



ENVELOPE ENGINEERING

LAND
STRUCTURE
MANAGE

ENGINEERING INFRASTRUCTURE REPORT

Proposed Plan Change
28, 30, 66 Crestview Rise, Papakura
Auckland

DOCUMENT CONTROL RECORD

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CONTENTS

1.0	INTRODUCTION	1
2.0	INFRASTRUCTURE	1
2.1	EARTHWORKS	1
2.2	ROADING	1
2.3	WASTEWATER	2
2.4	STORMWATER	4
2.5	WATER SUPPLY	6
2.6	UTILITY SERVICES	7
3.0	CONCLUSIONS	8
4.0	LIMITATIONS	8

APPENDICES

APPENDIX 1	PROPOSED CIVIL ENGINEERING PLANS
APPENDIX 2	CALCULATIONS
APPENDIX 3	AS-BUILT TOPOGRAPHICAL SURVEY PLANS (PROVIDED BY SURVEY WORX)
APPENDIX 4	WASTEWATER SCENARIO MODELLING
APPENDIX 5	AS-BUILT EXISTING WASTEWATER SURVEY
APPENDIX 6	EXISTING STORMWATER DISCHARGE MEMO
APPENDIX 7	VEOLIA CORRESPONDENCE

1.0 INTRODUCTION

The Site is Rural – Countryside Living Zone as defined by the Auckland Unitary Plan – Operative in Part (AUP). The site (3 titles) is bordered by Crestview Rise to the north and west, a recent subdivision completed by the present owner Harbour View Heights LP.

The proposed rezoning to Mixed Housing Urban and potential subsequent development could consist of the following:

- The construction of 31 residential Lots providing up to 90 dwellings
- Bulk Earthworks of the site to establish the Jointly Owned Access Lot
- Proposed formation of a Public Road (to vest) and a Jointly Owned Access Lot
- Proposed formation of a 3 stormwater management reserve lots
- Associated 3-waters infrastructure and utility services provision

To assist with understanding the form of development which might occur following a rezoning, a conceptual development plan and associated engineering plans showing earthworks, roading layout and 3-waters servicing has been prepared for the site.

This report should be read in conjunction with:

- Envelope Engineering – Crestview Rise Stormwater Management Plan (v4)
- Envelope Engineering – Wastewater Assessment Memo (M003)
- Envelope Engineering – Existing SW Discharge Memo (M002)
- Envelope Engineering – Concept Civil Engineering Plans (C10)

2.0 INFRASTRUCTURE

Refer to drawings in Appendix 1 showing the proposed infrastructure works for the development.

2.1 EARTHWORKS

2.1.1 BULK EARTHWORKS

A separate Bulk Earthworks Resource Consent has been applied for. Refer to the Bulk Earthworks plans: Proposed Contours and Proposed Cut and Fill plans.

2.1.2 PROPOSED EARTHWORKS

As per the Bulk Earthworks plans, earthworks are proposed for the development to provide suitable contour primarily for road access and services. An existing stockpile area of surplus fill adjacent to Kotahitanga Street will also be removed. The stockpile has been seeded and currently resembles a natural earth formation. An earthworks area of approximately 0.85 ha is required for the formation of road reserves and the levelling within the site. It is anticipated that there will be approximately 13,500m³ of cut and 1,100m³ of fill for the entire site.

Based on the existing site topography, there is no viable potential development plan that would lend itself to requiring filling of any significant volume. In fact, development will almost certainly require excavation, to form the roadways and the stormwater management device. Overall, there is likely to be an excess of cut material and this will need to be removed off-site to an appropriate tip-site. An earthworks resource consent may be required to establish individual site building platforms.

A Geotechnical Investigation Report for the site will be provided as part of the subdivision application.

2.2 ROADING

2.2.1 TRAFFIC REPORT

Commute Transportation Consultants have prepared a traffic assessment for the development at the site, which should be read in conjunction with this report.

2.2.2 EXISTING ROADING

The site is bordered by Crestview Rise to the West and North. And existing vegetated gully and stream bound the site to the south. Kotahitanga St is a small cul-de-sac street off Crestview Rise and provides access to the



western section of the development. The existing roading network and local roading hierarchy are shown in Appendix 1.

2.2.3 PROPOSED ROADING

It is proposed to create two new access points for the development: a private JOAL (JOAL01) and a public road (Road 01) that will be vested. These access points will connect to Crestview Rise and Kotahitanga Street via "T" intersections. Road 01 will feature roadside parking on one side and pedestrian footpaths on both sides.

Vertical grades of Road 01 have been discussed and accepted by Auckland Council and Auckland Transport based on a series of meetings.

The proposed roading network is shown in Appendix 1.

2.3 WASTEWATER

2.3.1 EXISTING WASTEWATER NETWORK

Geomaps shows a newly constructed 150mm uPVC gravity wastewater pipe network passing through the berm of Crestview Rise that has been recently installed to service the development to the north.

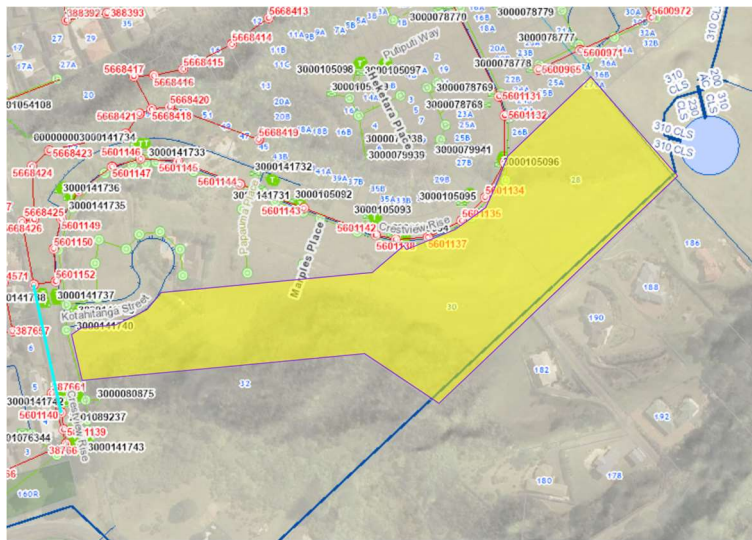


Figure 1: Existing Wastewater network

This newly constructed 150mm uPVC line was installed as part of subdivision of 162-166 Settlement Road. Upon review of the infrastructure report prepared by Crang Civil Consulting Engineers dated June 2016, the subject site was identified as rural lots with implied onsite wastewater disposal for each lot. Consequently, no additional flow allowance was catered for from the subject site.

The wastewater assets in Crestview Rise are operated by Veolia under a franchise agreement with Watercare. The wastewater network in Crestview Rise ultimately drains westwards towards the 450mm transmission main located to the west of Dominion Road.

Veolia have confirmed that their existing network is constrained immediately upstream of the 450mm dia transmission line, in the vicinity of Dominion Road, and will not cater for the development of the Plan Change area without upgrade.

2.3.2 PROPOSED WASTEWATER

The following engineering design is proposed to service the Site. Refer to drawing 400 for the proposed drainage plan.

- The entire Site will be serviced via a gravity-based public 150mm diameter reticulation network.
- The new internal public wastewater reticulation network will be conveyed along the new JOAL and road reserve.



- Each dwelling will have its own public 100mm diameter wastewater connection to the main reticulation network. The drainage network will eventually discharge into the existing 150mm diameter public pipes.

An assessment of the wastewater discharge from the site has been carried out based on Chapter 5: Wastewater of the Water and Wastewater Code of Practice for Land Development and Subdivision v2.2 by Watercare Services Limited.

The following parameters have been used to determine the Site discharge:

- Assumed Occupancy= 3 persons per dwelling
- Wastewater flow allowance = 180 L/person/day
- PDWF Peaking Factor = 3
- PWWF Peaking Factor = 6.7

It is proposed that the Plan Change area will be restricted to 90 dwellings, and this is the basis that infrastructure capacity has been assessed on.

The discharge from the proposed 90 dwelling development will be approximately **3.77 L/s**. At a minimum grade of 1%, the proposed 150mm diameter reticulation network has a capacity of approximately **15.48 L/s** therefore the immediate downstream network will have enough capacity to cater for the proposed redevelopment. However, as discussed in more detail below, Veolia have raised concerns about the network capacity further downstream.

Approval from Veolia will be required for all Public Wastewater works. This will be applied for during Detailed Design/Engineering Approval Stage.

Refer to the Engineering Drawings in Appendix 1 for the proposed wastewater layout.

2.3.3 PROPOSED WASTEWATER UPGRADES

Following discussions with Veolia in February and March 2023, and then more recently on 19 November 2024, it was advised that the existing wastewater network lacks sufficient capacity for the proposed residential dwellings, requiring further investigation.

A wastewater catchment analysis has been conducted by Envelope Engineering from the newly installed network at Crestview Rise (where HVHLP plan to connect) to the transmission main. Plans and model outputs are attached to this memo and illustrate the current capacity and flows in the catchment's wastewater system for three different scenarios as follows:

- Scenario 1 – Post-Development with updated survey data as of August 2024
- Scenario 2 – Post-Development with updated survey data as of August 2024, assuming 50% blockage of the downstream transmission main
- Scenario 3 – Pre-Development with updated survey data as of August 2024

Due to insufficient as-built information, pipe inverts were surveyed by Envelope, with the exception of WWMH 387377, which is located adjacent to the transmission main. This manhole could not be opened as it is sealed, and Watercare's approval is required to lift/open manhole lids on the transmission main. This approval has been requested but is still awaiting approval; as a result, GIS information has been used.

Our model outputs show that the existing pre-development scenario experiences surcharging during peak wet weather events. The post-development scenario increases flows by a negligible amount and has a minimal impact on the performance of the already overcapacity pipes.

The existing 300mm wastewater main (highlighted in black in Appendix 3) is undersized in both the pre- and post-development scenarios. We have considered options for flow mitigation, while this would mitigate the effects of the developments, it would not resolve the current surcharging issue, so upgrading the network would benefit both the asset owner (to improve existing performance) and the HVHLP proposal at Crestview Rise.



The existing pipe under 159 Dominion Road and pipe bridge, which directly connects to the transmission main, will likely need to be upgraded to a DN450 to address the existing surcharging, or manholes sealed to prevent any potential overflow.

A meeting was held with Veolia representatives (Sanjeev Morar and Anne Richomme) on 19 November 2024 where their own network capacity modelling results were presented. The results of Veolia's modelling resulted in the same conclusions as our own. The results indicate that if lines between the transmission manhole GIS ID 19389 to local manhole GIS ID 387371 are upgraded to 450mm dia then this will enable unconstrained capacity for 90 additional units at the Crestview Rise Plan Change site.

It was agreed with Veolia that subject to the above-mentioned upgrades being undertaken by the developer, there will be no constraint to the development of up to 90 dwellings (HUE's) within the Plan Change area.

The final details of the upgrade would be determined and designed at future Resource Consent and Engineering Plan Approval stages.

2.4 STORMWATER

2.4.1 STORMWATER MANAGEMENT PLAN

Envelope Engineering has prepared a Stormwater Management Plan, which should be read in conjunction with this report. The Stormwater Management Plan makes a range of recommendations on items including water sensitive urban design, flooding hazard mitigation and hydraulic neutrality.

2.4.2 EXISTING STORMWATER

Auckland Council Geomaps shows a newly constructed gravity stormwater pipe network. This new stormwater network passes through the berm of Crestview Rise and was installed to service the existing development.

This newly constructed stormwater network was installed as part of the subdivision of 162 – 166 Settlement Road. Upon review of the infrastructure report prepared by Crang Civil Consulting Engineers dated June 2016, it is noted that the subject site forms part of balance rural lots created at the time of that subdivision and these lots are the natural/ existing upstream catchment to the aforementioned public stormwater line.

The report states that "The rural lots will capture rain from the roof and store this on site for re-use. Overflows from the tanks will discharge to the ground and flow overland." The overland flow from the grassed rural lots (the site) has been allowed for within the piped network, however no future additional development flow from the site was allowed for.

Given this, the post-development discharge from the proposed site must be controlled to match the pre-development discharge which would naturally runoff from the rural lot. Our stormwater strategy, detailed within this report, ensures that stormwater is managed to less than pre-development flows.

2.4.3 EXISTING CRESTVIEW RISE STORMWATER DISCHARGE

Onsite investigations have identified erosion and scouring at an existing stormwater headwall and outlet pipe discharging from Crestview Rise. This outlet discharges flows from two mega pits located at the road low point within Crestview Rise and are designed to convey peak flows for the 100-year event.

This outlet will likely require remedial works in the future. Discussions with Council will be necessary as the remedial area is within a Council stormwater easement. A separate memo has been prepared and is attached in Appendix 6.

2.4.4 PROPOSED STORMWATER

To serve the proposed development enabled through rezoning of the land an extension of the existing stormwater network is required.

The proposed development will result in a net increase to the impervious coverage which will generate stormwater runoff that will need to be controlled with appropriate mitigation measures. A stormwater management network of rainwater collection tanks, catchpits and pipes will be utilised to convey flows from the proposed buildings and roading infrastructure in a treatment train approach.

Water Sensitive Urban Design outcomes will be achieved by a range of measures, including the use of raingardens to treat stormwater. Reduction of impervious areas will be utilised where practicable.



Stormwater management devices will consist of attenuation ponds to achieve hydraulic neutrality of peak flows and management of flood flows.

Stormwater pipe sizes will need confirmation at the detailed design stage based on final impervious areas.

2.4.5 HYDROLOGY

Our approach to hydrological inputs for the development is based on TP108 of the Auckland Design Manual, with a focus on climate change considerations. Key principles guiding our modelling include incorporating the TP108 Normalised 24-hour temporal rainfall intensity profile and utilizing climate-adjusted rainfall data. These measures are integral to ensuring infrastructure resilience by accounting for local rainfall patterns and anticipating future climate changes. The integration of these principles enhances TP108's capacity to address evolving hydrological challenges, aligning with our commitment to sustainable and adaptive infrastructure design.

Appendix 2 describes the hydrological inputs and adjustments employed in our design and modelling process.

2.4.6 WATER QUALITY

The stormwater treatment design aligns with GD04 and integrates a resilient water-sensitive urban design. To safeguard water quality, treatment measures will be implemented for the Water Quality Flow of 10mm/hr, incorporating the following proposed devices:

- Centralized bioretention device.
- On-lot stormwater retention tanks
- Inclusion of dead storage capacity within the centralized attenuation device

Further information can be found within the Stormwater Management Plan.

2.4.7 PEAK FLOW ATTENUATION

This site is not located within a SMAF zone; however, we propose to provide retention and detention on site. Retention and detention requirements will be met through a variety of measures.

Based on the geotechnical report produced, the site is underlain by expansive clay soils. Due to this, re-use within the accessway via soakage was considered impractical and due to steeper road grades pervious pavement solutions are not feasible.

Therefore, individual rainwater tanks are proposed for each dwelling and compliance with this requirement can be controlled through future consent notices registered against each title. The actual volume, sizing and tank shape will be finalised during consenting stages. The retention volume is to be re-used for non-potable water use such as laundry, toilet flushing and for landscaping.

A centralized stormwater detention pond is proposed at the lower end of the western catchment (Catchment 1). All stormwater from the development, except for that from Catchment 2, will be directed to this pond. Before entering the pond, a proposed low/high flow manhole will route smaller storm events (the first flush) to the proposed raingarden, while larger events will bypass the raingarden and discharge directly to the detention pond. This pond is designed to provide detention to ensure that peak discharge (for all storms up to the 1% AEP event) will be no greater than 80% of pre-development peak flows. A tiered orifice outlet will discharge into the existing stormwater manhole along Crestview Rise. The refinement of the basin shape, size, and outlet design will be undertaken during the detailed design stages of the development

Runoff from Catchment 2, which comprises the eastern part of the site will similarly discharge through a raingarden device for stormwater treatment and then with flows from larger events bypassing the raingarden to a detention pond which will attenuate all flows (for storms up to the 1% AEP event) to 80% of the predevelopment peak flows.

Overland flows from each catchment will be designed to pass through the stormwater detention ponds..

Appendix A includes drawings series 400 which shows the stormwater catchments for the site.



2.4.8 OVERLAND FLOWPATH AND FLOODING

There are multiple minor existing OLFP's that pass through the site. These overland flowpaths pass through the site from the east and flow towards Crestview Rise based on GIS. These overland flow paths are minor and form within the proposed development, with no stormwater being conveyed from outside the development boundary due to the existing ridgeline to the southeast.

Proposed overland flowpaths for the site have been designed to be conveyed and contained within the proposed roadways. Flowpaths across the site are minor with the contributing catchment being limited to from the site only. Upstream overland flow, from the south and the east are currently diverted away from the site and do not contribute to any flood risk on the site. Therefore, flooding in the 1% AEP (1 in 100 year) scenario is not anticipated to be an issue. No special arrangements need to be made with respect to setting of freeboards for building platforms within the proposed development. Instead, the standard freeboard requirements set out in the Building Code can be followed.

Further to this, the stormwater tanks on each dwelling and the stormwater retention pond has been sized to attenuate and reduce stormwater flows so that there is no increase in flow rates in a 1% AEP event.

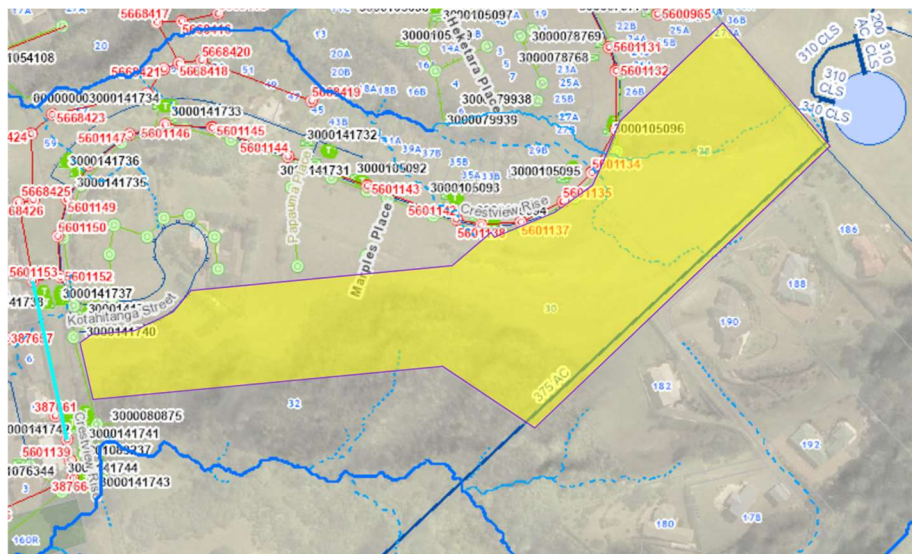


Figure 2: GIS MAP – Overland Flow Path

2.5 WATER SUPPLY

2.5.1 EXISTING WATER SUPPLY

Geomaps shows a newly constructed water supply network along the berm of Crestview Rise and Kotahitanga Street that has been recently installed to service the development to the north, refer to Figure 4 below. The water assets in Crestview Rise are operated by Veolia under a franchise agreement with Watercare. The water storage reservoir for the existing development is located at the top of Kaipara Road was installed as part of the subdivision of 162 – 166 Settlement Road.



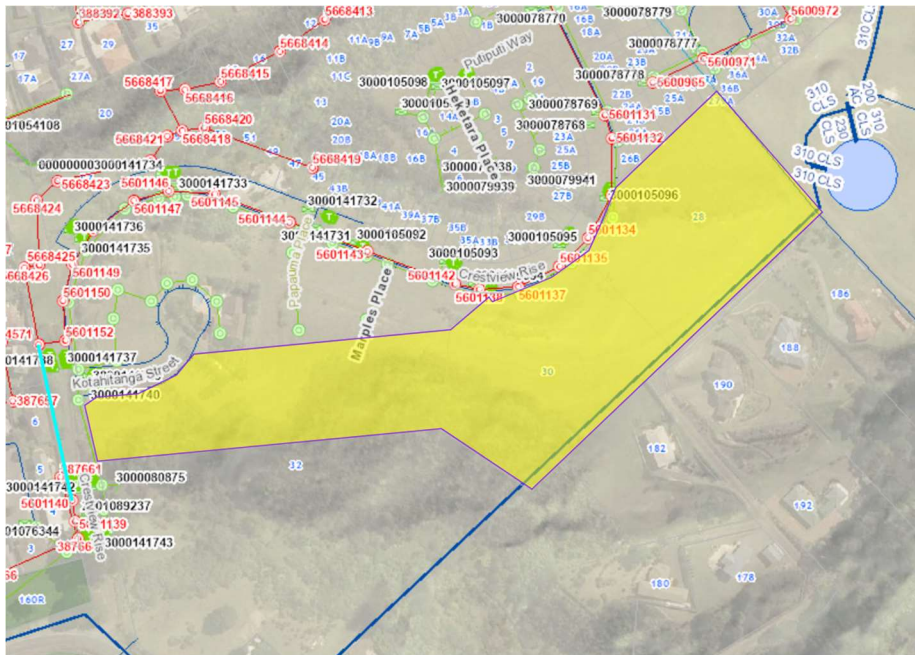


Figure 3: Existing Water Supply

2.5.2 PROPOSED WATER SUPPLY

The development will include individual water connections for each lot. Lots with access from Crestview Rise or Kotahitanga Street, will have new water meter connections provided from the existing public water main. Road 01 will feature water meters for each lot, supplied by a new public water main located within the berm of the road. The proposed JOAL will be serviced via a meter bank at the public road or a similar arrangement, providing 20mm individual connections to each dwelling.

Following discussions held with Veolia in August 2023 it was confirmed that there is currently sufficient capacity available at the Kaipara Reservoir site to provide for up to 90 dwelling units (DUE) over the Plan Change site/area. The current scheme produces 68 residential dwellings containing 2-4 bedrooms. We have assumed a 3-person occupancy based on Watercare code of practice, which can be sufficiently supplied based on 90 DUE available capacity.

The correspondence with Veolia has been included in Appendix 5.

Using Table 1 of SNZ PAS 4509:2008 the required firefighting water supply classification for this development is FW2. FW2 requires that one 12.5 l/s fire hydrant supply is available within 135m of the property and a second supply is available within 270m of the property. We expect the existing water network within Crestview Rise to have suitable pressure to support a new hydrant within Road 01 if required. Hydrant testing has not been undertaken at this stage and will be provided as part of detailed design documentation.

The proposed water layout is shown on drawings 500-502 included in Appendix 1.

2.6 UTILITY SERVICES

2.6.1 POWER

Counties Power is the local power distributor and network owner. The existing network within Crestview Rise includes 2x 400V HV cables on the northern side of the road, a 150mm duct and 1x 400V HV cable on the southern side. No servicing constraints are anticipated for the proposed development. Discussions with Counties Power are ongoing to confirm any potential power infrastructure upgrades.

2.6.2 TELECOMMUNICATIONS

Chorus is the local telecommunications provider and network owner. Existing cables are present on both sides of Crestview Rise and Kotahitanga Street. No servicing constraints are anticipated for the proposed development. Discussions with Chorus are ongoing.



2.6.3 GAS

Vector is the local gas distributor and network owner. An existing gas main is located on both side of Crestview Rise. No servicing constraints are anticipated for the proposed development. Discussions with Vector are ongoing.

3.0 CONCLUSIONS

Based on the above assessments, there are no known site constraints which should affect the ability for the proposed development to be serviced by the existing wastewater, water supply and utility services. Veolia have identified that there are capacity issues in the downstream wastewater network, but this can be resolved by a straightforward pipe size upgrade.

4.0 LIMITATIONS

This report is for the use by Harbourview Heights LP and should not be used or relied upon by any other person or entity or for any other project.

This report has been prepared for the particular project described to us and its extent is limited to the scope of work agreed between the client and Envelope Engineering Limited. No responsibility is accepted by Envelope Engineering Limited or its directors, servants, agents, staff or employees for the accuracy of information provided by third parties and/or the use of any part of this report in any other context or for any other purposes.



APPENDICES

APPENDIX 1
PROPOSED CIVIL ENGINEERING PLANS



CLIENT:
HARBOUR VIEW HEIGHTS LP

PROJECT:
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE
PAPAKURA

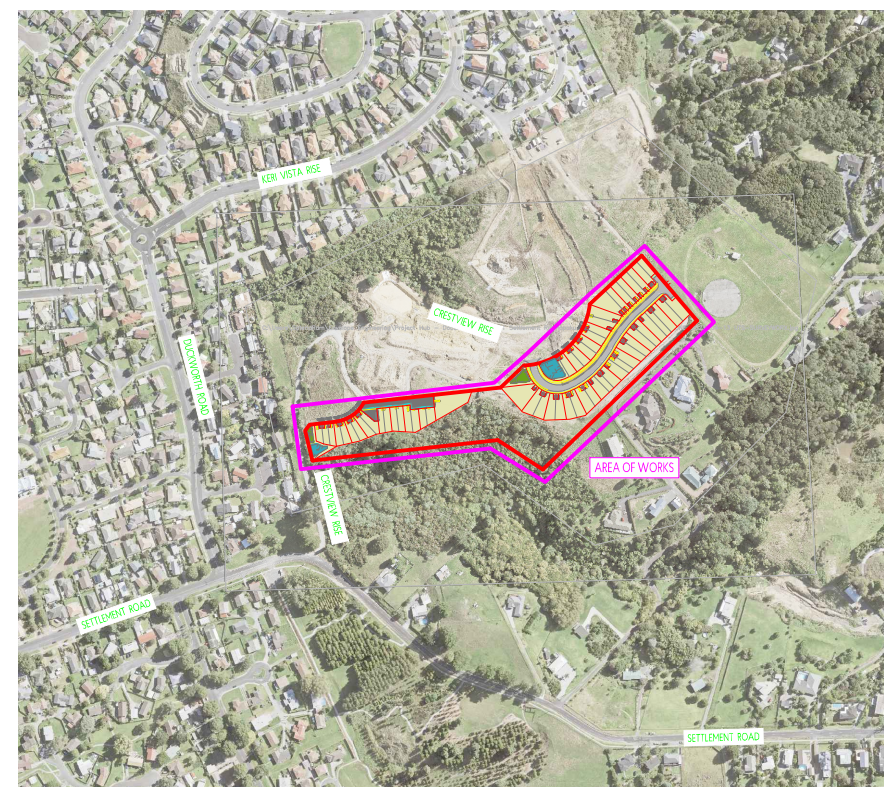
PLAN SET:
CIVIL ENGINEERING DESIGN

ISSUE:
PLAN CHANGE

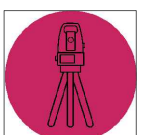
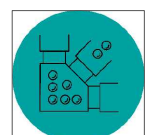
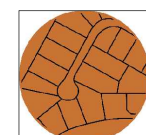
DATE:
25-11-2024

REFERENCE:
1915-01

DRAWING INDEX		
DRAWING	REVISION	TITLE
1915-01-000	-	COVER AND DRAWING INDEX
1915-01-150	C10	PROPOSED DEVELOPMENT PLAN
1915-01-200	C10	EXISTING SITE PLAN
1915-01-210	C10	PROPOSED CONTOUR PLAN - OVERALL SITE
1915-01-211	C10	PROPOSED CONTOUR PLAN - SHEET 1 OF 2
1915-01-212	C10	PROPOSED CONTOUR PLAN - SHEET 2 OF 2
1915-01-230	C10	CUT FILL CONTOUR PLAN - OVERALL SITE
1915-01-231	C10	CUT FILL CONTOUR PLAN - SHEET 1 OF 2
1915-01-232	C10	CUT FILL CONTOUR PLAN - SHEET 2 OF 2
1915-01-300	C10	ROAD AND PAVEMENT LAYOUT PLAN - OVERALL SITE
1915-01-301	C10	ROAD AND PAVEMENT LAYOUT PLAN - SHEET 1 OF 2
1915-01-302	C10	ROAD AND PAVEMENT LAYOUT PLAN - SHEET 2 OF 2
1915-01-310	C10	ROAD INTERSECTION PLAN - ROAD 1 AND CRESTVIEW RISE
1915-01-330	C10	ROAD LONGSECTION
1915-01-340	C10	TYPICAL ROAD CROSS SECTION
1915-01-400	C12	DRAINAGE PLAN - OVERALL SITE
1915-01-401	C12	DRAINAGE PLAN - SHEET 1 OF 2
1915-01-402	C12	DRAINAGE PLAN - SHEET 2 OF 2
1915-01-410	C11	DRAINAGE PLAN - EXISTING STORMWATER OUTLET
1915-01-411	C12	DRAINAGE PLAN - RAIN GARDEN AND MEGA PIT LAYOUT AT ROAD 1 ENTRANCE
1915-01-470	C10	STORMWATER CATCHMENT PLAN
1915-01-475	C10	OVERLAND FLOWPATH PLAN
1915-01-500	C10	WATER SUPPLY AND SERVICES PLAN - OVERALL SITE
1915-01-501	C10	WATER SUPPLY AND SERVICES PLAN - SHEET 1 OF 2
1915-01-502	C10	WATER SUPPLY AND SERVICES PLAN - SHEET 2 OF 2



LOCATION PLAN





NOTES:

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REV	NOTES	BY	DATE
C10	ISSUED FOR PLAN CHANGE	SKR	26-08-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:

PROPOSED DEVELOPMENT PLAN



DESIGNED: SKR	DRAWN: SKR	REVISION:
CHECKED: KD	PLOT DATE: 25/07/2024	1915-01
SCALE A1: 1:750	SCALE A3: 1:1500	150
STATUS: CONCEPT DESIGN	PROJECT No:	C10
PROJECT No:	DRAWING No:	

NOTES:

1. LEVELS ARE IN TERMS OF AUCKLAND 1946.
2. EXISTING CONTOURS ARE A COMBINATION OF SITE SURVEY DATA AND COUNCIL GIS DATA.

LEGEND:

- EXISTING STORMWATER
- EXISTING WASTEWATER
- EXISTING WATERMAIN
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING CATCHPIT
- EXISTING CONTOURS SHOWN AT 0.5m INTERVALS



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C10	ISSUED FOR PLAN CHANGE	SKR	26-08-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA
TITLE:

EXISTING SITE PLAN

ENVELOPE
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DESIGNED: SKR
CHECKED: KD
SCALE A1: 1:750
STATUS: CONCEPT DESIGN
PROJECT No: 1915-01

DRAWN: SKR
PLOT DATE: 25/07/2024
SCALE A3: 1:1500
DRAWING No: 200

REVISION: C10

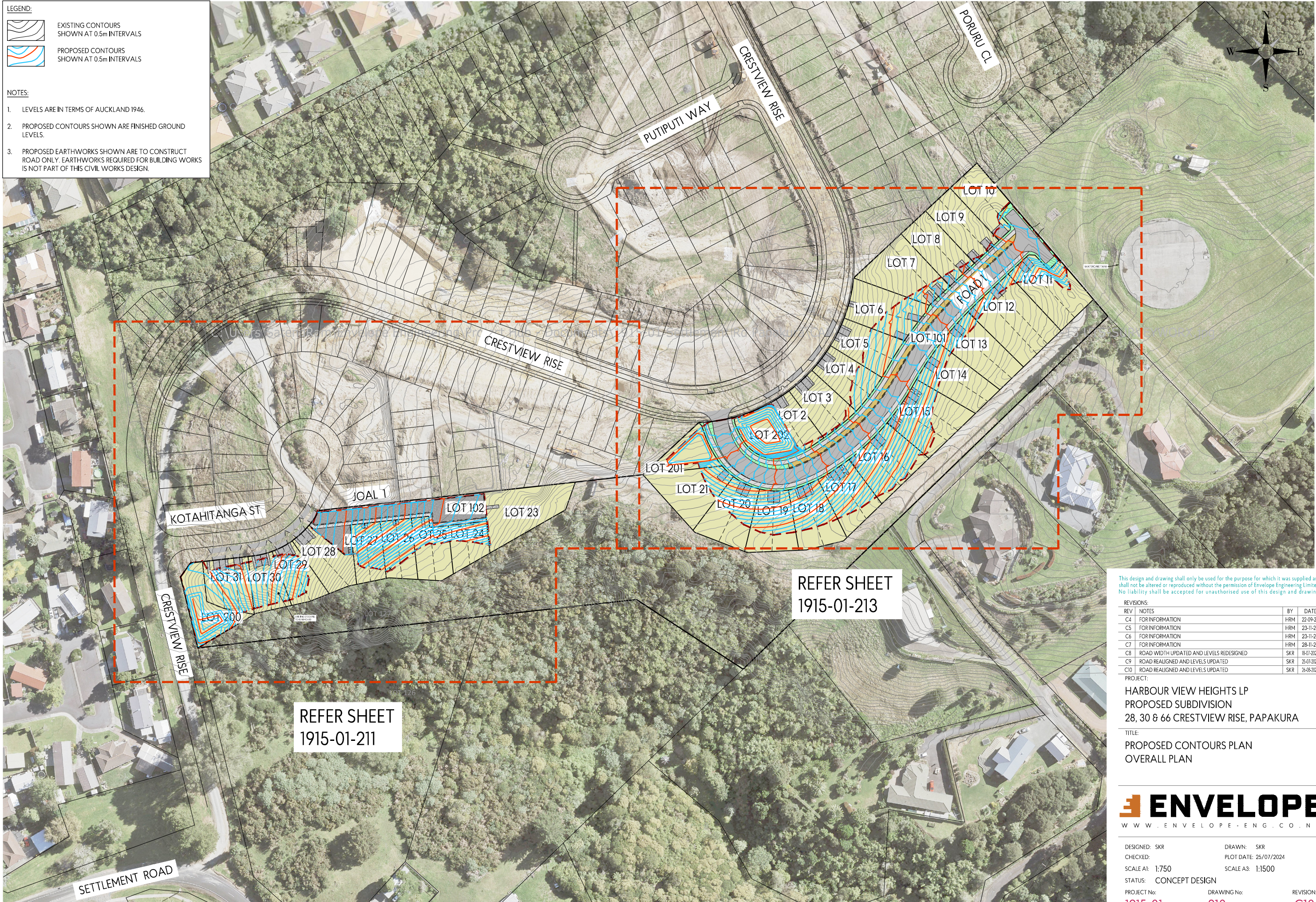
LEGEND:

 EXISTING CONTOURS
SHOWN AT 0.5m INTERVALS

 PROPOSED CONTOURS
SHOWN AT 0.5m INTERVALS

NOTES:

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- PROPOSED EARTHWORKS SHOWN ARE TO CONSTRUCT ROAD ONLY. EARTHWORKS REQUIRED FOR BUILDING WORKS IS NOT PART OF THIS CIVIL WORKS DESIGN.



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REV	NOTES	BY	DATE
C4	FOR INFORMATION	HRM	22-09-23
C5	FOR INFORMATION	HRM	23-11-23
C6	FOR INFORMATION	HRM	23-11-23
C7	FOR INFORMATION	HRM	28-11-23
C8	ROAD WIDTH UPDATED AND LEVELS REDESIGNED	SKR	18-07-2024
C9	ROAD REALIGNED AND LEVELS UPDATED	SKR	25-07-2024
C10	ROAD REALIGNED AND LEVELS UPDATED	SKR	26-08-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
PROPOSED CONTOURS PLAN
OVERALL PLAN



DESIGNED: SKR	DRAWN: SKR	
CHECKED:	PLOT DATE: 25/07/2024	
SCALE A1: 1:750	SCALE A3: 1:1500	
STATUS: CONCEPT DESIGN		
PROJECT No: 1915-01	DRAWING No: 210	REVISION: C10

LEGEND:

 EXISTING CONTOURS
SHOWN AT 0.5m INTERVALS

 PROPOSED CONTOURS
SHOWN AT 0.5m INTERVALS

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REV	NOTES	BY	DATE
C4	FOR INFORMATION	HRM	22-09-23
C5	FOR INFORMATION	HRM	23-11-23
C6	FOR INFORMATION	HRM	23-11-23
C7	FOR INFORMATION	HRM	28-11-23
C8	ROAD WIDTH UPDATED AND LEVELS REDESIGNED	SKR	18-07-2024
C9	ROAD REALIGNED AND LEVELS UPDATED	SKR	25-07-2024
C10	ROAD REALIGNED AND LEVELS UPDATED	SKR	26-08-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAKAPURA

TITLE:
PROPOSED CONTOURS PLAN
SHEET 1 OF 2



DESIGNED: SKR	DRAWN: SKR	REVISION:
CHECKED:	PLOT DATE: 25/07/2024	
SCALE A1: 1:300	SCALE A3: 1:600	
STATUS: CONCEPT DESIGN		
PROJECT No: 1915-01	DRAWING No: 211	

LEGEND:



EXISTING CONTOURS
SHOWN AT 0.5m INTERVALS



PROPOSED CONTOURS
SHOWN AT 0.5m INTERVALS

NOTES:

1.

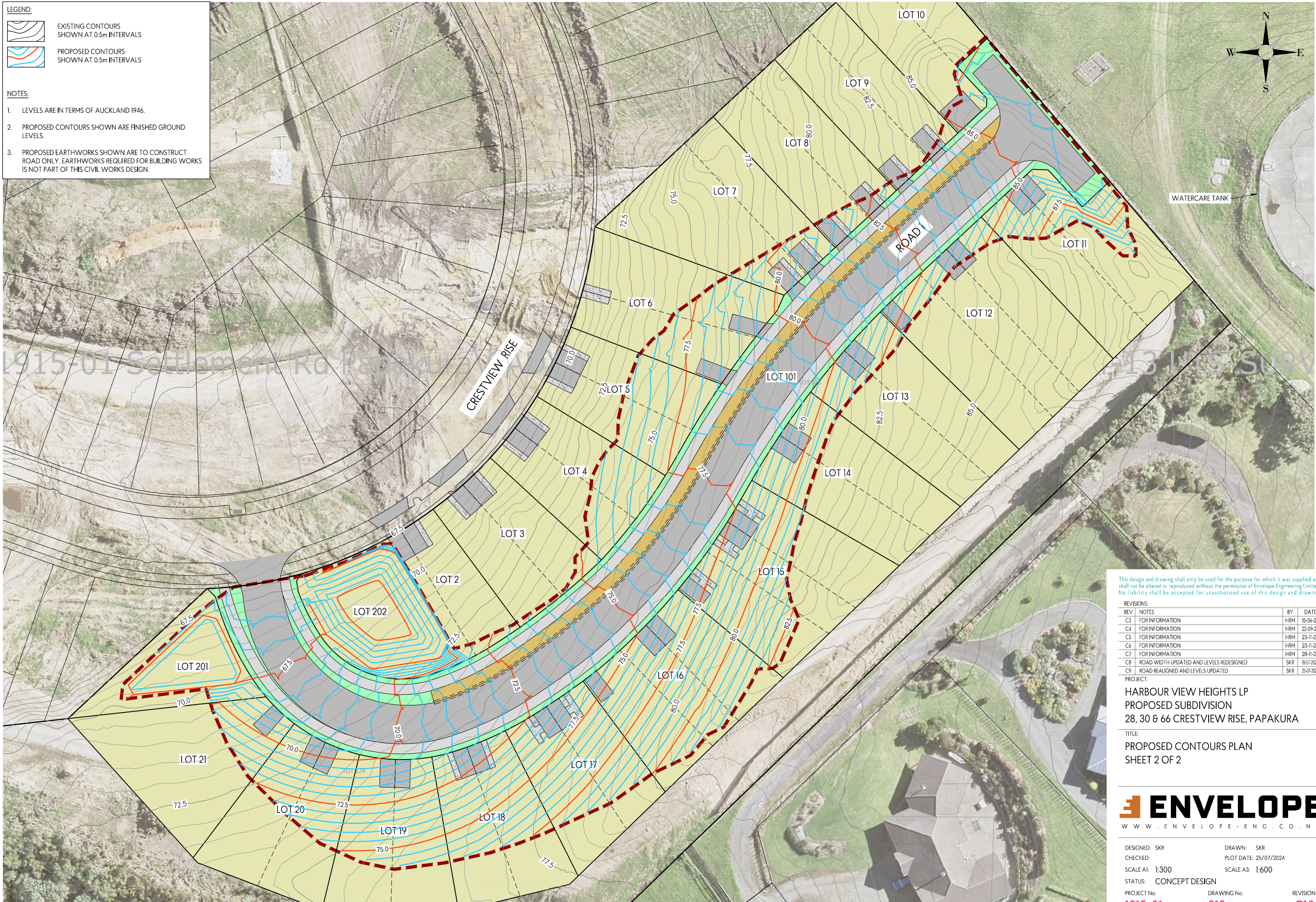
LEVELS ARE IN TERMS OF AUCKLAND 1946.

2.

PROPOSED CONTOURS SHOWN ARE FINISHED GROUND LEVELS.

3.

PROPOSED EARTHWORKS SHOWN ARE TO CONSTRUCT ROAD ONLY. EARTHWORKS REQUIRED FOR BUILDING WORKS IS NOT PART OF THIS CIVIL WORKS DESIGN.



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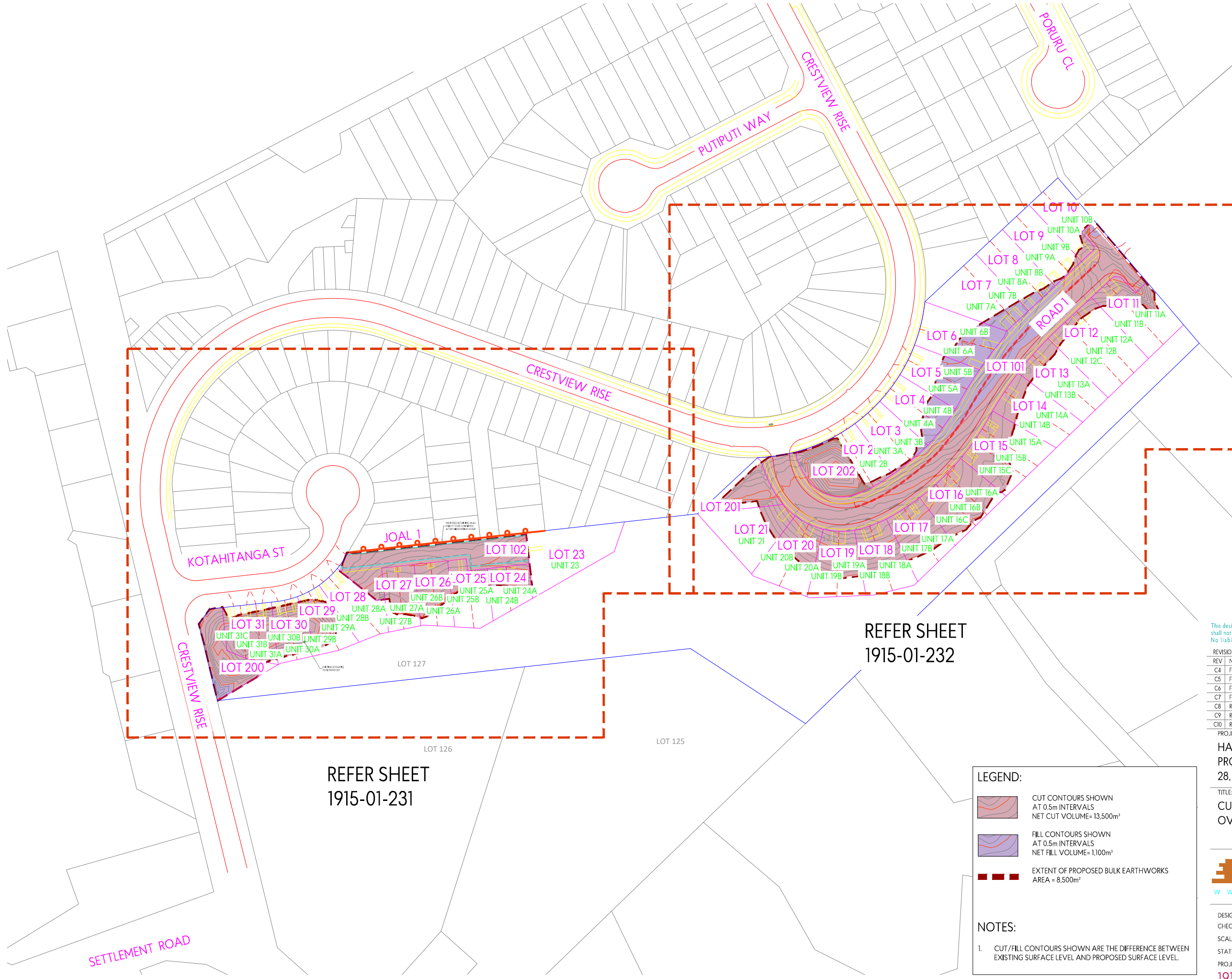
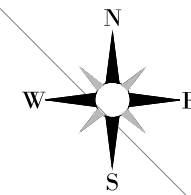
REVISIONS:			
REV	NOTES	BY	DATE
C3	FOR INFORMATION	HRM	15-06-23
C4	FOR INFORMATION	HRM	22-09-23
C5	FOR INFORMATION	HRM	23-11-23
C6	FOR INFORMATION	HRM	23-11-23
C7	FOR INFORMATION	HRM	23-11-23
C8	ROAD WIDTH UPDATED AND LEVELS REDESIGNED	SKR	18-07-2024
C9	ROAD REALIGNED AND LEVELS UPDATED	SKR	25-07-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
PROPOSED CONTOURS PLAN
SHEET 2 OF 2



DESIGNED: SKR	DRAWN: SKR	REVISION: C10
CHECKED:	PLOT DATE: 25/07/2024	
SCALE A1: 1:300	SCALE A3: 1:600	
STATUS: CONCEPT DESIGN		
PROJECT No: 1915-01	DRAWING No: 212	



REFER SHEET
1915-01-231

REFER SHEET
1915-01-232

LEGEND:



CUT CONTOURS SHOWN
AT 0.5m INTERVALS
NET CUT VOLUME= 13,500m³



FILL CONTOURS SHOWN
AT 0.5m INTERVALS
NET FILL VOLUME= 1,100m³



EXTENT OF PROPOSED BULK EARTHWORKS
AREA = 8,500m²

NOTES:

1. CUT/FILL CONTOURS SHOWN ARE THE DIFFERENCE BETWEEN EXISTING SURFACE LEVEL AND PROPOSED SURFACE LEVEL.

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REVISIONS:			
REV	NOTES	BY	DATE
C4	FOR INFORMATION	HRM	22-09-23
C5	FOR INFORMATION	HRM	23-11-23
C6	FOR INFORMATION	HRM	23-11-23
C7	FOR INFORMATION	HRM	28-11-23
C8	ROAD WIDTH UPDATED AND LEVELS REDESIGNED	SKR	18-01-2024
C9	ROAD REALIGNED AND LEVELS UPDATED	SKR	25-01-2024
C10	ROAD REALIGNED AND LEVELS UPDATED	SKR	26-06-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
CUT FILL CONTOUR PLAN
OVERALL SITE



DESIGNED: SKR	DRAWN: SKR	REVISION:
CHECKED: KD	PLOT DATE: 25/07/2024	
SCALE A1: 1:750	SCALE A3: 1:1500	
STATUS: CONCEPT DESIGN		
PROJECT No: 1915-01	DRAWING No: 230	



NOTES:

1. REFER TO 1915-01-230 FOR OVERALL LEGEND AND NOTES.

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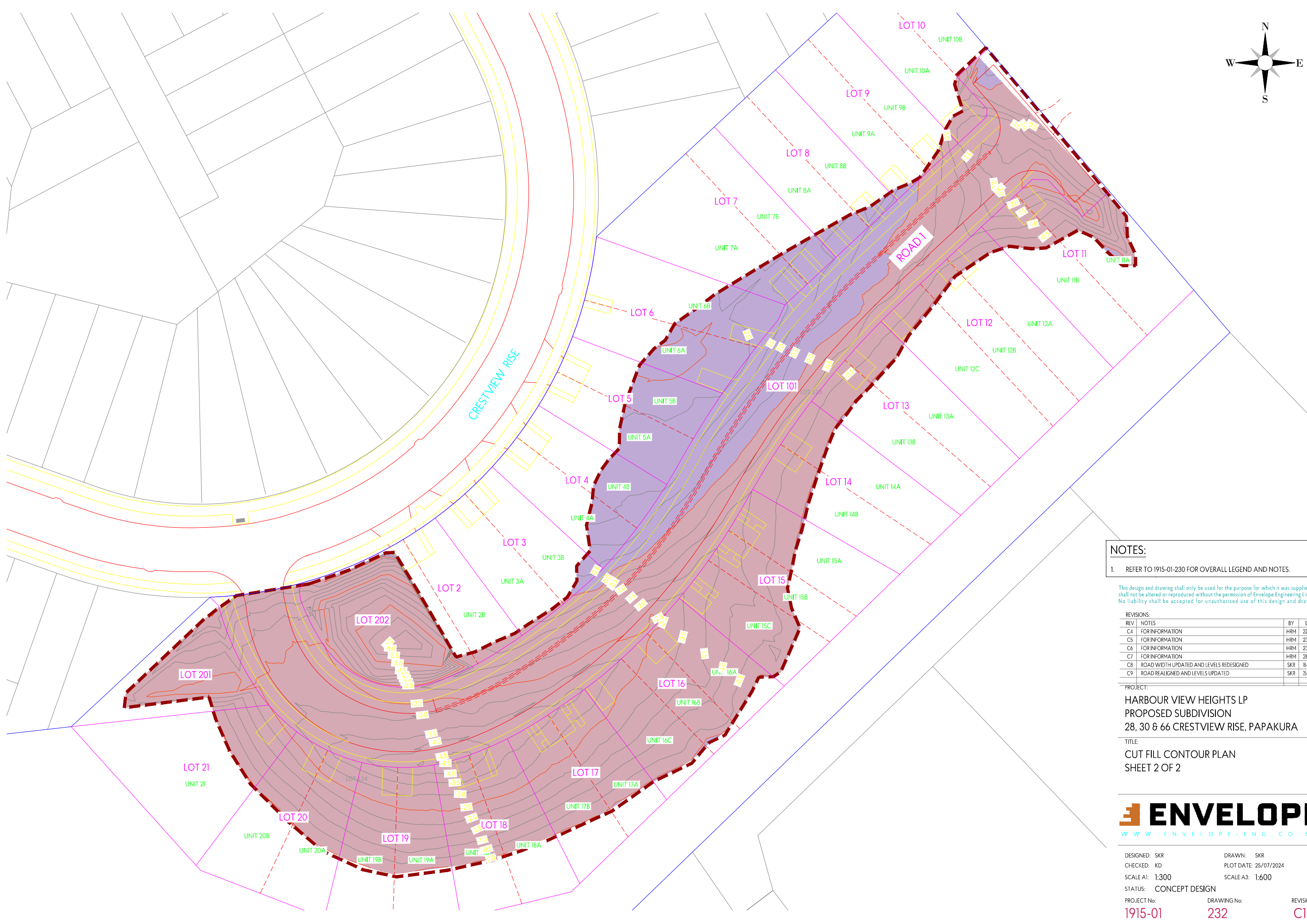
REVISIONS:		BY	DATE
REV	NOTES		
C3	FOR INFORMATION	HRM	15-06-23
C4	FOR INFORMATION	HRM	22-09-23
C5	FOR INFORMATION	HRM	23-11-23
C6	FOR INFORMATION	HRM	23-11-23
C7	FOR INFORMATION	HRM	28-11-23
C8	ROAD WIDTH UPDATED AND LEVELS REDESIGNED	SKR	18-01-2024
C9	ROAD WIDTH REIGNED AND LEVELS UPDATED	SKR	26-07-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
CUT FILL CONTOUR PLAN
SHEET 1 OF 2



DESIGNED: SKR	DRAWN: SKR	
CHECKED: KD	PLOT DATE: 25/07/2024	
SCALE A1: 1:300	SCALE A3: 1:600	
STATUS: CONCEPT DESIGN		
PROJECT No:	DRAWING No:	REVISION:
1915-01	231	C10



NOTES:

1. REFER TO 1915-01-230 FOR OVERALL LEGEND AND NOTES.

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REVISIONS:		BY	DATE
REV	NOTES		
C4	FOR INFORMATION	HRM	22-09-23
C5	FOR INFORMATION	HRM	23-11-23
C6	FOR INFORMATION	HRM	23-11-23
C7	FOR INFORMATION	HRM	28-11-23
C8	ROAD WIDTH UPDATED AND LEVELS REDESIGNED	SKR	18-07-2024
C9	ROAD REALIGNED AND LEVELS UPDATED	SKR	26-07-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
CUT FILL CONTOUR PLAN
SHEET 2 OF 2



DESIGNED: SKR	DRAWN: SKR	
CHECKED: KD	PLOT DATE: 25/07/2024	
SCALE A1: 1:300	SCALE A3: 1:600	
STATUS: CONCEPT DESIGN		
PROJECT No: 1915-01	DRAWING No: 232	REVISION: C10

LEGEND:



EXISTING CONTOURS
SHOWN AT 0.5m INTERVALS



PROPOSED CONTOURS
SHOWN AT 0.5m INTERVALS



PROPOSED CONCRETE
ACCESSWAYS



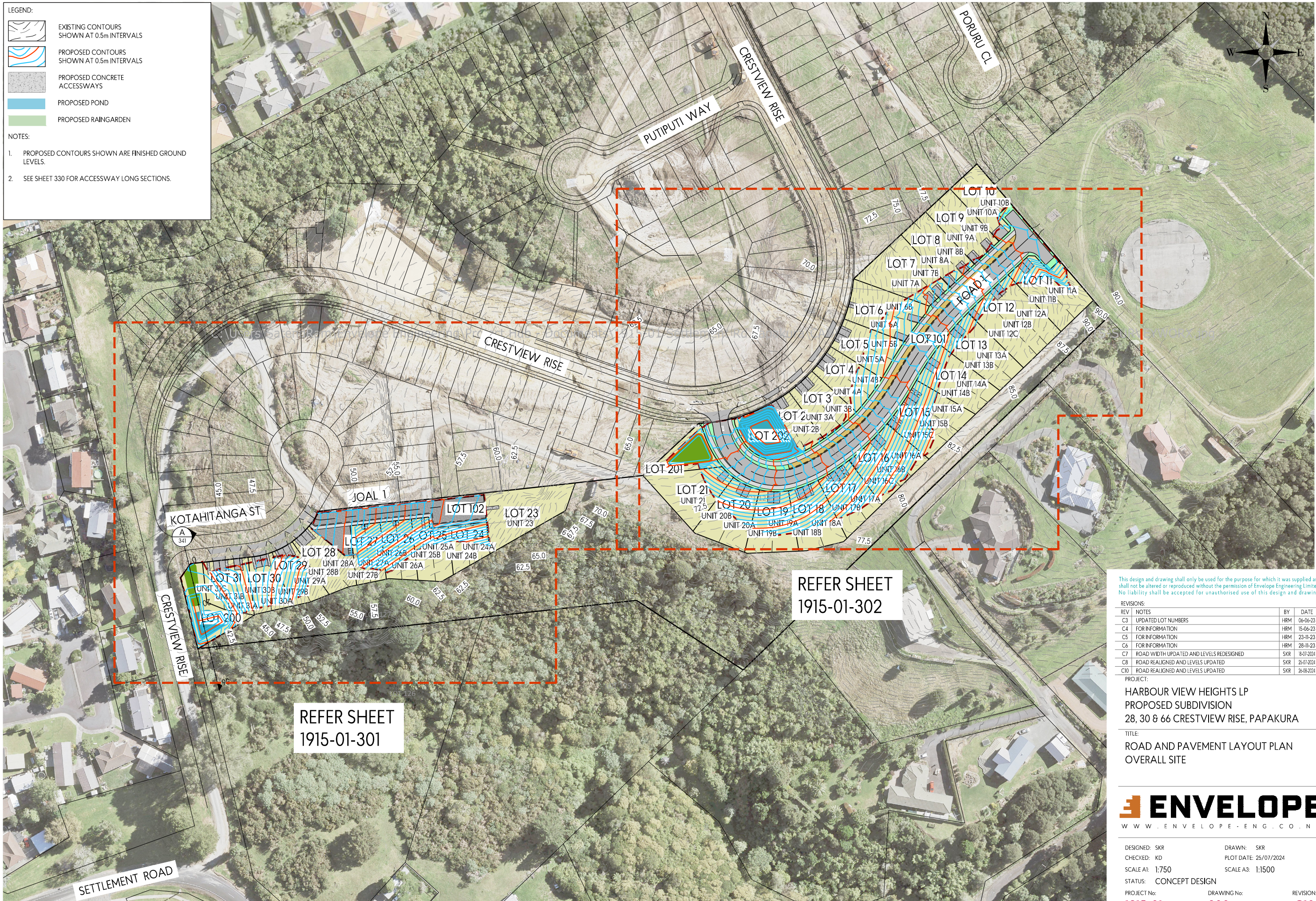
PROPOSED POND



PROPOSED RAINGARDEN

NOTES:

1. PROPOSED CONTOURS SHOWN ARE FINISHED GROUND LEVELS.
2. SEE SHEET 330 FOR ACCESSWAY LONG SECTIONS.



REFER SHEET
1915-01-302

REFER SHEET
1915-01-301

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REVISIONS:			
REV	NOTES	BY	DATE
C3	UPDATED LOT NUMBERS	HRM	06-06-23
C4	FOR INFORMATION	HRM	15-06-23
C5	FOR INFORMATION	HRM	23-11-23
C6	FOR INFORMATION	HRM	28-11-23
C7	ROAD WIDTH UPDATED AND LEVELS REDESIGNED	SKR	8-01-2024
C8	ROAD REALIGNED AND LEVELS UPDATED	SKR	25-01-2024
C10	ROAD REALIGNED AND LEVELS UPDATED	SKR	26-08-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
ROAD AND PAVEMENT LAYOUT PLAN
OVERALL SITE

ENVELOPE
WWW.ENVELOPE-ENG.CO.NZ

DESIGNED: SKR	DRAWN: SKR	REVISION: C10
CHECKED: KD	PLOT DATE: 25/07/2024	
SCALE A1: 1:750	SCALE A3: 1:1500	
STATUS: CONCEPT DESIGN		
PROJECT No: 1915-01	DRAWING No: 300	

LEGEND:

EXISTING CONTOURS
SHOWN AT 0.5m INTERVALS

PROPOSED CONTOURS
SHOWN AT 0.5m INTERVALS

PROPOSED CONCRETE
ACCESSWAYS

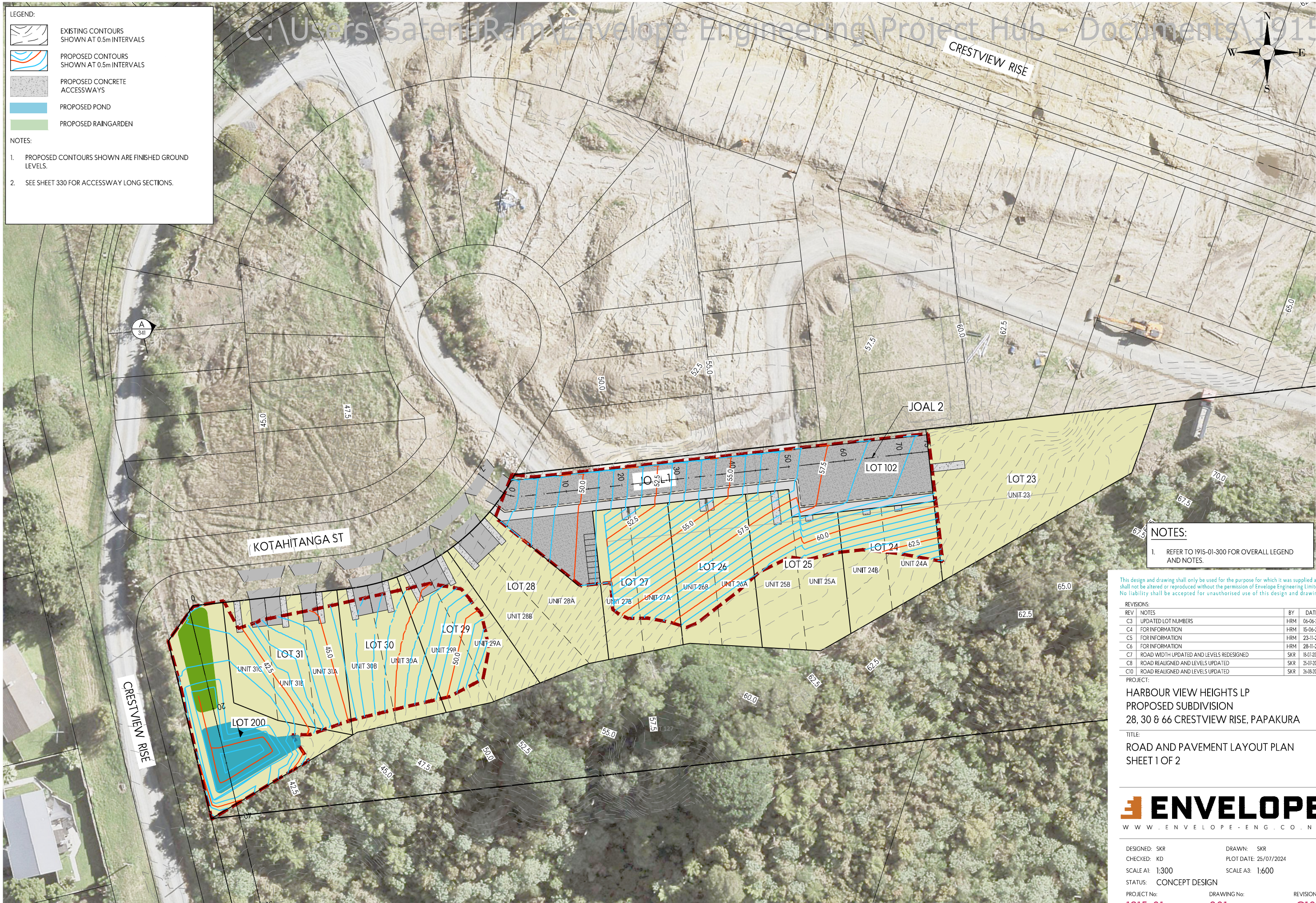
PROPOSED POND

PROPOSED RAINGARDEN

NOTES:

1. PROPOSED CONTOURS SHOWN ARE FINISHED GROUND LEVELS.

2. SEE SHEET 330 FOR ACCESSWAY LONG SECTIONS.



NOTES:

1. REFER TO 1915-01-300 FOR OVERALL LEGEND AND NOTES.

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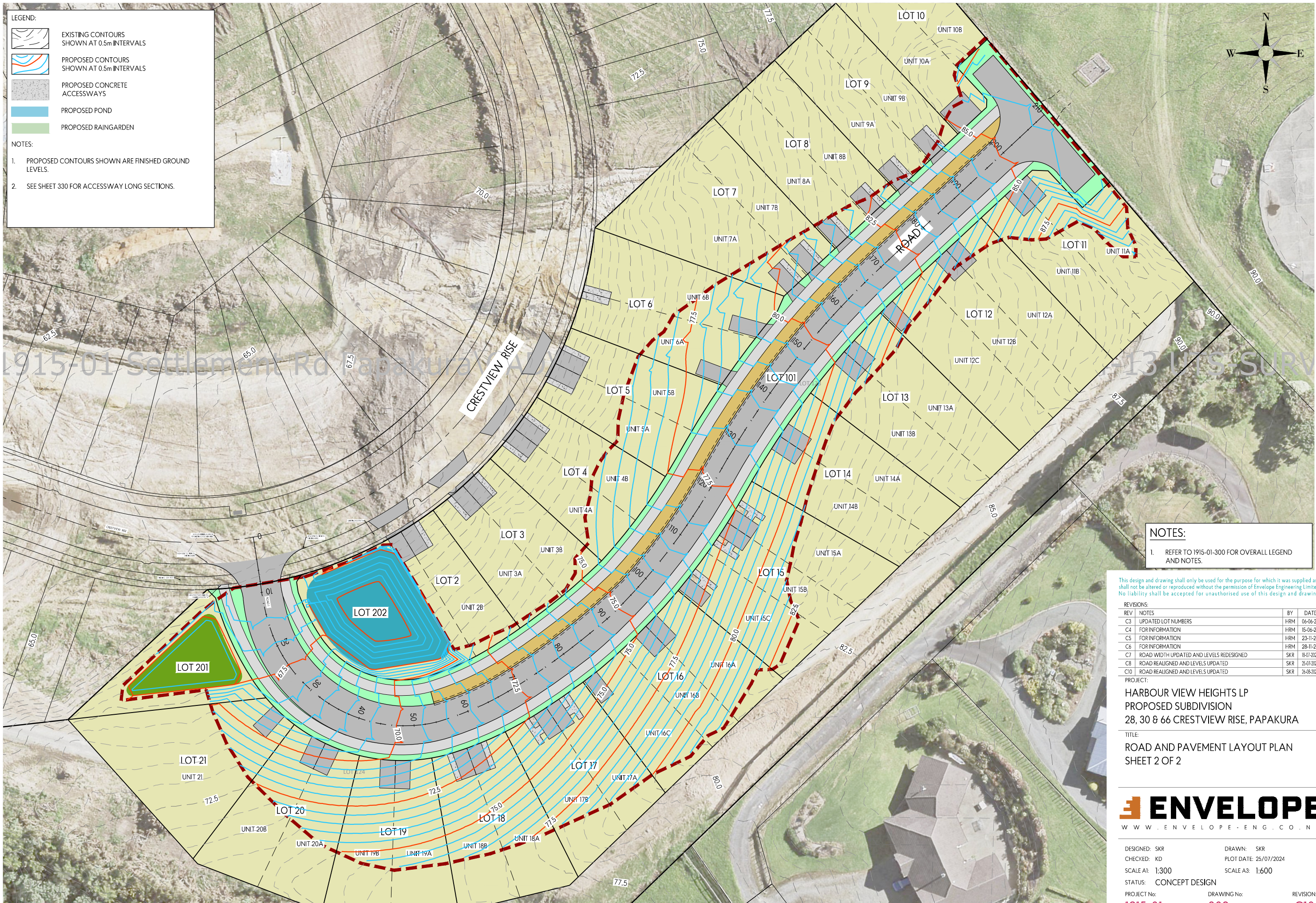
REVISIONS:			
REV	NOTES	BY	DATE
C3	UPDATED LOT NUMBERS	HRM	06-06-23
C4	FOR INFORMATION	HRM	15-06-23
C5	FOR INFORMATION	HRM	23-11-23
C6	FOR INFORMATION	HRM	28-11-23
C7	ROAD WIDTH UPDATED AND LEVELS REDESIGNED	SKR	18-07-2024
C8	ROAD REALIGNED AND LEVELS UPDATED	SKR	25-07-2024
C10	ROAD REALIGNED AND LEVELS UPDATED	SKR	26-08-2024

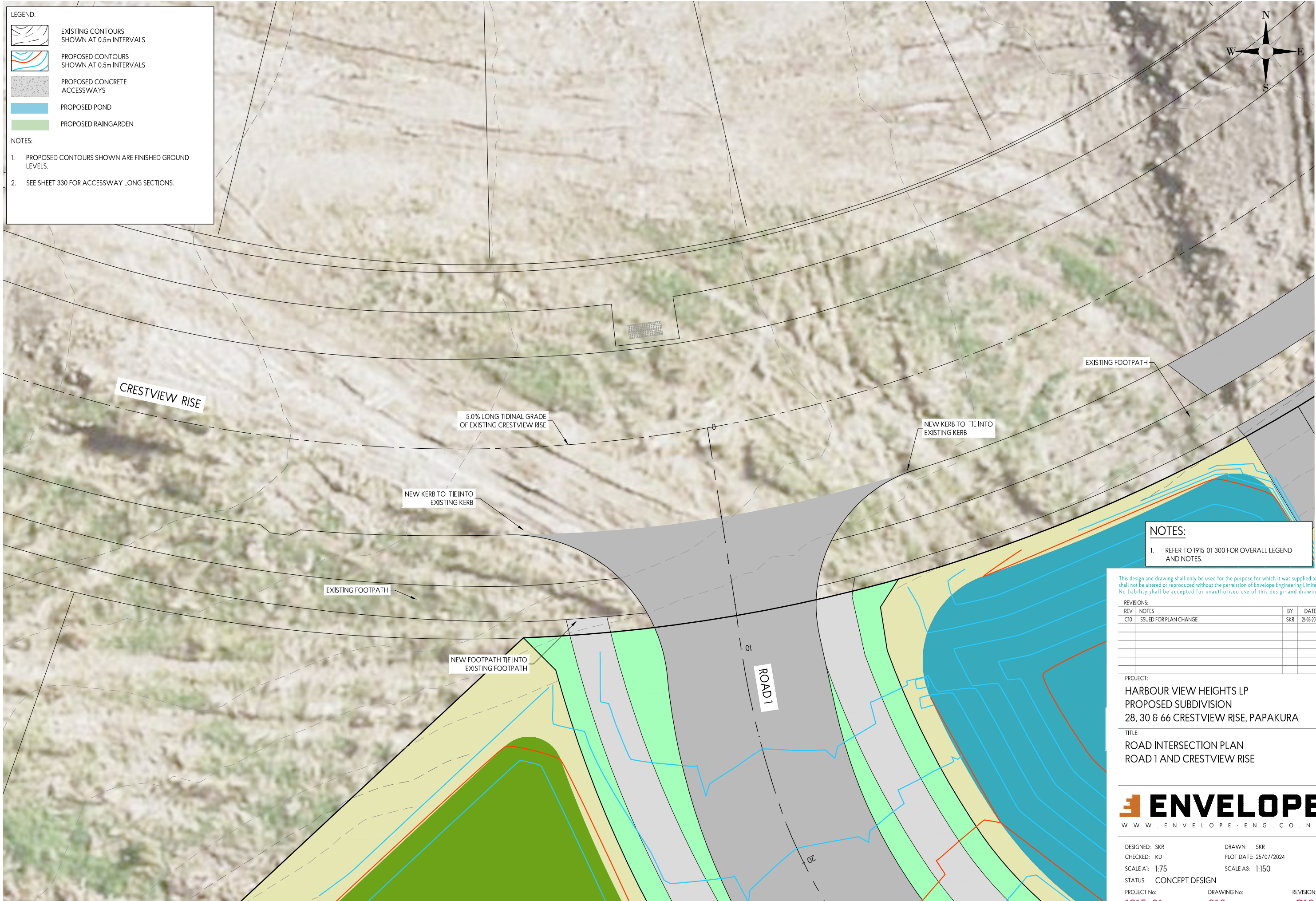
PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
ROAD AND PAVEMENT LAYOUT PLAN
SHEET 1 OF 2



DESIGNED: SKR	DRAWN: SKR	
CHECKED: KD	PLOT DATE: 25/07/2024	
SCALE A1: 1:300	SCALE A3: 1:600	
STATUS: CONCEPT DESIGN		
PROJECT No: 1915-01	DRAWING No: 301	REVISION: C10





LEGEND:

- EXISTING CONTOURS SHOWN AT 0.5m INTERVALS
- PROPOSED CONTOURS SHOWN AT 0.5m INTERVALS
- PROPOSED CONCRETE ACCESSWAYS
- PROPOSED POND
- PROPOSED RAINGARDEN

NOTES:

- PROPOSED CONTOURS SHOWN ARE FINISHED GROUND LEVELS.
- SEE SHEET 330 FOR ACCESSWAY LONG SECTIONS.

NOTES:

- REFER TO 1915-01-300 FOR OVERALL LEGEND AND NOTES.

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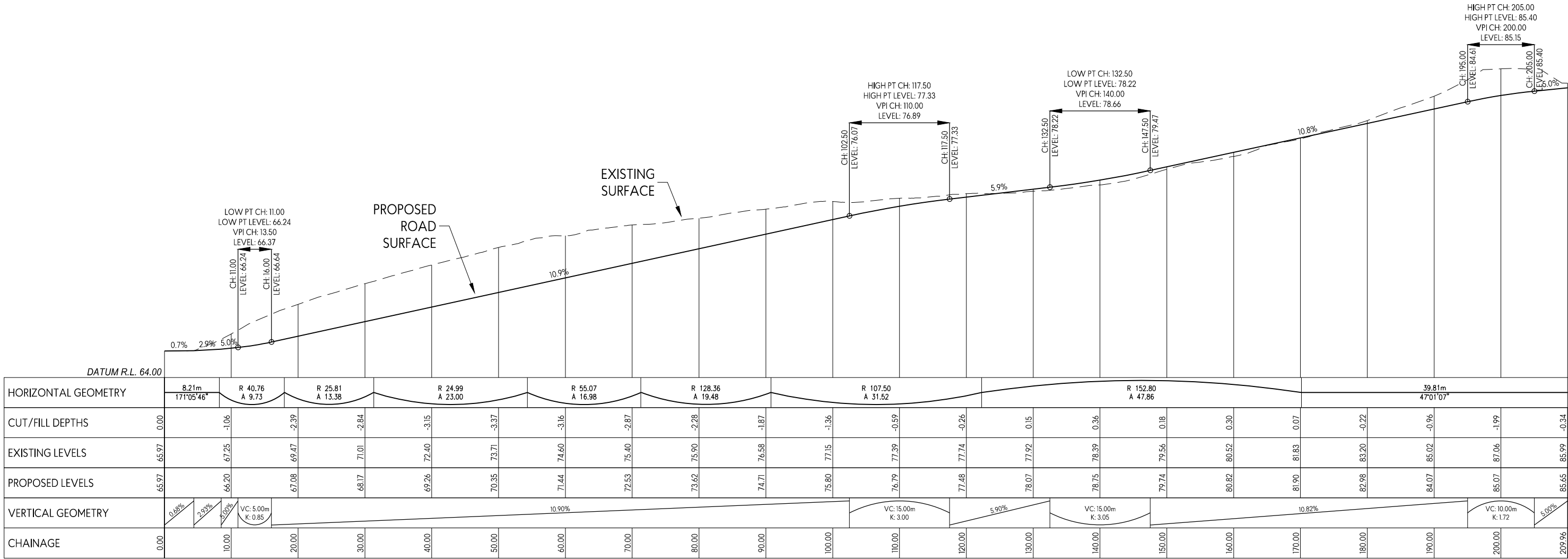
REVISIONS:			
REV	NOTES	BY	DATE
C10	ISSUED FOR PLAN CHANGE	SKR	26-08-2010

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
ROAD INTERSECTION PLAN
ROAD 1 AND CRESTVIEW RISE

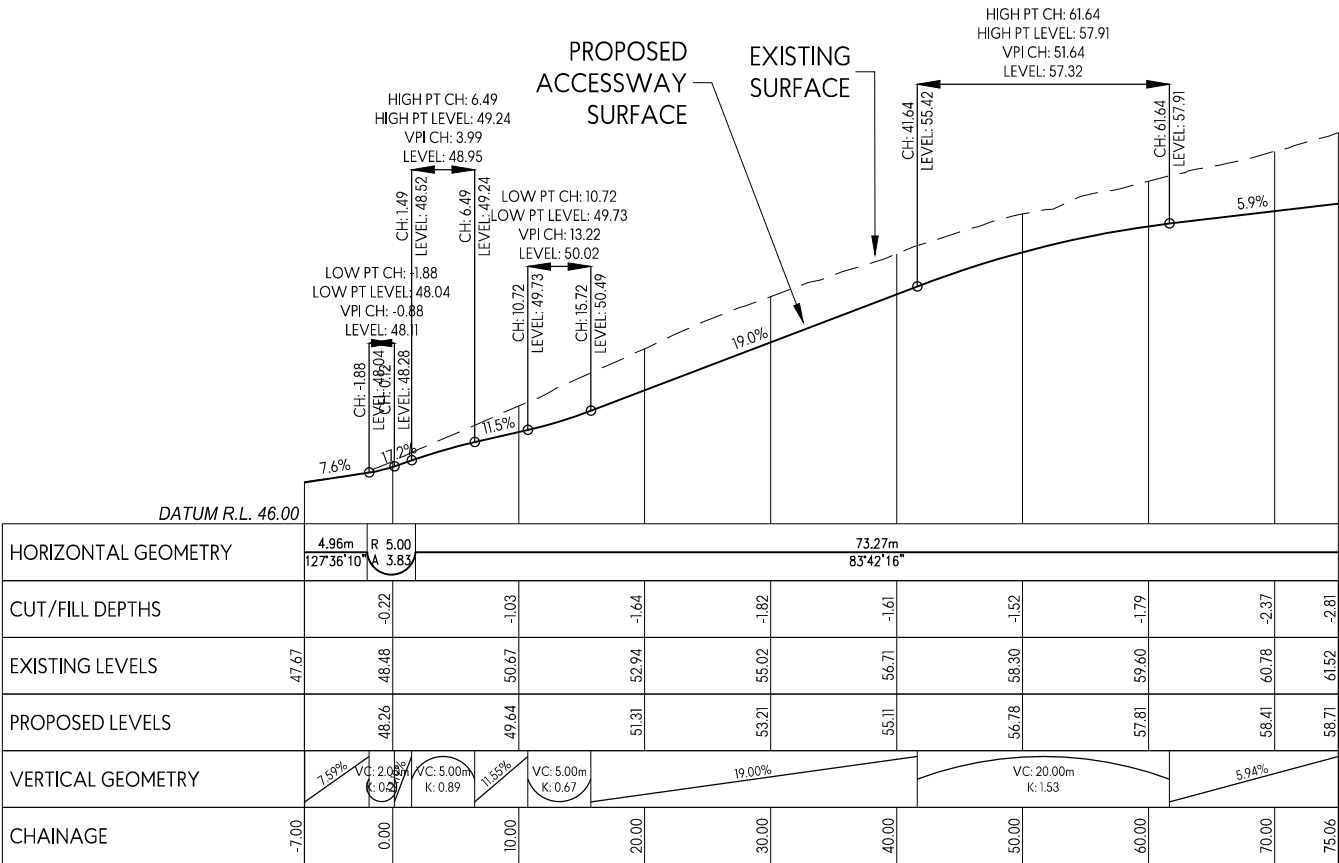


DESIGNED: SKR	DRAWN: SKR	REVISION:
CHECKED: KD	PLOT DATE: 25/07/2024	1915-01
SCALE A1: 1:75	SCALE A3: 1:150	310
STATUS: CONCEPT DESIGN	PROJECT No:	C10
PROJECT No:	DRAWING No:	



ROAD 1
LONGSECTION BETWEEN 0.00 AND 209.96

LONG SECTION - ROAD 1
SCALE: 1:300-A1, 1:600-A3 (Horizontal)
1:150-A1, 1:300-A3 (Vertical)



JOAL 2
LONGSECTION BETWEEN -7.00 AND 75.06

SCALE: 1:300-A1, 1:600-A3 (Horizontal)
1:150-A1, 1:300-A3 (Vertical)

NOTES:

- REFER TO DRAWING 300 FOR PROPOSED ACCESSWAY LAYOUT PLAN.

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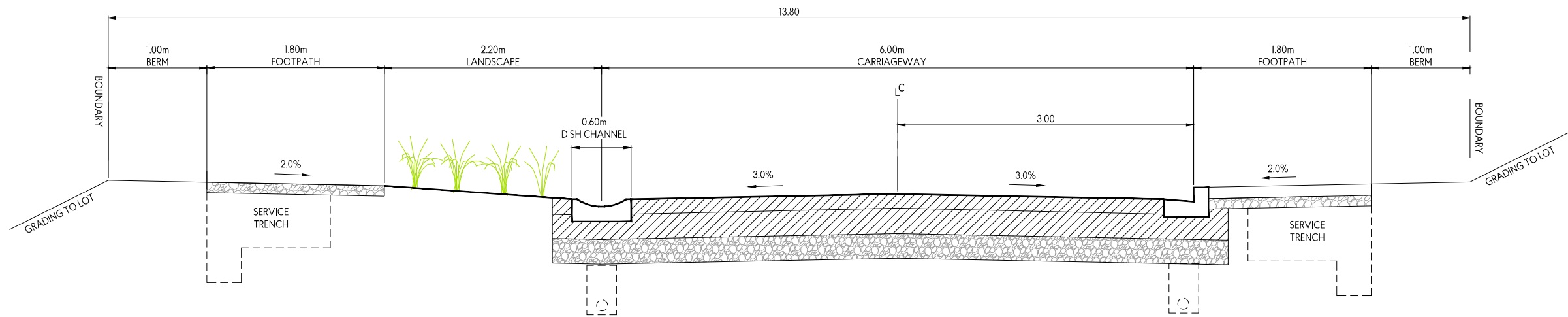
REVISIONS:			
REV	NOTES	BY	DATE
C4	FORINFORMATION	HRM	15-06-23
C5	FORINFORMATION	HRM	26-06-23
C6	FORINFORMATION	HRM	22-09-23
C7	FORINFORMATION	HRM	23-11-23
C8	FORINFORMATION	HRM	28-11-23
C9	ROAD WIDTH UPDATED AND LEVELS REDESIGNED	SKR	18-07-2024
C10	ROAD REALIGNED AND LEVELS UPDATED	SKR	26-08-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

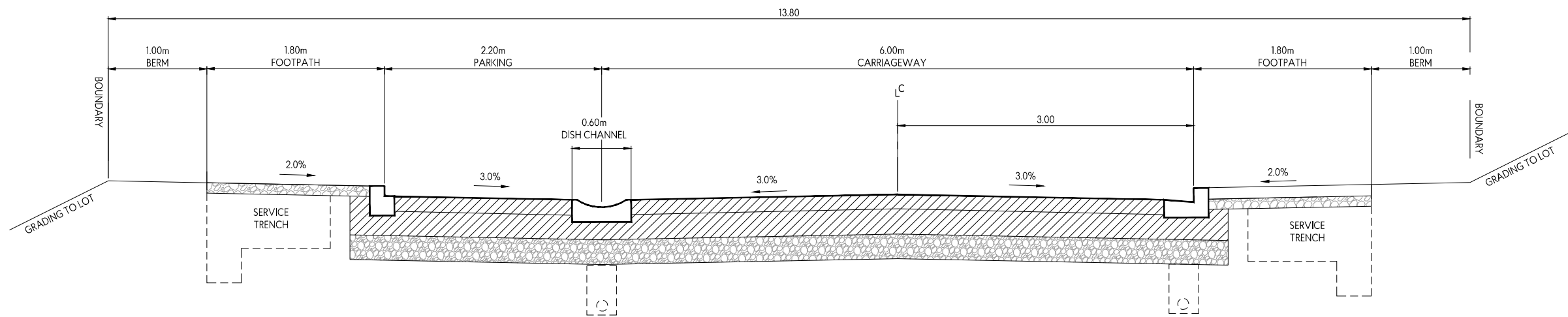
TITLE:
PROPOSED
ACCESSWAY
LONG SECTIONS



DESIGNED: SKR	DRAWN: SKR	
CHECKED: KD	PLOT DATE: 25/07/2024	
SCALE A1: AS SHOWN	SCALE A3:	
STATUS: CONCEPT DESIGN		
PROJECT No: 1915-01	DRAWING No: 330	REVISION: C10



TYPICAL ROAD CROSS-SECTION - PLANTING / RAIN GARDEN
SCALE: 1:25-A1
1:50-A3



TYPICAL ROAD CROSS-SECTION - PARKING BAY
SCALE: 1:25-A1
1:50-A3

NOTES:

- REFER TO DRAWING 300 FOR PROPOSED ACCESSWAY LAYOUT PLAN.

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REVISIONS:			
REV	NOTES	BY	DATE
C1	CONCEPT PLAN	JDP	31-03-23
C2	ADDITIONAL LOTS ADDED	HRM	30-05-23
C3	ACCESSWAY WIDTHS AMENDED	LGM	24-04-23
C4	FOR INFORMATION	HRM	15-04-23
C5	ROAD WIDTH UPDATED	SKR	18-07-2024
C6	ROAD REALIGNED AND LEVELS UPDATED	SKR	25-07-2024
C10	ROAD REALIGNED AND LEVELS UPDATED	SKR	26-08-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

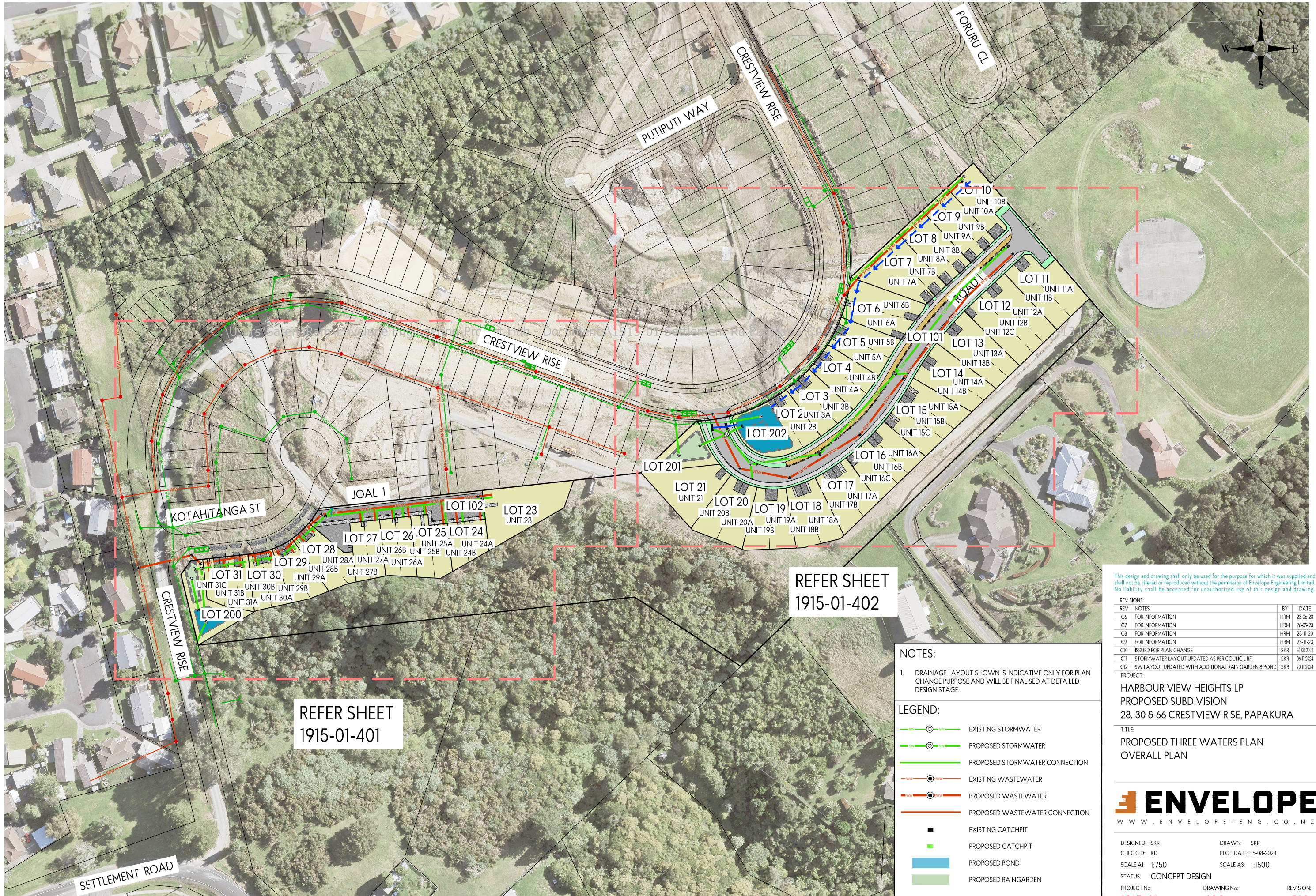
TITLE:
TYPICAL ROAD CROSS SECTION



DESIGNED: SKR
CHECKED: KD
SCALE A1: AS SHOWN
STATUS: CONCEPT DESIGN
PROJECT No: 1915-01

DRAWN: SKR
PLOT DATE: 25-11-2024
SCALE A3: AS SHOWN
DRAWING No: 340

REVISION: C10



REFER SHEET
1915-01-402

REFER SHEET
1915-01-401

NOTES:

1. DRAINAGE LAYOUT SHOWN IS INDICATIVE ONLY FOR PLAN CHANGE PURPOSE AND WILL BE FINALISED AT DETAILED DESIGN STAGE.

LEGEND:

- EXISTING STORMWATER
- PROPOSED STORMWATER
- PROPOSED STORMWATER CONNECTION
- EXISTING WASTEWATER
- PROPOSED WASTEWATER
- PROPOSED WASTEWATER CONNECTION
- EXISTING CATCHPIT
- PROPOSED CATCHPIT
- PROPOSED POND
- PROPOSED RAINGARDEN

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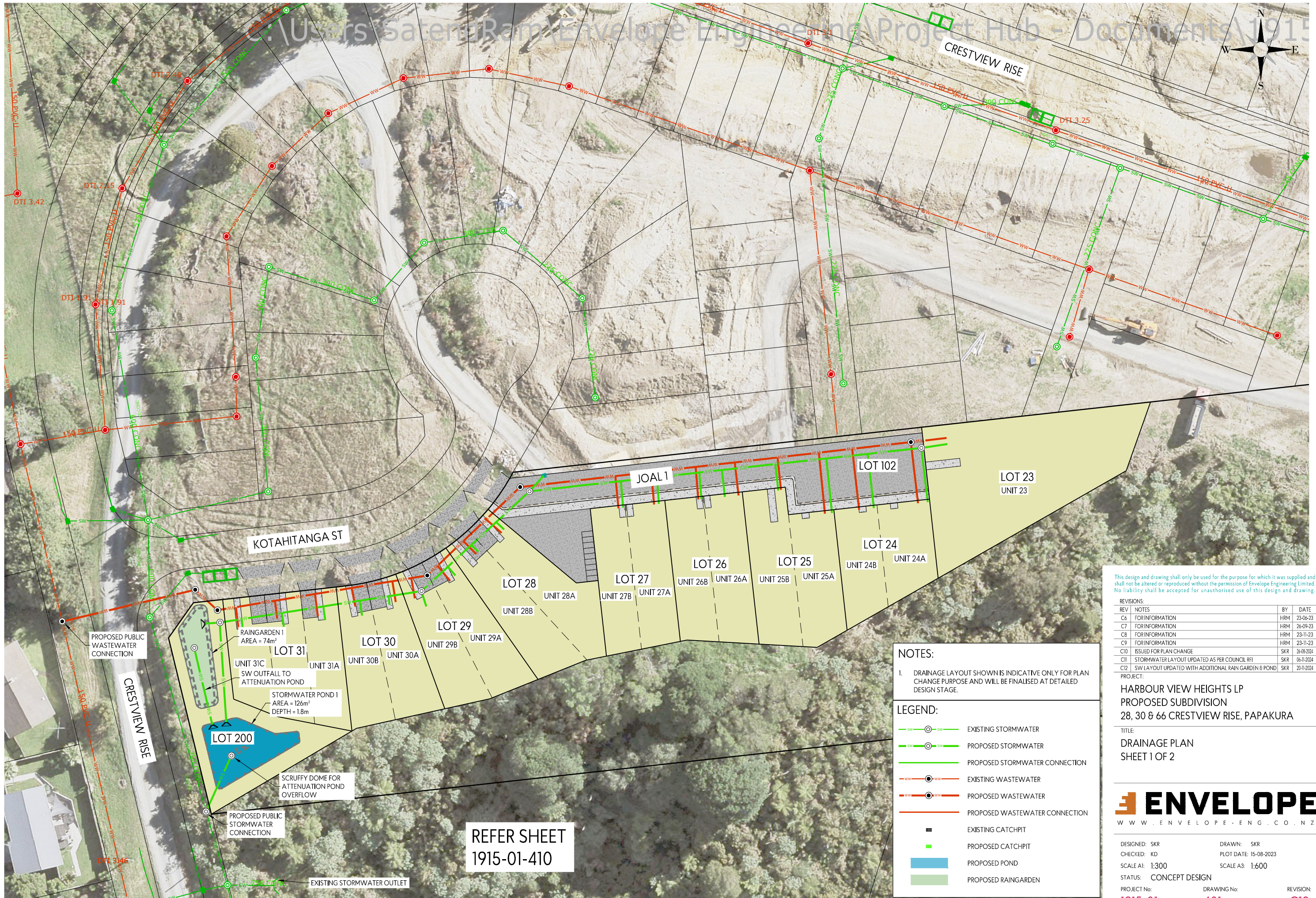
REVISIONS:		BY:	DATE:
REV	NOTES		
C6	FOR INFORMATION	HRM	23-06-23
C7	FOR INFORMATION	HRM	26-09-23
C8	FOR INFORMATION	HRM	23-11-23
C9	FOR INFORMATION	HRM	23-11-23
C10	ISSUED FOR PLAN CHANGE	SKR	26-08-2024
C11	STORMWATER LAYOUT UPDATED AS PER COUNCIL RFI	SKR	06-11-2024
C12	SW LAYOUT UPDATED WITH ADDITIONAL RAIN GARDEN & POND	SKR	20-11-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
PROPOSED THREE WATERS PLAN
OVERALL PLAN



DESIGNED: SKR	DRAWN: SKR	REVISION:
CHECKED: KD	PLOT DATE: 15-08-2023	
SCALE A1: 1:750	SCALE A3: 1:1500	
STATUS: CONCEPT DESIGN		
PROJECT No: 1915-01	DRAWING No: 400	C12



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REVISONS:		BY	DATE
REV	NOTES		
C6	FOR INFORMATION	HRM	23-06-23
C7	FOR INFORMATION	HRM	26-09-23
C8	FOR INFORMATION	HRM	23-11-23
C9	FOR INFORMATION	HRM	23-11-23
C10	ISSUED FOR PLAN CHANGE	SKR	26-08-2024
C11	STORMWATER LAYOUT UPDATED AS PER COUNCIL RFI	SKR	06-11-2024
C12	SW LAYOUT UPDATED WITH ADDITIONAL RAIN GARDEN & POND	SKR	20-11-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
DRAINAGE PLAN
SHEET 1 OF 2

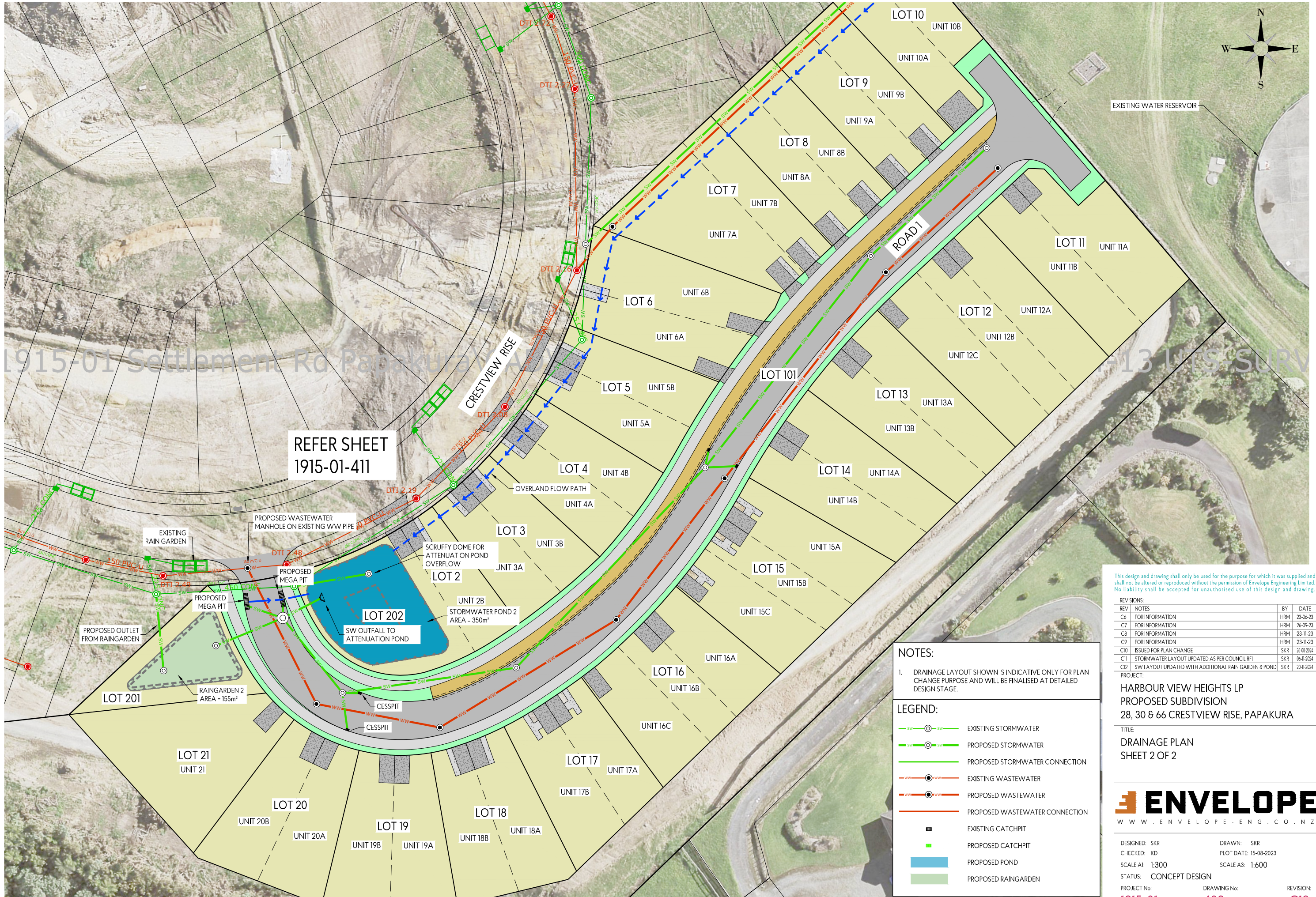


DESIGNED: SKR	DRAWN: SKR	REVISION:
CHECKED: KD	PLOT DATE: 15-08-2023	1915-01
SCALE A1: 1:300	SCALE A3: 1:600	401
STATUS: CONCEPT DESIGN		C12
PROJECT No:	DRAWING No:	

NOTES:
1. DRAINAGE LAYOUT SHOWN IS INDICATIVE ONLY FOR PLAN CHANGE PURPOSE AND WILL BE FINALISED AT DETAILED DESIGN STAGE.

LEGEND:	
	EXISTING STORMWATER
	PROPOSED STORMWATER
	PROPOSED STORMWATER CONNECTION
	EXISTING WASTEWATER
	PROPOSED WASTEWATER
	PROPOSED WASTEWATER CONNECTION
	EXISTING CATCHPIT
	PROPOSED CATCHPIT
	PROPOSED POND
	PROPOSED RAINGARDEN

REFER SHEET
1915-01-410



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REVISIONS:			
REV	NOTES	BY	DATE
C6	FOR INFORMATION	HRM	23-06-23
C7	FOR INFORMATION	HRM	26-09-23
C8	FOR INFORMATION	HRM	23-11-23
C9	FOR INFORMATION	HRM	23-11-23
C10	ISSUED FOR PLAN CHANGE	SKR	26-08-2024
C11	STORMWATER LAYOUT UPDATED AS PER COUNCIL RFI	SKR	06-11-2024
C12	SW LAYOUT UPDATED WITH ADDITIONAL RAIN GARDEN & POND	SKR	20-11-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
DRAINAGE PLAN
SHEET 2 OF 2



DESIGNED: SKR	DRAWN: SKR	REVISION:
CHECKED: KD	PLOT DATE: 15-08-2023	
SCALE A1: 1:300	SCALE A3: 1:600	
STATUS: CONCEPT DESIGN		
PROJECT No: 1915-01	DRAWING No: 402	REVISION: C12



STORMWATER OUTLET - PHOTO 1



STORMWATER OUTLET - PHOTO 2

NOTES:

- DRAINAGE LAYOUT SHOWN IS INDICATIVE ONLY FOR PLAN CHANGE PURPOSE AND WILL BE FINALISED AT DETAILED DESIGN STAGE.

LEGEND:

- EXISTING STORMWATER
- PROPOSED STORMWATER
- PROPOSED STORMWATER CONNECTION
- EXISTING WASTEWATER
- PROPOSED WASTEWATER
- PROPOSED WASTEWATER CONNECTION
- EXISTING CATCHPIT
- PROPOSED CATCHPIT
- PROPOSED POND
- PROPOSED RAINGARDEN

This design and drawing shall only be used for the purpose for which it was supplied and shall not be altered or reproduced without the permission of Envelope Engineering Limited. No liability shall be accepted for unauthorised use of this design and drawing.

REVISIONS:			
REV	NOTES	BY	DATE
C11	STORMWATER LAYOUT UPDATED AS PER COUNCIL RFI	SKR	06-11-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPAKURA

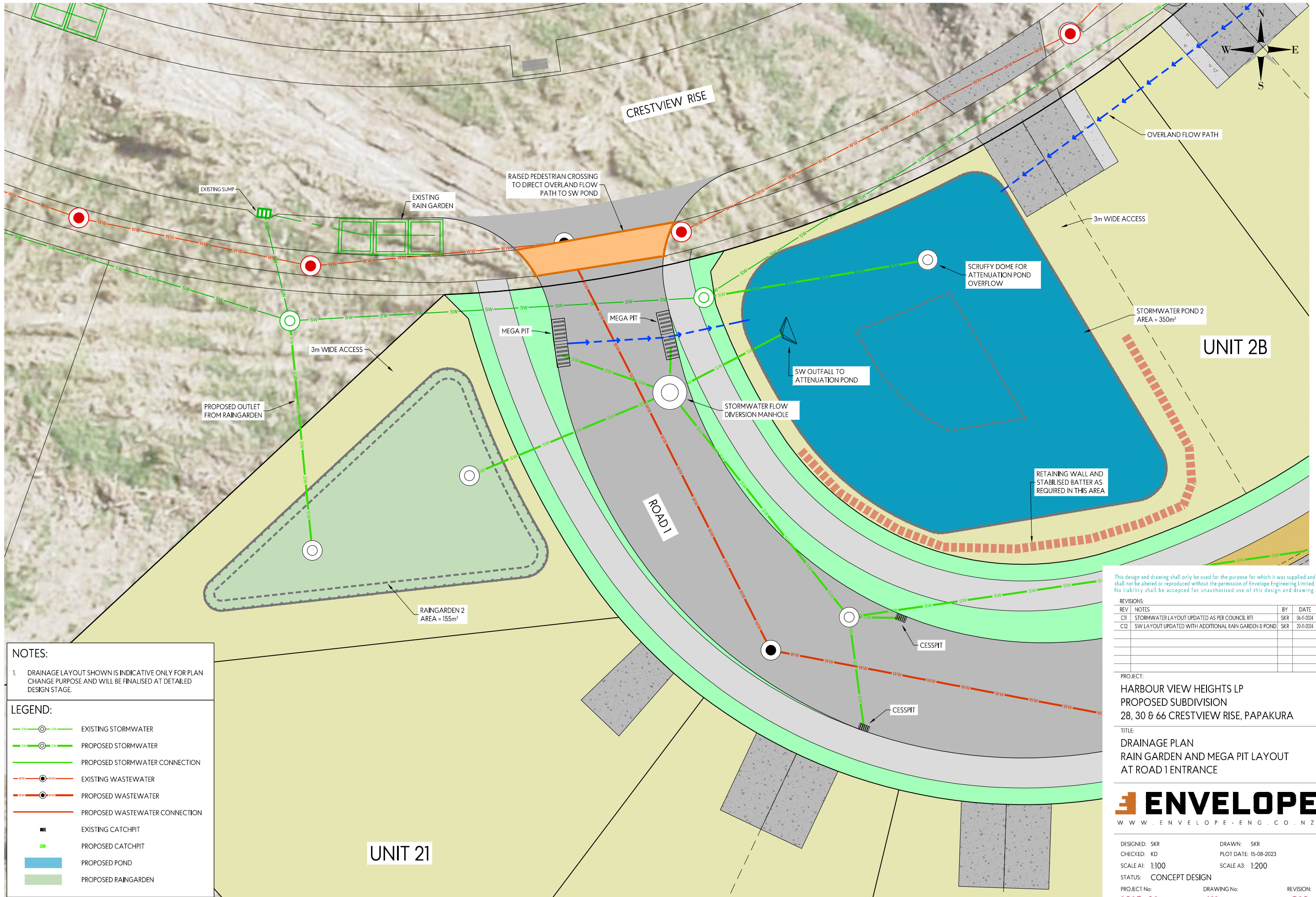
TITLE:
DRAINAGE PLAN
EXISTING STORMWATER OUTLET

ENVELOPE
WWW.ENVELOPE-ENG.CO.NZ

DESIGNED: SKR
CHECKED: KD
SCALE A1: 1:75
STATUS: CONCEPT DESIGN
PROJECT No: 1915-01

DRAWN: SKR
PLOT DATE: 15-08-2023
SCALE A3: 1:150
DRAWING No: 410

REVISION: C11



NOTES:

1. DRAINAGE LAYOUT SHOWN IS INDICATIVE ONLY FOR PLAN CHANGE PURPOSE AND WILL BE FINALISED AT DETAILED DESIGN STAGE.

LEGEND:

SW

SW

EXISTING STORMWATER

SW

SW

PROPOSED STORMWATER

SW

SW

WW

WW

WW

WW

WW

WW

This design and drawing shall only be used for the purpose for which it was supplied and shall not be altered or reproduced without the permission of Envelope Engineering Limited. No liability shall be accepted for unauthorised use of this design and drawing.

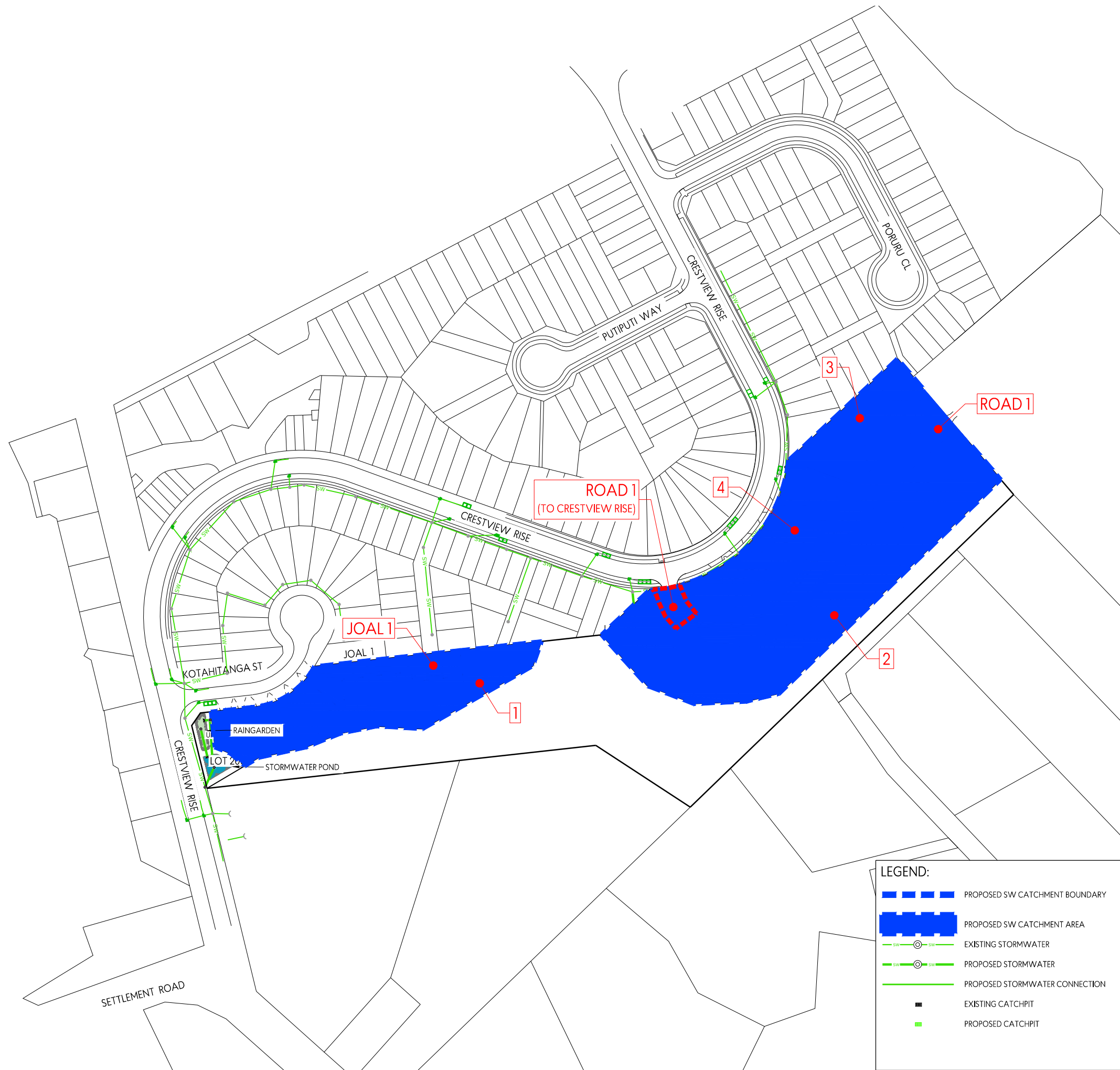
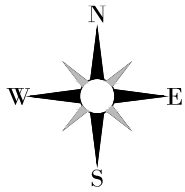
REVISIONS:			
REV	NOTES	BY	DATE
C11	STORMWATER LAYOUT UPDATED AS PER COUNCIL RFI	SKR	06-11-2024
C12	SW LAYOUT UPDATED WITH ADDITIONAL RAIN GARDEN & POND	SKR	20-11-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
DRAINAGE PLAN
RAIN GARDEN AND MEGA PIT LAYOUT
AT ROAD 1 ENTRANCE



DESIGNED: SKR	DRAWN: SKR	REVISION:
CHECKED: KD	PLOT DATE: 15-08-2023	
SCALE A1: 1:100	SCALE A3: 1:200	1915-01
STATUS: CONCEPT DESIGN	PROJECT No:	
PROJECT No:	DRAWING No:	411
1915-01		C12



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REVISIONS:		BY	DATE
REV	NOTES		
C10	ISSUED FOR PLAN CHANGE	SKR	26-08-2024

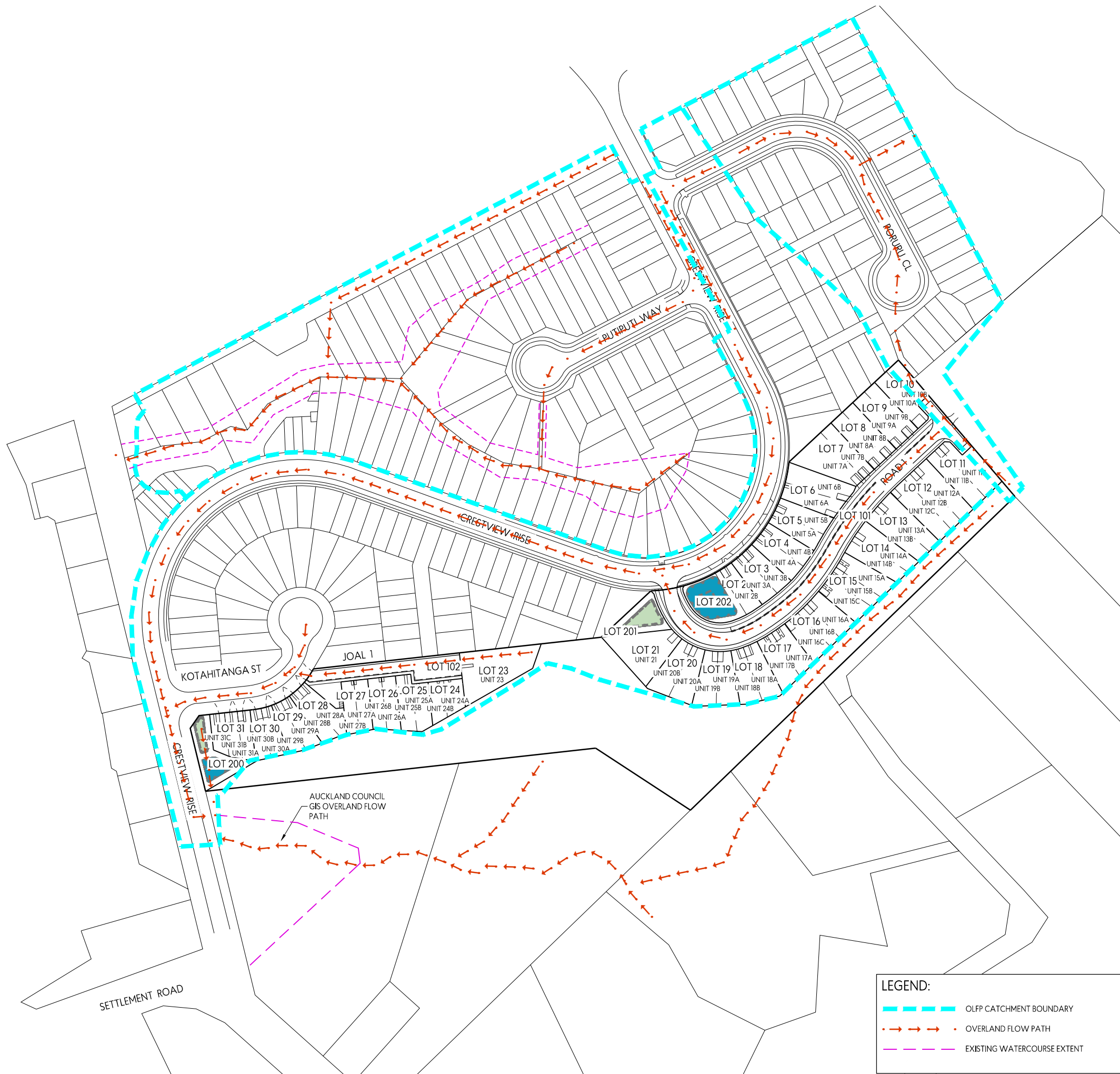
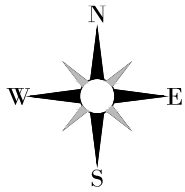
PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:

STORMWATER CATCHMENT PLAN



DESIGNED: SKR	DRAWN: SKR	REVISION:
CHECKED: KD	PLOT DATE: 02-09-2024	
SCALE A1: 1:1000	SCALE A3: 1:2000	
STATUS: CONCEPT DESIGN		
PROJECT No: 1915-01	DRAWING No: 470	C10



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REVISIONS:			
REV	NOTES	BY	DATE
C10	ISSUED FOR PLAN CHANGE	SKR	26-08-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPAKURA

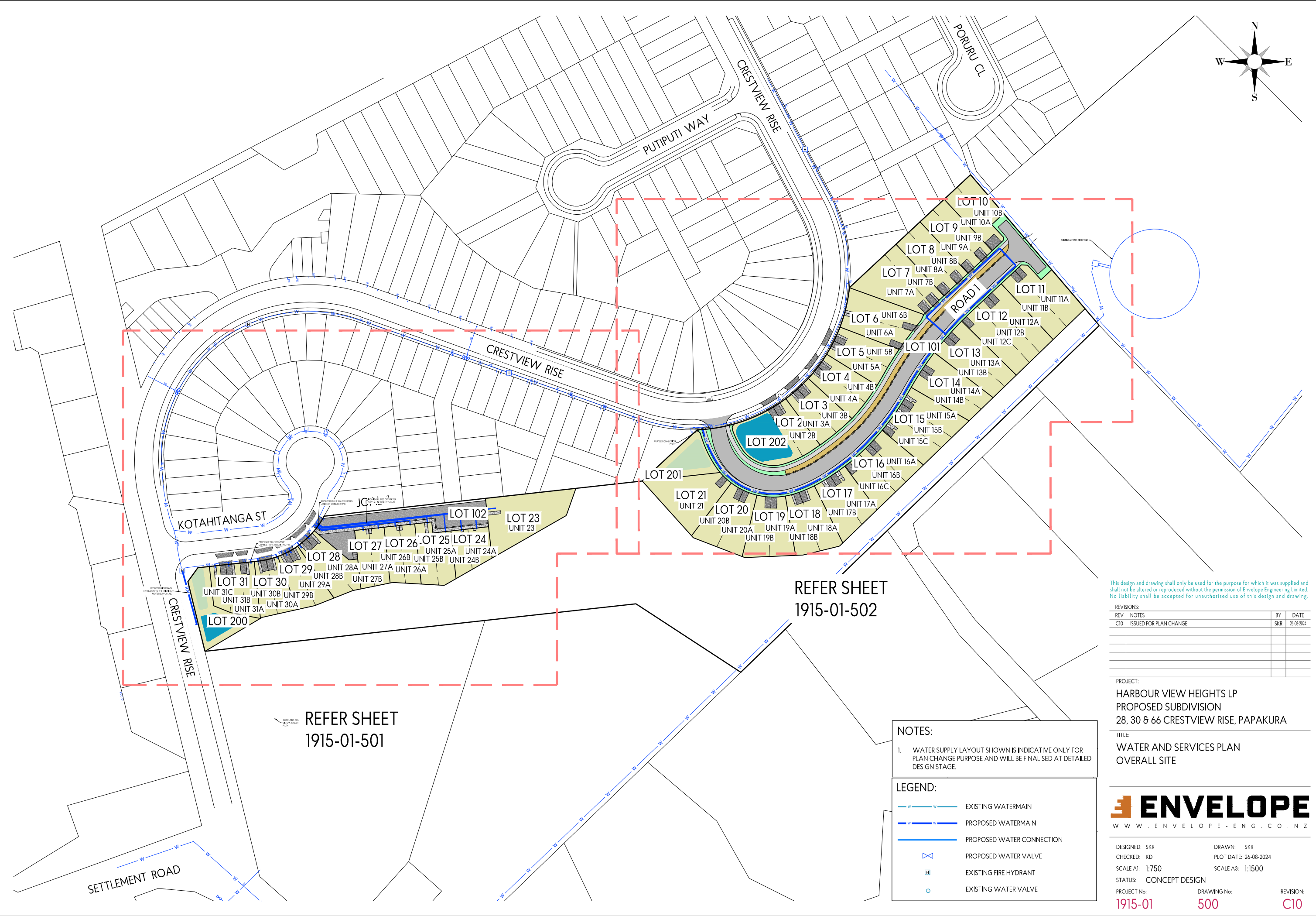
TITLE:

OVERLAND FLOWPATH PLAN



LEGEND:	
	OLFP CATCHMENT BOUNDARY
	OVERLAND FLOW PATH
	EXISTING WATERCOURSE EXTENT

DESIGNED: SKR	DRAWN: SKR	REVISION:
CHECKED: KD	PLOT DATE: 02-09-2024	475
SCALE A1: 1:1000	SCALE A3: 1:2000	C10
STATUS: CONCEPT DESIGN	PROJECT No: 1915-01	
	DRAWING No:	



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REVISIONS:			
REV	NOTES	BY	DATE
C10	ISSUED FOR PLAN CHANGE	SKR	26-08-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
WATER AND SERVICES PLAN
OVERALL SITE



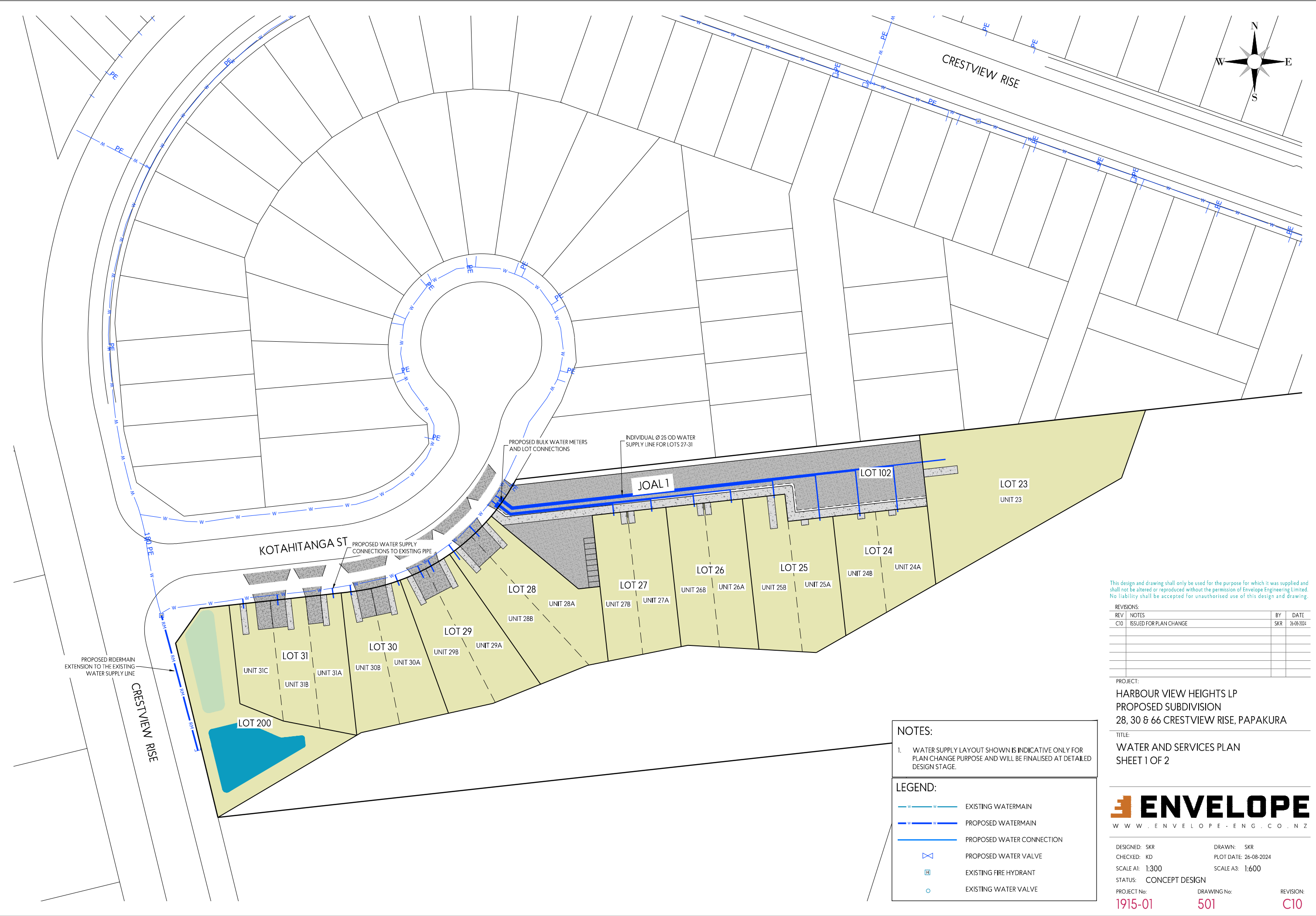
DESIGNED: SKR
CHECKED: KD
SCALE A1: 1:750
STATUS: CONCEPT DESIGN
PROJECT No: 1915-01

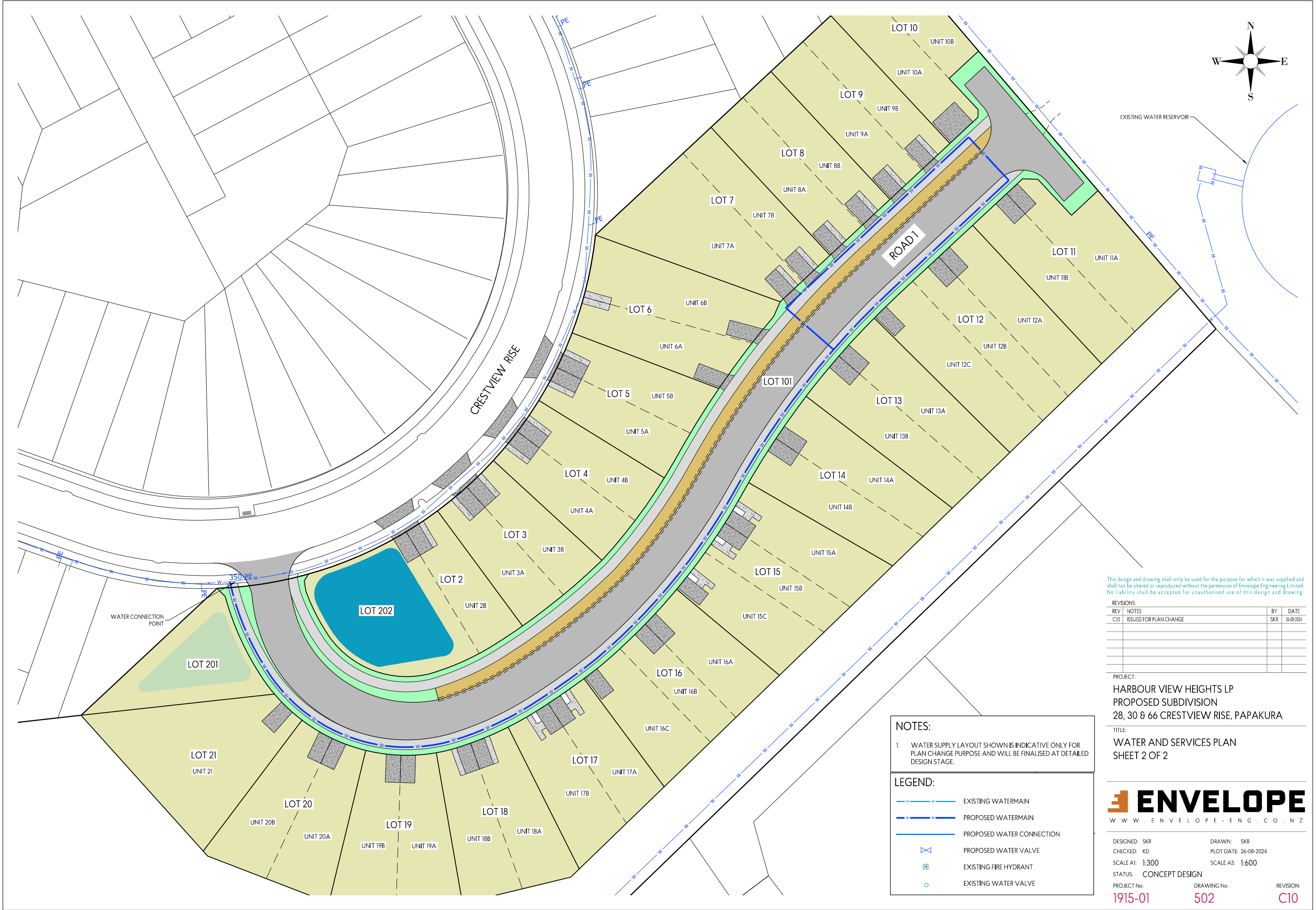
DRAWN: SKR
PLOT DATE: 26-08-2024
SCALE A3: 1:1500
DRAWING No: 500

REVISION: C10

NOTES:
1. WATER SUPPLY LAYOUT SHOWN IS INDICATIVE ONLY FOR PLAN CHANGE PURPOSE AND WILL BE FINALISED AT DETAILED DESIGN STAGE.

LEGEND:	
	EXISTING WATERMAIN
	PROPOSED WATERMAIN
	PROPOSED WATER CONNECTION
	PROPOSED WATER VALVE
	EXISTING FIRE HYDRANT
	EXISTING WATER VALVE





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REVISIONS:		BY	DATE
REV	NOTES		
C10	ISSUED FOR PLAN CHANGE	SKR	26-08-2024

PROJECT:
HARBOUR VIEW HEIGHTS LP
PROPOSED SUBDIVISION
28, 30 & 66 CRESTVIEW RISE, PAPA KURA

TITLE:
WATER AND SERVICES PLAN
SHEET 2 OF 2



DESIGNED: SKR	DRAWN: SKR	REVISION:
CHECKED: KD	PLOT DATE: 26-08-2024	
SCALE A1: 1:300	SCALE A3: 1:600	
STATUS: CONCEPT DESIGN		
PROJECT No: 1915-01	DRAWING No: 502	C10

APPENDIX 2
CALCULATIONS

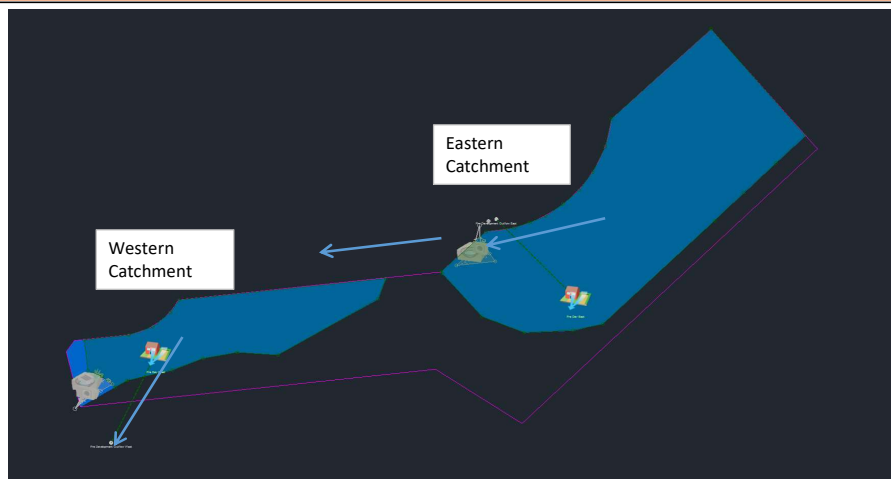
Client	Harbourview Heights LP	
Project Site	Settlement Road	
Envelope Ref	1915-01	
Version	1	
Date	20/11/2024	
STORMWATER - RAINFALL		

TP108 Rainfall Method				
Event	Depth			
Figure A.1 - 2 yr ARI - 50% AEP	75	mm		
Figure A.2 - 5 yr ARI - 20% AEP		mm		
Figure A.3 - 10 yr ARI - 10% AEP	135	mm		
Figure A.4 - 20 yr ARI - 5% AEP		mm		
Figure A.5 - 50 yr ARI - 2% AEP		mm		
Figure A.6 - 100 yr ARI - 1% AEP	215	mm		
Climate Change Adjusted				
Annual Exceedence Probability (AEP)	% increase in 24-Hour Design Rainfall Depth FCC - 2.1 degree	% increase in 24-Hour Design Rainfall Depth FCC - 3.8 degree	Climate adjusted rainfall depth (mm) - 2.1 degree cc	Climate adjusted rainfall depth (mm) - 3.8 degree cc
50%	15%	27%	86.325	95.55
20%	16%	30%	0	0
10%	17%	31%	157.95	176.58
5%	17%	31%	0	0
2%	18%	32%	0	0
1%	18%	33%	253.915	285.305

Client	Harbourview Heights LP	
Project Site	Settlement Road	
Envelope Ref	1915-01	
Version	2	
Date	20/11/2024	
STORMWATER - PRE DEVELOPMENT		

Catchment Areas			
Catchment Pre Development	100 yr - (3.8 degrees cc)		
Eastern Area	1.465	ha	
Catchment Areas			
Catchment Pre Development	100 yr - (3.8 degrees cc)		
Catchment number	EAST	→	
Impervious Area	0	ha	
Pervious Area	1.465	ha	
Total area	1.5	ha	
% Impervious	0.0		
Catchment Slope (Sc)	0.1	m/m	
Catchment Length (l)	0.1	km	
Channelisation Factor (C)	0.6		
Hydrological Soil Group	Group_C		
SCS Curve Number (CN)	74		
24-Hour Rainfall Depth (P24)	258.8	mm	
Weighted Curve Number	74.0		
Initial Abstraction (Ia) weighted	5.0	mm	
tc	0.2	hours	
tp	0.1	hours	
Storage (S)	89.2	mm	
$c^*=(P24-2Ia)/(P24-2Ia+2S)$	0.6		
q* (from Fig. 6.1)	0.1	Approx!!	
Peak Flowrate (qp)	0.5	m3/s	
Peak Flowrate (qp)	497.6	L/s	
24 hour rainfall depth (Q 24)	187.8	mm	
24 hour runoff volume (V24)	2750.9	m3	
80% Peak Flowrate (qp)	398.1	L/s	

Catchment Map



Eastern Catchment Results

Summary Results for Pre Development Outflow East

Storm Event	Max. Inflow (L/s)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
ARC - 2yr ARI - FCC: +15.1 %: ARC - 2yr ARI - FCC1440	118.3	118.3	610.197	OK
ARC - 5yr ARI - FCC: +16.4 %: ARC - 5yr ARI - FCC1440	215.2	215.2	1102.481	OK
ARC - 10yr ARI - FCC: +17 %: ARC - 10yr ARI - FCC1440	281.7	281.7	1442.935	OK
ARC - 20yr ARI - FCC: +17.2 %: ARC - 20yr ARI - FCC1440	360.7	360.8	1851.498	OK
ARC - 50yr ARI - FCC: +17.6 %: ARC - 50yr ARI - FCC1440	451.4	451.4	2324.667	OK
ARC - 100yr ARI - FCC: +18.1 %: ARC - 100yr ARI - FCC1440	514.0	514.0	2654.389	OK

Client	Harbourview Heights LP	
Project Site	Settlement Road	
Envelope Ref	1915-01	
Version	2	
Date	20/11/2024	
STORMWATER - PRE DEVELOPMENT		

Catchment Areas			
Catchment Pre Development	100 yr - (3.8 degrees cc)		
Western Area	0.469	ha	
Catchment Areas			
Catchment Pre Development	100 yr - (3.8 degrees cc)		
Catchment number	WEST	→	
Impervious Area	0	ha	
Pervious Area	0.469	ha	
Total area	0.5	ha	
% Impervious	0.0		
Catchment Slope (Sc)	0.1	m/m	
Catchment Length (l)	0.1	km	
Channelisation Factor (C)	0.6		
Hydrological Soil Group	Group_C		
SCS Curve Number (CN)	74		
24-Hour Rainfall Depth (P24)	258.8	mm	
Weighted Curve Number	74.0		
Initial Abstraction (Ia) weighted	5.0	mm	
tc	0.2	hours	
tp	0.1	hours	
Storage (S)	89.2	mm	
$c^*=(P24-2Ia)/(P24-2Ia+2S)$	0.6		
q* (from Fig. 6.1)	0.1	Approx!!	
Peak Flowrate (qp)	0.2	m3/s	
Peak Flowrate (qp)	159.3	L/s	
24 hour rainfall depth (Q 24)	187.8	mm	
24 hour runoff volume (V24)	880.7	m3	
80% Peak Flowrate (qp)	127.4	L/s	

Catchment Map



Western Catchment Results

Summary Results for Pre Development Outflow West

Storm Event	Max. Inflow (L/s)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
ARC - 2yr ARI - FCC: +15.1 %: ARC - 2yr ARI - FCC1440	37.9	37.9	195.427	OK
ARC - 5yr ARI - FCC: +16.4 %: ARC - 5yr ARI - FCC1440	68.9	68.9	353.070	OK
ARC - 10yr ARI - FCC: +17 %: ARC - 10yr ARI - FCC1440	90.2	90.2	462.114	OK
ARC - 20yr ARI - FCC: +17.2 %: ARC - 20yr ARI - FCC1440	115.5	115.5	592.930	OK
ARC - 50yr ARI - FCC: +17.6 %: ARC - 50yr ARI - FCC1440	144.6	144.6	744.502	OK
ARC - 100yr ARI - FCC: +18.1 %: ARC - 100yr ARI - FCC1440	164.6	164.6	850.074	OK

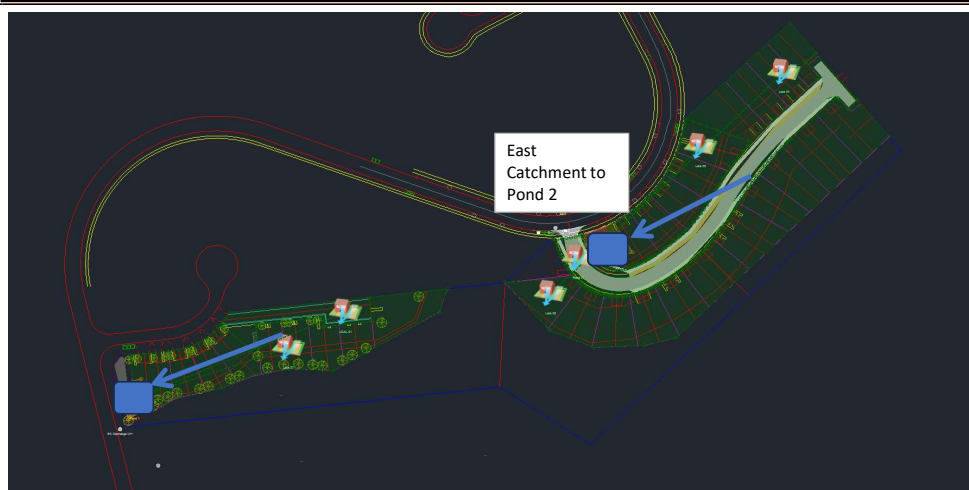
Client	Harbourview Heights LP
Project Site	Settlement Road
Envelope Ref	1915-01
Version	2
Date	20/11/2024



STORMWATER - POST DEVELOPMENT

Catchment Areas			
Catchment Post Development	100 yr - (3.8 degrees cc)		
Eastern Area	1.465	ha	
Catchment Areas			
Catchment Post Development	100 yr - (3.8 degrees cc)		
Catchment number	EAST	→	
Impervious Area	1.26	ha	
Pervious Area	0.205	ha	
Total area	1.465	ha	
% Impervious	0.86		
Catchment Slope (Sc)	0.1	m/m	
Catchment Length (l)	0.1	km	
Channelisation Factor (C)	0.6		
Hydrological Soil Group	Group_C		
SCS Curve Number (CN)	74		
24-Hour Rainfall Depth (P24)	258.8	mm	
Weighted Curve Number	94.6		
Initial Abstraction (Ia) weighted	0.7	mm	
tc	0.2	hours	
tp	0.1	hours	
Storage (S)	14.4	mm	
$c^*=(P24-2Ia)/(P24-2Ia+2S)$	0.9		
q* (from Fig. 6.1)	0.2	Approx!!	
Peak Flowrate (qp)	0.6	m3/s	
Peak Flowrate (qp)	612.0	L/s	
24 hour rainfall depth (Q 24)	244.5	mm	
24 hour runoff volume (V24)	3581.6	m3	
80% Peak Flowrate (qp) (Pre Development)	398.1	L/s	
Peak Flowrate (qp) (Post Development)	612.0	L/s	
Additional peak flows	213.9	L/s	

Catchment Map - Post



Eastern Catchment Results

Summary Results for Pre Development Outflow East

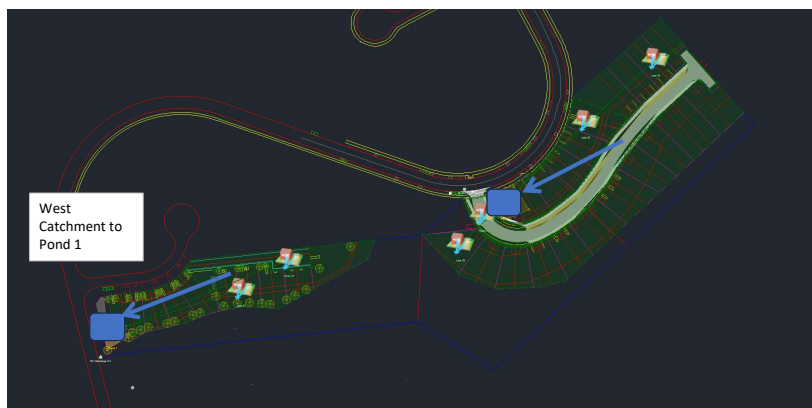
Storm Event	Max. Inflow (L/s)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Status
ARC - 2yr ARI - FCC: +15.1 %: ARC - 2yr ARI - FCC1440	118.3	118.3	610.197	OK
ARC - 5yr ARI - FCC: +16.4 %: ARC - 5yr ARI - FCC1440	215.2	215.2	1102.481	OK
ARC - 10yr ARI - FCC: +17.2 %: ARC - 10yr ARI - FCC1440	281.7	281.7	1442.935	OK
ARC - 20yr ARI - FCC: +17.2 %: ARC - 20yr ARI - FCC1440	360.7	360.8	1851.498	OK
ARC - 50yr ARI - FCC: +17.6 %: ARC - 50yr ARI - FCC1440	451.4	451.4	2324.667	OK
ARC - 100yr ARI - FCC: +18.1 %: ARC - 100yr ARI - FCC1440	514.0	514.0	2654.389	OK

Client	Harbourview Heights LP	
Project Site	Settlement Road	
Envelope Ref	1915-01	
Version	2	
Date	20/11/2024	

STORMWATER - POST DEVELOPMENT

Catchment Areas			
Catchment Post Development	100 yr - (3.8 degrees cc)		
Western Area	0.469	ha	
Catchment Areas			
Catchment Post Development	100 yr - (3.8 degrees cc)		
Catchment number	EAST	→	
Impervious Area	0.403	ha	
Pervious Area	0.0657	ha	
Total area	0.469	ha	
% Impervious	0.86		
Catchment Slope (Sc)	0.1	m/m	
Catchment Length (l)	0.1	km	
Channelisation Factor (C)	0.6		
Hydrological Soil Group	Group_C		
SCS Curve Number (CN)	74		
24-Hour Rainfall Depth (P24)	258.8	mm	
Weighted Curve Number	94.6		
Initial Abstraction (Ia) weighted	0.7	mm	
tc	0.2	hours	
tp	0.1	hours	
Storage (S)	14.4	mm	
$c^* = (P24 - 2Ia) / (P24 - 2Ia + 2S)$	0.9		
q* (from Fig. 6.1)	0.2	Approx!!	
Peak Flowrate (qp)	0.2	m ³ /s	
Peak Flowrate (qp)	195.8	L/s	
24 hour rainfall depth (Q 24)	244.5	mm	
24 hour runoff volume (V24)	1145.8	m ³	
80% Peak Flowrate (qp) (Pre Development)	127.4	L/s	
Peak Flowrate (qp) (Post Development)	195.8	L/s	
Additional peak flows	68.4	L/s	

Catchment Map - Post



Western Catchment Results

Summary Results for Pre Development Outflow West

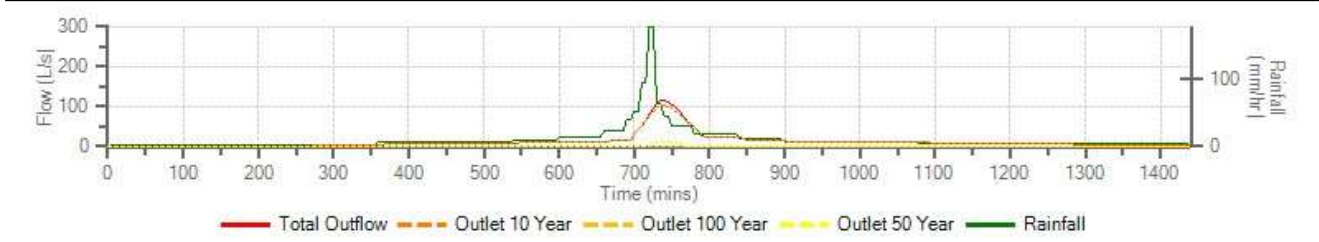
Storm Event	Max. Inflow (L/s)	Max. Outflow (L/s)	Total Discharge Volume (m ³)	Status
ARC - 2yr ARI - FCC: +15.1 %: ARC - 2yr ARI - FCC1440	37.9	37.9	195.427	OK
ARC - 5yr ARI - FCC: +16.4 %: ARC - 5yr ARI - FCC1440	68.9	68.9	353.070	OK
ARC - 10yr ARI - FCC: +17 %: ARC - 10yr ARI - FCC1440	90.2	90.2	462.114	OK
ARC - 20yr ARI - FCC: +17.2 %: ARC - 20yr ARI - FCC1440	115.5	115.5	592.930	OK
ARC - 50yr ARI - FCC: +17.6 %: ARC - 50yr ARI - FCC1440	144.6	144.6	744.502	OK
ARC - 100yr ARI - FCC: +18.1 %: ARC - 100yr ARI - FCC1440	164.6	164.6	850.074	OK

Client	Harbourview Heights LP	
Project Site	Settlement Road	
Envelope Ref	1915-01	
Version	2	
Date	20/11/2024	

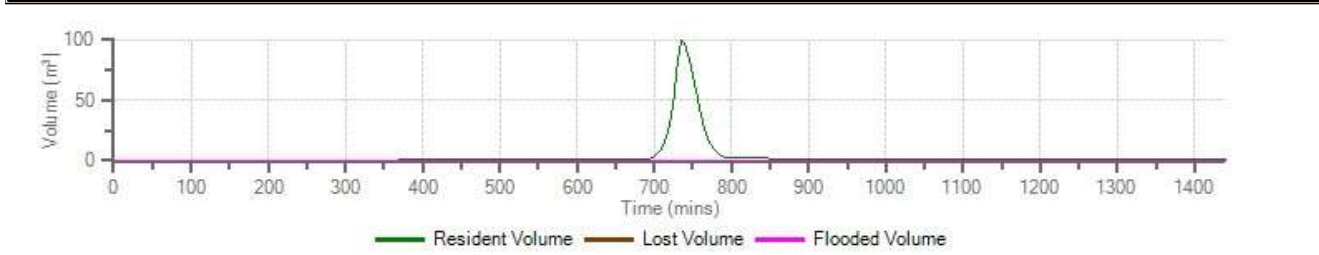
STORMWATER - PROPOSED POND 1

Outlet Design			
Depth	2.5	m	
Freeboard	500	mm	
Volume	165	m ³	
Orifice 1 Size	190	mm	diameter
Orifice 1 Invert Elevation	0	mm	
Orifice 2 Size	75	mm	diameter
Orifice 2 Invert Elevation	0.8	m	
Orifice 3 Size	200	mm	diameter
Orifice 3 Invert Elevation	2	m	
Peak Flowrate (qp) 100 yr	128.7	litres/second	OK

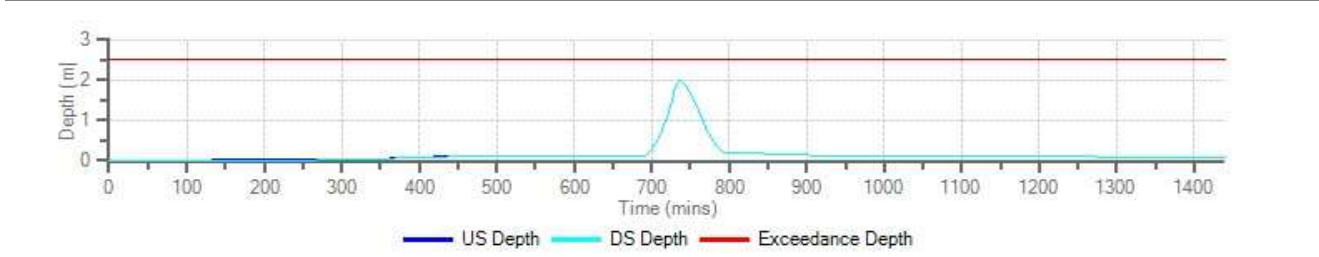
Flow Graph - Pond 1



Volume Graph - Pond 1



Depth Graph - Pond 2



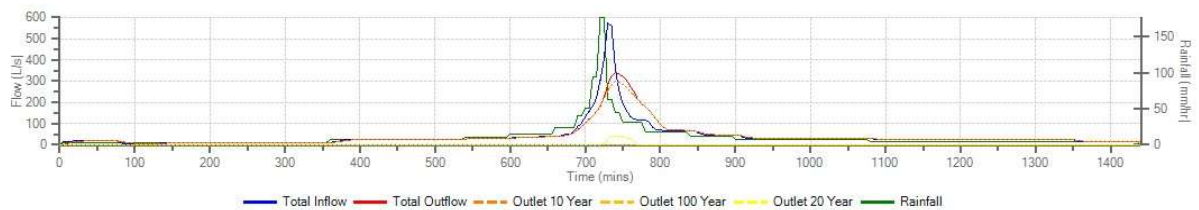
Scenarios - Pond 1

Summary Results for Pond 1									
Storm Event	Max. Avg. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
ARC - 100yr ARI - FCC: +18.1 %: ARC - 100yr ARI - FCC1440	1.984	224.0	99.419	0.000	0.000	128.7	1083.114	2	OK
ARC - 20yr ARI - FCC: +17.2 %: ARC - 20yr ARI - FCC1440	1.535	169.5	58.375	0.000	0.000	110.1	803.497	42	OK
ARC - 10yr ARI - FCC: +17 %: ARC - 10yr ARI - FCC1440	1.226	140.6	37.679	0.000	0.000	94.8	656.329	63	OK
ARC - 5yr ARI - FCC: +16.4 %: ARC - 5yr ARI - FCC1440	0.892	114.9	21.185	0.000	0.000	72.8	529.440	79	OK
ARC - 2yr ARI - FCC: +15.1 %: ARC - 2yr ARI - FCC1440	0.190	23.8	2.340	0.000	0.000	23.1	332.997	98	OK
ARC - 50yr ARI - FCC: +17.6 %: ARC - 50yr ARI - FCC1440	1.819	201.9	82.647	0.000	0.000	122.2	969.532	18	OK
First Flush - Rainfall Depth (mm): 10.0, Run Time (mins): 2880	0.004	0.0	0.036	0.000	0.000	0.0	5.507	100	OK

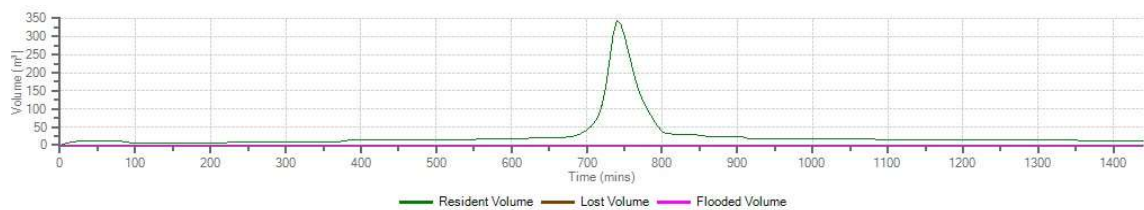
Client	Harbourview Heights LP	
Project Site	Settlement Road	
Envelope Ref	1915-01	
Version	2	
Date	20/11/2024	
STORMWATER - PROPOSED POND 2		

Outlet Design			
Depth	2.5	m	
Freeboard	500	mm	
Volume	540	m ³	
Orifice 1 Size	325	mm	diameter
Orifice 1 Invert Elevation	0	mm	
Orifice 2 Size	150	mm	diameter
Orifice 2 Invert Elevation	0.6	m	
Orifice 3 Size	150	mm	diameter
Orifice 3 Invert Elevation	2	m	
Peak Flowrate (qp) 100 yr	382.4	litres/second	OK

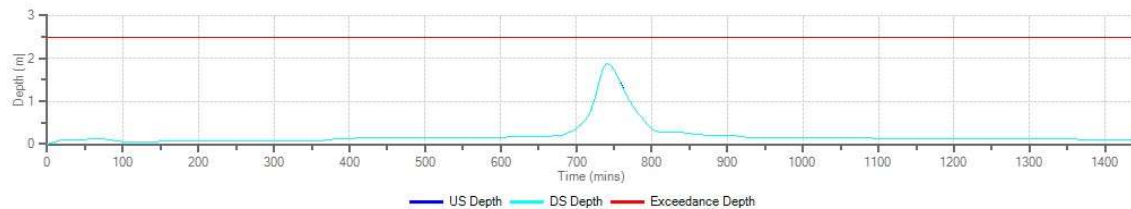
Flow Graph - Pond 2



Volume Graph - Pond 2



Depth Graph - Pond 2



Scenarios - Pond 2

Summary Results for Pond 2

Storm Event	Max. Avg. Depth (m)	Max. Inflow (L/s)	Max. Resident Volume (m³)	Max. Flooded Volume (m³)	Total Lost Volume (m³)	Max. Outflow (L/s)	Total Discharge Volume (m³)	Percentage Available (%)	Status
ARC - 100yr ARI - FCC: +18.1 %: ARC - 100yr ARI - FCC1440	1.882	575.8	343.923	0.000	0.000	382.4	3362.428	9	OK
ARC - 20yr ARI - FCC: +17.2 %: ARC - 20yr ARI - FCC1440	1.424	435.3	227.570	0.000	0.000	310.6	2535.220	40	OK
ARC - 10yr ARI - FCC: +17 %: ARC - 10yr ARI - FCC1440	1.153	360.9	169.535	0.000	0.000	252.1	2100.180	55	OK
ARC - 5yr ARI - FCC: +16.4 %: ARC - 5yr ARI - FCC1440	0.869	291.2	116.919	0.000	0.000	190.9	1724.502	69	OK
ARC - 2yr ARI - FCC: +15.1 %: ARC - 2yr ARI - FCC1440	0.353	118.6	39.974	0.000	0.000	98.6	1144.084	89	OK
ARC - 50yr ARI - FCC: +17.6 %: ARC - 50yr ARI - FCC1440	1.703	518.8	295.676	0.000	0.000	356.5	3026.150	22	OK
First Flush - Rainfall Depth (mm): 10.0, Run Time (mins): 2880	0.107	17.0	11.101	0.000	0.000	17.0	112.074	97	OK

APPENDIX 3
AS-BUILT TOPOGRAPHICAL SURVEY PLANS (PROVIDED BY
SURVEY WORX)



SURVEYED	TH	13.04.23	APPROVED	DATE
DESIGNED				
DRAWN	RRR	18.04.23		
CHECKED				
APPROVED				
REV	CHANGES		CHKD	DATE
0	ORIGINAL ISSUE		MWC	19.04.23
1	SYSTEM/DATUM SHIFTED		RRR	11.09.23

NOTES:

BEARING AND COORDINATE DATUM IS NZGD2000
NEW ZEALAND TRANSVERSE MERCATOR PROJECTION
LEVELS ARE IN TERMS OF LANDS AND SURVEY DATUM (MSL)
AUCKLAND 1946

ORIGIN OF SURVEY CLLQ RM X DP 80473
 5895891.033mN
 1775447.737mE
 RL 28.048m

1. CONTOURS ARE SHOWN AT 1.0M INTERVALS
2. DTM TRIANGLES ARE FROZEN ON LAYER (300-SF-TRIANGLES-SW)
3. BOUNDARY INFORMATION FROM LINZ LAND ONLINE EXTRACT AND SUBJECT TO SURVEY
4. CONTOURS ARE TOP OF VEGETATION
5. PHOTOGRAMMETRY &/OR LIDAR PRINCIPLES APPLY

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SURVEY EQUIPMENT USED:
INSTRUMENT: TRIMBLE ROBOTIC S8 1" / LEICA TS16 3"
GPS: TRIMBLE R6/R8 SYSTEMS / LEICA GPS08 PLUS
PRECISE LEVELLING: TRIMBLE DINI Series 0.3mm DIGITAL
VERTICAL PLUMBING: FOF G22 LASER PLUMMIT
LASER SCANNER: LEICA RTC360 / LEICA P30

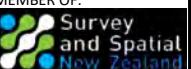
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HARBOUR VIEW HEIGHTS
LP C/- RDB CONSULT

PROJECT

LOTS 123, 124 & 127, 166
SETTLEMENT RD,
PAPAKURA

TITLE

UAV TOPOGRAPHICAL
SURVEY PLAN
SHEET LAYOUT

SCALE	1:1000 (A1)	1:2000 (A3)
DRAWING No	7077-705-001	SHEET 1 of 6
		REVISION 1



SURVEYED	TH	13.04.23	APPROVED	DATE
DESIGNED				
DRAWN	RRR	18.04.23		
CHECKED				
APPROVED				
REV	CHANGES		CHKD	DATE
0	ORIGINAL ISSUE		MWC	19.04.23
1	SYSTEM/DATUM SHIFTED		RRR	11.09.23

NOTES:

BEARING AND COORDINATE DATUM IS NZGD2000
NEW ZEALAND TRANSVERSE MERCATOR PROJECTION
LEVELS ARE IN TERMS OF LANDS AND SURVEY DATUM (MSL)
AUCKLAND 1946

ORIGIN OF SURVEY CLLQ RM X DP 80473
 5895891.033mN
 1775447.737mE
 RL 28.048m

1. CONTOURS ARE SHOWN AT 1.0M INTERVALS
2. DTM TRIANGLES ARE FROZEN ON LAYER (300-SF-TRIANGLES-SW(X))
3. BOUNDARY INFORMATION FROM LINZ LAND ONLINE EXTRACT AND SUBJECT TO SURVEY
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PRECISE LEVELLING: TRIMBLE DINI Series 0.3mm DIGITAL
VERTICAL PLUMBING: FOF G22 LASER PLUMMIT
LASER SCANNER: LEICA RTC360 / LEICA P90

SURVEY WORX

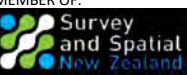
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PROJECT

LOTS 123, 124 & 127, 166
SETTLEMENT RD,
PAPAKURA

TITLE

UAV TOPOGRAPHICAL
SURVEY PLAN

SCALE	1:300 (A1)	1:600 (A3)
DRAWING No	7077-705-001	SHEET 2 of 6
		REVISION 1



SURVEYED	TH	13.04.23	APPROVED	DATE
DESIGNED				
DRAWN	RRR	18.04.23		
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APPROVED				
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>SCALE	1:300 (A1)	1:600 (A3)
>DRAWING No	7077-705-001	>SHEET 4 of 6
		>REVISION 1



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APPROVED					
REV	CHANGES			CHKD	DATE
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TITLE

UAV TOPOGRAPHICAL
SURVEY PLAN

SCALE	1:300 (A1)	1:600 (A3)
DRAWING No	7077-705-001	SHEET 5 of 6
REVISION		1

APPENDIX 4
WASTEWATER SCENARIO MODELLING

MEMO

CRESTVIEW RISE WASTEWATER ASSESSMENT

TO	Veolia/Watercare	DATE	1 October 2024
PROJECT NAME	Crestview Rise, Proposed Plan Change	ENVELOPE REF	1915-01
ATTENTION	Sanjeev Morar	FROM	Kyle Dirse
EMAIL ADDRESS	Sanjeev.morar@veolia.com		

1.0 INTRODUCTION

Envelope Engineering Ltd has been engaged to provide an infrastructure assessment in support of a Private Plan Change (rezoning) application that will inform a future Resource Consent application for proposed residential development of land located at 28, 30 and 66 Crestview Rise, Papakura, Auckland. This memo pertains to the wastewater infrastructure required to service up to 31 residential lots and a total of up to 90 dwellings

We understand an agreement in principle has been earlier reached between Veolia and Harbour View Heights LP (HVHLP) regarding potable water supply for up to 90 DUE. This memo is also in response to clarifying the nature of the issue and potential options for resolution of wastewater alluded to by Veolia, and more recently by email to Council dated 12 September (attached).

2.0 EXISTING WASTEWATER NETWORK AND POST DEVELOPMENT SCENARIOS

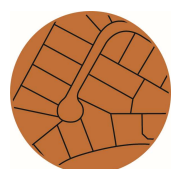
Following discussions with Veolia in February and March 2023, it was advised that the existing wastewater network lacks sufficient capacity for the proposed residential dwellings, requiring further investigation.

A wastewater catchment analysis has been conducted by Envelope Engineering from the newly installed network at Crestview Rise (where HVHLP plan to connect) to the transmission main. Plans and model outputs are attached to this memo and illustrate the current capacity and flows in the catchment's wastewater system for three different scenarios as follows:

- Scenario 1 – Post-Development with updated survey data as of August 2024
- Scenario 2 – Post-Development with updated survey data as of August 2024, assuming 50% blockage of the downstream transmission main
- Scenario 3 – Pre-Development with updated survey data as of August 2024

Due to insufficient as-built information, pipe inverts were surveyed by Envelope, with the exception of WWMH 387377, which is located adjacent to the transmission main. This manhole could not be opened as it is sealed, and Watercare's approval is required to lift/open manhole lids on the transmission main. This approval has been requested but is still awaiting approval; as a result, GIS information has been used.

Our model outputs show that the existing pre-development scenario experiences surcharging during peak wet weather events. The post-development scenario increases flows by a negligible amount and has a minimal impact on the performance of the already overcapacity pipes.



3.0 RECOMMENDATIONS

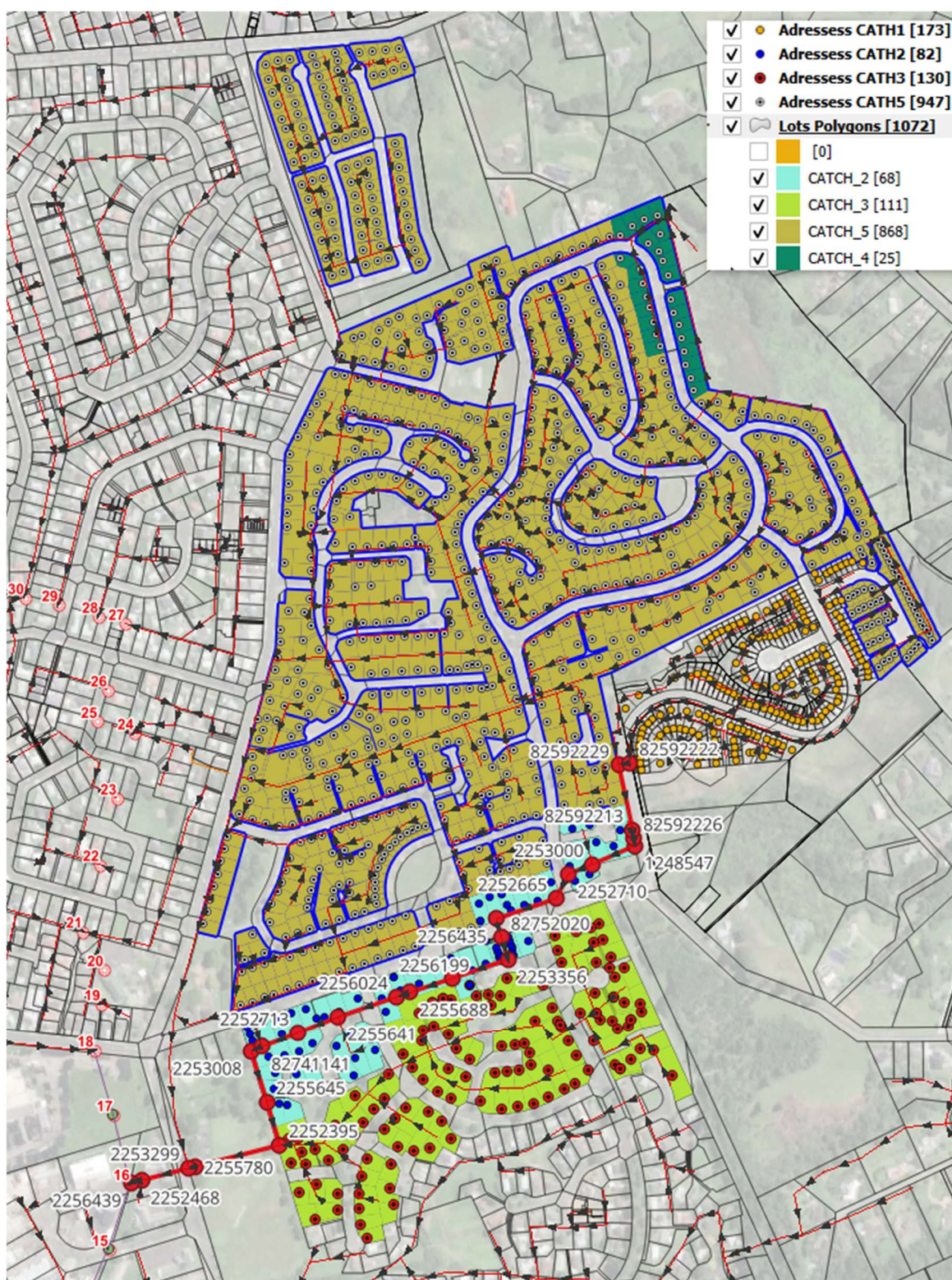
The existing 300mm wastewater main (highlighted in black on the plans below) is undersized in both the pre- and post-development scenarios. We have considered options for flow mitigation, while this would mitigate the effects of the developments, it would not resolve the current surcharging issue, so upgrading the network would benefit both the asset owner (to improve existing performance) and the HVHLP proposal at Crestview Rise. The existing pipe under 159 Dominion Road and pipe bridge, which directly connects to the transmission main, will likely need to be upgraded to a DN450 to address the existing surcharging, or manholes sealed to prevent any potential overflow.

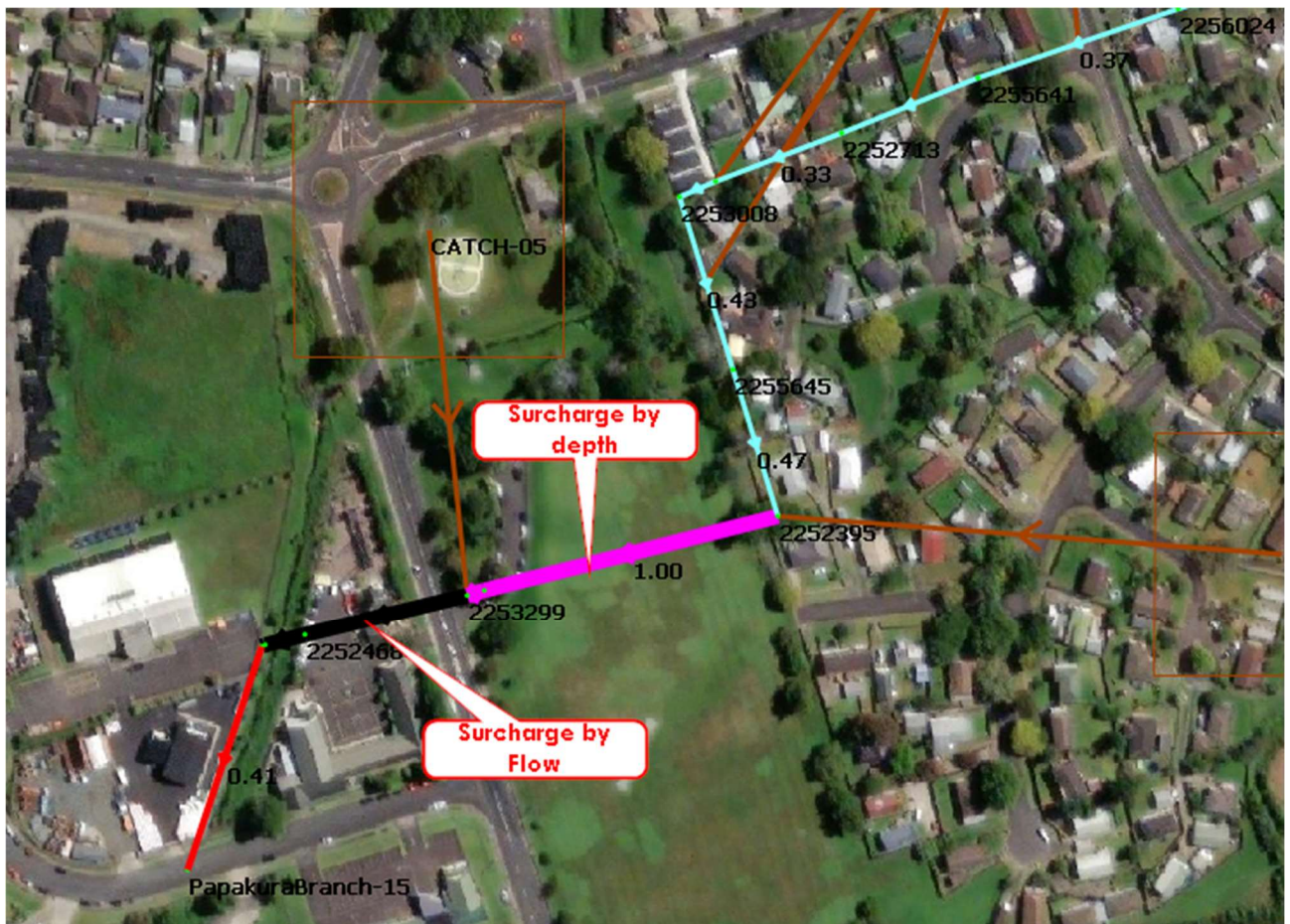
We believe Veolia should contribute to these necessary upgrades, as there would be a benefit to the existing network, providing an improved level of service, and accommodating future growth.

We are requesting a meeting to discuss upgrade options and an agreement regarding responsibility (with Veolia and Watercare as need be), cost apportioning for the works and related manifestation.

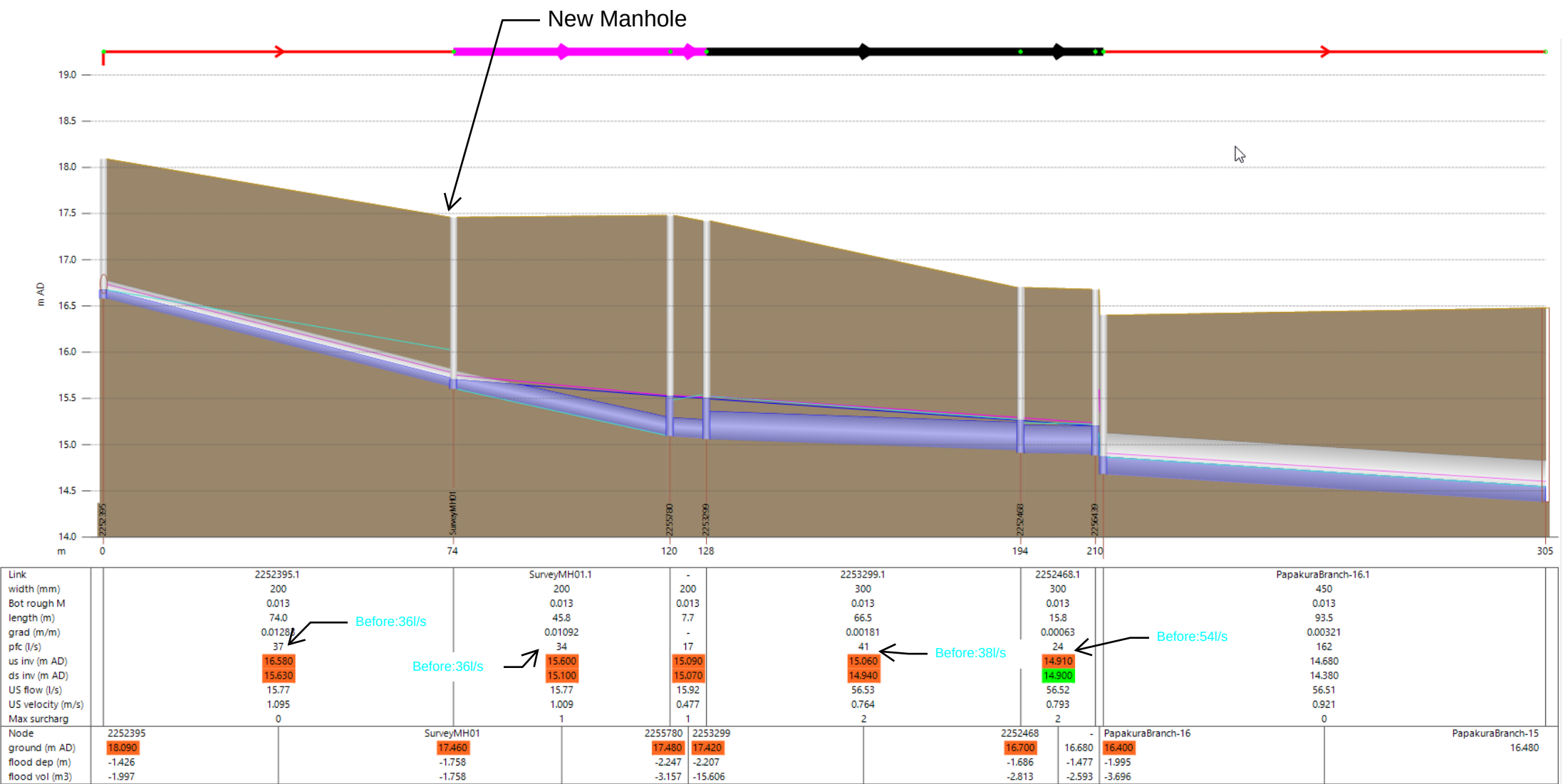


MODEL EXTENT:



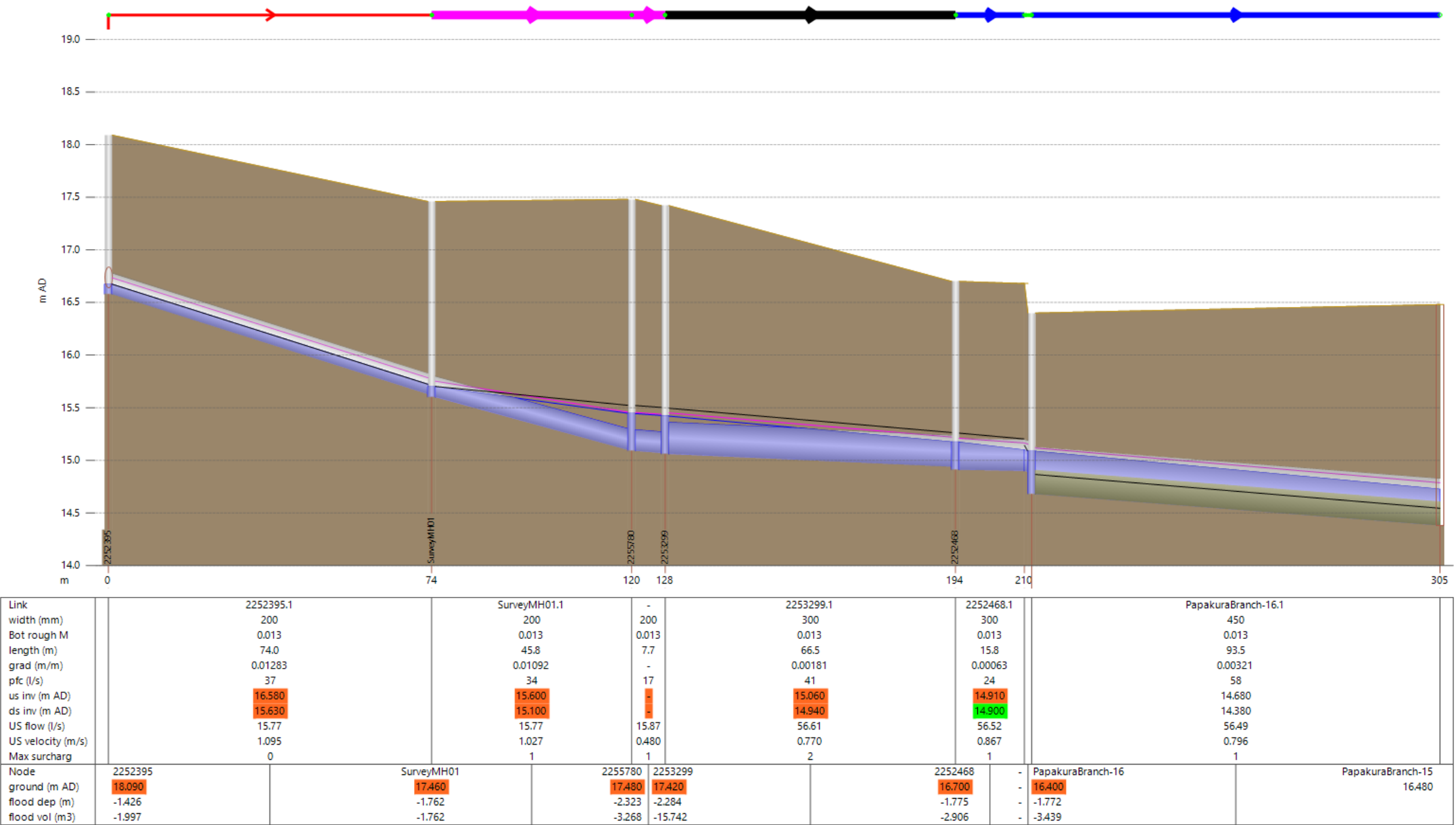


Scenario 01: Just updating with the new survey data (orange values). Comparison previous results (cyan line and text)

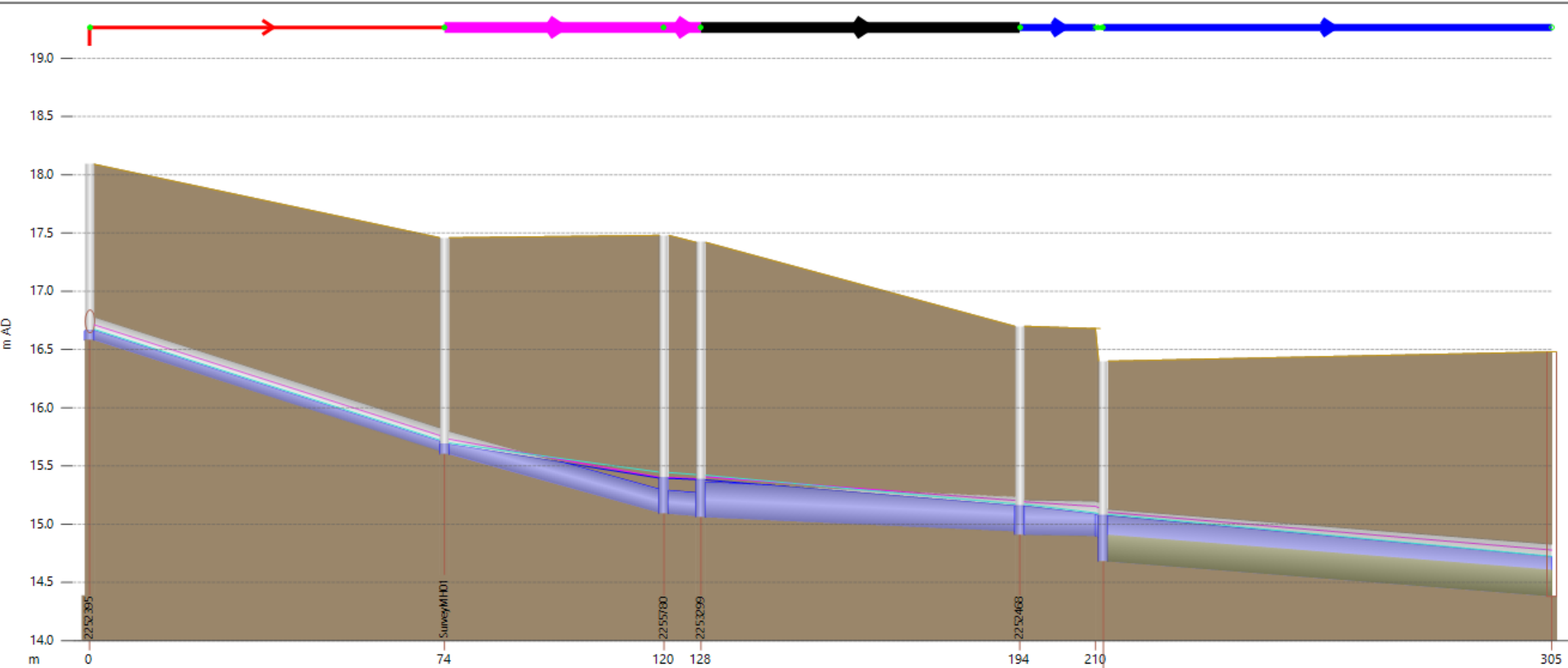


Scenario 02: Scenario 01 (black line) AND adding the following assumptions:

- 50% blockage in the transmission pipe downstream.
- Avoiding `satellite manhole 2256439. Deleting 150mmø pipe.

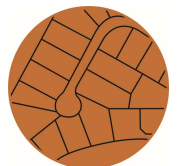


Scenario 03: EXISTING SCENARIO

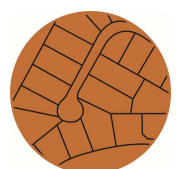


MODEL INFLOWS:

		Discharge To COMPEY Manhole	Critical	Assumed max occupants per unit		WSL WWCOP 5.3.5.1.1	WSL WWCOP 5.3.5.1.1	WSL WWCOP 5.3.5.1.1	Ave Dry Weather Flow	Peak Dry Weather Flow	Peak Wet Weather Flow
			Number of dwellings	People per dwelling	Total Population	ADWF per person, litres/day	PDWF peaking factor	PWWF Peaking factor	Total ADWF, litres/second	Total PDWF, litres/second	Total PWWF, litres/second
CATCH-00	Proposed by Harbour View Heights LP	82592222	90	3	270	180	3	6.7	0.56	1.69	3.77
CATCH-01	Recently developed	82592222	82	3	246	180	3	6.7	0.51	1.54	3.43
CATCH-02	Existing	Along 1248547 and 2255645	82	3	246	180	3	6.7	0.51	1.54	3.43
CATCH-03	Existing	2252395	114	3	342	180	3	6.7	0.71	2.14	4.77
CATCH-05	PS upstream loaded by 25 dwelling	2253299	947	3	2841	180	3	6.7	5.92	17.76	39.66



US node ID	DS node ID	Width (mm)	Length (m)	Gradient (m/m)	Full capacity (l/s)	PDWF		PWWF	
						Max. (L/S)	Max. Surcharge State	Max. (L/S)	Max. Surcharge State
82592222	82592229	150	15.5	0.06471	39	3.22	0.24	7.52	0.34
82592229	82592213	150	90.7	0.05636	36	3.21	0.24	7.51	0.34
82592213	82592226	150	11.8	0.08536	45	3.21	0.22	7.51	0.31
82592226	1248547	150	10	0.19465	67	3.21	0.3	7.51	0.44
1248547	2253000	150	63.8	0.0185	21	3.34	0.3	7.82	0.45
2253000	2252710	150	35.5	0.02337	23	3.41	0.32	7.98	0.48
2252710	2252665	150	36.8	0.01522	19	3.49	0.34	8.16	0.51
2252665	2256435	150	87.2	0.01238	17	3.66	0.4	8.58	0.62
2256435	82752020	180	26.4	0.00493	17	3.71	0.33	8.71	0.53
82752020	2253356	150	30	0.007	13	3.77	0.4	8.85	0.63
2253356	2256199	150	80.9	0.01273	17	3.93	0.35	9.24	0.54
2256199	2255688	150	60.2	0.01396	18	4.05	0.35	9.52	0.54
2255688	2256024	150	19.7	0.04292	32	4.09	0.28	9.62	0.4
2256024	2255641	200	84.2	0.04292	68	4.25	0.25	10.02	0.37
2255641	2252713	200	58.5	0.0135	38	4.37	0.25	10.3	0.37
2252713	82741141	200	53.4	0.02135	48	4.47	0.23	10.55	0.33
82741141	2253008	200	16.1	0.01432	39	4.5	0.25	10.63	0.37
2253008	2255645	200	72.2	0.01455	40	4.64	0.28	10.97	0.43
2255645	2252395	200	61.1	0.00851	30	4.64	0.31	10.97	0.47
2252395	2255780	200	119.8	0.01231	36	6.61	0.45	15.85	1
2255780	2253299	200	7.7	0.01231	36	6.63	0.86	15.91	1
2253299	2252468	300	66.5	0.0015	38	24.01	0.57	56.55	2
2252468	2256439	300	15.8	0.00317	54	24	0.45	56.54	2
2256439	PapakuraBranch-16	150	1.7	0.11895	53	24	0.8	56.54	2
PapakuraBranch-16	PapakuraBranch-15	450	93.5	0.00321	162	23.96	0.26	56.51	0.41



APPENDIX 5
AS-BUILT EXISTING WASTEWATER SURVEY



NOTES

1. LEVELS ARE IN TERMS OF NEW ZEALAND VERTICAL DATUM 2016
ORIGIN OF LEVELS
(EUFCE) PRM IX DP 79174
RL 17.66 m
2. COORDINATES ARE IN TERMS NZ GEODETIC DATUM 2000
MT EDEN CIRCUIT
ORIGIN OF COORDINATES
(C64B) RM 6147 SO 58077
779160.27 mN 417933.95 mE
3. THIS PLAN HAS BEEN CARRIED OUT TO TOPOGRAPHICAL STANDARDS
OF +/-30MM ON HARD STAND AND +/-50MM ON SOFT SURFACES.
ALL LEVELS SHOWN ARE CORRECT AT TIME OF SURVEY. CRITICAL
DIMENSIONS AND LEVELS SHOULD BE VERIFIED.
4. BOUNDARIES SHOWN ON THIS PLAN HAVE BEEN ADOPTED FROM
XML DATA AND HAVE NOT BEEN SURVEYED. A BOUNDARY DEFINITION
SURVEY SHOULD BE CARRIED OUT TO ESTABLISH EXACT BOUNDARY
POSITIONS ON SITE.
5. ALL EASEMENTS, COVENANTS AND OTHER LEGAL INSTRUMENTS
ASSOCIATED WITH THIS SITE MAY NOT BE SHOWN ON THIS PLAN. AN
INVESTIGATION OF THE MOST CURRENT LEGAL RECORDS SHOULD BE
UNDERTAKEN PRIOR TO DESIGN AND CONSTRUCTION COMMENCING.
6. WASTEWATER LIDS HAVE BEEN MEASURED WITH TOTAL STATION AND
LID LEVELS WILL BE WITHIN +/-5MM. ENVELOPE SURVEYING DOES NOT
IN ANY WAY GUARANTEE THE ACCURACY OF ANY UNDERGROUND
SERVICE SHOWN ON THIS PLAN.
7. THESE NOTES ARE AN INTEGRAL PART OF THIS PLAN.
8. THIS PLAN IS ISSUED FOR A SPECIFIC PROJECT AND MAY NOT BE
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WRITTEN CONSENT OF ENVELOPE SURVEYING.
9. INVERT LEVELS MAY DIFFER FROM RECORDS DUE TO FLOW AND
OBSTRUCTIONS IN CHAMBERS. WE WOULD RECOMMEND WATERCARE
UNDERTAKE DEPTH MEASURES TO GAIN A GREATER ACCURACY. WE
ESTIMATE INVERT LEVELS TO BE WITHIN +/-50MM.

**DRAFT PLAN
ONLY**

LEGEND

- WW — WASTEWATER MAIN
⊙ MANHOLE
△ SITE BENCHMARK

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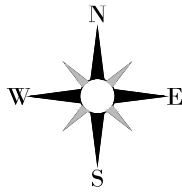
PROJECT:
HARBOUR VIEW HEIGHTS LP
SETTLEMENT ROAD
PAPAKURA

TITLE:

WASTEWATER LINE ASBUILT
(SHEET 1 OF 2)



DESIGNED: AP	DRAWN: AP	
CHECKED: MF	PLOT DATE: 24-09-2024	
SCALE A1: 1:400	SCALE A3: 1:800	
STATUS: FOR INFORMATION		
PROJECT No: 1915-01	DRAWING No: 1915-01-SV	REVISION: A



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DRAFT PLAN
ONLY

LEGEND

- WW — WASTEWATER MAIN
- ⊙ MANHOLE
- Δ SITE BENCHMARK

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PROJECT:

HARBOUR VIEW HEIGHTS LP
SETTLEMENT ROAD
PAPAKURA

TITLE:

WASTEWATER LINE ASBUILT
(SHEET 2 OF 2)



DESIGNED: AP	DRAWN: AP
CHECKED: MF	PLOT DATE: 24-09-2024
SCALE A1: 1:400	SCALE A3: 1:800
STATUS: FOR INFORMATION	
PROJECT No: 1915-01	DRAWING No: 1915-01-SV
	REVISION: A

APPENDIX 6
EXISTING STORMWATER DISCHARGE MEMO

MEMO

SETTLEMENT ROAD

Assessment of existing wingwall outlet

TO	Harbourview Heights LP	DATE	06 December 2023
PROJECT NAME	Settlement Road, Papakura	ENVELOPE REF	1915-01
ATTENTION	Russell Baikie	FROM	Kyle Dirse
EMAIL ADDRESS	russell@rdbconsult.com		

1.0 INTRODUCTION

This memo addresses the existing stormwater wingwall outlet discharging from Crestview Rise. The outlet is currently scouring and eroding the existing banks and riprap apron. Remedial works will be likely be required to prevent further scouring.

2.0 EXISTING DESIGN

This existing wingwall design discharges stormwater from two mega pits located within the Crestview Rise road reserve. This system is designed to convey 100-year flows to flood detention area. The outlet design on Crang Civil (ENG60256101) requires a 12m (L) x 2.5m (W) x 1.2m (D) rip rap apron to slow peak flows and prevent scouring of the surrounding banks and flood detention area.

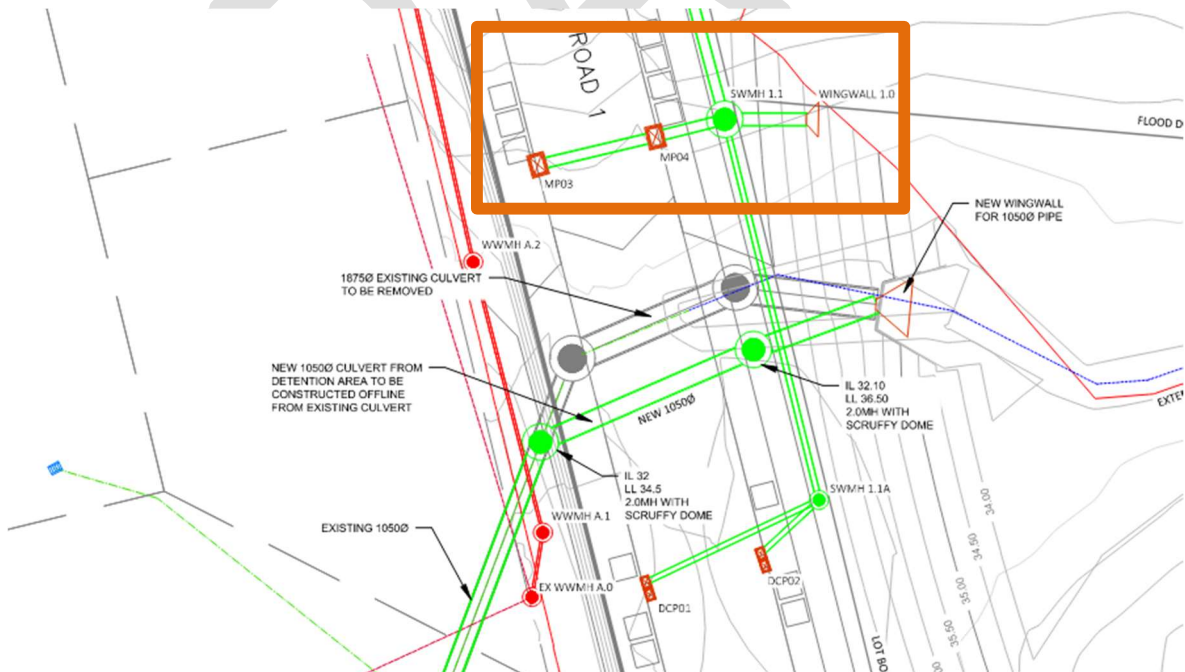
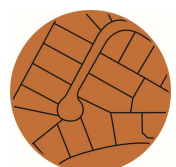
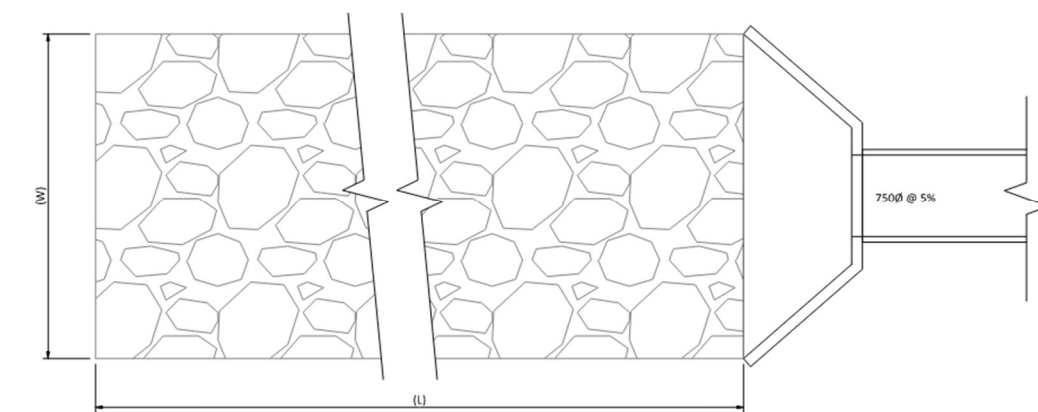


Image 1: Approved Engineering Plans (ENG60256101)





OUTLET DETAIL WINGWALL 1.0	
PIPE DIAMETER	750mm Ø
WINGWALL	750 SERIES
APRON DIMENSION	12.0m(L) x 2.5m(W)
APRON DEPTH	1.2m(D)
RIP RAP SIZE	0.6m

Image 2: Approved Engineering Plans (ENG60256101) – Wingwall and Apron Detail

Using guidance from the Auckland Council Technical Report: Hydraulic Energy Management: Inlet and Outlet Design for Treatment Devices 2013/01, back calculations based on the apron rip rap sizing indicate that high velocity flows (in the order of 7 to 8 m/s) were expected at this outlet structure. Flows at this level can cause significant erosion. For comparison, the typical maximum velocity of water flow that well established grass can accommodate is 1.5 to 2.0m/s.

3.0 ON SITE INVESTIGATIONS

On site investigations demonstrate erosion and scouring of the banks adjacent to the wingwall. An existing bank is located approximately 3m in front of the wingwall, this means that stormwater from the outlet structure must make a 90 degree change of direction to flow into the flood detention area. It has also meant that the designed 12m long rip rap apron was not fully installed. Instead, it appears that only 3-4m of rip rap was installed. In addition, it appears that the size of stone used is smaller than the 600mm size specified on the previous design drawings. Filter cloth has been placed, to control erosion, but the shortened rip rap apron would not have sufficient area to slow flows before hitting and the unprotected (unconcreted) parts of the embankment, therefore causing the observed scour and erosion on the bank and apron. Rip rap aprons that are too short simply move the erosion problem, which is what has occurred here.

This is an unsatisfactory situation and, without remedial measures, erosion and scour will continue to occur. Overtime this main lead to instability of the outlet structure and the embankment.





Image 3: Existing wingwall outlet (28 November 2023)



Image 4: Existing riprap apron (28 November 2023)

4.0 RECOMMENDATIONS

Remedial works should be undertaken to fix the rip rap apron to prevent further erosion of the surrounding embankments. There are two categories of remedial works to consider. Firstly, full construction of the originally designed rip rap apron. Earthworks and vegetation removal will likely be required to achieve the 12m long apron that was designed. It may be possible to modify the geometry of this as well as using more robust forms of riprap installation, such as a reno mattress. However, if the earthworks required to construct this are not feasible, other energy dissipator methods should be considered. Due to the relatively short distance available and high exit velocities it is likely that a SAF type stilling basin would provide an economical alternative method of dissipating energy and preventing stream bed erosion. Some concrete works within the outlet area are required so this has some logistical difficulties as a retrofit option. This option would still need a rip rap apron as a transition back to the natural ground, but this could be much shorter than the current 12m design.

Based on the above, our recommendation is to carry out a detailed assessment of the constructability constraints of the site, including access for machinery and base flow through culvert that might affect stilling basin construction. The primary option should be to implement the original design (or a close variation to it) as this is likely to not require a revision to current approvals.

Within the Crestview Rise plan change, a proposed stormwater attenuation pond north of the current outlet is under consideration. This presents an opportunity to discharge pre-development flows to this location, simultaneously addressing existing erosion issues with the wingwall outlet. This approach would create a single construction element, minimizing disturbance.



APPENDIX 7
VEOLIA CORRESPONDENCE

Kyle Dirse

From: Alan Blyde
Sent: Thursday, 21 November 2024 4:17 pm
To: Russell Baikie; Morar, Sanjeev
Cc: fred@ikonbuilding.co.nz; Kyle Dirse
Subject: RE: Crestview Rise - Wastewater Assessment

Hi Sanjeev

I write to acknowledge a few of the specific details discussed in Tuesdays meeting:

1. The modelling carried out by Veolia (Anne Richomme) confirmed similar results to that provided by Envelope.
2. This indicates that if lines between the transmission manhole GIS ID 19389 to local manhole GIS ID 387371 are upgraded to 450mm dia then this will enable unconstrained capacity for 90 additional units at the development site which is the subject site of the Crestview Rise Plan Change.
3. Veolia has no programme or available funds to carry out any upgrade works on the network and the upgrade described above must be funded by the developer.

On the basis that the Plan Change provisions and our associated Infrastructure Assessment confirms a maximum development yield of 90 HUE's and that the necessary upgrades as described above are undertaken, at the developers cost then you are able to confirm that infrastructure servicing for wastewater and water supply will not be a constraint to enable the proposed Plan Change. As per Russell's email below could you please confirm this to the Council Planner.

Separate matters which were discussed and which we will continue to follow up on include:

1. Could you please inform us of any other development in the catchment that could be required to cost-share the upgrade
2. Could you give further consideration to whether Veolia could undertake the upgrade work on the basis of receiving financial contribution from the developer, and what this arrangement might look like.
3. We will prepare a draft HOA which reflects the above.

Regards

ALAN BLYDE

DIRECTOR

M +64 21 390 304

A James Smith Building - Level 1, 65 Cuba Street

Te Aro, Wellington 6011

 **ENVELOPE**



From: Russell Baikie <russell@rdbconsult.com>
Sent: Thursday, 21 November 2024 9:24 am
To: Morar, Sanjeev <sanjeev.morar@veolia.com>
Cc: Alan Blyde <alan.blyde@envelope-eng.co.nz>; fred@ikonbuilding.co.nz
Subject: RE: Crestview Rise - Wastewater Assessment

Hi Sanjeev, thanks for the meeting on Tuesday; productive.

Kyle Dirse

From: Alan Blyde
Sent: Monday, 18 November 2024 3:29 pm
To: Miguel Hernandez; Kyle Dirse
Subject: FW: Crestview Rise - Wastewater Assessment

fyi

ALAN BLYDE

DIRECTOR

M +64 21 390 304

A James Smith Building - Level 1, 65 Cuba Street
Te Aro, Wellington 6011



From: Morar, Sanjeev <sanjeev.morar@veolia.com>
Sent: Monday, 18 November 2024 3:26 pm
To: Russell Baikie <russell@rdbconsult.com>
Cc: Alan Blyde <alan.blyde@envelope-eng.co.nz>
Subject: Re: Crestview Rise - Wastewater Assessment

Hi Russell,

Please see below wastewater analysis undertaken by our engineer;

Capacity Analysis:

- Scenario 1. Development of 70 DUE
- Scenario 2. Development of 90 DUE
- Scenario 3. Development of 237 DUE
 - Estimated on plan change to Residential - Mixed Housing Suburban Zone
 - Ratio estimation (sqm/HUE) = 230
 - Development Land area = 54513 sqm

Resultats - Scenario 1 & 2:

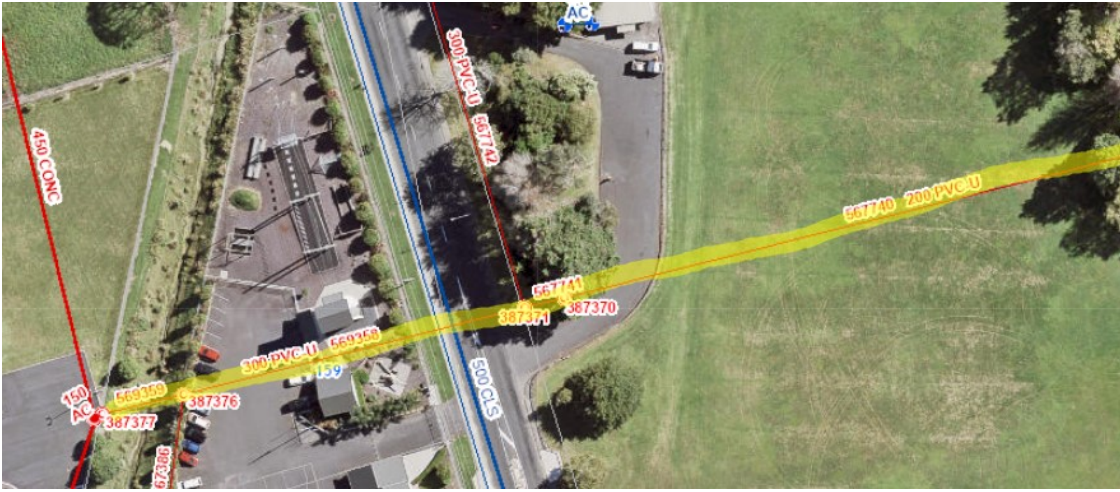
- Capacity constraints detected on asset GIS ID: 569360, and 569358.
- GIS 569360 is the asset connected to the satellite manhole (transmission) - size 150 mm
 - I recommend verifying the size of the pipe.
- Upgrade requirements:
 - **For 70 up to 90 dwellings - Upgrade to 450 mm assets from the transmission manhole ([GIS.ID 19389](#)) to local manhole ([GIS.ID 387371](#)).**



Resultats - Scenario 3

- Capacity constraints detected on
 - From manhole [GIS.ID 386009](#) to transmission MH
 - Asset GIS ID: 567740, 567741, 569358, 569359, 569360.
 - From manhole [GIS.ID 387677](#) to [GIS.ID 384576](#)
 - Asset GIS ID: 566664, 567061, 569931
 - From manhole [GIS.ID 387670](#) to [GIS.ID 387671](#)
 - Asset GIS ID : 566665
- GIS 569360 is the asset connected to the satellite manhole (transmission) - size 150 mm
 - I recommend verifying the size of the pipe.
- Upgrade requirements:
 - **Upgrade to 450 mm assets from the transmission manhole ([GIS.ID 19389](#)) to local manhole ([GIS.ID 387371](#)).**
 - **Upgrade to 300 mm assets from the local manhole ([GIS.ID 387371](#)). to the local manhole ([GIS.ID 386009](#)).**
 - **Upgrade to 200 mm assets from the local manhole ([GIS.ID 384576](#)). to the local manhole ([GIS.ID 387670](#)).**

Screenshot shows assets from the transmission manhole ([GIS.ID 19389](#)) to local manhole ([GIS.ID 386009](#)).



Screenshot shows assets from local manhole ([GIS.ID 384576](#)). to the local manhole ([GIS.ID 387670](#)).



The outcome aligns with what your engineers have identified also.

Regards,

Sanjeev Morar
Developments Manager
Veolia Australia and New Zealand

mob. : +64 27 547 2653/ tel. : +64 9 295 0515
Address PO Box 72243, Papakura, Auckland, New Zealand
www.veolia.com/anz



On Fri, 15 Nov 2024 at 17:45, Russell Baikie <russell@rdbconsult.com> wrote:

Hi Sanjeev, are you able to share and forward to us in advance of the meeting on Tuesday, your respective assessments please?

Thanks

Regards

Russell Baikie

rdbconsult

From: Morar, Sanjeev <sanjeev.morar@veolia.com>
Sent: Wednesday, 13 November 2024 11:23 am
To: Russell Baikie <russell@rdbconsult.com>
Cc: fred@ikonbuilding.co.nz; Alan Blyde <alan.blyde@envelope-eng.co.nz>
Subject: Re: Crestview Rise - Wastewater Assessment

Hi Russell,

As discussed this morning, please see below proposed meeting times;

Friday 15 November (online, no network modeller)- 11.30am

Tuesday 19 November (in person or online) - 11-12.30pm

Thursday 21 November (in person or online) 10-1pm

Please advise your preference.

Regards,

Sanjeev Morar
Developments Manager
Veolia Australia and New Zealand

mob. : +64 27 547 2653/ tel. : +64 9 295 0515
Address PO Box 72243, Papakura, Auckland, New Zealand
www.veolia.com/anz



On Mon, 11 Nov 2024 at 12:47, Russell Baikie <russell@rdbconsult.com> wrote:

Hi Sanjeev, I would welcome a meaningful update please including the results of your wastewater assessment.

You have provided earlier acceptance in principle for upto 90 DUE for water so can't comprehend why this needs to be revisited.

Thanks

Regards

Russell Baikie

rdbconsult

Ph 0274 612315

From: Russell Baikie

Sent: Friday, 8 November 2024 2:58 pm

To: Morar, Sanjeev <sanjeev.morar@veolia.com>

Cc: fred@ikonbuilding.co.nz; Alan Blyde <alan.blyde@envelope-eng.co.nz>

Subject: RE: Crestview Rise - Wastewater Assessment

Thanks Sanjeev.

I thought water had been done previously based on earlier discussions and agreement by you.

Look forward to seeing the results and to confirm a meeting as need be.

Regards

Russell Baikie

rdbconsult

Ph 0274 612315

From: Morar, Sanjeev <sanjeev.morar@veolia.com>

Sent: Friday, 8 November 2024 2:35 pm

To: Russell Baikie <russell@rdbconsult.com>

Subject: Re: Crestview Rise - Wastewater Assessment

Hi Russell,

Wastewater modelling is now complete. We just have water to do now, which will be done early next week, with an aim to meet on Thursday (TBC pending completion).

Regards,

Sanjeev Morar
Developments Manager
Veolia Australia and New Zealand

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Address PO Box 72243, Papakura, Auckland, New Zealand
www.veolia.com/anz



On Thu, 7 Nov 2024 at 15:50, Russell Baikie <russell@rdbconsult.com> wrote:

Hi Sanjeev, please advise progress on Veolia assessment.

Thanks

Regards

Russell Baikie

rdbconsult

From: Russell Baikie <russell@rdbconsult.com>
Sent: Sunday, 3 November 2024 5:32 pm
To: sanjeev.morar@veolia.com
Subject: Fw: Crestview Rise - Wastewater Assessment

Hi Sanjeev; proof of payment from Harbour View Heights.

Look forward to seeing the results of your assessment.

Regards

Russell

rdbconsult

Get [Outlook for iOS](#)

From: Fred Lin <fred@ikonbuilding.co.nz>
Sent: Friday, November 1, 2024 11:03:16 PM
To: Russell Baikie <russell@rdbconsult.com>
Subject: Re: Crestview Rise - Wastewater Assessment

Best Regards,

Fred

在 2024年11月1日, 上午11:47, Russell Baikie <russell@rdbconsult.com> 写道 :

Hi Fred; can you arrange for payment please and inform Veolia once transaction goes through?

Thanks

Regards

Russell

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From: Morar, Sanjeev <sanjeev.morar@veolia.com>
Sent: Friday, November 1, 2024 11:43:26 AM
To: Russell Baikie <russell@rdbconsult.com>
Cc: Alan Blyde <alan.blyde@envelope-eng.co.nz>; Kyle Dirse <kyle.dirse@envelope-eng.co.nz>; Brad Laughton <brad.laughton@veolia.com>; fred@ikonbuilding.co.nz <fred@ikonbuilding.co.nz>
Subject: Re: Crestview Rise - Wastewater Assessment

Hi Russell,

Please find the requested invoice attached. Please advise once payment is complete.

Regards,

**Sanjeev
Morar**
*Developments
Manager*
Veolia
Australia and New Zealand

mob.
: +64 27 547 2653/ tel. : +64 9 295 0515
Address
PO Box 72243, Papakura, Auckland, New Zealand
www.veolia.com/anz



On Thu, 31 Oct 2024 at 10:06, Morar, Sanjeev <sanjeev.morar@veolia.com> wrote:

Hi Russell,

Once we have completed the assessment, I will make contact and we can schedule a meeting.

Regards,

Sanjeev Morar
Developments Manager
Veolia Australia and New Zealand

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Address PO Box 72243, Papakura, Auckland, New Zealand
www.veolia.com/anz



On Thu, 31 Oct 2024 at 10:04, Russell Baikie <russell@rdbconsult.com> wrote:

Hi Sanjeev, thanks for taking my call yesterday and explaining matters.

I would appreciate if you can arrange a meeting date and time from mid next week (some options) for discussion of the findings from Veolia's assessment to be established please.

Thanks

Regards

Russell Baikie

rdbconsult

ph 0274 612315

From: Russell Baikie <russell@rdbconsult.com>

Sent: Tuesday, 29 October 2024 2:30 pm

To: Morar, Sanjeev <sanjeev.morar@veolia.com>; Alan Blyde <alan.blyde@envelope-eng.co.nz>

Cc: Kyle Dirse <kyle.dirse@envelope-eng.co.nz>; Brad Laughton <brad.laughton@veolia.com>; fred@ikonbuilding.co.nz

Subject: Re: Crestview Rise - Wastewater Assessment

Hi Sanjeev; on behalf of Harbour View Heights LP we accept your estimate and please proceed with your investigation and assessment forthwith. Could you please send your invoice to myself (email) and advise a timeframe to complete the work.

Thanks

Regards

Russell Baikie

Project Director

rdbconsult

Get [Outlook for iOS](#)

From: Morar, Sanjeev <sanjeev.morar@veolia.com>
Sent: Tuesday, October 29, 2024 2:18:35 PM
To: Alan Blyde <alan.blyde@envelope-eng.co.nz>
Cc: Russell Baikie <russell@rdbconsult.com>; Kyle Dirse <kyle.dirse@envelope-eng.co.nz>; Brad Laughton <brad.laughton@veolia.com>; fred@ikonbuilding.co.nz>
Subject: Re: Crestview Rise - Wastewater Assessment

Hi Alan,

An approximate cost is as follows;

Undertake public network analysis:

- 6hrs

Time charged to date

- 3hrs

Proposed meeting

- 2hrs (2 staff)

Total - 10hrs

Please also see below a link to our relevant charges;

<https://www.anz.veolia.com/sites/g/files/dvc2011/files/document/2024/06/Veolia%20Other%20Charges%202024-25%20%281%29.pdf>

Please let me know how you would like to proceed and I will raise an invoice accordingly.

Regards,

Sanjeev Morar
Developments Manager
Veolia Australia and New Zealand

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Address PO Box 72243, Papakura, Auckland, New Zealand
www.veolia.com/anz



On Fri, 25 Oct 2024 at 15:42, Alan Blyde <alan.blyde@envelope-eng.co.nz> wrote:

Hi Sanjeev

Just wondering if you could give us an indication of budget for the detailed analysis of upgrade requirements. We will then be able to provide acceptance to proceed, from our client.

Regards

ALAN BLYDE

DIRECTOR

M +64 21 390 304

A James Smith Building - Level 1, 65 Cuba Street
Te Aro, Wellington 6011

From: Alan Blyde
Sent: Tuesday, 22 October 2024 2:14 pm
To: Morar, Sanjeev <sanjeev.morar@veolia.com>
Cc: russell@rdbconsult.com; Kyle Dirse <kyle.dirse@envelope-eng.co.nz>; Brad Laughton <brad.laughton@veolia.com>; fred@ikonbuilding.co.nz
Subject: RE: Crestview Rise - Wastewater Assessment

Hi Sanjeev,

Thank you for your email. We think a detailed analysis of the upgrade requirements would be beneficial. Prior to commencing with that, could you please give an indication of budget so that we can get approval from our client for the detailed analysis to proceed.

The clients billing details are:

Harbour View Heights LP; PO Box 106 282 Harbour View Heights Auckland.

I will separately send through all current engineering information which has been updated through the course of working through RFI's for the Plan Change. This will be an updated Infrastructure Report and Civil Drainage and Water Supply plans and calculations.

I will also call just to discuss the specific as-built survey of the network we have recently obtained as well the network model we have purpose built to see if there is benefit to Veolia in receiving and reviewing this.

With regard to the question around DUE's to allow for, we think it is best to allow for 90 units. It is difficult to pin down the future development yield as we are currently only at Plan Change stage, but we believe that 90 units is reasonable, particularly on the basis that you have already confirmed that the water supply network can cater for 90.

Thanks and regards

ALAN BLYDE

DIRECTOR

M +64 21 390 304

A James Smith Building - Level 1, 65 Cuba Street
Te Aro, Wellington 6011

From: Morar, Sanjeev <sanjeev.morar@veolia.com>
Sent: Monday, 21 October 2024 4:10 pm
To: Alan Blyde <alan.blyde@envelope-eng.co.nz>
Cc: russell@rdbconsult.com; Kyle Dirse <kyle.dirse@envelope-eng.co.nz>; Brad Laughton <brad.laughton@veolia.com>
Subject: Re: Crestview Rise - Wastewater Assessment

Hi Alan,

Good speaking with you on Friday.

As indicated in your report, upgrades identified are likely to be required, should you wish to proceed with the proposed plan change/development. Typically, specific upgrades are detailed once engineering drawings are received and a Resource Consent is issued. As advised, upgrades are the FULL responsibility of the Developer.

If you would like us to undertake a detailed analysis to specify upgrades as at the date of assessment, please advise. Note: Network assessments are valid for 12 months only. Russell has also indicated a proposed reduced DUE. Please confirm prior to assessment. Please also send through invoicing details for this work.

Regards,

Sanjeev Morar
Developments Manager
Veolia Australia and New Zealand

Address PO Box 72243, Papakura, Auckland, New Zealand
www.veolia.com/anz



On Fri, 18 Oct 2024 at 17:02, Alan Blyde <alan.blyde@envelope-eng.co.nz> wrote:

Hi Sanjeev

Further to our discussion earlier today, you have declined our request to meet and have directed me to your email of 11th October 2024 (included below).

Although you have stated there's nothing further to discuss, I request that you review the latest memo we supplied on 17th October 2024. At the very least, there are matters to be agreed including the form/ scope and specification of any potential upgrade to the wastewater network. Also the consenting and approval process for this. This specific detail must be identified and agreed, to aid decision-making for the Proposed Plan Change associated with our client's site. For this we require your specific input and advice.

As you have advised we will discuss the issues of cost-sharing and IGC credits at our meeting on Monday with Watercare. As our memo outlines, the proposed Plan Change area/ development comprises under 6% of the total catchment which will benefit from any upgrade of the existing public network.

I ask that you review our latest memo and consider a meeting following that.

Thank you for your consideration.

Regards

ALAN BLYDE

DIRECTOR

M +64 21 390 304

A James Smith Building - Level 1, 65 Cuba Street
Te Aro, Wellington 6011

From: Alan Blyde
Sent: Thursday, 17 October 2024 12:20 pm
To: Morar, Sanjeev <sanjeev.morar@veolia.com>; anna.jennings@water.co.nz
Cc: russell@rdbconsult.com; Kyle Dirse <kyle.dirse@envelope-eng.co.nz>
Subject: RE: Crestview Rise - Wastewater Assessment

Hi Sanjeev and Anna

In advance of meeting up, we attach a further Memo for discussion on the wastewater capacity matters.

@Sanjeev we have arranged a meeting with Anna at Watercare which is scheduled for Monday 21st October at 2.00pm. Can you make that time so we can have a collective discussion? If not, please confirm when you are available to meet with us separately.

Thanks and regards

ALAN BLYDE

DIRECTOR

M +64 21 390 304

A James Smith Building - Level 1, 65 Cuba Street
Te Aro, Wellington 6011

—

—

From: Alan Blyde

Sent: Wednesday, 16 October 2024 4:35 pm

To: Morar, Sanjeev <sanjeev.morar@veolia.com>; Kyle Dirse <kyle.dirse@envelope-eng.co.nz>

Cc: russell@rdbconsult.com; anna.jennings@water.co.nz

Subject: RE: Crestview Rise - Wastewater Assessment

Hi Sanjeev

As previously requested by Kyle, we would like to meet with you to further discuss our memo and findings on the wastewater issues pertaining to the site.

Could you please confirm some times you are available? We are keen for this to happen urgently please to enable work in regard to the Proposed Plan Change to continue.

Regards

ALAN BLYDE

DIRECTOR

M +64 21 390 304

A James Smith Building - Level 1, 65 Cuba Street
Te Aro, Wellington 6011

From: Morar, Sanjeev <sanjeev.morar@veolia.com>
Sent: Friday, 11 October 2024 12:23 pm
To: Kyle Dirse <kyle.dirse@envelope-eng.co.nz>
Cc: Alan Blyde <alan.blyde@envelope-eng.co.nz>; russell@rdbconsult.com;
anna.jennings@water.co.nz
Subject: Re: Crestview Rise - Wastewater Assessment

You don't often get email from sanjeev.morar@veolia.com. [Learn why this is important](#)

Hi Kyle,

Thanks for reaching out.

We have reviewed your memorandum and make the following comments.

The original development by HVH identified significant issues with water capacity. Wastewater capacity was also assessed and at the time, was determined as being borderline adequate.

Given that the existing infrastructure is unable to support the proposed additional demand, upgrades will be required should your development progress. While theoretical data is used for network design, levels of service to our customers are also used to determine when an upgrade should be undertaken. The existing catchment levels of service are currently adequate. This is unlikely to be the case should additional demand be introduced. Any additional capacity required would be the responsibility of those who require it.

Regards,

Sanjeev Morar
Developments Manager
Veolia Australia and New Zealand

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Address PO Box 72243, Papakura, Auckland, New Zealand
www.veolia.com/anz



On Tue, 1 Oct 2024 at 13:54, Kyle Dirse <kyle.dirse@envelope-eng.co.nz> wrote:

Hi Sanjeev,

We are reaching out regarding the proposed plan change for Settlement Road.

We believe a discussion involving all parties is necessary to address the wastewater upgrades.

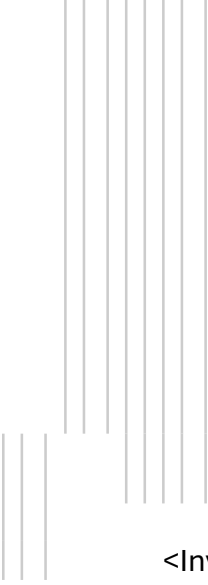
Attached is a wastewater assessment memo to inform the discussion.

Please let me know a suitable date and time for a meeting. We are keen to meet as soon as possible.

We also invite Watercare to participate, given the proximity of the transmission main. Anna – if this sits outside of your team, please direct to the appropriate person.

Regards,

KYLE DIRSE



DIRECTOR - CIVIL / SENIOR CIVIL ENGINEER

M +64 27 228 1287

A 26A Tawa Street
Mount Maunganui 3116

—

—

<Invoice 3000033333 - Crestview Rise Plan Change.pdf>

Kyle Dirse

From: Russell Baikie <russell@rdbconsult.com>
Sent: Wednesday, 22 November 2023 10:44 pm
To: Kyle Dirse
Subject: FW: Water Supply Capacity

Hi Kyle, confirmation from Veolia as per below. Regards
Russell
rdbconsult

From: Russell Baikie <russell.baikie1@gmail.com>
Sent: Thursday, August 17, 2023 8:19 AM
To: Laurent Marechal <laurent.marechal@envelope-eng.co.nz>
Cc: Russell Baikie <russell@rdbconsult.com>
Subject: Fwd: Water Supply Capacity

Hi Laurent we now have Veolia response.
There are some geotechnical challenges which we will hear about next week- unsure whether that will affect lot design at this stage.
Regards
Russell

Sent from my iPhone

Begin forwarded message:

From: Craig Johnson <craig@projectconsultants.co.nz>
Date: 16 August 2023 at 8:06:25 PM NZST
To: "Morar, Sanjeev" <sanjeev.morar@veolia.com>
Cc: russell.baikie1@gmail.com, "Fred.Ikonbuilding" <fred@ikonbuilding.co.nz>
Subject: RE: FW: Water Supply Capacity

Hi Sanjeev,

Thanks for getting this confirmation through.

We will, our end put together a more formalised document even though We understand that your letter is as good as gospel.

Thanks again for the closure.

Craig JOHNSON
PROJECT DIRECTOR
PCL NZ Limited
0274 923464

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From: Morar, Sanjeev <sanjeev.morar@veolia.com>
Sent: Wednesday, August 16, 2023 7:55 PM
To: Craig Johnson <craig@projectconsultants.co.nz>
Cc: russell.baikie1@gmail.com; Fred.Ikonbuilding <fred@ikonbuilding.co.nz>
Subject: Re: FW: Water Supply Capacity

Hi Craig,

Thanks for your patience on this.

I can confirm that we are able to provide water services for the 90 DUE proposed.

Note: Downstream wastewater networks will require some upgrades.

Regards,

Sanjeev Morar | Developments Manager | Veolia New Zealand

A: Veolia | PO Box 72243, Papakura, Auckland 2244

Tel: (09) 295 0515 | DDI: (09) 295 1467 | M: 027 5472 653 | E: Sanjeev.Morar@veolia.com



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On Mon, 14 Aug 2023 at 09:31, Craig Johnson <craig@projectconsultants.co.nz> wrote:

Hi Sanjeev,

Thanks for the call this morning with the confirmations required to proceed with the application.

As discussed if you could come back formally today we would like to formalise in a HOA or other to reserve to required capacity as we have no bearing as to how long the application process will take with Auckland Council.

Thanks in advance.

Craig JOHNSON

PROJECT DIRECTOR

PCL NZ Limited

0274 923464

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From: Morar, Sanjeev <sanjeev.morar@veolia.com>
Sent: Thursday, August 10, 2023 7:45 PM
To: Craig Johnson <craig@projectconsultants.co.nz>
Cc: russell.baikie1@gmail.com; Fred.Ikonbuilding <fred@ikonbuilding.co.nz>
Subject: Re: FW: Water Supply Capacity

Hi Craig,

Good speaking with you today.

As discussed, the meeting has unfortunately been pushed back to 10.30am 11/8/23. I will call you with an update following the meeting.

Regards,

Sanjeev Morar | Developments Manager | Veolia New Zealand

A: Veolia | PO Box 72243, Papakura, Auckland 2244

Tel: (09) 295 0515 | DDI: (09) 295 1467 | M: 027 5472 653 | E: Sanjeev.Morar@veolia.com



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On Wed, 9 Aug 2023 at 21:29, Craig Johnson <craig@projectconsultants.co.nz> wrote:

Sanjeev,

I understand that you were on a training course today, however I can reasonably assume that the internal meeting took place in your absence.

As we have been illuding to , we are needing Veolia's responses and an agreement in principle to continue with a meaningful application for the plan change.

Please provide this as discuss now a number of times.

Thanks again in advance.

Craig JOHNSON

PROJECT DIRECTOR

PCL NZ Limited

0274 923464

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From: Morar, Sanjeev <sanjeev.morar@veolia.com>
Sent: Tuesday, August 8, 2023 7:52 PM
To: russell.baikie1@gmail.com
Cc: Craig Johnson <craig@projectconsultants.co.nz>
Subject: Re: FW: Water Supply Capacity

Hi Russell,

The Operations Manager has organised another meeting for internal discussion tomorrow. I will not be in attendance as I will be on a training course, however, I will push him for an outcome following. Apologies for the delay on this, I hope to have a favourable outcome for you shortly.

Regards,

Sanjeev Morar | Developments Manager | Veolia New Zealand

A: Veolia | PO Box 72243, Papakura, Auckland 2244

Tel: (09) 295 0515 | DDI: (09) 295 1467 | M: 027 5472 653 | E: Sanjeev.Morar@veolia.com



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On Mon, 7 Aug 2023 at 11:22, <russell.baikie1@gmail.com> wrote:

Hi Sanjeev; how soon is Veolia able to advise a response on this matter please?

The information is critical in the preparation of our plan change application and is being held up by Veolia.

Unless you need more information from us or other parties?

Would welcome effective communication on this please towards ultimately working up a development agreement between the parties.

Thanks

Regards

Russell Baikie

Project Director/Planner

rdbconsult

Ph 0274 612315

Sent from [Mail](#) for Windows

From: [Craig Johnson](#)

Sent: Tuesday, 1 August 2023 10:49 am

To: russell.baikie1@gmail.com

Subject: Fwd: Water Supply Capacity

Kind Regards,

Craig Johnson

Director

PCL Nz Limited

From: Craig Johnson <craig@projectconsultants.co.nz>
Sent: Tuesday, August 1, 2023 7:52:25 AM
To: Morar, Sanjeev <sanjeev.morar@veolia.com>
Cc: fred@ikonbuilding.co.nz <fred@ikonbuilding.co.nz>
Subject: Re: Water Supply Capacity

Hi Sanjeev ,

Please provide a response to this email. Time has dragged on and we are looking to progress our application.

A response would be appreciated

Kind Regards,

Craig Johnson

Director

PCL Nz Limited

From: Morar, Sanjeev <sanjeev.morar@veolia.com>
Sent: Friday, June 16, 2023 4:03:32 PM
To: Craig Johnson <craig@projectconsultants.co.nz>
Cc: fred@ikonbuilding.co.nz <fred@ikonbuilding.co.nz>
Subject: Re: Water Supply Capacity

Hi Craig,

Thanks for your email. I have requested our SCADA team to investigate your request as well as the existing operating levels and fill times. I will be in contact with you shortly.

Regards,

Sanjeev

Sanjeev Morar | Developments Manager | Veolia New Zealand

A: Veolia | PO Box 72243, Papakura, Auckland 2244

Tel: (09) 295 0515 | DDI: (09) 295 1467 | M: 027 5472 653 | E: Sanjeev.Morar@veolia.com



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On Thu, 25 May 2023 at 08:42, Craig Johnson <craig@projectconsultants.co.nz> wrote:

Good Afternoon Sanjeev,

Further to your email dated May 18th 2023, the development team have reviewed your confirmation of capacity for 65DUE's and have prepared the attached memorandum for your consideration in the view of having either a face to face meeting or at a minimum a meeting on-line to explore options towards a potentially higher yield.

We have reviewed the calculations, capacity and economics for a total of 90 DUE's for the ongoing subdivisions of the allotments at Crestview Rise.

As this request comes with a dual commitment from both Veolia and Watercare, we anticipate and request that Mark Iszard and Suzie Clarke would also be in attendance.

If you could review the attached and confirm a suitable time to meet as soon as possible, either in your offices in Papakura or online.

In the event that the above is agreeable, we would welcome the option to formalise our discussion in an agreement as a simple Heads of Agreement confirming reservation of the required capacity for the agreed DUE's.

Thanks in advance.

Craig JOHNSON

PROJECT DIRECTOR

PCL NZ Limited

0274 923464

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From: Morar, Sanjeev <sanjeev.morar@veolia.com>
Sent: Friday, May 19, 2023 3:54 PM
To: Hamish McLean <Hamish.McLean@envelope-eng.co.nz>
Cc: Jimmy Zhuang <jimmy@urbanformdesign.co.nz>; Craig Johnson <craig@projectconsultants.co.nz>; Laurent Marechal <laurent.marechal@envelope-eng.co.nz>; fred@ikonbuilding.co.nz; russell@rdbconsult.com
Subject: Re: Water Supply Capacity

Hi Hamish,

Thanks for your email.

You have correctly identified the volumetric demand used to calculate Infrastructure Growth Charges. A volume of 220kL/year is used as a baseline demand figure. This figure is used for the calculation of IGC's, as per your posted link.

When undertaking network design, the Watercare Code of Practice for Land Development and Subdivision is prescribed. As per the CoP, water demand is specified as 220L/p/day, with an occupancy of 3 people/dwelling, resulting in 660L/dwelling/day.

The term "DUE" is often used interchangeably for simplification, however, I will clarify to advise that the remaining available capacity is 43m3 (as previously advised), equal to 65 'standard' residential allotments, in accordance with the WSL CoP.

I trust this clarifies your query.

Regards,

Sanjeev Morar | **Developments Manager** | **Veolia New Zealand**

A: Veolia | PO Box 72243, Papakura, Auckland 2244

Tel: (09) 295 0515 | DDI: (09) 295 1467 | M: 027 5472 653 | E: Sanjeev.Morar@veolia.com



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On Fri, 19 May 2023 at 14:59, Hamish McLean <Hamish.McLean@envelope-eng.co.nz> wrote:

Hi all,

Attached is the memo for the updated water supply capacity calculations.

Please note, we have found on the Watercare website that the water supply demand for 1 DUE is 220 kilolitres, which results in 603 litres per day.

[Watercare - Infrastructure Growth Charge \(IGC\)](#)

Thanks,

HAMISH MCLEAN

CIVIL ENGINEER

M +64 21 664 685

A 31B Drake Street (inside Victoria Park Market)
Auckland Central 1010

 **ENVELOPE**

