



ENVELOPE ENGINEERING
LAND
STRUCTURE
MANAGE

INFRASTRUCTURE ASSESSMENT

Matai Moana

Released under the provision of
the Official Information Act 1982

DOCUMENT CONTROL RECORD

CLIENT	Taranaki Whānui Limited
PROJECT	Mata Moana
PROJECT NO.	1501-01
DOCUMENT TYPE	R001-v1-1501-01 Mata Moana Infrastructure Assessment
DATE ISSUED	16 December 2022
ADDRESS FOR SERVICE	Envelope Engineer Limited Level 1 68 Dixon Street Te Aro Wellington 6022
CONTACT	Louise Ireland s 9(2)(a) s 9(2)(a)

ISSUE AND REVISION RECORD

DATE OF ISSUE	16 December 2022
STATUS	or Fast Track Referral
ORIGINATOR	 Louise Ireland – Civil Engineer
REVIEWED	 Andrew Jackson – Director
APPROVED FOR ISSUE	 Alan Blyde – Director



CONTENTS

1.0	INTRODUCTION	1
2.0	PROPOSED DEVELOPMENT.....	1
3.0	EARTHWORKS.....	2
3.1	EROSION AND SEDIMENT CONTROL	2
3.2	EARTHWORKS APPROACH	3
4.0	STORMWATER	3
4.1	EXISTING INFRASTRUCTURE	3
4.2	FLOOD HAZARD	3
4.3	PROPOSED INFRASTRUCTURE	3
5.0	WASTEWATER.....	4
5.1	EXISTING INFRASTRUCTURE	4
5.2	PROPOSED INFRASTRUCTURE	5
6.0	POTABLE WATER	6
6.1	EXISTING INFRASTRUCTURE	6
6.2	PROPOSED INFRASTRUCTURE	6
7.0	UTILITIES.....	7
8.0	SUMMARY	8

APPENDICES

APPENDIX 1 CONCEPT ENGINEERING DRAWINGS



1.0 INTRODUCTION

This report has been prepared to provide an overview of the existing infrastructure surrounding the Mata Moana site and on the potential for this infrastructure to service the proposed development.

This report has been to support an application to the Minister for the Environment for referral into the Covid-19 Fast-Track consent process. It is understood that the referral application must include details relating to the proposed servicing of the development and confirmation whether any on-site or off-site upgrades or additional infrastructure may be required to service the development. This Assessment seeks to satisfy these requirements.

2.0 PROPOSED DEVELOPMENT

It is proposed to develop Mata Moana (Mount Crawford) into a comprehensive development. This will consist of:

- Approximately 650-700 residential sections and units including standalone houses, townhouses and apartments.
- Associated amenities including café, early learning centre, superette, cultural/community centre, shared community gardens and cable car.

To date several activities have been carried out to determine appropriate development concepts for the site. Assessments were then undertaken by experts from several disciplines against these concepts. A brief summary of these activities is listed below:

- Numerous site visits have been carried out by Envelope staff, other consultants and key stakeholders.
- Discussion with Wellington Water on aspects of servicing the site, review of the technical reports and review of previous correspondence and technical reports on past proposals for development at the site.
- Meetings with mana whenua.
- Meetings with key stakeholders.



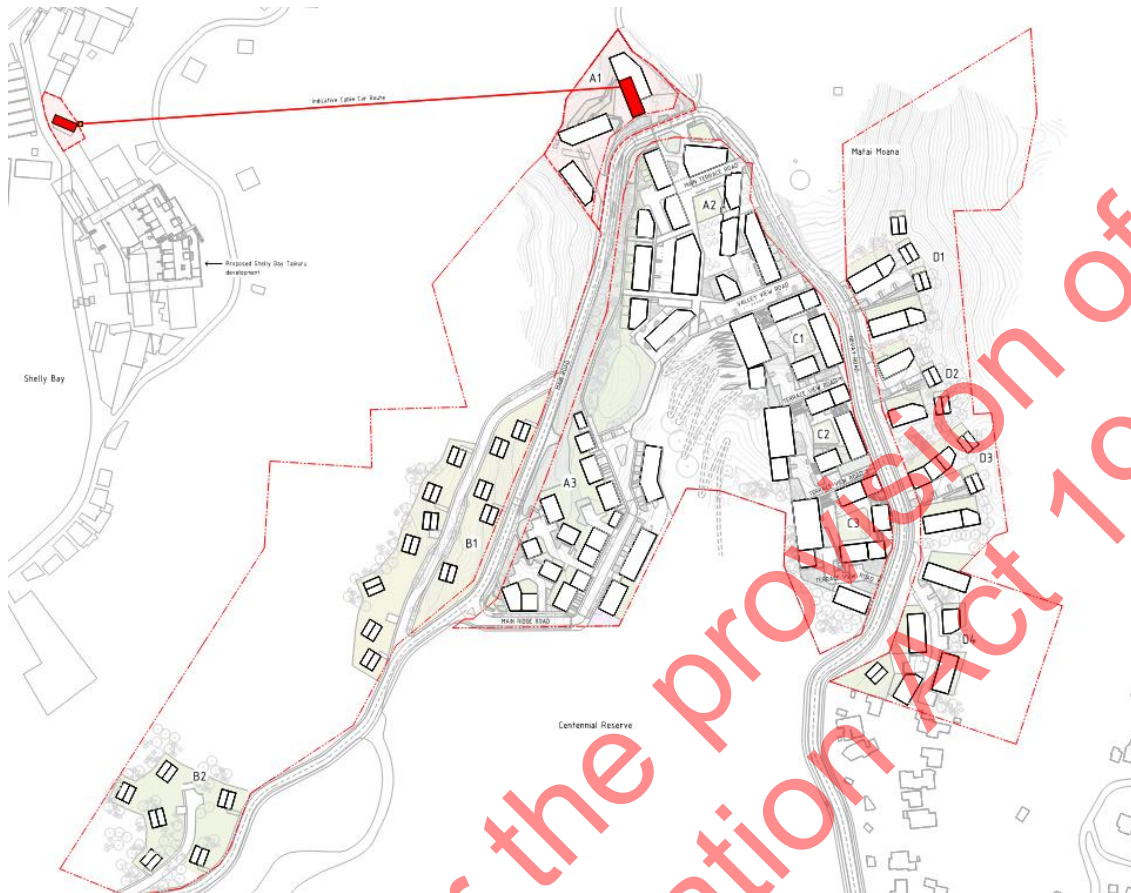


Figure 1. Development layout plan (Athfield Architects)

3.0 EARTHWORKS

3.1 EROSION AND SEDIMENT CONTROL

Any disturbance to existing ground removes the existing vegetative cover and potentially allows erosion of the bare ground to occur. The risk of generating erosion is proportional to the surface area exposed, the duration of earthworks, the steepness of the earthworks area and the rainfall occurrences during the earthworks process.

The fast-track consent will include seeking earthworks consent from both Wellington City Council and Greater Wellington Regional Council. Principles of Erosion and Sediment control that will be assessed at the fast-track consent stage include:

- Minimise disturbance – Minimise the extent of earthworks as much as is practicable. This will be achieved by undertaking bulk earthworks for portions of the site, minimising the need for secondary earthworks on individual building platforms.
- Stage construction – Minimise the amount of area open at one time and the time that these areas are left unstable.
- Protect receiving environments – Apply additional protection (e.g. silt fences) and work methodologies around sensitive receiving environments (near stream corridors etc).
- Rapid stabilisation – Progressively stabilise disturbed areas as soon as practicable.
- Perimeter controls – Installation of perimeter controls for the diversion of clean water around the earthworks extent and separate this from sediment-laden water within the site.
- Employ sediment retention devices – Install treatment devices to maximise the efficiency of sediment removal within treatment devices.



- Review – Review and revise the effectiveness of erosion and sediment controls on a regular basis to ensure that they are still effective and applicable to the current site conditions

These are the fundamental elements of good practice that should be common to all sites. These limit the opportunity for erosion; however, even with best practice, there will always be the risk of some sediment being mobilised during and immediately after rainfall events. Therefore, it is equally important to put in place control measures to contain, collect, and manage any sediment that is generated before it can leave the site. The GWRC guidance document “Erosion and Sediment Control Guide for Land Disturbance Activities in the Wellington Region” details control measures and is widely used as the appropriate standard for management of erosion and sediment control in the Wellington Region.

It is our view that the erosion and sediment control design can be adequately addressed through future consents to ensure that potential adverse effects can be managed and mitigated to an acceptable level. We consider that subject to employing the measures outlined above, there will be no significant adverse effects relating to the proposed earthworks.

3.2 EARTHWORKS APPROACH

The site topography and proposed development plans means that earthworks will need to be undertaken to create stable building platforms. While earthworks are likely to be large in scale, an earthworks balance will be targeted so that minimal material is required to be brought onto or taken off site. Material unsuitable for earthworks will be used on site (e.g. in landscaping areas) or disposed of in identified locations for unsuitable material where this is feasible.

It is our view that earthworks design can be adequately addressed through future consents with input from other consultants e.g. Geotechnical Engineers.

4.0 STORMWATER

4.1 EXISTING INFRASTRUCTURE

There is no existing public stormwater infrastructure at the site. Stormwater sheds to several gullies to the east, west, and south of the site. The gullies to the east and west discharge to small piped stormwater systems before flowing into the sea at Scorching Bay and Shelly Bay respectively. The gully to the south discharges to piped stormwater systems on Darlington Road, Maramar.

In addition, we believe there may be several unrecorded private stormwater pipes around the site connecting to the existing impervious areas within the historic prison buildings. These would discharge directly to the gullies surrounding the site.

To support the proposed development, stormwater management measures will need to be employed on site. Resource consent from Wellington City Council will be required for new stormwater discharges and consents will be required from Greater Wellington Regional Council.

4.2 FLOOD HAZARD

Flooding hazards are not expected within the development itself due to its location on the crest of the hill. However, we are aware of flooding issues within the downstream catchment in Maramar. There may also be local sediment capacity constraints within the small piped sections in Scorching Bay.

4.3 PROPOSED INFRASTRUCTURE

Attenuation will be required to achieve hydraulic neutrality for the site and ensure that post-development peak discharges are no more than the pre-development peak stormwater discharges. Parts of the development have large areas of existing imperviousness (e.g. prison and surrounding grounds) and this will mean that only limited attenuation is required in those areas to achieve hydraulic neutrality. Other areas of the site will need to have larger attenuation devices installed, which could be centralised attenuation tanks and/or dual tanks for houses or a combination of the two.

It will be important to ensure that post-development discharges are located within the pre-development catchments (especially within the Maramar catchment). Otherwise additional stormwater attenuation may be required.



We anticipate that treatment of stormwater runoff from roads and hardstand areas would be required by Wellington Water (WWL) and Greater Wellington Regional Council (GWRC). Due to the steepness of the site, rain gardens and smaller constructed wetlands are considered feasible design solutions to be integrated into the design. Treatment of stormwater from roofs is not typically required provided that the materials used for roofs are inert.

GWRC and WWL may require treatment of the existing road network to some extent due to the increased traffic demand from the proposed development. We intend to incorporate this treatment into the design where practicable.

The stormwater system will be designed with the principles of Te Mana o te Wai and Water Sensitive Urban Design in mind. This will be done by preserving vegetated areas around the property, treating stormwater runoff and peak flow attenuation.

It is our view that the design of stormwater infrastructure can be adequately addressed through future consents. Based on the assessments undertaken to date, it is our view that no significant adverse effects will arise as a result of the proposed stormwater servicing works.



Figure 2. Mapped stormwater network in the vicinity of the site (WCC GIS)

5.0 WASTEWATER

5.1 EXISTING INFRASTRUCTURE

There are no public wastewater pipes currently servicing the site recorded on WCC GIS mapping. However, we understand that the decommissioned Mount Crawford Prison buildings are serviced by a 150mm earthenware sewer main installed in 1974. This extends from Countess Close and up Main Road to the site. There is also a pipe on Nevay Road which extends up to the prison site although this is not shown on Council maps.





Figure 3. Mapped public wastewater network in the vicinity of the site (WCC G S)

5.2 PROPOSED INFRASTRUCTURE

We understand that there are significant capacity constraints within the Maramar wastewater catchment and this will mean that storage and attenuation of wastewater flows for the development will be required. Options for wastewater storage and discharge for the development are as follows:

1. Centralised wastewater pumping stations to attenuate flows and discharge to the Maramar Catchments (Nevay Road and/or Countess Close)
2. Individual pump stations on each dwelling to attenuate peak flows and discharge to the Maramar Catchments (Nevay Road and/or Countess Close)
3. Pump wastewater down to the Shelly Bay development and discharge this into the pump station there.

Options 1 and 2 require the wastewater to be stored in tanks on-site. Detailed design would be required to ensure this does not cause septicity issues within the downstream network. However, even if septicity was identified as an issue, there are suitable pre-treatment systems available to mitigate this risk. It is likely that odour control would also need to be integrated into the design. Odour control and septicity treatment are common features of wastewater storage tanks and pumped systems and there are well established practices for dealing with both issues. Because of this, we believe options 1 and 2 to be feasible satisfactory design options.

However, if project timeframes allow, we would recommend Option 3 (pumping to Shelly Bay) as this allows a simpler design with less interface with the existing network. From what we understand of the development timeframes at Shelly Bay, there will not actually be excess capacity in the existing line due to the staging of the development.



It is expected that the wastewater reticulation from Shelly Bay will need to be upgraded to a larger size with additional storage and pumping capacity provided at the Shelly Bay Pump station to account for additional flows. However, as these assets will be installed within the next year, we expect that any upgrade of size and pipes and pump stations could be implemented to coincide with construction of these assets and would likely be in place prior to when it is required for Mata Moana. As an interim measure, it would be possible to connect to the existing gravity sewer lines on Nevay and Maun Road if required.

It is our view that the design of wastewater infrastructure can be adequately addressed through future consents. Based on the assessments undertaken to date, it is our view that no significant adverse effects will arise as a result of the proposed wastewater servicing.

6.0 POTABLE WATER

6.1 EXISTING INFRASTRUCTURE

There are existing vested potable water assets at the site including 150mm water mains on Maun Road and Nevay road and the Mount Crawford Reservoir. The base elevation of the reservoir is RL 159.6m with the site having typical elevations of RL 105m to RL 150m.

6.2 PROPOSED INFRASTRUCTURE

We have reviewed Wellington Waters Marama Zone Management Plan (June 2022) which assesses potable water supply and demand for developments at Shelly Bay and Mount Crawford. This suggests that supply of the site is feasible; however, there would need to be upgrades to the water network. This would include a reservoir upgrade from the existing 0.5ML Mount Crawford Reservoir. Upgrade options are shown in Table 1.

Wellington Water have confirmed that the current reservoir has 0.2ML of spare capacity which would be capable of servicing 92 homes or units based on Wellington Water emergency storage requirements. This would provide servicing for the initial stages of development while a solution is constructed for subsequent stages.

The reticulation from Maupua Reservoir and pump station at Maupua Reservoir will need to be upgraded to service the new reservoir once this is constructed and ensure that there is adequate supply of flow to the reservoir.

Table 1. Reservoir size requirements for different development yields

Yield (Units)	Storage Required (development site only)	Reservoir Upgrade (additional to current Mount Crawford reservoir)	Reservoir Upgrade (combined reservoir)
300	0.65ML	11m dia x 4.5 m tall	18m dia x 4.5 m tall
400	0.87ML	14m dia x 4.5 m tall	20m dia x 4.5 m tall
600	1.30ML	18m dia x 4.5 m tall	23m dia x 4.5 m tall
800	1.74ML	21m dia x 4.5 m tall	25m dia x 4.5 m tall

Due to the height of the reservoir compared to the site levels at the development, there will be lower pressure for potable water use than the minimums that WWL requires (25m head for potable and 10m for fire supply). This could be addressed by the following methods:

1. Shared public booster pump to provide adequate water pressure
2. Individual booster pumps (private) on each dwelling

We expect that either approach could be implemented subject to detailed engineering design and discussion and agreement with Wellington Water. Minimum pressure for fire supply would be supplied by



the height difference between the reservoir and the site (~10m at the lowest point) and pipes would need to be sized to prevent undesirable head losses

It is our view that the design of potable water infrastructure can be adequately addressed through future consents. Further given that Wellington Water have considered this project within their latest modelling there are no impediments to advancing this work to ensure supply is available for the proposed development when it is required once the existing reservoir reaches capacity.



Figure 4. Mapped potable water network in vicinity of the site (WCC GIS)

7.0 UTILITIES

We have contacted Chorus who have advised that there is existing infrastructure in the area surrounding the site and that this can be extended and upgraded where required to service the development.

A power supply network is available adjacent to the site. We have had preliminary discussions with the Network Utility Operator (Wellington Electricity) who have advised us that the initial stages of development at the site can be serviced from the existing network. Upgrades to the high voltage network will be required (in respect of this development) and these are currently planned for 2025. These will enable further stages of development.

Ret culated gas is not proposed for the development and as such we have not contacted the Network Utility Operator to establish if there is sufficient capacity in the existing infrastructure to service the development. However, there is gas infrastructure adjacent to the site and we expect that this could be extended to supply isolated facilities e.g. cafes if required.

It is our view that the design of utilities infrastructure can be adequately addressed through future consents.



8.0 SUMMARY

This report has been prepared to provide an overview of the existing infrastructure surrounding the Mata Moana site and on the potential for these services to service the development to support a fast-track consent application with the Ministry for the Environment for development at the site.

Three water infrastructure will be designed to Council standards. The final design will be developed in consultation with Wellington City Council and Wellington Water to achieve an acceptable outcome with regard to the Council's technical standards.

The resource consent application will include an Infrastructure Report that provides full details of the proposed servicing of the project including calculations and in-depth technical drawings. In addition, a Stormwater Management Plan will outline how stormwater will be appropriately managed on the site.

In summary, it is our view that the site can be developed and adequately serviced subject to further engineering design and that this can be addressed through future consents. Further to this, there appear to be no impediments to implementing the proposed development based on the delivery programme provided with the referral application.



APPENDICES

Released under the provision of
the Official Information Act 1982

Released under the provision of
the Official Information Act 1982

- NOTES:
1. EXISTING CONTOURS ARE A COMBINATION OF LIDAR SOURCED FROM LINZ DATA SERVICE AND SITE TOPO SURVEY UNDERTAKEN BY CUTTRISS IN 2020.
 2. LEVELS ARE IN TERMS OF NZVD 2016 DATUM.
 3. CONTOURS SHOWN ARE EXISTING GROUND LEVELS SHOWN AT 5.0m INTERVALS.
 4. BASE PLAN INFORMATION BY ATHFIELD ARCHITECTS AND WRIGHTS AND ASSOCIATES.

- LEGEND:
- INDICATES PROPOSED RISING MAIN (FEED TO RESERVOIR)
 - INDICATES PROPOSED PUBLIC WATERMAIN
 - INDICATES 0m to 10m ZONE BELOW RESERVOIR
 - INDICATES 10m to 20m ZONE BELOW RESERVOIR

PROPOSED CABLE CAR ROUTE

BOOSTER PUMP FROM RESERVOIR IF PROPOSED LEVELS DICTATE.

EXISTING MT CRAWFORD RESERVOIR.
0.5ML CAPACITY, 14m DIA, 4.1m HEIGHT

PROPOSED REPLACEMENT RESERVOIR.
1.8ML CAPACITY, 25m DIA, 4.5m HEIGHT

UPGRADE RISING MAIN FROM MAUPUJA RESERVOIR.
PUMP STATION AT RESERVOIR TO BE UPGRADED.

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
P1	FOR FAST TRACK REFERRAL	LAF	16-12-2022

PROJECT:

MATAI MOANA
NEVAY ROAD
WELLINGTON

TITLE:

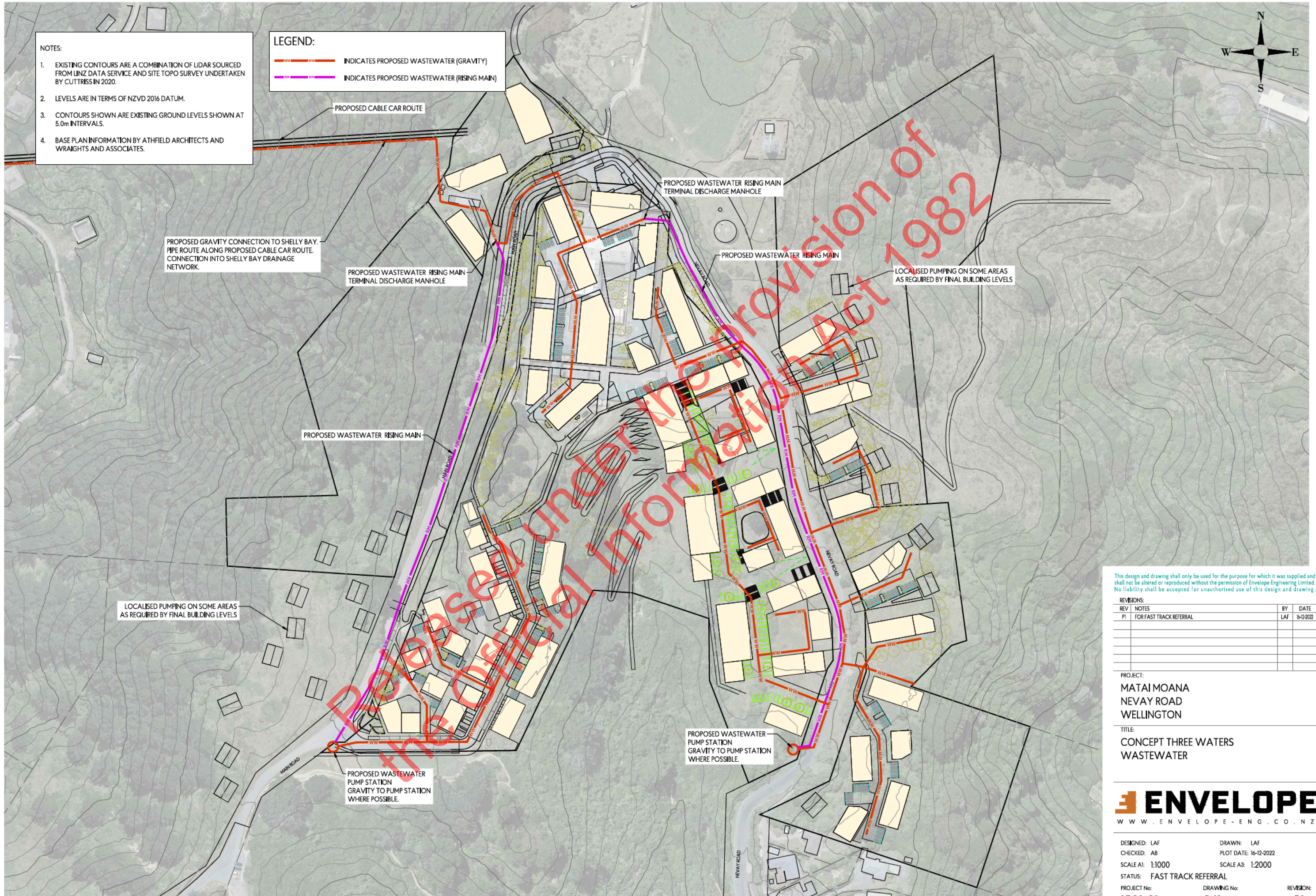
CONCEPT THREE WATERS
WATER SUPPLY

ENVELOPE
WWW.ENVELOPE-ENG.CO.NZ

DESIGNED: LAF
CHECKED: AB
SCALE A1: 1:1000
STATUS: FAST TRACK REFERRAL

DRAWN: LAF
PLOT DATE: 16-12-2022
SCALE A3: 1:2000

PROJECT No: 1501-01
DRAWING No: 940
REVISION: P1



- NOTES:
- EXISTING CONTOURS ARE A COMBINATION OF LIDAR SOURCED FROM LINZ DATA SERVICE AND SITE TOPO SURVEY UNDERTAKEN BY CUTTRISS IN 2020.
 - LEVELS ARE IN TERMS OF NZVD 2016 DATUM.
 - CONTOURS SHOWN ARE EXISTING GROUND LEVELS SHOWN AT 5.0m INTERVALS.
 - BASE PLAN INFORMATION BY ATHFIELD ARCHITECTS AND WRIGHTS AND ASSOCIATES.

LEGEND:

- INDICATES PROPOSED WASTEWATER (GRAVITY)
- INDICATES PROPOSED WASTEWATER (RISING MAIN)



LOCALISED PUMPING ON SOME AREAS AS REQUIRED BY FINAL BUILDING LEVELS

PROPOSED GRAVITY CONNECTION TO SHELLY BAY. PIPE ROUTE ALONG PROPOSED CABLE CAR ROUTE. CONNECTION INTO SHELLY BAY DRAINAGE NETWORK.

PROPOSED WASTEWATER RISING MAIN TERMINAL DISCHARGE MANHOLE

PROPOSED WASTEWATER RISING MAIN

PROPOSED WASTEWATER RISING MAIN TERMINAL DISCHARGE MANHOLE

PROPOSED WASTEWATER RISING MAIN

LOCALISED PUMPING ON SOME AREAS AS REQUIRED BY FINAL BUILDING LEVELS

PROPOSED WASTEWATER PUMP STATION GRAVITY TO PUMP STATION WHERE POSSIBLE.

PROPOSED WASTEWATER PUMP STATION GRAVITY TO PUMP STATION WHERE POSSIBLE.

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
P1	FOR FAST TRACK REFERRAL	LAF	16-12-2022

PROJECT:
MATAI MOANA
NEVAY ROAD
WELLINGTON

TITLE:
CONCEPT THREE WATERS
WASTEWATER



DESIGNED: LAF	DRAWN: LAF
CHECKED: AB	PLOT DATE: 16-12-2022
SCALE A1: 1:1000	SCALE A3: 1:2000
STATUS: FAST TRACK REFERRAL	
PROJECT No: 1501-01	DRAWING No: 941
	REVISION: P1

NOTES:

1. EXISTING CONTOURS ARE A COMBINATION OF LIDAR SOURCED FROM LINZ DATA SERVICE AND SITE TOPO SURVEY UNDERTAKEN BY CUTTRISS IN 2020.
2. LEVELS ARE IN TERMS OF NZVD 2016 DATUM.
3. CONTOURS SHOWN ARE EXISTING GROUND LEVELS SHOWN AT 5.0m INTERVALS.
4. BASE PLAN INFORMATION BY ATHFIELD ARCHITECTS AND WRIGHTS AND ASSOCIATES.

LEGEND:

- INDICATES STORMWATER - PROPOSED
- ◆— INDICATES STORMWATER - EXISTING GULLY

PROPOSED CABLE CAR ROUTE

UPGRADES REQUIRED TO CREATE STORMWATER SYSTEM ALONG MAIN ROAD. KERBS, SUMPS AND OUTLETS INSTALLED AS REQUIRED.

HIGH LEVEL OF EXISTING IMPERVIOUSNESS

ENSURE GULLIES HAVE SUFFICIENT VEGETATION FOR PROPOSED DISCHARGES. PLANT OR OTHERWISE STABILISE AS REQUIRED.

ALL OUTLETS TO BE STABILISED WITH ENERGY DISSIPATION AS REQUIRED.

UPGRADE INLET STRUCTURES ALONG MASSEY ROAD AND KARAKA BAYS ROAD AS REQUIRED.

STORMWATER TO DISCHARGE TO LOCAL GULLIES. MAINTAINING EXISTING FLOW PATHS AND CATCHMENT BOUNDARIES WHERE POSSIBLE.

UPGRADE INLET STRUCTURES ALONG SHELLY BAY ROAD AND WITHIN SHELLY BAY AS REQUIRED

STORMWATER TO DISCHARGE TO LOCAL GULLIES. MAINTAINING EXISTING FLOW PATHS AND CATCHMENT BOUNDARIES WHERE POSSIBLE.

ENSURE GULLIES HAVE SUFFICIENT VEGETATION FOR PROPOSED DISCHARGES. PLANT OR OTHERWISE STABILISE AS REQUIRED.

POSSIBLE AREA FOR STORMWATER ATTENUATION OR TREATMENT DEVICE

STORMWATER TO DISCHARGE TO LOCAL GULLIES. MAINTAINING EXISTING FLOW PATHS AND CATCHMENT BOUNDARIES WHERE POSSIBLE.

ALL OUTLETS TO BE STABILISED WITH ENERGY DISSIPATION AS REQUIRED.

UPGRADES REQUIRED TO CREATE STORMWATER SYSTEM ALONG NEVAY ROAD. KERBS, SUMPS AND OUTLETS INSTALLED AS REQUIRED.

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
P1	FOR FAST TRACK REFERRAL	LAF	16-12-2022

PROJECT:

MATAI MOANA
NEVAY ROAD
WELLINGTON

TITLE:

CONCEPT THREE WATERS
STORMWATER

ENVELOPE
WWW.ENVELOPE-ENG.CO.NZ

DESIGNED: LAF

CHECKED: AB

SCALE A1: 1:1000

STATUS: FAST TRACK REFERRAL

PROJECT No:

1501-01

DRAWN: LAF

PLOT DATE: 16-12-2022

SCALE A3: 1:2000

DRAWING No:

942

REVISION:

P1