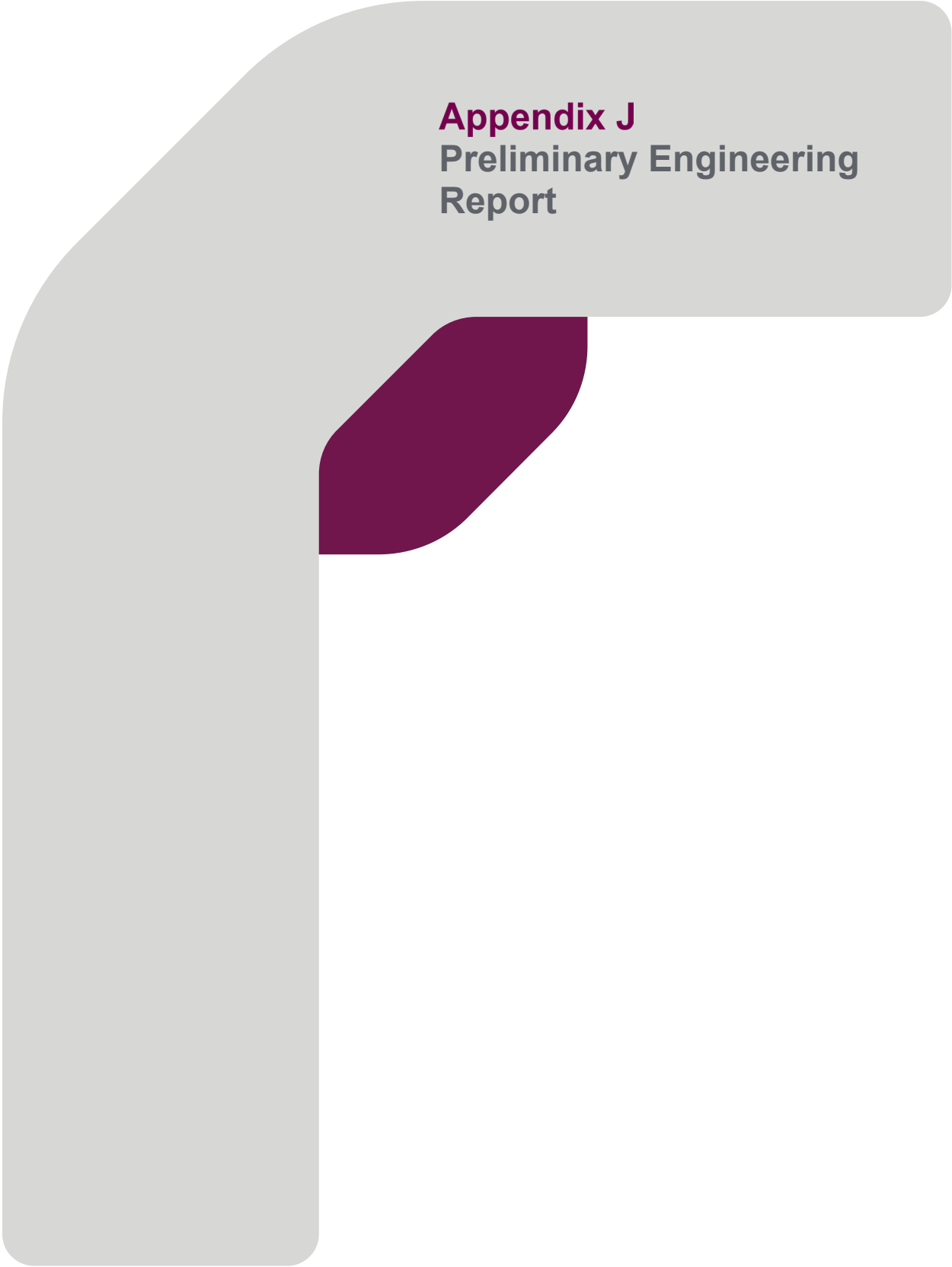




## **Appendix J**

### **Preliminary Engineering Report**

# Marana Street, Bilambil Heights, New South Wales

## PRELIMINARY ENGINEERING REPORT

Address: Marana Street, Bilambil Heights,  
NSW

Lot & RP Description: Lot 32//DP1085109

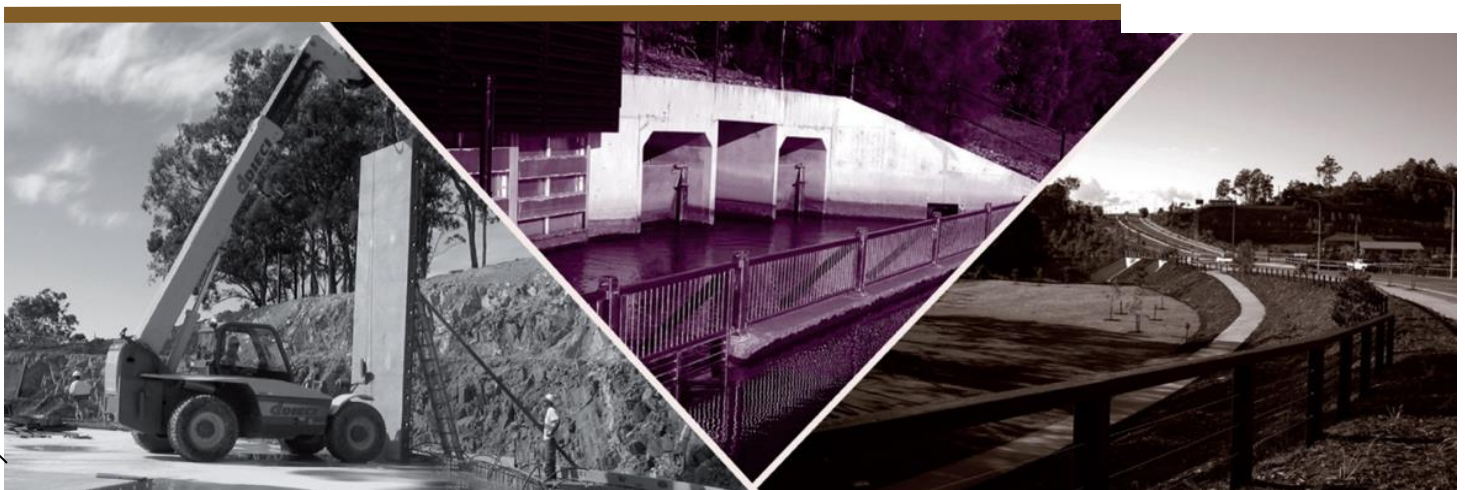
Local Government: Tweed Shire Council

Prepared for: GTH Resorts No.20 Pty Ltd

Prepared by: **Mortons – Urban Solutions**  
Level 2, 19 Short Street  
(PO Box 2484)  
Southport Qld 4215

Ph: (07) 5571 1099  
Email: mortons@urbansolutions.net.au

**DATE: Jan 2025**



CIVIL ENGINEERING

PROJECT COORDINATION

19 Short Street,  
Southport Qld 4215

P: (07) 5571 1099  
www.urbansolutions.net.au



**Prepared for:**  
GTH Resorts No.20  
Pty Ltd

**Property Address:**  
Marana Street, Bilambil Height,  
NSW

**Real Property Description/s:**  
Lot 32//DP1085109

#### DOCUMENT CONTROL

| Report Summary     |            |                                                                        |          |          |                |
|--------------------|------------|------------------------------------------------------------------------|----------|----------|----------------|
| Document Details   |            |                                                                        |          |          |                |
| Project Reference: |            | [ID 1039055]                                                           |          |          |                |
| Document Title:    |            | Preliminary Engineering Report<br>Marana Street, Bilambil Heights, NSW |          |          |                |
| Distribution       |            |                                                                        |          |          |                |
| Revision           | Date       | Author                                                                 | Reviewed |          | Distributed To |
| A                  | 29/01/2025 | KF                                                                     | JH       | 29/01/25 | Draft          |
| B                  | 31/01/2025 | KF                                                                     | JH       | 31/01/25 | Client         |
|                    |            |                                                                        |          |          |                |

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### List of Appendices

- Appendix A      Landsurv Survey plans**  
Prepared by Landsurv, dated October 2021
- Appendix B      Water Network Plan**  
45101-WNA-700, Prepared by Mortons Urban Solutions, dated January 2025
- Appendix C      SEWER Network Plan and Offsite Infrastructure Plan**  
44401-SNA-500/501, Prepared by Mortons Urban Solutions, dated January 2025

## 1.0 INTRODUCTION

---

This Preliminary Engineering Report has been prepared by Mortons - Urban Solutions on behalf of *GTH Resorts No. 20 Pty Ltd* and is supporting information for consideration by the Department of Planning, Housing and Infrastructure (DPHI) to modify the Major Project ('Concept Plan') Approval No. 08\_0234 for the Marana Street development. The major Project Approval No. 08\_0234 was originally issued on 29 June 2010, with two subsequent modifications approved on 4 April 2018 (Mod 1) and 31 October 2022 (Mod 2).

The proposed modification to the Concept Plan Approval seeks to retain the approved 'retirement Living land use over the subject site while removing the building footprint and layout. The proposed removing of the building footprint is intended to provide flexibility in the final design of the development to be assessed as part of a subsequent application to Council.

The proposed modification will not change the approved density of the development and will amend the approved building height. Introduce a consistent building height of 13.6m and 4 storeys.

- Retain the approved density of development at no more than 195 dwellings, plus community facilities
- Introduce a consistent building height of 13.6m and 4 storeys.

The application will introduce development requirements that will inform future building footprints to ensure a similar built form outcome.

The proposed changes to Precinct B will not impact on the current description of the approval. It is also acknowledged a separate modification application (Bilambil Heights Concept Plan Modification 3) is currently with the department for approval. The application acknowledges there will continue to be 195 dwellings on Precinct B and therefore this change does not impact on that modification process.



## 2.0 THE SITE AND ITS CONTEXT

The site is located at Marana Street, Bilambil Heights NSW 2486 (formally described as Lot 32//DP1085109). The site is located in New South Wales just south of the border with Queensland and approximately 10km south-west of Tweed Heads in the township of Bilambil Heights.

The majority of the proposed development has been cleared of native vegetation and was previously operated as a Golf Course as shown below in Figure 1.

For a detailed description of the current vegetation on site, refer to the reports by JWA Ecological Consultants Pty Ltd included as part of this modification application under separate cover.

The site has an area of 6.96Ha with elevations ranging between 137m to 161m

For context the below Figure provides an overview of its location:

**Figure 1-Site Location and Surrounds**



Source: [www.whereis.com.au](http://www.whereis.com.au)

### 3.0 PROPOSED DEVELOPMENT AND ENGINEERING DESIGN

As stated, the modification to the concept plan approval seeks to retain the approved 'retirement Living land use over the subject site while removing the building footprint and layout. The proposed removing of the building footprint is intended to provide flexibility in the final design of the development to be assessed as part of a subsequent application to Council.

The proposed modification will not change the approved density of the development however will amend the approved building height.

- Retain the approved density of development at no more than 195 dwellings, plus community facilities
- Amend the approved building height (building height is currently approved at 3 storeys) to 13.6m and 4 storeys.

The design brief for the development will be to cater for the above yields (Maximum 195 dwellings plus community facilities) compliant with Tweed Shire Council engineering guidelines unless otherwise approved by Council officers.

- Earthworks are to be undertaken in accordance with D1 of Council's Guidelines.
- Roadworks will be designed internally as private roads that incorporates safe sight lines and roads speeds (approved vertical and horizontal geometry)
- Stormwater design will be designed to incorporate the legal points of discharge as determined by Gilbert & Sutherlands Integrated Stormwater Management Plan submitted under separate cover.
- Sewer and water infrastructure upgrades are required within the Elysian Development, currently under a separate modification application, but incorporates the approved yield of 195 dwellings for both sewer and water.

#### 3.1 Vegetation Clearing and Preservation

The majority of the proposed development site will occur in areas that have been cleared of native vegetation for past agricultural activities and a golf course. Vegetation remaining can be seen on the below image-Figure 2

Figure 2-Site Vegetation

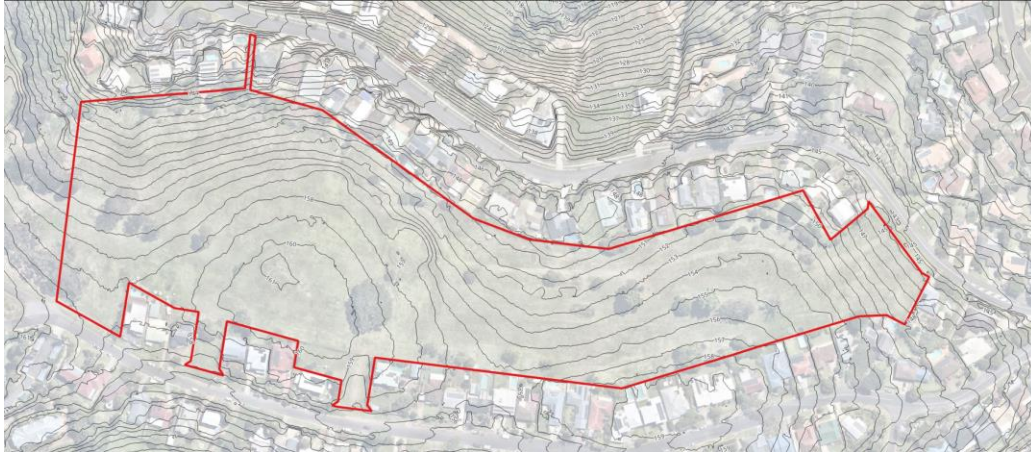




### 3.2 Topography /Stormwater Catchments

The site has an area of approximately 6.96Ha with elevations ranging between 137m to 161mAHD as shown in Figure 3 Below:

**Figure 3: Site Topography**

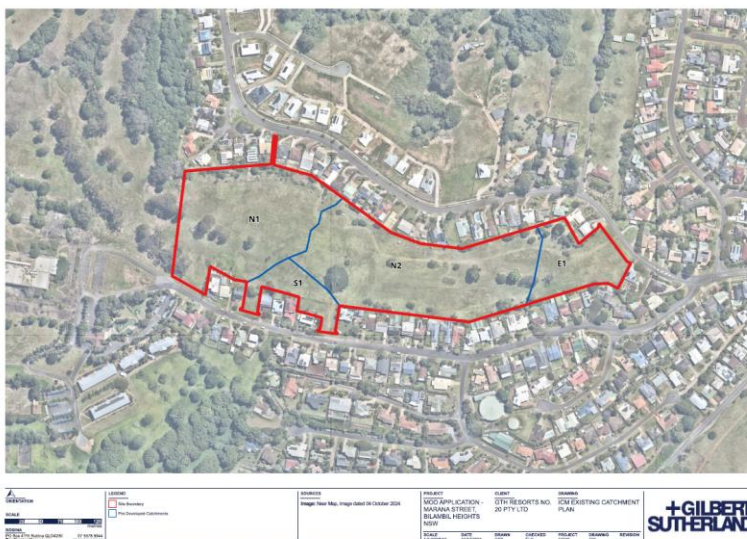


The existing topography has the site broken into 4 distinct stormwater catchments as described in Gilbert & Sutherland's Integrated Stormwater Quality and Quantity Assessment (ISQQA).

- 1) Catchment 1-(E1)- Draining Contour draining to the East toward McAllisters Road-Elevation ranging between 144-154M
- 2) Catchment 2-(N1)-Draining toward the North-Elevation ranging between 137-161m
- 3) Region 3-(N2)-Draining toward the North-elevation ranging between 149-161m
- 4) Region 4-(S1)-Draining toward the South (Elevation ranging between 156 and 161m

The existing catchments are shown in Figure 3 below:

**Figure 3-Existing Catchments**



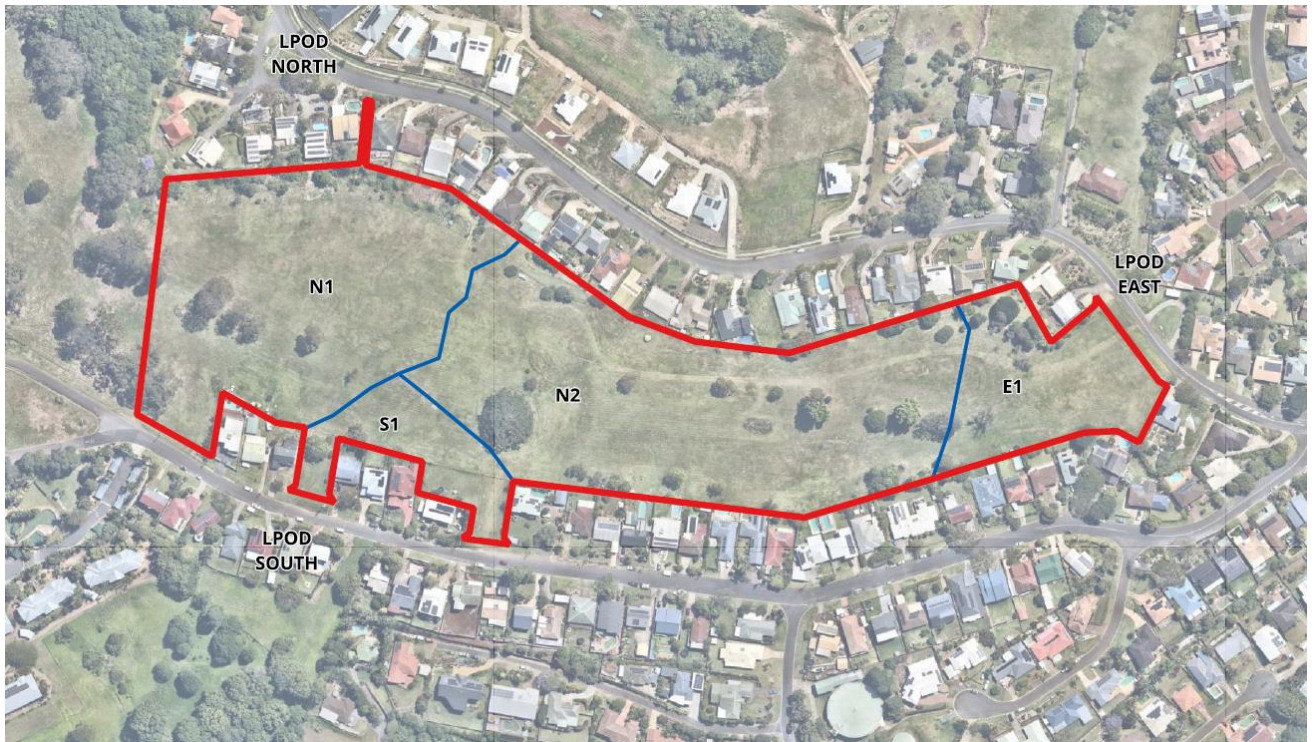
Source: G&S Integrated Stormwater Management Quantity and Quality Assessment



### 3.3 Earthworks, Proposed Levels and Retaining Structures

No earthwork design has been completed as part of this preliminary engineering report; however, it is anticipated that retaining walls and fill batters will be constructed along the northern boundary to raise central portion of the site to allow stormwater to grade to the northern and eastern legal points of discharge as described in Gilbert & Sutherland's ISQQA. These legal points of discharge are shown in Figure 4 below:

**Figure 4 Legal point of discharge:**



It is anticipated that earthwork cut and fills in the range of 4-5m is anticipated on site to accommodate residential development and direct stormwater runoff. Design of cut/fill depths shall be in accordance with TSC DCP-D6 where earthworks cut/fill depths exceeding 5m is kept to a maximum percentage of 10%.

### 3.4 Traffic

Preliminary traffic reporting has been undertaken by Bitzios consulting and is submitted under separate cover.

Access and Egress to the site will be off Marana Street as a private driveway.

### 3.5 Water Reticulation and Booster Pump Stations

The proposed property, “Marana Street Development” abuts the proposed Elysian development. Various meetings have been held with Tweed Shire Council in relation to servicing Elysian, the McCalister and the other areas identified as proposed general residential development within the same regional catchment as The Rise. To supply potable water to these developments it has been indicated there will be a need for major infrastructure upgrades to achieve service levels that meet the required flow and pressure required.

The Marana development will potentially need to be serviced by a new reservoir built on the adjacent land next to the existing Country Club reservoir with the same top operation water level 213.42m AHD, this Reservoir needs to be sized to service all of the identified development areas. Information provided by Council has shown that the reservoir was to service areas above 130m AHD, requiring an additional 4.5ML (Approximate) storage based on previously identified development yields. Connection from the Elysian reticulation should be made to the end of the Marana Street reticulation main which will be the likely connection location for The Rise. When a detailed network analysis is completed, it will be tested if the Marana Development can be serviced by the existing reservoir only prior to the construction of the new reservoir.

Should additional storage be required for the Marana Development, a contribution from The Marana Development may be required pending Council advice on the servicing Strategy.

We note that Council has plans in place to upgrade Water Pump Station 7 in Snowgum Drive (the supply water pump station) to meet the demand of this development and the other zoned land in the McAllister area adjacent above 130m AHD, (These developments will need to confirm the flow rate required based on Council’s design criteria), and this work will then be timed to coincide with the construction of the new reservoir.

A full water network analysis of the catchment area will be required to ensure fire flow can be met via gravity flows from the new reservoir to all lots/properties. Also, any lots/properties below 139m AHD will require pressure reduction to ensure supply pressure does not exceed 75m. The Marana property levels range from 161m AHD to 137m AHD prior to any proposed earthworks. When a full network is completed, it will be determined if the Marana Street development can be serviced by the existing reservoir without the need for the additional 4.5ML reservoir.

Please refer to the attached Mortons-Urban Solutions Preliminary Water Network Drawings showing proposed Potable Water Network for Elysian and The Marana Street (**Appendix B**). As per above this will require a full network analysis for the future Section 68 application to Council.

### 3.6 Sewer Reticulation and Pump Stations

Initial discussions with Council, they have indicated that there is no further capacity in the existing sewer system. Further discussions with Council to determine if the Marana Street development can be staged to determine if there is capacity in the existing system for a portion of the site needs to occur to determine if works can commence prior to the Elysian Development is constructed.

For the Marana development a private sewer pump station located at the site low point with a private rising main within the development is required to discharge into the Elysian development. There are various sewerage sub-catchments within the Elysian development that will be sewered by gravity sewer combined with pump stations and rising mains to convey the sewer to a major pump station near Cobaki Road (Council to confirm location). These sewers and pump stations within the Elysian

development are proposed to be transferred to Council ownership for operation and maintenance and the Marana sewer outfall will be dependent on the construction of this system to provide a sewer connection point.

Ultimately, the collective sewer flows from Elysian and Marana Street will gravitate and be pumped to the north of the site and conveyed along Cobaki/Piggabeen Road by rising main and pressure injected to Council's existing infrastructure at Gollan Drive/Kennedy Road

Mortons Urban Solutions have undertaken meetings with Tweed Shire Council in relation to servicing the Elysian development with sewer reticulation that caters for the needs of their development and a review of the contributing catchments (Marana Street) adjacent to the site, Marana Street being one of these developments will be dependent on the timing of the Elysian Development. Council have confirmed the following:

- There is sufficient capacity in the Banora point Wastewater Treatment Plant for the current proposed developments
- Council has carried out an assessment on the sewer system capacity and reconfirm that no part of The Elysian, McCalister or adjacent proposed residential developments can be serviced from the existing sewer system, and the existing system cannot be appropriately upgraded.
- A new separate system is required to be provided by the developers unless otherwise reviewed and agreed by Council, and their sewer connection point will be the Gollan Dive/Kennedy Drive Bridge rising main where pressure injection will occur.
- Council have assumed that a rising main along Piggabeen Road will carry the developments sewer to the Gollan Drive/Kennedy Drive Bridge connection point.
- Council have provided a development consent for the road services corridor through the wetland on Piggabeen Road. Council have allotted a future 375mm sewer that is allocated for Elysian and the future McAllister Road and included developments.

The adjacent Elysian Development will be a standard subdivision and Council pump stations and rising mains will need to be constructed within the boundaries of the development to negotiate the terrain. We note that pump stations will be required to service more than 50 Lots to be considered a future Council pump station.

Discussions with TSC is required to determine a location for a future regional Pump Station servicing The Elysian, Marana Street and the additional development coming from the McAllister area, and potentially the Cobaki Development to the NW of the site. The location of this infrastructure has yet to be determined and will require negotiations with Tweed Shire Council.

Please refer to the attached Mortons-Urban Solutions Preliminary Sewer Network Drawings (**Appendix C**) showing a proposed sewer Network for the development.

### **3.7 Stormwater Quality Management**

A separate stormwater quality management plan has been prepared by Gilbert and Sutherland addressing the site and will be submitted as a standalone report as part of the application. The site earthworks will be carried out in accordance with the requirements within this report.

### **3.8 Hydraulic Analysis / Stormwater Quantity**

A separate stormwater quantity analysis has been prepared by Gilbert and Sutherland addressing the site and will be submitted as a standalone report as part of the application. The site earthworks will be carried out in accordance with the requirements within this report.



## 4.0 CONCLUSION

---

This Preliminary Engineering Report has been prepared by Mortons - Urban Solutions on behalf of *GTH Resorts No. 20 Pty Ltd* and is supporting information for consideration by the Department of Planning, Housing and Infrastructure (DPHI) to modify the Major Project ('Concept Plan') Approval No. 08\_0234 for the Marana Street development.

This report provides a preliminary overview of the engineering constraints for the proposed development at Marana Street. Earthwork contouring of the site is required to ensure stormwater runoff on the site will be directed to the legal points of discharge with the use of Stormwater quality and quantity devices to ensure no offsite impact. Water infrastructure is available to the site; however, further modelling of the overall networks is required to determine if proposed additional reservoir is required for the Marana Street development as a standalone site. The site is dependent on sewer infrastructure external to the site being constructed in order to have a sewer discharge point for the Marana Street Development. Discussions with Tweed Shire Council to determine if a staged approach to the development can assist with both water and sewer to determine if the existing systems have any capacity for a portion of the site only. This would allow commencement of the development without the need for the works on the adjacent Elysian Development. The site is reliant on the Elysian Project to the west having to construct multiple pump stations and rising mains both internal and external to the site as the ultimate solution to service the full Marana Street Development.

Based on the preliminary review of the site topography, water and sewer infrastructure and the adjoining Elysian Development to the west, we consider that the development can be constructed substantially the same for which the consent was originally granted.



## APPENDIX A

### **Contour survey of Lot 32 on DP1085109**

Landsurv Pty Ltd, dated October 2021



MCALLISTERS ROAD

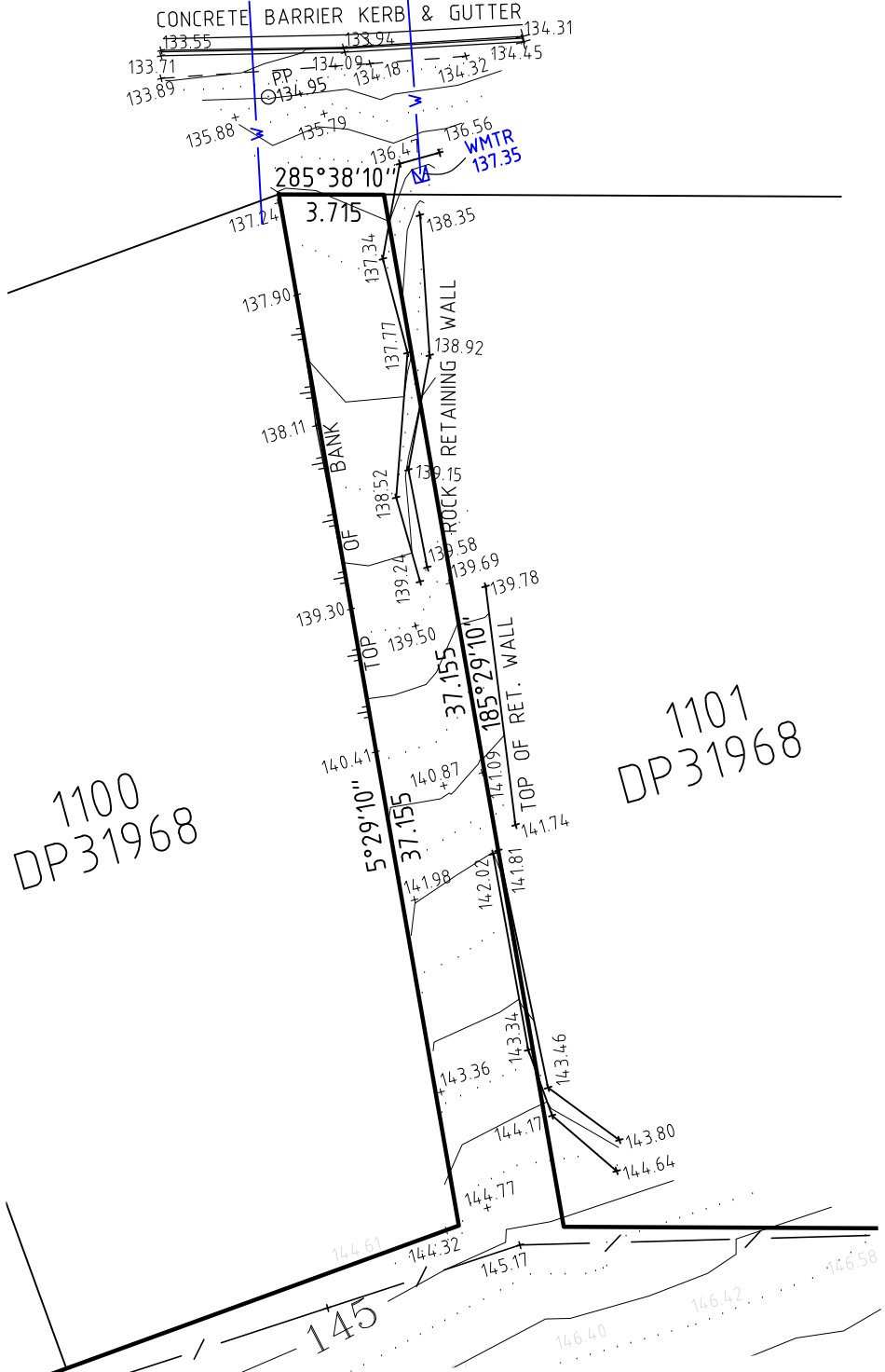


DIAGRAM A  
SCALE 1:250 [A1]  
SCALE 1:500 [A3]

LEGEND

- TOP OF BANK
- TOE OF BANK
- CHANGE OF GRADE
- DRAIN CENTRELINE
- FENCE
- MASONRY WALL / FENCE

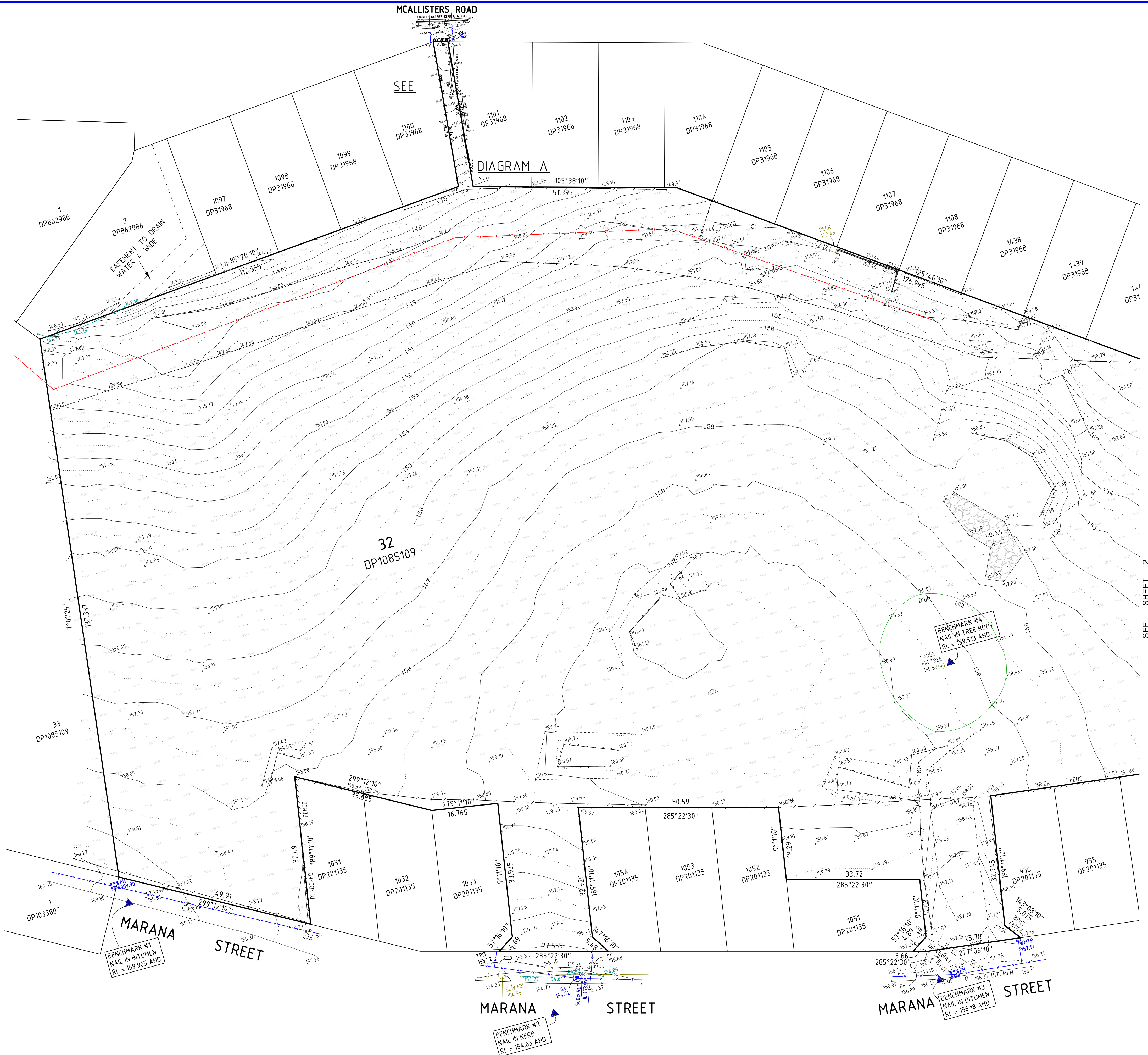
- GRATE GRATED DRAINAGE PIT (LEVEL ON GRATE)
- WMTR WATER METER
- SV WATER VALVE
- FH HYDRANT
- PIT TELSTRA PIT
- SEW MH SEWER MANHOLE
- PP POWER POLE
- D UNDERGROUND DRAINAGE (PLOTTED FROM DBYD RECORDS)
- S UNDERGROUND SEWER (PLOTTED FROM DBYD RECORDS)
- T UNDERGROUND TELECOMMS (PLOTTED FROM DBYD RECORDS)
- W UNDERGROUND WATER (PLOTTED FROM DBYD RECORDS)

NOTES

- TREES HAVE NOT BEEN LOCATED AS PART OF THIS SURVEY, EXCEPT FOR THE LARGE FIG TREE. OTHER TREES AND VEGETATION EXIST ON SITE.
- SERVICES HAVE BEEN LOCATED WHERE VISIBLE ONLY AND PLOTTED FROM DBYD RECORDS. UNDERGROUND SERVICES HAVE NOT BEEN LOCATED.
- ALL SERVICES SHOULD BE LOCATED PRIOR TO COMMENCEMENT OF ANY WORKS OR EXCAVATION.
- LEVEL DATUM IS AHD. ORIGIN OF LEVELS IS PM74550 RL = 141.649 AHD.
- CONTOUR INTERVAL  
5.1. MAJOR = 1 m  
5.2. MINOR = 0.5 m
- TOPOGRAPHIC SURFACE HAS BEEN COMPILED FROM GROUND SURVEY AND GROUND-TRUTHED & ADJUSTED LIDAR DATA FOR ENHANCED TOPOGRAPHIC RESOLUTION. AVERAGE DIFFERENCE BETWEEN SURVEY AND LIDAR = 0mm (AFTER ADJUSTMENT).
- CONTOURS ARE INDICATIVE OF GENERAL TOPOGRAPHY. DO NOT INFER CRITICAL LEVELS FROM CONTOURS.
- HORIZONTAL COORDINATE DATUM IS APPROXIMATE MGA ZONE 56 (GDA2020) ON GROUND DISTANCES. (S.F=1) TO TRANSFORM TO MGA, ALL DATA MUST BE SCALED AROUND ORIGIN (EASTING: 546726.473 NORTHING: 6878773.231) USING COMBINED SCALE FACTOR = 0.999598.
- PROPERTY BOUNDARIES HAVE BEEN DEFINED FOR DETAIL SURVEY PURPOSES ONLY. MORE EXTENSIVE SURVEY IS REQUIRED FOR FULL DETERMINATION OF BOUNDARIES.

0 10m 20m 30m 40m 50m 60m 70m 80m 90m 100m

SCALE 1:500 [A1]  
SCALE 1:1000 [A3]

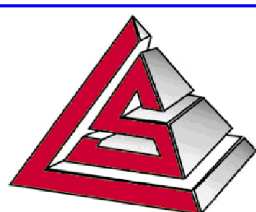


CLIENT:  
GEMLIFE

ALL UNDERGROUND  
SERVICES SHOULD BE  
LOCATED ON SITE BY  
RELEVANT AUTHORITIES  
BEFORE ANY WORK IS  
COMMENCED



| REVISION /DATE | REVISION DETAILS | REVISION BY |
|----------------|------------------|-------------|
|                |                  |             |
|                |                  |             |
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|                |                  |             |
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**LANDSURV PTY LTD**  
REGISTERED SURVEYORS & DEVELOPMENT CONSULTANTS  
14 ENID STREET TWEED HEADS NSW 2485  
Ph. (07) 55366467 Fax (07)55367489 email: macsurv@landsurv.com.au

|                |           |
|----------------|-----------|
| DATE OF SURVEY | 12.10.21  |
| DATE           | 19.10.21  |
| DRAWN          | CBS       |
| CHECKED        | BG        |
| CAD FILE No.   | 40289_DET |

CONTOUR AND DETAIL SURVEY OF LOT 32 ON DP1085109  
MARANA STREET, BILAMBIL HEIGHTS, NSW

ORIGIN OF LEVELS: PM74550 RL 141.649 AHD

SCALE 1: 500 [A1]  
REVISION:  
SHEET 1 OF 2  
JOB No  
40289







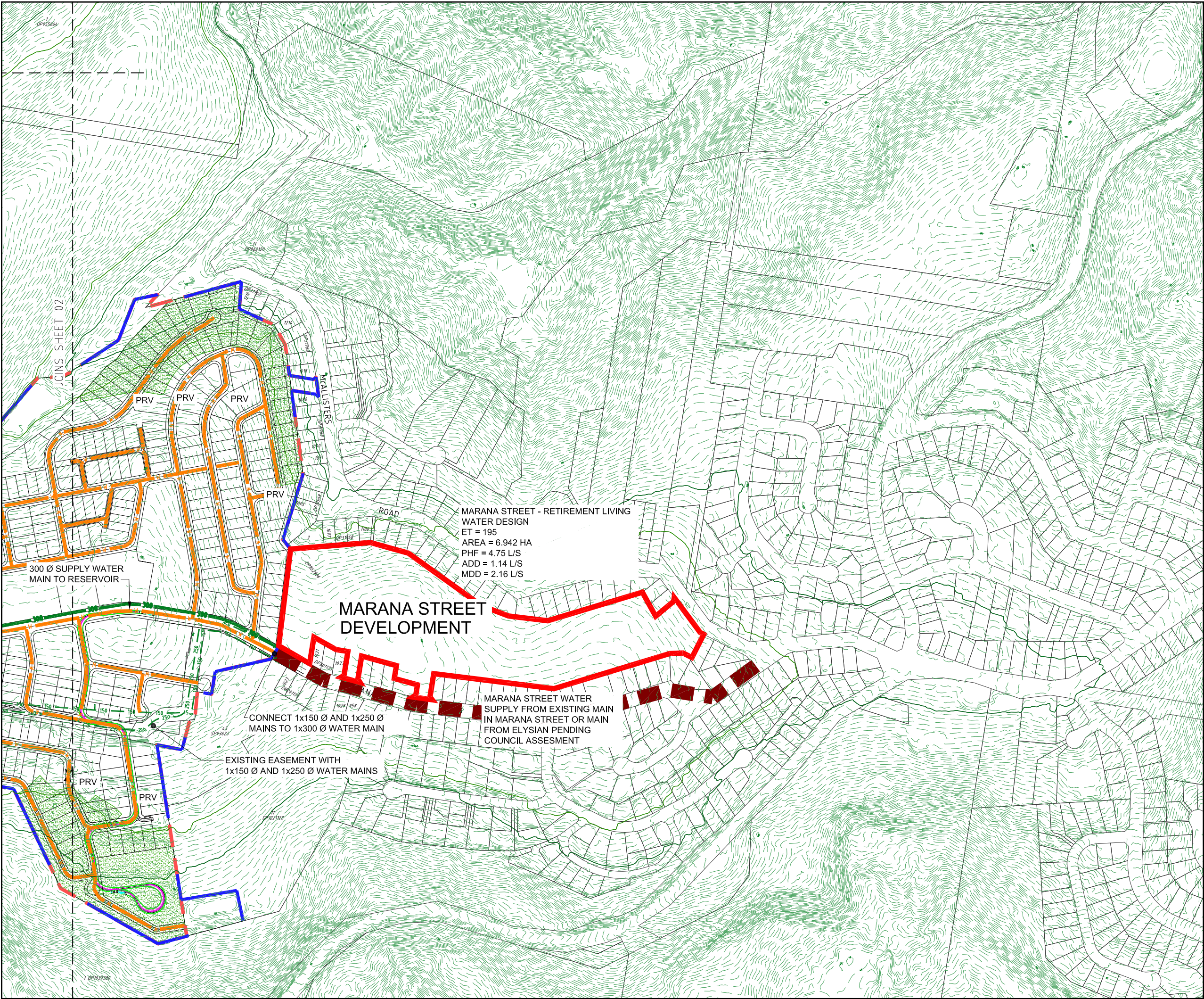


## APPENDIX B

### **Preliminary Water Network Drawings**

Prepared by Mortons-Urban Solutions





PROJECT NAME

MARANA STREET  
WATER NETWORK  
RP DESCRIPTION

MARANA ST  
BILIAMBIL HEIGHTS

CLIENT

GTH RESORTS  
No.20  
PTY LTD

0 25 50 75 100 125m  
Scale 1:2500 - A1 (15000 - A3)

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| REV | DATE | DESCRIPTION   | INT |

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ASSOCIATED CONSULTANTS

DRAWING TITLE

WATER NETWORK PLAN  
SHEET 01

Civil Engineering  
Project Coordination

MUS Pty Ltd T/As:  
Mortons-Urban Solutions  
ABN 39 116 375 065  
mortons@urbansolutions.net.au  
www.urbansolutions.net.au  
Tel 07 5571 1099

Postal Address  
PO Box 2484  
Southport QLD 4215  
  
Gold Coast Office  
Suite 9, 19 Short St  
Southport QLD 4215

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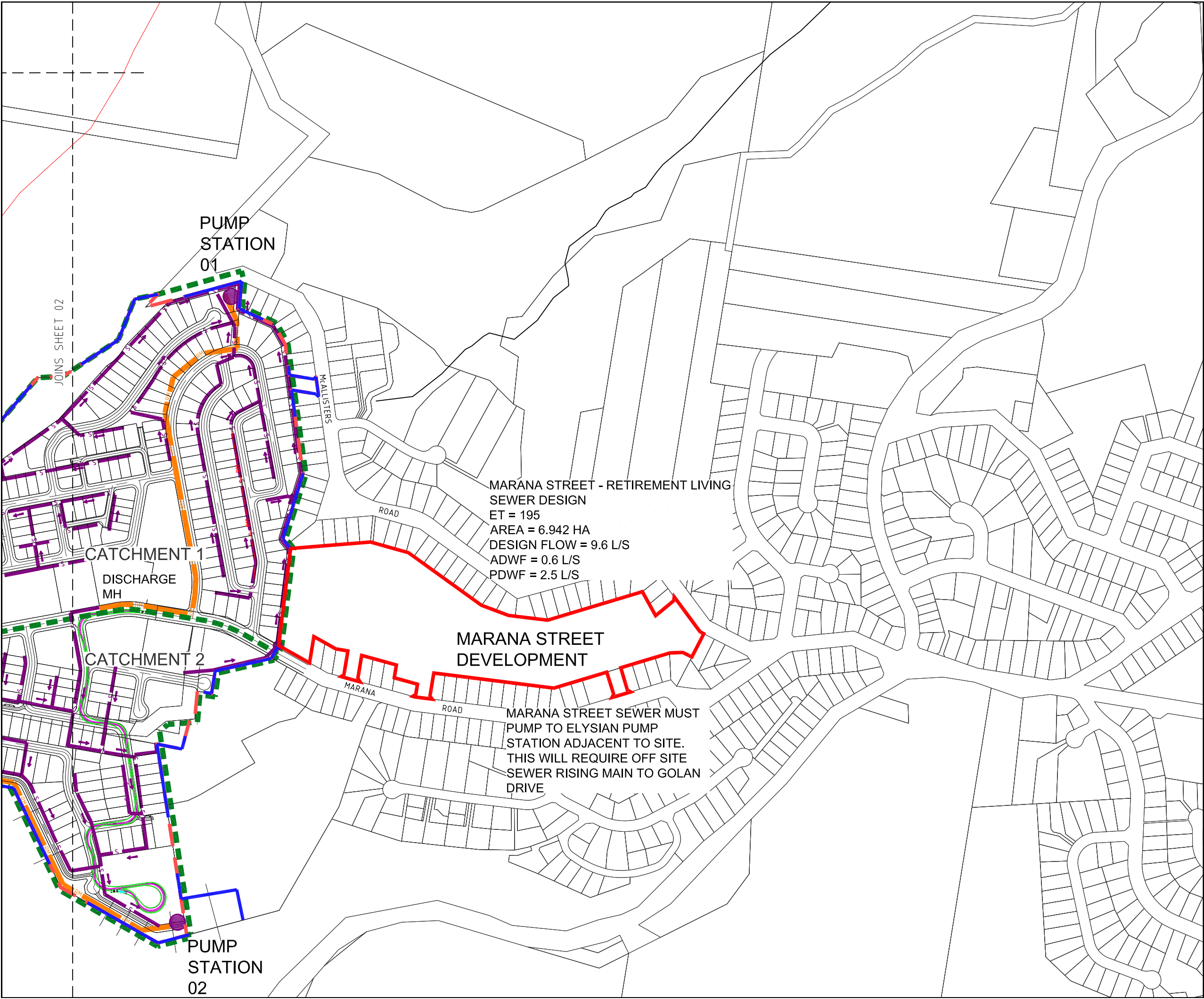


## APPENDIX C

### **Preliminary Sewer Network Drawings**

Prepared by Mortons-Urban Solutions





PROJECT NAME

MARANA STREET

SEWER NETWORK

RP DESCRIPTION

MARANA ST  
BILIAMBIL HEIGHTS

CLIENT

GTH RESORTS  
No.20  
PTY LTD

NORTH

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Scale 1:2500 - A1 (15000 - A3)

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SHEET 01

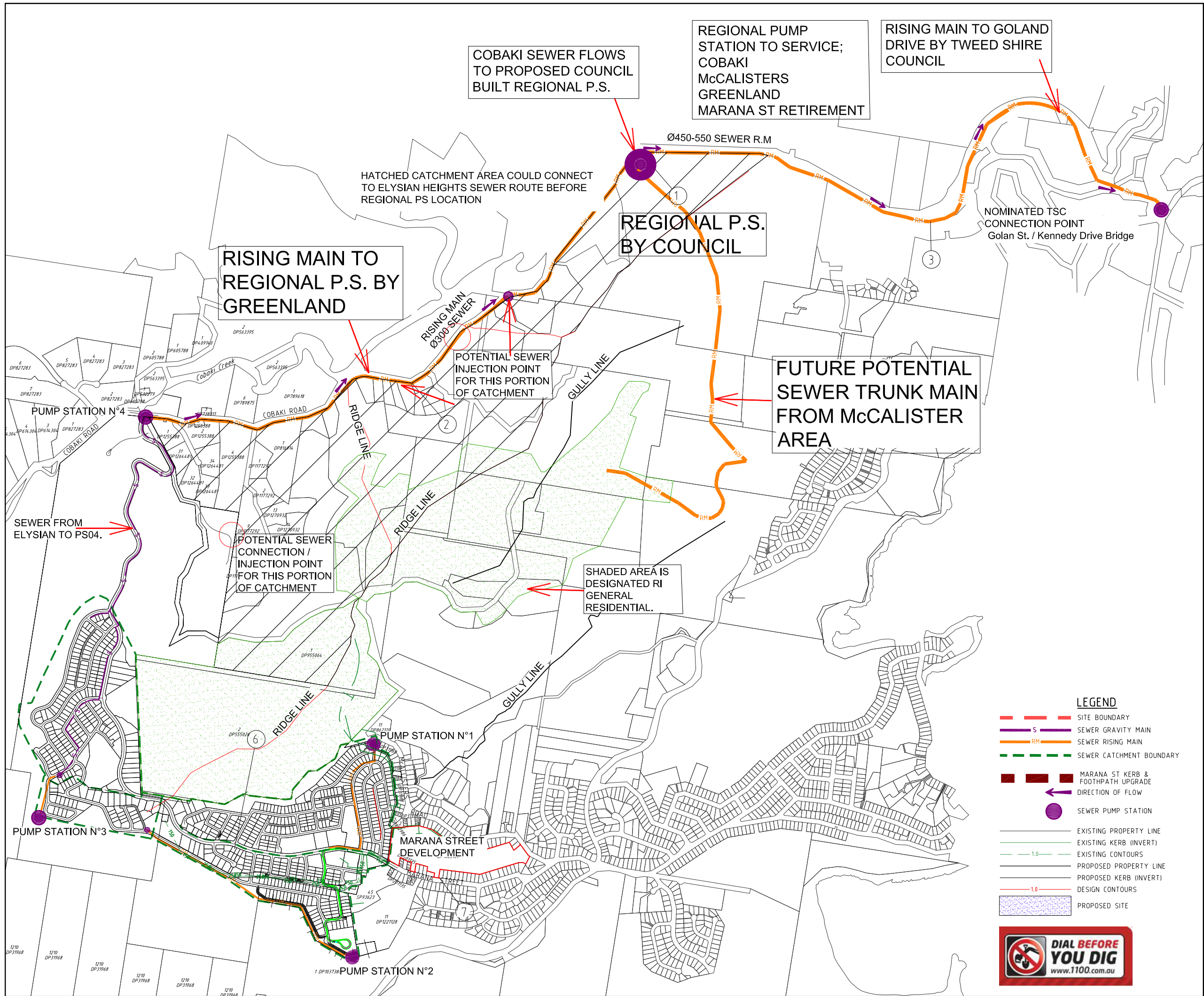
MORTONS  
urbansolutions  
Civil Engineering  
Project Coordination

MUS Pty Ltd T/As:  
Mortons-Urban Solutions  
ABN 39 116 375 065  
mortons@urbansolutions.net.au  
www.urbansolutions.net.au  
Tel 07 5571 1099

Postal Address  
PO Box 2484  
Southport QLD 4215  
  
Gold Coast Office  
Suite 9, 19 Short St  
Southport QLD 4215

| DESIGNED       | BM | DRAWN | BL |
|----------------|----|-------|----|
| DRAWING NUMBER |    | REV   |    |
| 45101-SNA-500  |    | A     |    |

Y:\451 - GTH Resorts No.20 Pty Ltd\Preliminary Drawings\Sewer Network\45101-SNA-500.dwg, PLAN SHEET 01, 31/01/2025 9:30:07 AM, 1:2



PROJECT NAME

MARANA STREET  
SEWER NETWORK  
RP DESCRIPTION

MARANA ST  
BILIAMBIL HEIGHTS

CLIENT

GTH RESORTS  
No.20  
PTY LTD

0 75 150 225 300 375m  
Scale 1:7500 - A1 (1:15000 - A3)

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DRAWING TITLE

OFFSITE SEWER  
INFRASTRUCTURE  
PLAN

Civil Engineering  
Project Coordination

MUS Pty Ltd T/As:  
Mortons-Urban Solutions  
ABN: 39 116 375 065  
mortons@urbansolutions.net.au  
www.urbansolutions.net.au  
Tel: 07 5571 1099

Postal Address  
PO Box 2484  
Southport QLD 4215  
  
Gold Coast Office  
Suite 9, 19 Short St  
Southport QLD 4215

| DESIGNED       | BM | DRAWN | BL |
|----------------|----|-------|----|
| DRAWING NUMBER |    | REV   |    |
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