: 1:50 (A1)



REVISION	AMENDMENT	DATE
A	ISSUE FOR TENDER	2022-08-06
B	DEVELOPED CONCEPT DESIGN	2025-11-21



Nelson Office
46-43 Hill Street
New Zealand
Phone: 06 388 1099

SCALES	ORIGINAL SIZE
1:50 (A1), 1:100 (A3)	A1

DESIGNED	APPROVED
C. CRENCIA	A. SOWERSBY

DRAWN	DESIGN VERIFIED	APPROVED DATE
NAUDEA	A. JOHNSTON	2025-11-21

CIVIL

DEVELOPED CONCEPT DESIGN

PROJECT: HAWKES BAY REGIONAL COUNCIL
Wairoa, Hawke's Bay
Wairoa Flood Mitigation Project
TITLE: STOPBANK 1
TYPICAL CROSS SECTIONS
WSP PROJECT NO: 2-14441-WSP-03-DR

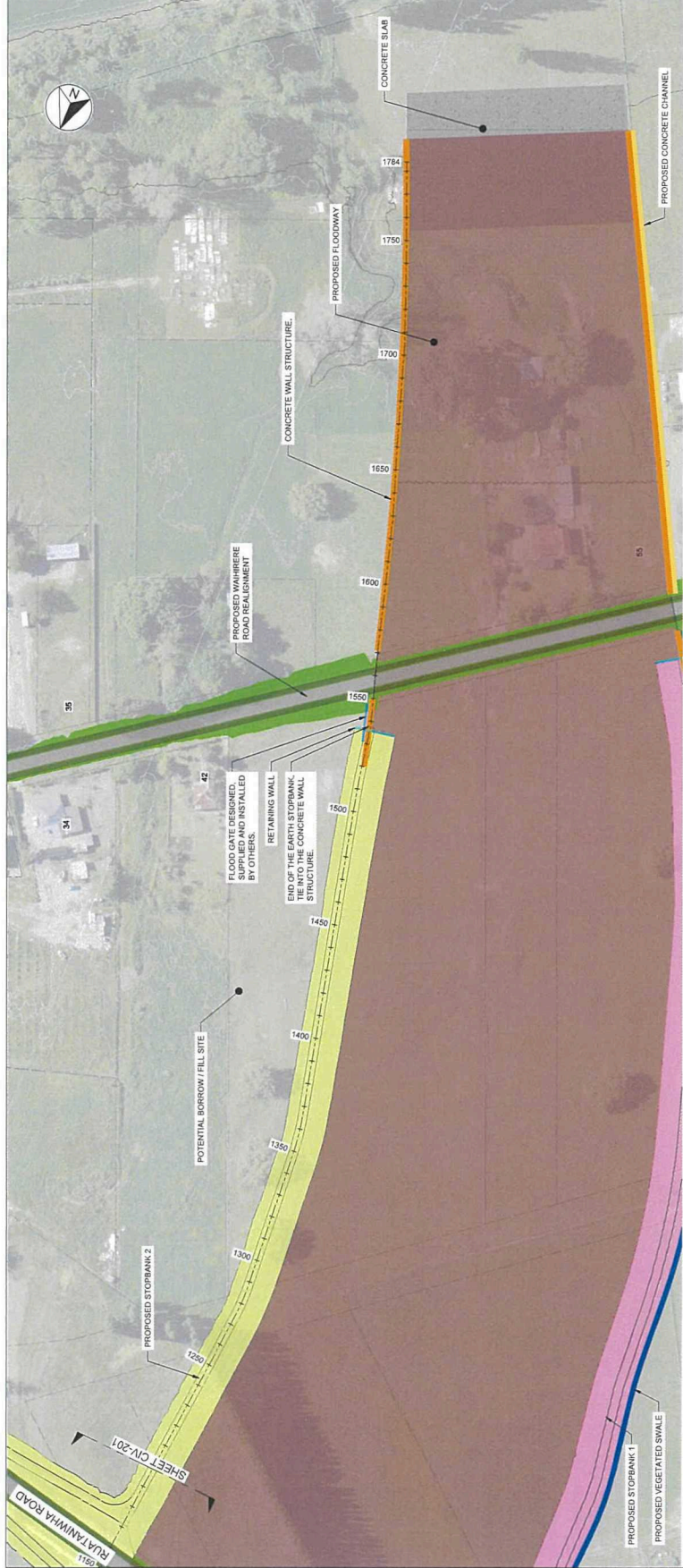
SHEET NO: CIV-103
REVISION: B

NOTE

1. CO-ORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR (NTM) PROJECTION.
2. VERTICAL LEVELS ARE IN TERMS OF NZVD2016 DATUM.
3. DETAILS AND BOUNDARIES SOURCED FROM GRIPMAP.

LEGEND

- EXISTING BOUNDARY
- MAJOR CONTOUR (1m)
- MINOR CONTOUR (5m)
- PROPOSED STOPBANK 2
- PROPOSED STOPBANK 1
- PROPOSED RUATIMAHUA ROAD & WAHIRE ROAD REALIGNMENT
- PROPOSED FLOODWAY
- PROPOSED REINFORCED CONCRETE SLAB
- PROPOSED CONCRETE WALL
- PROPOSED RETAINING WALL
- PROPOSED FLOODGATE
- PROPOSED VEGETATED SWALE
- PROPOSED CONCRETE CHANNEL



STOPBANK 2 - PLAN VIEW
SCALE: 1:1000(A1), 1:2000(A3)

STOPBANK 2 - PROFILE VIEW
SCALE: H:1:1000 V:1:200 @ A1

Datum R.L. 2.00	PROPOSED LEVEL	EXISTING LEVEL	CUT/FILL	HORIZONTAL GEOMETRY	CHAINAGE
				L=110.29m	1210.00
				L=16.88m	1220.00
				L=100.00m	1230.00
				L=81.19m	1240.00
				L=10.29m	1250.00
				L=100.00m	1260.00
				L=141.70m	1270.00
				L=170.29m	1280.00
				L=200.00m	1290.00
				L=19.29m	1300.00
				L=42.28m	1310.00
				L=21.61m	1320.00
				L=90.89m	1330.00
				L=47.99m	1340.00
				L=42.45m	1350.00
				L=37.52m	1360.00



REVISION	AMENDMENT	DATE
A	ISSUE FOR TENDER	2025-08-06
B	DEVELOPED CONCEPT DESIGN	2025-11-21
C	DEVELOPED CONCEPT DESIGN	2025-11-27
D	DEVELOPED CONCEPT DESIGN	2025-12-01

HAWKES BAY REGIONAL COUNCIL
TE MAHIAHĀRA-ROHE O TE MATAU-A-MĀUI

WSP
Nelson Office
44-544-1099
Private Bag 36
Nelson Road
New Zealand

PROJECT
HAWKES BAY REGIONAL COUNCIL
WAROA, HAWKE'S BAY
WAROA FLOOD MITIGATION PROJECT

DESIGNED BY
C. GRENOUA

APPROVED BY
A. SOWERSBY

DESIGN VERIFIED
A. MOHAMMADINA

APPROVED DATE
2025-12-01

TITLE
STOPBANK 2
PLAN AND PROFILE - SHEET 3 OF 3

WSP PROJECT NO.
2-14441-WSP-03-DR

ORIGINAL SIZE
A1

SCALE
1:1000(A1), 1:2000(A3)

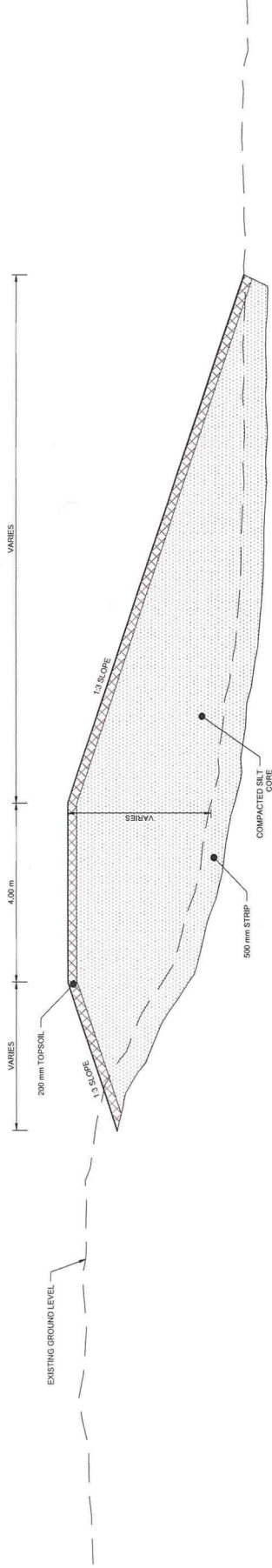
SCALE
H:1:1000 V:1:200 @ A1

DEVELOPED CONCEPT DESIGN

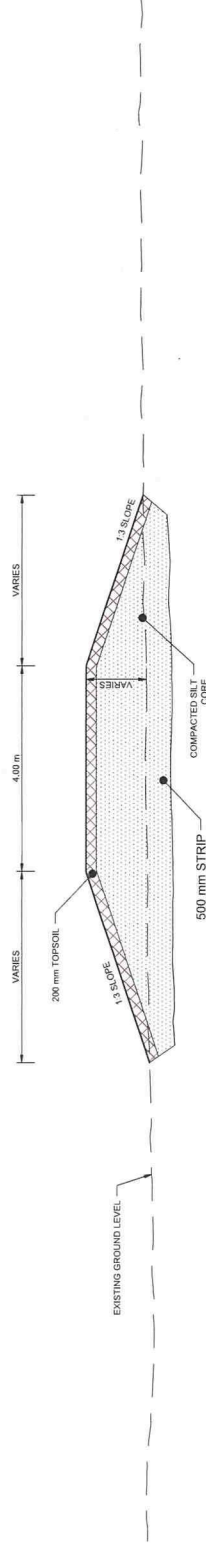
CIVIL

SHEET NO.
CIV-202

REVISION
D



STOPBANK 2 - TYPICAL CROSS SECTION AT INDICATIVE CH. 250
SCALE: 1:50 (A1)



STOPBANK 2 - TYPICAL CROSS SECTION AT INDICATIVE CH. 600
SCALE: 1:50 (A1)



REVISION	AMENDMENT	APPROVED	DATE
A	ISSUE FOR TENDER	A.S.	2025-09-08
B	DEVELOPED CONCEPT DESIGN	A.S.	2025-11-21



wsp
Nelson Office
+64 3 546 1099
Private Bag 38
Nelson 7042
New Zealand

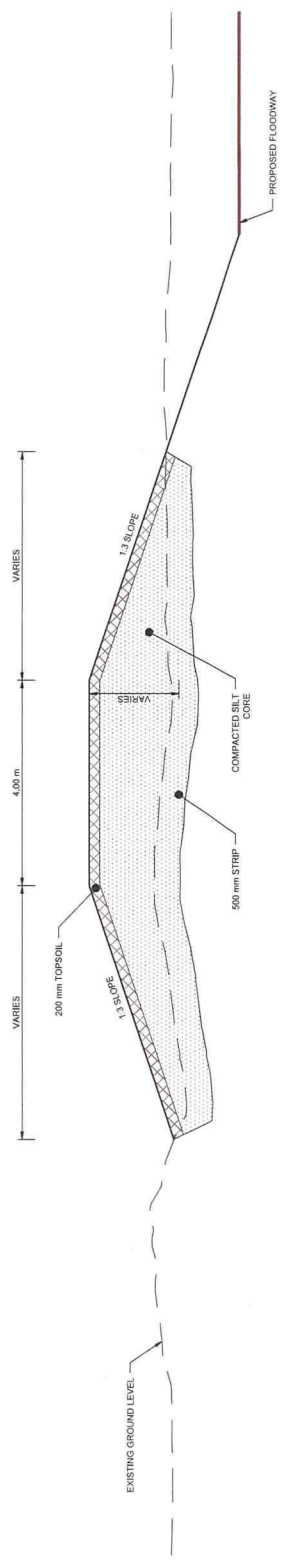
CIVIL

DEVELOPED CONCEPT DESIGN

PROJECT: HAWKES BAY REGIONAL COUNCIL
Wairoa, Hawke's Bay
Wairoa Flood Mitigation Project
TITLE: STOPBANK 2
TYPICAL CROSS SECTION - SHEET 1 OF 2
WSP PROJECT NO.: 2-T4441-WSP-03-DR

ORIGINAL SIZE: A1
SCALE: 1:50 (A1) 1:100 (A3)
DRAWN: H. AUREA
CHECKED: C. BRENDIA
DESIGN VERIFIED: A. MOHAMMADINA
DRAWING VERIFIED: P. FIEREK
APPROVED: A. SPOWERSBY
APPROVED DATE: 2025-11-21

SHEET NO.: CIV-203
REVISION: B



STOPBANK 2 - TYPICAL CROSS SECTION AT INDICATIVE CH. 1100

SCALE: 1:50 (A1)

REVISION	AMENDMENT	DATE
A	ISSUE FOR TENDER	2025-08-06
B	DEVELOPED CONCEPT DESIGN	2025-11-21



wsp
Nelson Office
+64 3 541 0599
Private Bag 36
Nelson 7042
New Zealand

CIVIL

SCALE	ORIGINAL SIZE
1:50(A1), 1:100(A3)	A1
DRAWN: N. ALDEA	DESIGNED: C. FRENCIA
DRAWING VERIFIED: P. FRIEBEK	DESIGN VERIFIED: A. MOHAMMADINA
APPROVED: A. SOWERSBY	APPROVED DATE: 2025-11-21

DEVELOPED CONCEPT DESIGN

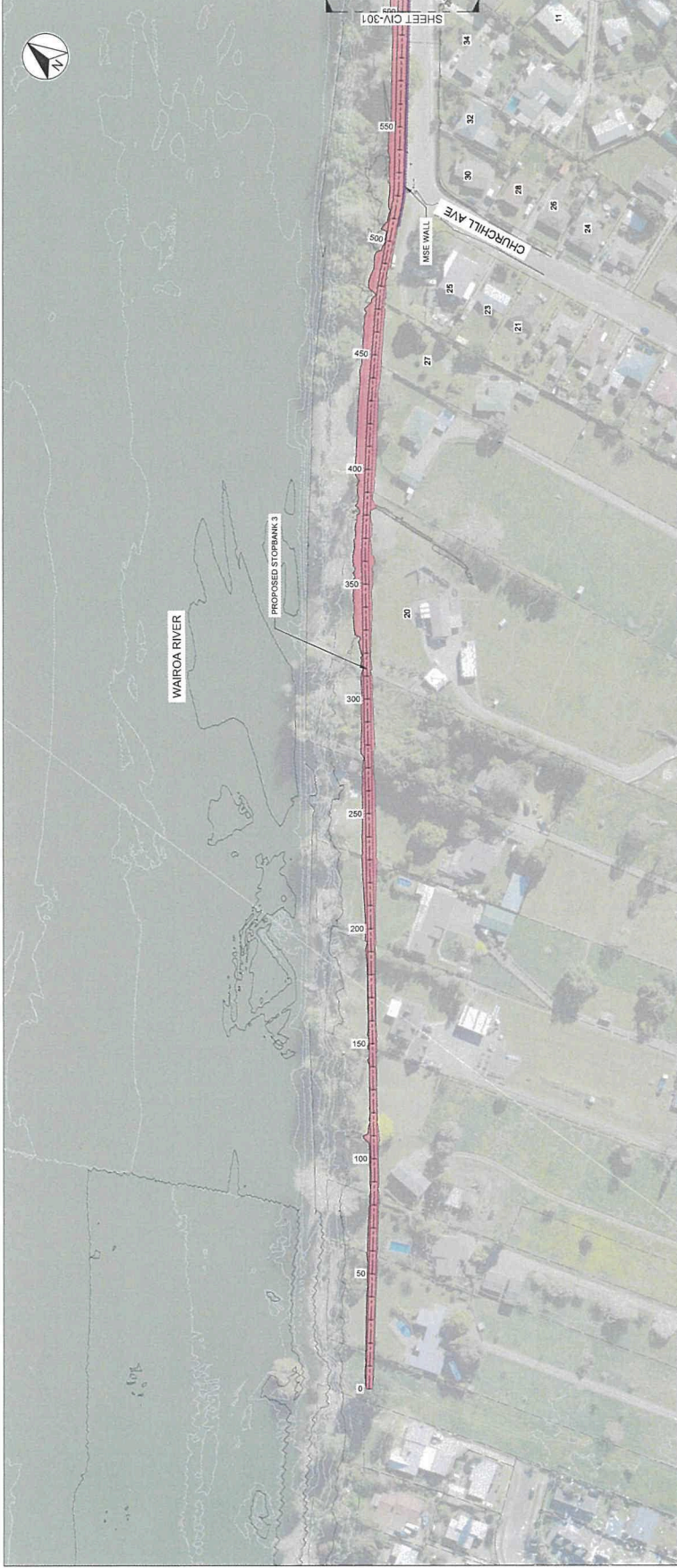
PROJECT: HAWKES BAY REGIONAL COUNCIL
Wairoa, Hawke's Bay
Wairoa Flood Mitigation Project
TITLE: STOPBANK 2
TYPICAL CROSS SECTION - SHEET 2 OF 2
WSP PROJECT NO: 2-T4441-WSP-03-DR
SHEET NO: CIV-204
REVISION: B

NOTE

1. CO-ORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR (NZTM) PROJECTION.
2. VERTICAL LEVELS ARE IN TERMS OF NZVD2016 DATUM.
3. REFINALS AND BOUNDARIES SOURCED FROM GISMAP.

LEGEND

- EXISTING BOUNDARY
- MAJOR CONTOUR (1m)
- MINOR CONTOUR (50m)
- PROPOSED STOPBANK
- MSE WALL



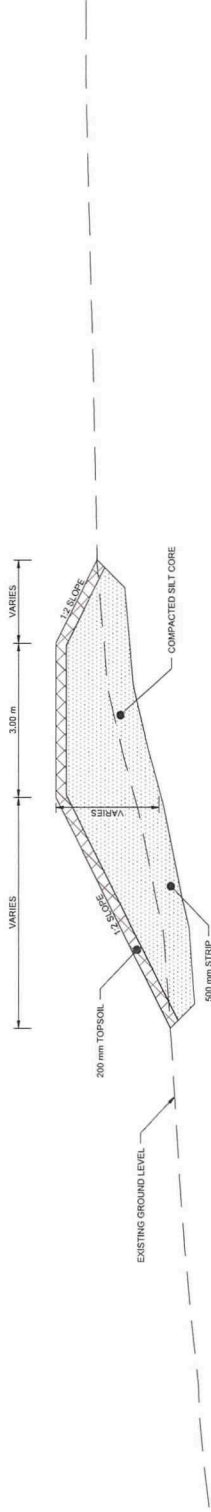
STOPBANK 3 - PLAN VIEW
SCALE: 1:1000 (A1), 1:2000 (A3)

CHAINAGE	HORIZONTAL GEOMETRY		EXISTING GROUND	PROPOSED STOPBANK LEVEL
	CUT/FILL	EXISTING LEVEL		
0.00	6.90	6.90	6.90	6.90
10.00	6.90	6.90	6.90	6.90
20.00	6.90	6.90	6.90	6.90
30.00	6.90	6.90	6.90	6.90
40.00	6.90	6.90	6.90	6.90
50.00	6.90	6.90	6.90	6.90
60.00	6.90	6.90	6.90	6.90
70.00	6.90	6.90	6.90	6.90
80.00	6.90	6.90	6.90	6.90
90.00	6.90	6.90	6.90	6.90
100.00	6.90	6.90	6.90	6.90
110.00	6.90	6.90	6.90	6.90
120.00	6.90	6.90	6.90	6.90
130.00	6.90	6.90	6.90	6.90
140.00	6.90	6.90	6.90	6.90
150.00	6.90	6.90	6.90	6.90
160.00	6.90	6.90	6.90	6.90
170.00	6.90	6.90	6.90	6.90
180.00	6.90	6.90	6.90	6.90
190.00	6.90	6.90	6.90	6.90
200.00	6.90	6.90	6.90	6.90
210.00	6.90	6.90	6.90	6.90
220.00	6.90	6.90	6.90	6.90
230.00	6.90	6.90	6.90	6.90
240.00	6.90	6.90	6.90	6.90
250.00	6.90	6.90	6.90	6.90
260.00	6.90	6.90	6.90	6.90
270.00	6.90	6.90	6.90	6.90
280.00	6.90	6.90	6.90	6.90
290.00	6.90	6.90	6.90	6.90
300.00	6.90	6.90	6.90	6.90
310.00	6.90	6.90	6.90	6.90
320.00	6.90	6.90	6.90	6.90
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340.00	6.90	6.90	6.90	6.90
350.00	6.90	6.90	6.90	6.90
360.00	6.90	6.90	6.90	6.90
370.00	6.90	6.90	6.90	6.90
380.00	6.90	6.90	6.90	6.90
390.00	6.90	6.90	6.90	6.90
400.00	6.90	6.90	6.90	6.90
410.00	6.90	6.90	6.90	6.90
420.00	6.90	6.90	6.90	6.90
430.00	6.90	6.90	6.90	6.90
440.00	6.90	6.90	6.90	6.90
450.00	6.90	6.90	6.90	6.90
460.00	6.90	6.90	6.90	6.90
470.00	6.90	6.90	6.90	6.90
480.00	6.90	6.90	6.90	6.90
490.00	6.90	6.90	6.90	6.90
500.00	6.90	6.90	6.90	6.90
510.00	6.90	6.90	6.90	6.90
520.00	6.90	6.90	6.90	6.90
530.00	6.90	6.90	6.90	6.90
540.00	6.90	6.90	6.90	6.90
550.00	6.90	6.90	6.90	6.90

STOPBANK 3 - PROFILE
SCALE: H:1:1000 V:1:200 @ A1

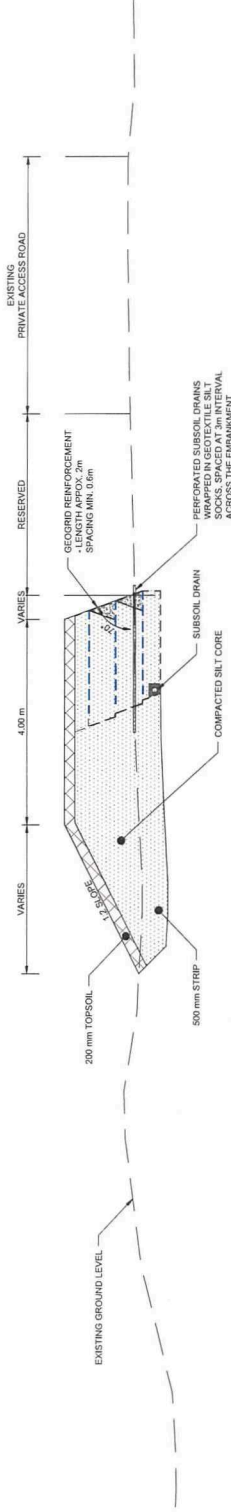


<p>HAWKES BAY REGIONAL COUNCIL TE KAUNIHEKA ROHE O TE MATAU-A-MAUI</p>		<p>Private Bag 35 Nelson Road New Zealand</p>	
<p>Project: HAWKES BAY REGIONAL COUNCIL WAIROA, HAWKE'S BAY WAIROA FLOOD MITIGATION PROJECT</p>		<p>Original Size: A1</p>	
<p>Title: STOPBANK 3 PLAN AND PROFILE - SHEET 1 OF 2</p>		<p>Scale: 1:1000 (A1), 1:2000 (A3)</p>	
<p>WSP Project No: 2-14441-WSP-03-DR</p>		<p>Region: C. KREKREA Design Verified: A. MOHAMMADINA Approved Date: 2025-11-21</p>	
<p>Developed Concept Design</p>		<p>CIVIL</p>	
<p>Issue for Tender</p>		<p>Approved</p>	
<p>Developed Concept Design</p>		<p>Date: 2025-08-06</p>	
<p>2025-11-21</p>		<p>2025-11-21</p>	



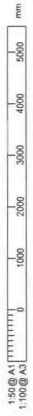
STOPBANK 3 - TYPICAL CROSS SECTION AT INDICATIVE CH. 450

SCALE: 1:50 (A1)



STOPBANK 3 - TYPICAL CROSS SECTION AT INDICATIVE CH. 550

SCALE: 1:50 (A1)



REVISION / AMENDMENT	DATE
A	2025-05-06
B	2025-11-21



WSP
Nelson Office
Private Bag 38
New Zealand
+61 3 548 1099

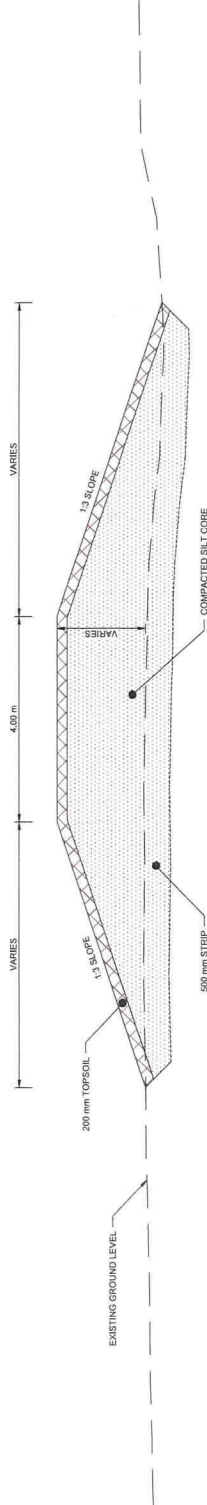
CIVIL

SCALES	ORIGINAL SIZE
1:50(A1); 1:100(A3)	A1
DRAWN	APPROVED
NAUDEA	A. SOWERBY
DESIGNED	DESIGN VERIFIED
C. CREENCIA	A. MOHAMMADINA
DRAWING VERIFIED	APPROVED DATE
P. FIEBER	2025-11-21

DEVELOPED CONCEPT DESIGN

PROJECT
HAWKES BAY REGIONAL COUNCIL
WAIROA, HAWKE'S BAY
WAIROA FLOOD MITIGATION PROJECT
TITLE
STOPBANK 3
TYPICAL CROSS SECTIONS SHEET 1 OF 2
WSP PROJECT NO.
2-14441-WSP-03-DR

SHEET NO.
CIV-302
REVISION
B



STOPBANK 3 - TYPICAL CROSS SECTION AT INDICATIVE CH. 900
SCALE: 1:50 (A1)

1:50 @ A1
1:100 @ A3



REVISION	AMENDMENT	APPROVED	DATE
A	ISSUE FOR TENDER	A.S.	2025-09-05
B	DEVELOPED CONCEPT DESIGN	A.S.	2025-11-21



wsp
Nelson Office
+61 3 548 1099

Private Bag 35
Mason Tce
New Zealand

CIVIL

SCALES	ORIGINAL SIZE
1:50 (A1), 1:100 (A3)	A1
DESIGNED C. FREENIA	APPROVED A. SOWERBY
DESIGNED / VERIFIED A. JOHANNARDINA	APPROVED DATE 2025-11-21

DEVELOPED CONCEPT DESIGN

PROJECT
HAWKES BAY REGIONAL COUNCIL
Wairoa, Hawke's Bay
Wairoa Flood Mitigation Project

TITLE
STOPBANK 3
TYPICAL CROSS SECTION SHEET 2 OF 2

WSP PROJECT NO.
2-14441-WSP-03-DR

SHEET NO.
CIV-303

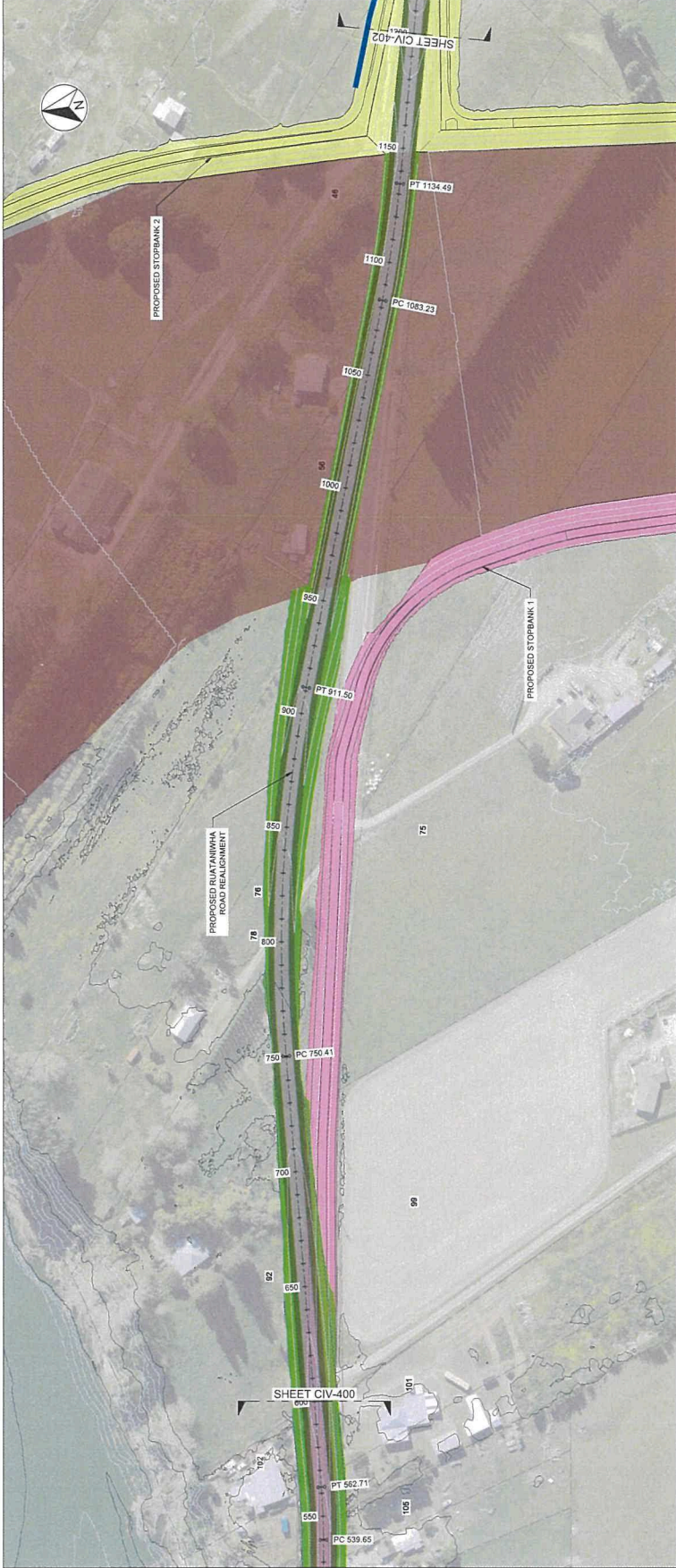
REVISION
B

NOTE

- COORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR (NZTM) PROJECTION.
- VERTICAL LEVELS ARE IN TERMS OF NZVD2016 DATUM.
- AERIALS AND BOUNDARIES SOURCED FROM GRIPMAP.

LEGEND

- EXISTING BOUNDARY
- MAJOR CONTOUR (1m)
- MINOR CONTOUR (50m)
- PROPOSED ROAD ALIGNMENT
- PROPOSED BATTER
- PROPOSED STOPBANK 1
- PROPOSED STOPBANK 2
- PROPOSED FLOODWAY
- PROPOSED VEGETATED SWALE



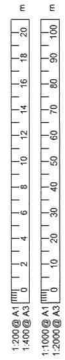
RUATANIWHA ROAD - PLAN VIEW

SCALE: H=1:1000 @ A1



RUATANIWHA ROAD - PROFILE

SCALE: H=1:1000 V=1:200 @ A1



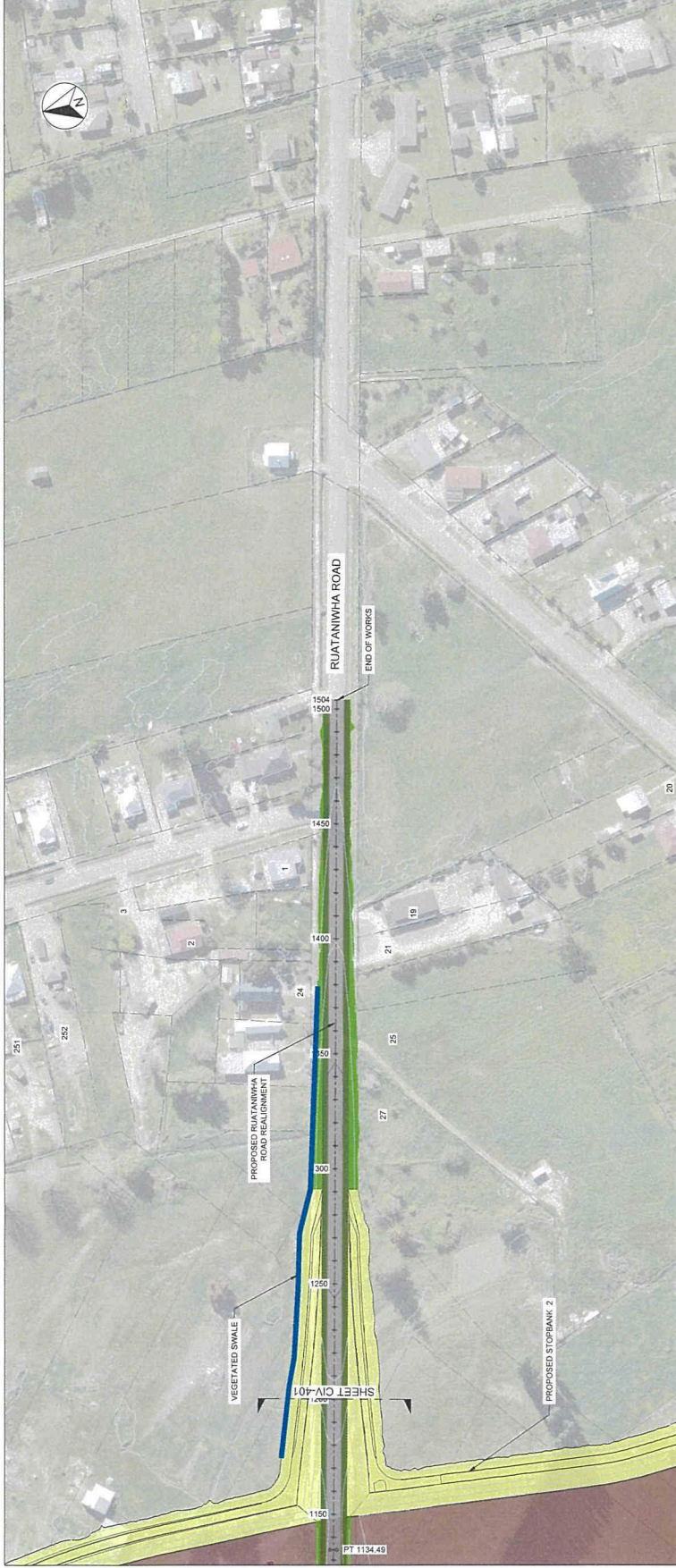
<p>HAWKES BAY REGIONAL COUNCIL TE KAUNIHERA A-ROHE O TE MATAU-A-MAUI</p>		<p>PROJECT: HAWKE'S BAY REGIONAL COUNCIL WAIROA, HAWKE'S BAY WAIROA FLOOD MITIGATION PROJECT</p> <p>TITLE: RUATANIWHA ROAD PLAN AND PROFILE - SHEET 2 OF 3</p> <p>WSP PROJECT NO: 2-14441-WSP-03-DR</p>	
<p>SCALE: 1:1000 (DRAWING) 1:2000 (A0/A1)</p> <p>DRAWN: NAUREA</p> <p>DRAWN/VERIFIED: P. FIEBERK</p>	<p>DESIGNED: CLPREENCIA</p> <p>DESIGN/VERIFIED: A.MOHAMMADINA</p>	<p>APPROVED: A.SOWERSBY</p> <p>APPROVED DATE: 2025-11-21</p>	<p>ORIGINAL SIZE: A1</p> <p>DEVELOPED CONCEPT DESIGN</p>
<p>Private Bag 36 Nelson Office 46-548 1099</p>		<p>CIVIL</p>	
<p>REVISION AMENDMENT DATE</p> <p>A ISSUE FOR TENDER A.S. 2025-08-06</p> <p>B DEVELOPED CONCEPT DESIGN A.S. 2025-11-21</p>		<p>SHEET NO. CIV-401</p> <p>REVISION B</p>	

NOTE

1. CO-ORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR (NCTM) PROJECTION.
2. VERTICAL LEVELS ARE IN TERMS OF NZGD2016 DATUM.
3. HEIGHTS AND BOUNDARIES SOURCED FROM GRIPMAPS.

LEGEND

- EXISTING BOUNDARY
- MAJOR CONTOUR (1m)
- MINOR CONTOUR (5m)
- PROPOSED ROAD ALIGNMENT
- PROPOSED BATTER
- PROPOSED STOPBANK 1
- PROPOSED STOPBANK 2
- PROPOSED FLOODWAY
- PROPOSED VEGETATED SWALE



RUATANIWHA ROAD - PLAN VIEW

SCALE: H=1:1000 V=1:200 @ A1



RUATANIWHA ROAD - PROFILE

SCALE: H=1:1000 V=1:200 @ A1



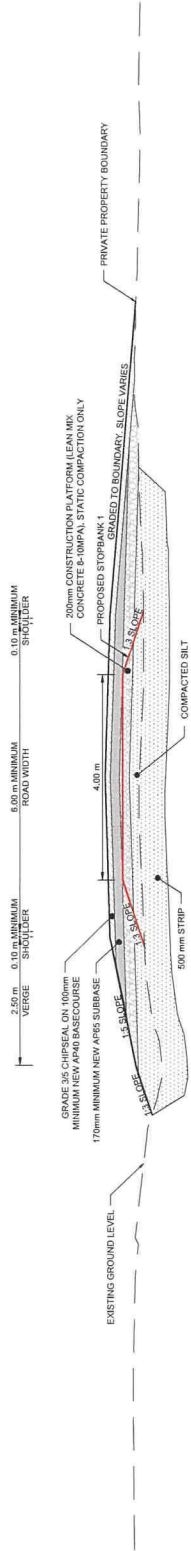
REVISION	AMOUNT	DATE
A	ISSUE FOR TENDER	2025-08-06
B	DEVELOPED CONCEPT DESIGN	2025-11-21

WSP
Nelson Office
44-334-1099
Private Bag 28
New Zealand

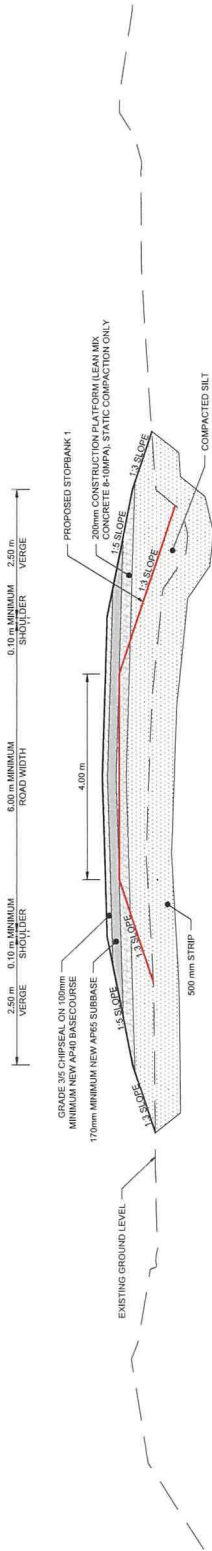
HAWKES BAY REGIONAL COUNCIL
TE KAUNIHERA-A-ROHE O TE MATAU-A-MAU

SCALES	1:1000(200(A1), 1:200(A0/A3))	ORIGINAL SIZE	A1
DRAWN	NAUDEA	DESIGNED	A.S. SOWERSBY
DESIGNED/VERIFIED	P. FIEREK	DESIGN/VERIFIED	A.K.O./A.M.A.G.I.N.I.A
APPROVED	A.S. SOWERSBY	APPROVED DATE	2025-11-21

PROJECT: HAWKES BAY REGIONAL COUNCIL
WAIROA, HAWKE'S BAY
WAIROA FLOOD MITIGATION PROJECT
TITLE: RUATANIWHI ROAD
PLAN AND PROFILE - SHEET 3 OF 3
WSP PROJECT NO.: 2-14441-WSP-03-DR
SHEET NO.: CIV-402
REVISION: B



RUATANIWHIA ROAD - TYPICAL CROSS SECTION - ACROSS DRIVEWAYS AT INDICATIVE CH. 205
SCALE: 1:50 (A1)



RUATANIWHIA ROAD - TYPICAL CROSS SECTION AT INDICATIVE CH. 360
SCALE: 1:50 (A1)



REVISION	AMENDMENT	DATE
A	ISSUE FOR TENDER	2025-06-06
B	DEVELOPED CONCEPT DESIGN	2025-11-21



SCALES	ORIGINAL SIZE
1:50(A1), 1:100(A3)	A1

DRAWN	DESIGNED	APPROVED
NAUDEA	C.FRENCIA	A.SCHWERSBY

DRAWING NUMBER	APPROVED DATE
P1/FIEBKA	2025-11-21

DEVELOPED CONCEPT DESIGN

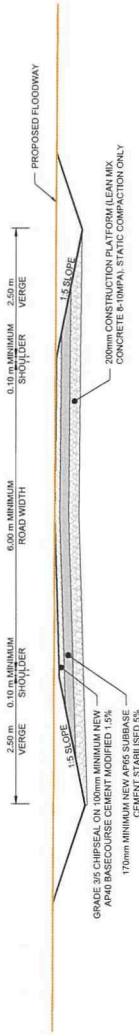
CIVIL

PROJECT
HAWKES BAY REGIONAL COUNCIL
Wairoa, Hawke's Bay
Wairoa Flood Mitigation Project

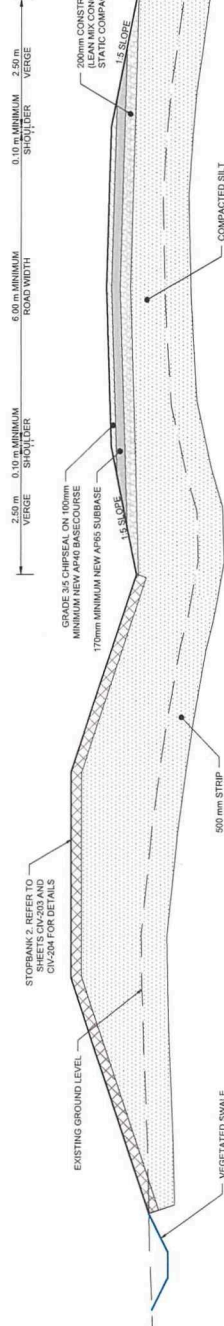
TITLE
RUATANIWHIA ROAD
TYPICAL CROSS SECTIONS - SHEET 1 OF 3

PROJECT NUMBER
2-14441-WSP-03-DR

REVISION
B



RUATANIWHIA ROAD - TYPICAL CROSS SECTION AT INDICATIVE CH. 1060
SCALE: 1:50 (A1)



RUATANIWHIA ROAD - TYPICAL CROSS SECTION AT INDICATIVE CH. 1200
SCALE: 1:50 (A1)



REVISION / AMENDMENT	DATE
A	2025-09-06
B	2025-11-21

HAWKES BAY REGIONAL COUNCIL
TE KAUHINEHA A ROHE O TE MATAU A HAUKI

Nelson Office
441 548 1099
Private Bag 38
New Zealand

CIVIL

DESIGNED	APPROVED
C. CREENCIA	A. SOWERSBY
DESIGNED / CHECKED	APPROVED / DATE
A. MOHAMMADINA	2025-11-21

DEVELOPED CONCEPT DESIGN

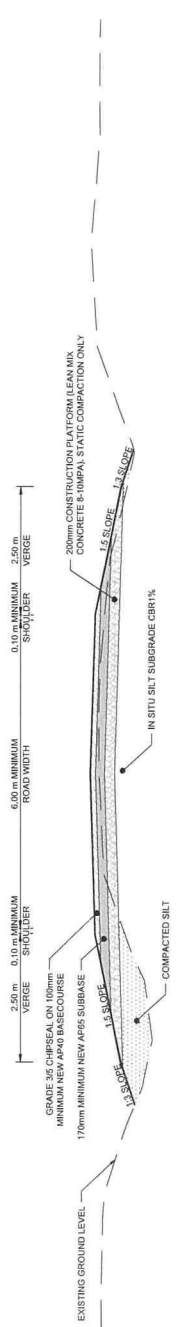
PROJECT: HAWKES BAY REGIONAL COUNCIL
Wairoa, Hawke's Bay
Wairoa Flood Mitigation Project

TITLE: RUATANIWHIA ROAD
TYPICAL CROSS SECTIONS - SHEET 2 OF 3

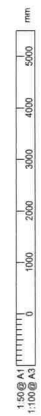
WSP PROJECT NO.: 2-14441-WSP-03-DR

SHEET NO.: CIV-404

REVISION: B



RUATANIWHA ROAD - TYPICAL CROSS SECTION AT INDICATIVE CH. 1440
SCALE: 1:50 (A1)



REVISION	AMENDMENT	DATE
A	ISSUE FOR TENDER	2025-08-06
B	DEVELOPED CONCEPT DESIGN	2025-11-21



CIVIL

SCALES	ORIGINAL SIZE
1:50 (A1), 1:100 (A3)	A1

DESIGNED	APPROVED
C. PREENIA	A. SOMERBY

DESIGNED VERIFIED	APPROVED DATE
A. MOHAMMADINA	2025-11-21

DEVELOPED CONCEPT DESIGN

PROJECT: HAWKES BAY REGIONAL COUNCIL
 Wairoa, Hawke's Bay
 Wairoa Flood Mitigation Project
 TITLE: RUATANIWHA ROAD
 TYPICAL CROSS SECTIONS - SHEET 3 OF 3
 WSP PROJECT NO.: 2-14441-WSP-03-DR
 SHEET NO.: CIV-405
 REVISION: B

NOTE

1. CO-ORDINATES ARE IN TERMS OF NEW ZEALAND TRANSVERSE MERCATOR (NZTM) PROJECTION.
2. ELEVATIONS ARE IN METRES ABOVE SEA LEVEL (MASL).
3. AERIALS AND BOUNDARIES SOURCED FROM BRIMAP.

LEGEND

- EXISTING BOUNDARY
- MAJOR CONTOUR (1m)
- MINOR CONTOUR (5m)
- PROPOSED ROAD ALIGNMENT
- PROPOSED BATTER
- PROPOSED STOPBANK 1
- PROPOSED STOPBANK 2
- PROPOSED FLOODWAY
- PROPOSED CONCRETE WALL
- PROPOSED RETAINING WALL
- PROPOSED FLOODGATE



WAIHIERE ROAD - PLAN VIEW
SCALE: 1:1000 (A1), 1:2000 (A3)



WAIHIERE ROAD - PROFILE
SCALE: 1:1000 (A1), 1:2000 (A3)



REVISION / AMENDMENT	APPROVED	DATE
A ISSUE FOR TENDER	A.S.	2025-09-06
B DEVELOPED CONCEPT DESIGN	A.S.	2025-11-21

SCALES	ORIGINAL SIZE
1:1000/2000(A1), 1:2000/4000(A3)	A1

PROJECT	HAWKES BAY REGIONAL COUNCIL
WAIROA FLOOD MITIGATION PROJECT	WAIROA, HAWKE'S BAY
TITLE	WAIHIERE ROAD
PLAN AND PROFILE	2-14441-WSP-03-DR

DESIGNED	APPROVED
C.REENICA	A.SOVERSBY
DESIGN DATE	APPROVED DATE
2025-11-21	

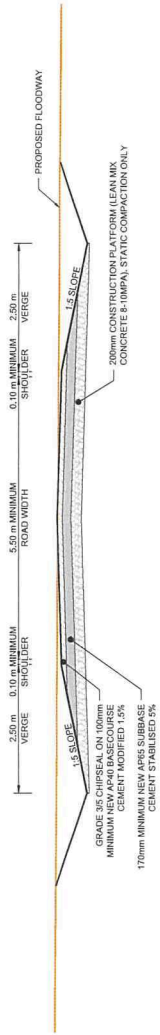
DRAWN	NAUDEA
CHECKED	P.FIEBER
PROJECT MANAGER	A.MOHAMMADINA

Project Bg-38
Nelson Office
483 348 1099
New Zealand

HAWKES BAY REGIONAL COUNCIL
TE KAUNIHEKA A-IHOE O TE MATAU-A-MAU

CIVIL

DEVELOPED CONCEPT DESIGN



WAIHIRERE ROAD - TYPICAL CROSS SECTION AT INDICATIVE CH. 240

SCALE: 1:50 (A1)



REVISION	AMENDMENT	DATE	APPROVED
A	ISSUE FOR TENDER	2025-08-06	A.S.
B	DEVELOPED CONCEPT DESIGN	2025-11-21	A.S.



CIVIL

SCALES	ORIGINAL SIZE
1:50(A), 1:100(A3)	A1
DRAWN N.AUDEA	DESIGNED C.GREENCIA
DRAWING CHECKED P.FIEBERK	DESIGN CHECKED A.ACHANDARAJA
APPROVED A.SOMERSBY	APPROVED DATE 2025-11-21

DEVELOPED CONCEPT DESIGN

PROJECT HAWKES BAY REGIONAL COUNCIL WAIROA, HAWKES BAY WAIROA FLOOD MITIGATION PROJECT
TITLE WAIHIRERE ROAD TYPICAL CROSS SECTION
WSP PROJECT NO. 2-14441-WSP-03-DR
SHEET NO. CIV-501
REVISION B