Proposed Mixed Use Development

Miles Franklin Drive, Talbingo
West Talbingo Masterplan
Water Cycle Management Strategy Report
Project No.22113 – July 2023

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flooding . engineering . landscape . design . management

WATER CYCLE MANAGEMENT STRATERGY REPORT

LOT 35 DP878863, MILES FRANKLIN DRIVE, TALBINGO

PREPARED FOR

Ironstone Development Group Pty Ltd

PREPARED BY

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EXECUTIVE SUMMARY

Siteplus Pty Ltd has been commissioned by Ironstone Development Group Pty Ltd. to undertake a Water Cycle Management Study to support the Proposed subdivision and development of land at Lot 35 DP878862, Miles Franklin Drive, Talbingo. The West Talbingo Masterplan site is located within the Snowy Valleys Council Local Government Area (LGA). This report details the procedures used and presents the results of investigations to support the masterplan development application submitted to Snowy Valleys Council.

This Water Cycle Management Strategy presents the Hydrological, Hydraulic and Water Quality characteristics of the site and demonstrates how the proposed stormwater infrastructure will meet the requirements of Councils Standards DCP and LEP requirements. The modelling and overall Water Cycle Management Study is based on the Masterplan undertaken by Robert Harwood Architects and preliminary gradings by Siteplus.

An XP-RAFTS model was developed for the subject site and upstream contributing catchments for hydrological analysis of the 20%, 5%, 1% Annual Exceedance Probability (AEP) events and PMF (Probable Maximum Flood). The hydrological flood routing model was used to determine sub-catchment hydrographs for input in the 2D hydraulic model of the existing and proposed flood regime for the development area. Comparison of both scenarios is required in the design of detentions basins to reduce post development peak flows to pre-existing conditions.

A two-dimensional hydraulic analysis of the site was developed using TUFLOW 2020. The TUFLOW model was developed to simulate overland flow for the 20%, 5% and 1% AEP as well as the PMF storm events in the existing and proposed scenarios. The modelling results obtained demonstrate the current flood characteristics and proposed management of floodwaters through the West Talbingo Development.

Both the hydrological and hydraulic models have adopted the Australian Rainfall and Runoff (ARR) 2016 rainfall values for 20% to the 1% AEP events and ARR87 rainfall values for the PMF event. ARR 2019 methodology has been followed for the AEP events and Bulletin 53 for the PMF.

A MUSIC model was produced to design water quality treatment measures, reducing urban generated pollutants to ensure the environmental impacts of stormwater runoff are minimized. The model demonstrates the proposed water sensitive urban design (WSUD) measures meet the required pollutant load reduction objectives outlined within the report.

The Water Cycle Management Strategy proposed for West Talbingo Village delivers the required technical performance, lessens environmental degradation and pressure on downstream ecosystems and provides a sustainable solution for stormwater management

1. INTRODUCTION

1.1. Preliminary

1.1.1. Siteplus Engagement

Site Plus Pty Ltd (Siteplus) has been engaged by Ironstone Development Group Pty Ltd to prepare a Water Cycle Management study to support the Proposed Mixed Use Development at Lot 35 DP878862, Miles Franklin Drive, Talbingo.

1.1.2. Scope of Work

Siteplus determined the following investigations were required to complete a thorough Water Cycle Management study of the site:

- Construct a Hydrological model to determine the rainfall hyetographs and hydrographs for input into the TUFLOW models;
- Use the Hydrological model in the design of stormwater detention systems for the development;
- Develop a 2D TUFLOW model to calculate the 20%, 5% and 1% AEP as well as Probable Maximum Flood (PMF) levels, velocities, hazard and hydraulic precincts for the development and ensure there are no adverse flood effects for existing downstream developments;
- Develop a MUSIC model to assess how the development will meet the requirements of Snowy Valleys Council controls for minimising the environmental impacts of urban run-off; and
- Prepare a report which summarises the findings of the analysis.

1.2. Subject Land

The West Talbingo Village Masterplan is located within the Snowy Valleys Council Local Government Area and consists of a parcel approximately 15.25ha in size, located to the south of Miles Franklin Drive. The subject site is bound to the north by Miles Franklin Drive, the Talbingo Tourist Park and Thomas Street to the east and lightly vegetated agricultural land to the south and west.

The site is influenced by a series of upstream catchments ranging from 1ha to 10ha that are conveyed via unnamed watercourses, discharging to culverts beneath Miles Franklin Drive before Jounama Pondage and the Tumut River. The study area contains multiple small existing dams located upstream of the proposed development.

The site is predominantly vacant land with undulating terrain and two remnant asphalt roads, Wilkinson and Yan Street that traverse the site. The majority of the site has a northerly aspect, sloping towards Miles Franklin Drive. The entire parcel of land is zoned as RU5 – Village according to the NSW Planning Portal Spatial Viewer.

Title:
Site Location - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

Figure: **1.1**

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1.3. Proposed Development

The Proposed Development is supported by a Masterplan, which represents the overall planning framework and preferred outcome for the West Talbingo Village. The Masterplan includes the following significant features:

- Residential development with associated road infrastructure
- Multi-storey Hotel
- Mixed use / commercial areas
- Passive / Active Open Space Area throughout the masterplan.

Preliminary site grading has been performed by Siteplus for the purpose of conveying overland flow through the development. Two (2) stormwater detention basins will be provided at strategic locations throughout the development to mitigate peak flows resulting from urbanisation of the catchment to less than (or equal to) existing conditions. The existing watercourse through the east of the site is to be maintained and various water quality devices are proposed throughout the development to minimise the impact on the environment and deliver water quality objectives. Refer to Appendix A for the Masterplan of the site.

1.4. Existing Flood Studies

There are currently no existing Flood Studies for the subject area. In lieu of a Council adopted Flood Study for the site, Siteplus has taken a conservative approach and followed the guidelines and methodology outlined in ARR 2019 to produce a flood study for the site using design rainfall.

The Regional Flood Frequency Estimation Model (RFFE) has been utilized to determine peak flow rates for the Tumut River.

2. DEVELOPMENT GUIDELINES AND CONSTRAINTS

The following were considered in developing the Water Cycle Management Strategy for the West Talbingo Village Proposal site.

2.1. Snowy Valleys Council Development Control Plan (2019)

The Snowy Valleys Council Development Control Plan identifies the following objectives for considerations with regard to water management:

- Development must not occur on land that is affected by the 1 in 100-year ARI event unless the development is consistent with, and meets the requirements, of the NSW Floodplain Development Manual.
- The stormwater system design and construction should minimise the environmental impact of urban run-off on other aspects of the natural environment (creeks and vegetation) by employing techniques which are appropriate and effective in reducing run-off and pollution.

The NSW Floodplain Development Manual will be referenced for further technical directions.

2.2. NSW Floodplain Development Manual

The NSW Floodplain Development Manual identifies the following areas for considerations with regard to water management:

- Access to the site during flood events
- Fill or excavation in the floodplain
- Freeboard
- Floor levels
- Differences between land use
- Services
- Impact on flood behaviour
- Structural Soundness when flooded
- Building materials
- Fencing

2.3. Snowy Valleys Council Planning and Design Manual (2019)

The Snowy Valleys Council Planning and Design Manual identifies the following objectives for considerations with regard to water management:

- To ensure that inundation of private and public buildings located in flood-prone areas occurs only on rare occasions and that, in such events, surface flow routes convey floodwaters below the prescribed velocity/depth limits.
- To provide convenience and safety for pedestrians and traffic in frequent stormwater flows by controlling those flows within prescribed limits.
- Retain within each catchment as much incident rainfall and runoff as is possible and appropriate for the planned use and the characteristics of the catchment.

2.4. Tumut Shire Council Local Environmental Plan (2012)

Snowy Valleys Council is currently operating with the former Tumbarumba Shire Council and Tumut Shire Council Local Environmental Plans (LEP). For the purpose of this study, the Tumut Shire Councils LEP will be referenced.

The Tumut Shire Council LEP identifies the following objectives for considerations with regard to water management:

- to minimise the flood risk to life and property associated with the use of land,
- to allow development on land that is compatible with the flood function and behaviour on the land, taking into account projected changes as a result of climate change,
- to avoid adverse or cumulative impacts on flood behaviour and the environment,
- to enable the safe occupation and efficient evacuation of people in the event of a flood.

2.5. Using MUSIC in Sydney's Drinking Water Catchment (2012)

Using MUSIC in Sydney's Drinking Water Catchment by Sydney Catchment Authority was used as a guide in the creation of the West Talbingo Village MUSIC stormwater quality model. The manual is a step-by-step guide to develop a water quality treatment train and water sensitive design. The manual was primarily used in the definition of treatment measures including rainwater tanks, gross pollutant traps, bioretention basins and swales.

3. MODEL DEVELOPMENT

As part of the Water Cycle Management Study, it was identified that modelling was required to address the Hydrological, Hydraulic and Water Quality requirements of Snowy Valleys Council.

XP-RAFTS has been adopted for the hydrological analysis of the study area surrounding the West Talbingo Village. XP-RAFTS has been extensively used in NSW and is the industry standard for hydrological modelling.

Due to the site being affected by numerous overland flow paths, Siteplus has adopted a 2D/1D hydrodynamic numerical model as they are most accurate, cost efficient and industry standard tool to predict flood behaviour. For this study, TUFLOW was chosen for the estimation of flood behaviour for the following reasons:

- Accurately representing overland flow paths.
- Dynamically linking the 1D (culverts) to any point within the 2D model.
- Apply rainfall directly to the modelled area.
- Produce high quality map outs; and
- Is widely accepted by councils as the preferred 2D model.

This study utilises the TUFLOW 2020 release, which was the latest release at the time the West Talbingo Village model was developed.

eWater MUSIC was chosen to model the proposed stormwater treatment train and how it meets the pollutant load reduction objectives outlined above.

3.1. Hydrological Model Development

An XP-RAFTS rainfall-runoff flood routing model has been developed and provided for the subject site and upstream catchment to the Tumut River (Jounama Pondage).

3.1.1. Design Rainfall

Design storms were in XP-RAFTS based on rainfall data at the grid location 35.585 (S) 148.292 (E). ARR 2016 data was obtained for the AEP events while the ARR87 Storm Generator was used for the PMF.

3.1.2. Design Rainfall Losses

The ARR Data Hub provides guidance on the loss parameters for pervious catchments for this locality. Design Rainfall losses were applied to the XP-RAFTS model as per Table 3-1.

Table 3-1 Design Rainfall Losses

Catchment Condition	Initial Loss (mm)	Continuing Loss (mm/h)
Pervious	28	1.68
Urban Pervious	19.6	1.68
Impervious	1.5	0

Initial losses for urban pervious surfaces have been factored by 70% due to the urban nature of the catchment. This is consistent with advice in ARR19 Book 5 section 3.5.3.2.1.

3.1.3. Sub-Catchments

The study area surrounding the West Talbingo Village Development has been split into 17 distinct sub catchments for the existing scenario and 20 in the proposed scenario as depicted in Figure 3-1 and Figure 3-2. A summary of the sub-catchment details is provided in Table 3-3.

In order to identify the catchment boundaries a 1.0m DEM was accessed via the ELVIS website using data provided by the NSW Government Spatial Service. The survey was used to determine the sub-catchment boundaries and overland flow paths within the site.

The Manning's roughness parameters used within each catchment are based on industry best practices and those values contained within Table 6.2.2 of Book 6, Chapter 2 of ARR 2019. Refer to Table 3-2 for Manning's values used.

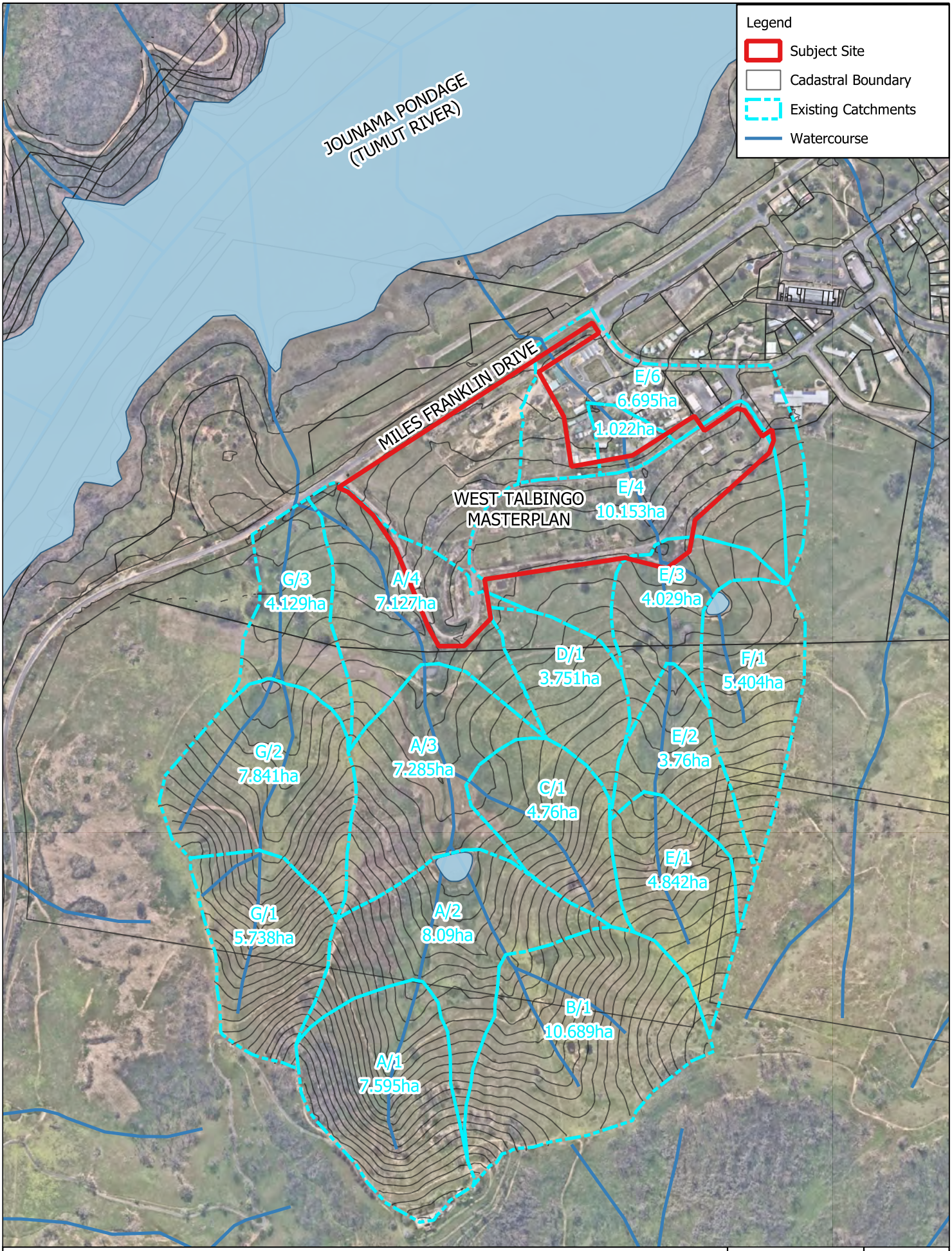
Table 3-2 Manning's Roughness 'n'

Condition	Manning's Value
Pervious	0.03
Impervious	0.02

Channel routing was determined using the Muskingum Cunge method with 'K' values calculated based on link length and channel flow velocity. Flows velocities calibrated iteratively using the hydraulic model. A channel storage exponent 'x' of 0.15 was adopted for all links.

Table 3-3 Sub-Catchment Summary

Sub Catchment	Area (Ha)	Impervious %	Vectored Slope %	Routing Length	K Factor
Existing Scenario					
A/1	7.595	0	27.80	234	0.03
A/2	8.090	0	22.67	272	0.03
A/3	7.285	0	15.43	259	0.02
A/4	7.127	5	11.47		
B/1	10.689	0	23.57	270	0.03
C/1	4.760	0	12.67	223	0.07
D/1	3.751	0	12.67	346	0.10
E/1	4.842	0	21.63	244	0.05
E/2	3.760	0	20.92	267	0.03
E/3	4.029	0	13.93	153	0.04
E/4	10.153	10	20.04	115	0.02
E/5	1.022	40	6.70	141	0.02
E/6	6.695	50	6.25		
F/1	5.404	0	20.04	200	0.03
G/1	5.738	0	30.00	308	0.04
G/2	7.841	0	19.46	276	0.05
G/3	4.129	0	30.00	171	0.03
Total	**102.91**				
Proposed Scenario					
A/1	7.595	0	27.80	234	0.03
A/2	8.090	0	22.67	272	0.03
A/3	7.285	0	15.43	259	0.02
A/4	5.250	5	11.47		
B/1	10.689	0	23.57	270	0.03
C/1	4.760	0	12.67	223	0.07
D/1	4.860	0	13.96	297	0.06
D/2	2.730	60	9.70	288	0.04
D/3	0.530	60	8.71	208	0.03
E/1	4.842	0	21.63	244	0.05
E/2	3.760	0	20.92	267	0.03
E/3	5.160	0	13.93	174	0.04
E/4	7.100	60	9.73	130	0.02
E/5	0.730	40	6.70	141	0.02
E/6	6.140	50	6.25		
F/1	5.404	0	20.04	200	0.03
G/1	5.738	0	30.00	308	0.04
G/2	7.841	0	19.46	276	0.05
G/3	4.129	0	30.00	171	0.03
H/1	4.400	80	8.54	222	0.03
Total	**107.03**				



Title:

Existing Sub-Catchments - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

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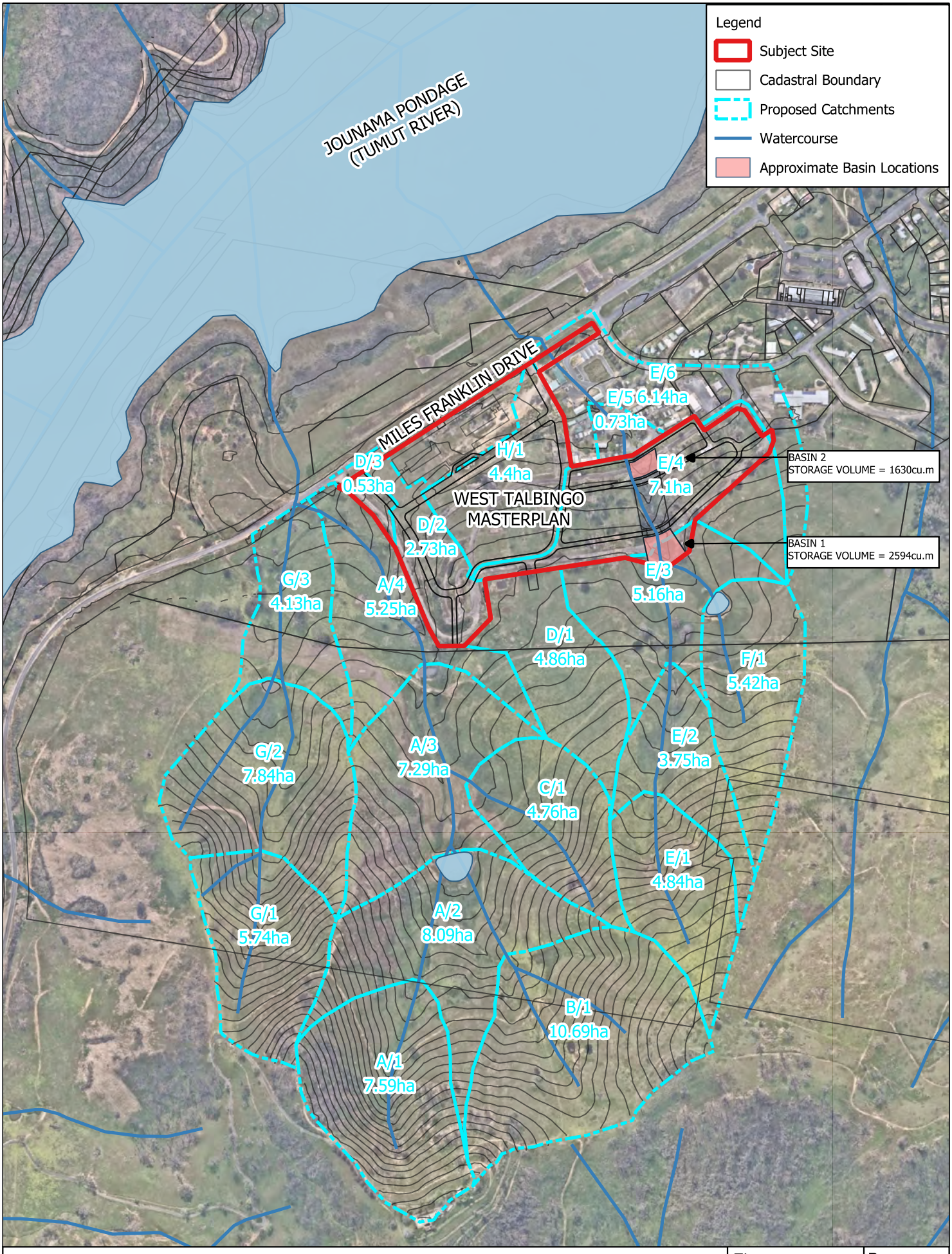

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Proposed Sub-Catchments - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

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3.2. TUFLOW Model Development

This Siteplus study will analyse the development in two (2) unique development scenarios. These are outlined below.

- An existing scenario – this will include the current topography and developments constructed at the time of undertaken the study. This includes modelling of the surrounding stormwater infrastructure and Talbingo Caravan Park.
- A proposed scenario – this will include the proposed West Talbingo Village development as seen in Appendix A. Preliminary site grading has been undertaken for the purpose of defining catchments. A more detailed will be developed and accessed in the subsequent approval stages.

These two development scenarios will enable the proposed development to be assessed completely for flood affectation and safe conveyance of stormwater in the fully developed scenario.

3.2.1. Data Collection

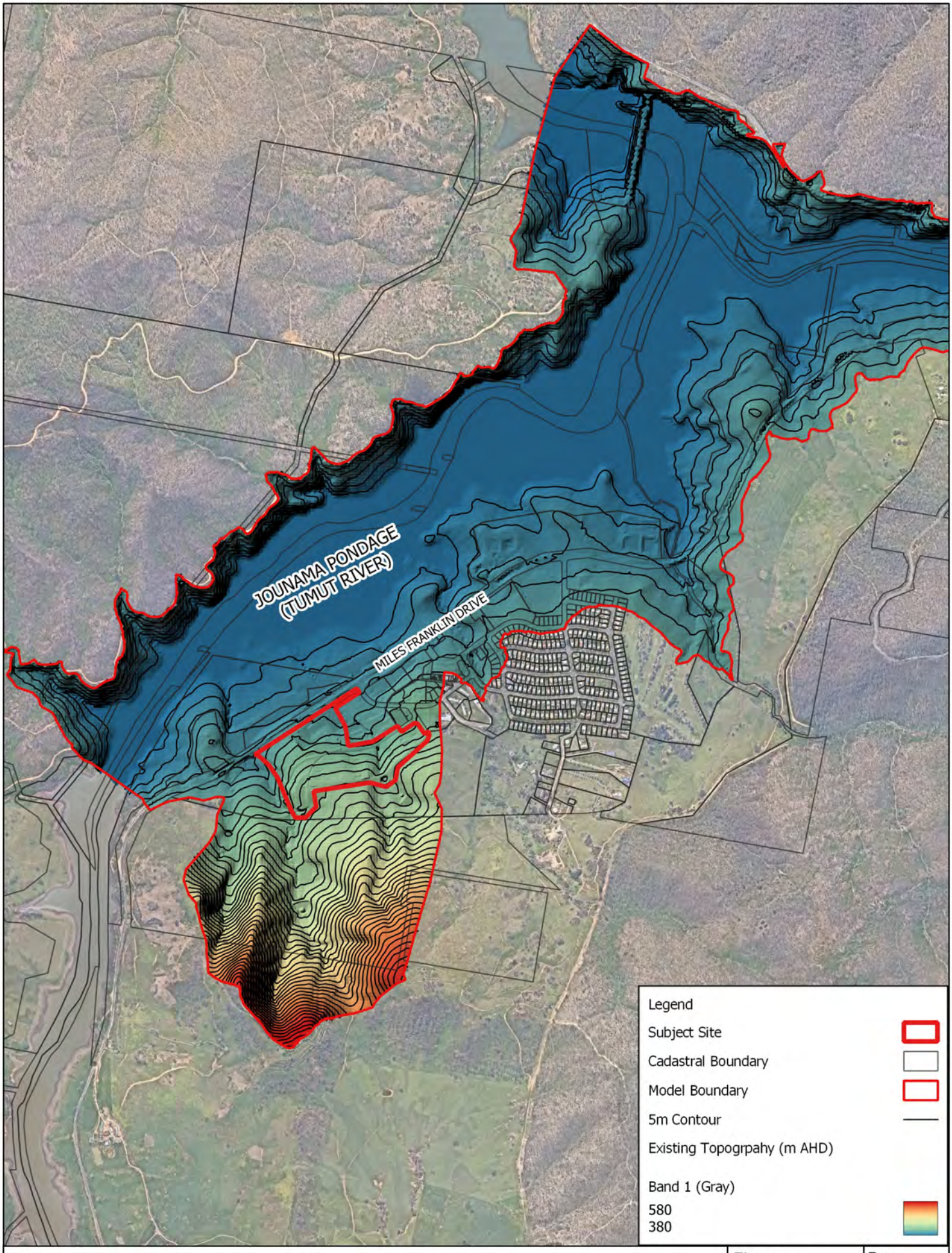
Topographic Data collated and used for this Study includes:

- Detailed site survey provided by Foresight Engineering;
- 2020, 1.0m DEM, ALS data provided by NSW Government Spatial Service;
- Civil 3D Design Surface;

The above sources have been ground proven through onsite delineation.

The DEM data provided by the NSW Government Spatial Service was fed directly into the TUFLOW model and formed the existing topography. Modifications were made to the surface via the site survey to accurately model the existing land topography.

Figure 3-3 and Figure 3-4 show the final DEM used within the existing, proposed model. Within the catchment the elevation ranges from 373m AHD to 581m AHD.



Title:

Existing Model Topography - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

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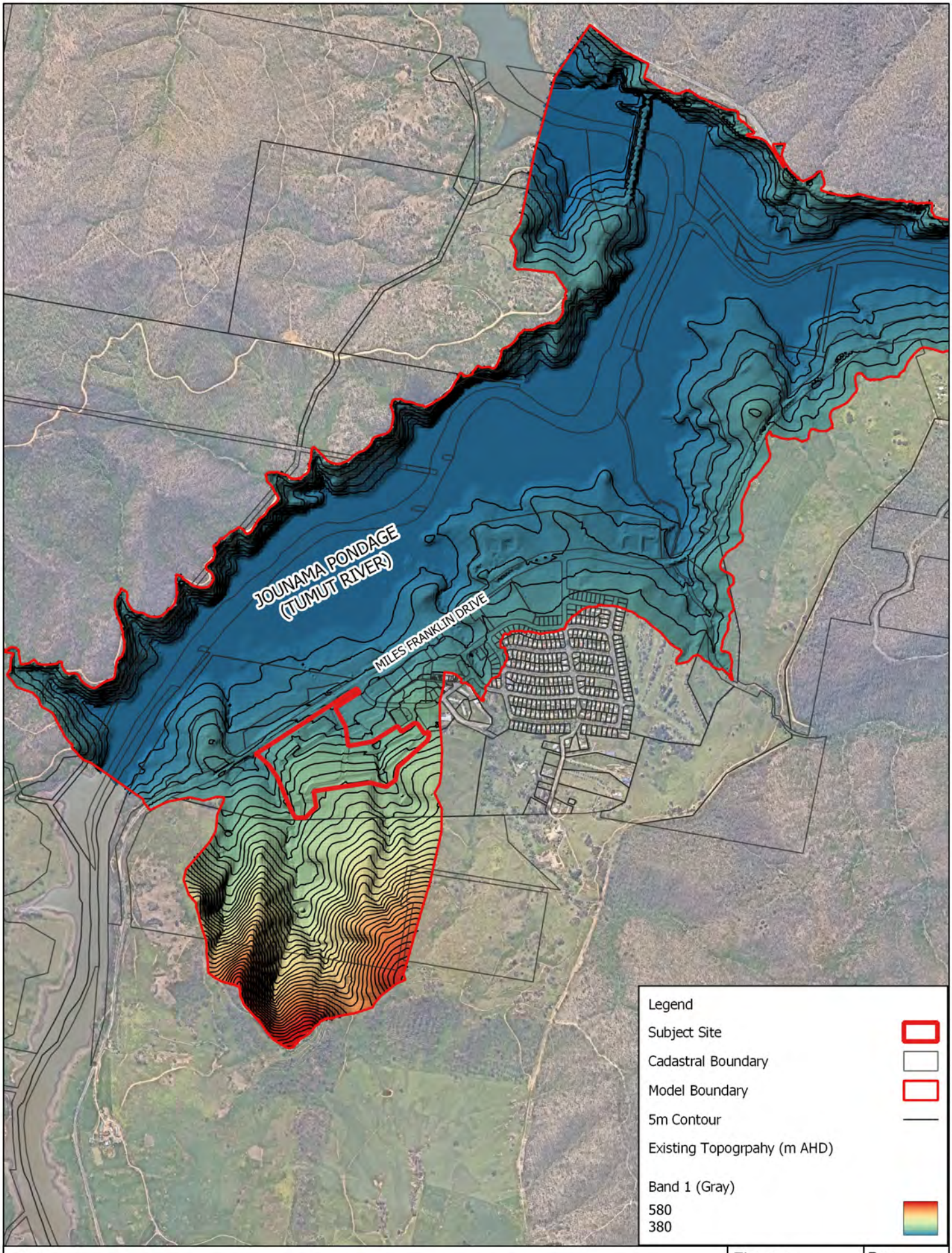

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Proposed Model Topography - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

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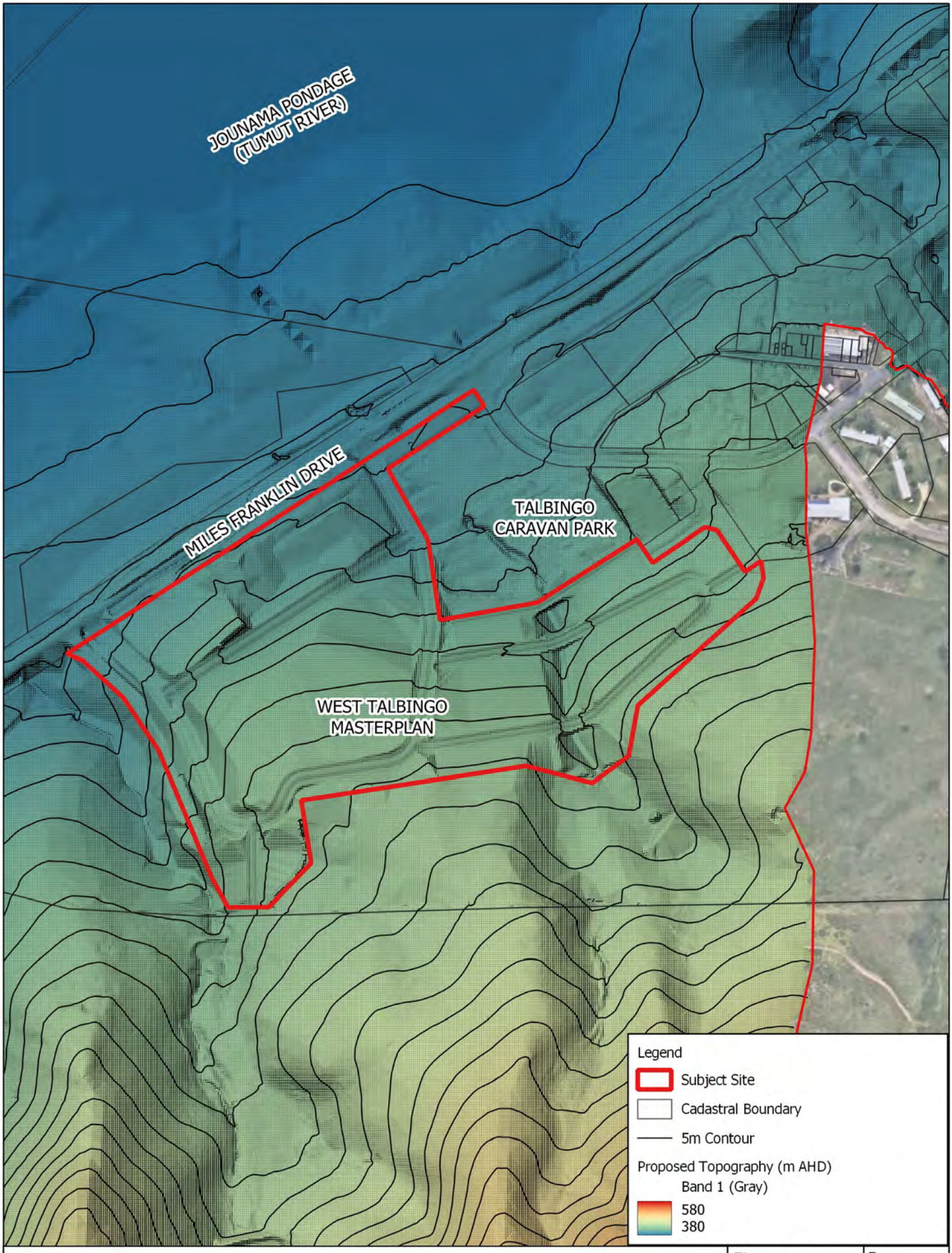

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Proposed Model Topography Detail - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

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3.2.2. Modelling Technique

Siteplus has adopted a 2D/1D hydrodynamic numerical model as it is currently the most accurate, cost effective and efficient tools to predict flood behaviour.

For this Study TUFLOW was chosen for the modelling for the following reasons:

- Accurately representing overland flow paths;
- Dynamically linking the 1D (culverts) to any point within the 2D model;
- Apply rainfall directly to the modelled area;
- Produce high quality map outs; and
- Is widely accepted by councils as the preferred 2D model.

This Study utilises the TUFLOW 2020 release, which was the latest release at the time of the creation of the Siteplus West Talbingo Village Flood Study.

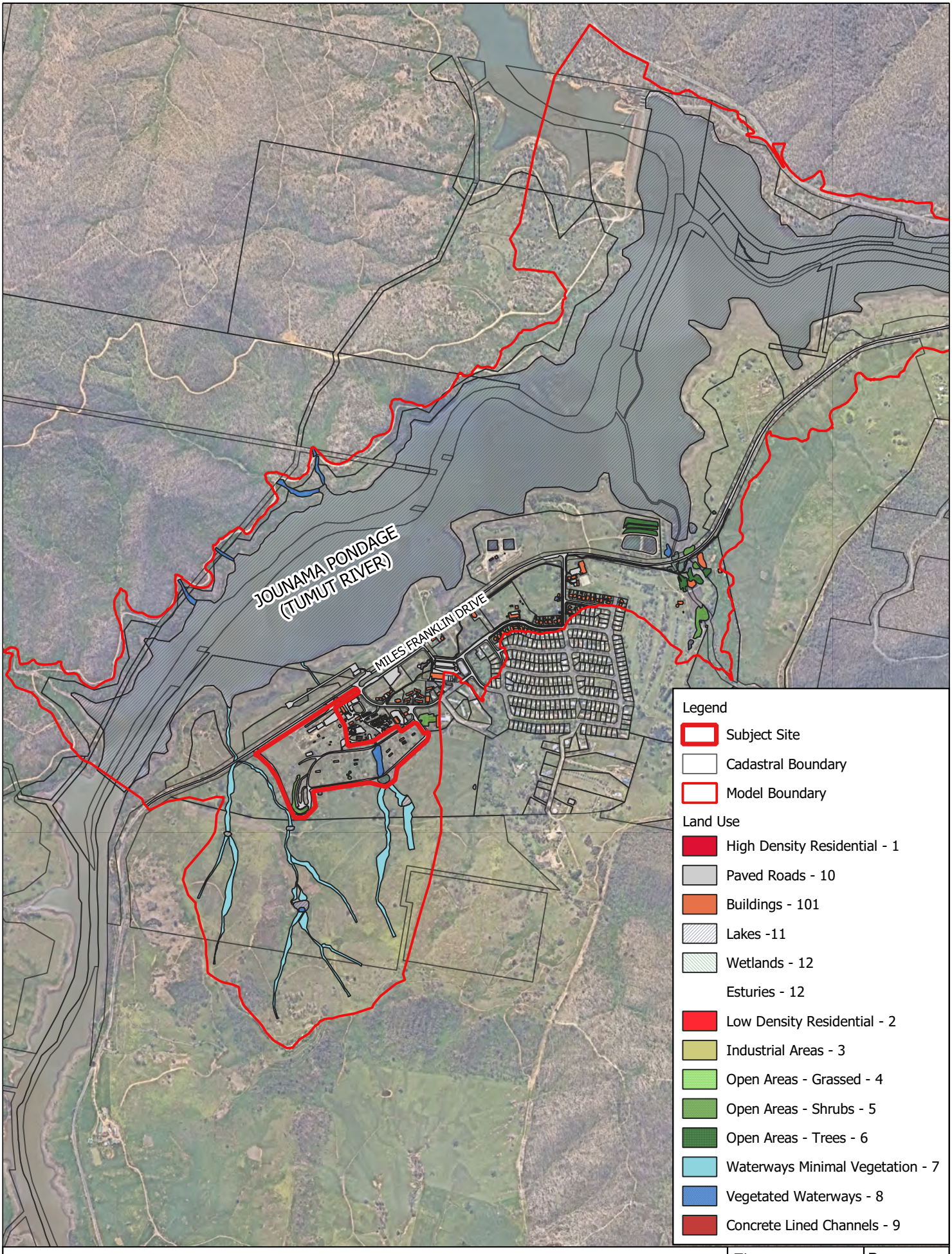
3.2.3. Hydraulic Roughness

Roughness coefficients represent the resistance to flood flows in channels and floodplains. The land use delineation for the model is based on aerial photography and the proposed lot layout. The land use delineation used in the TUFLOW model is presented in Figure 3-6 and Figure 3-8.

Manning's 'n' values were adopted in line ARR2019, Table 6.2.2 values. This is a simplistic approach and ensures that studies are utilising the same parameters and therefore may have similar flow rates. The adopted Manning's 'n' roughness coefficients for the land uses within the 2D hydraulic model extent are listed in Table 3-4.

Table 3-4 Land Use Table

Land Use Type	Manning's 'n'
Open Pervious Areas (Grassed)	0.04
Open Pervious Areas (Shrubs)	0.06
Open Pervious Areas (Trees)	0.009
Paved Roads	0.025
Residential Areas – High Density	0.35
Residential Areas – Low Density	0.15
Waterways/channels – minimal vegetation	0.03
Waterways/channels –(Vegetated)	0.07
Lakes (No Emergent Vegetation)	0.025
Wetlands (Emergent Vegetation)	0.065
Buildings	
Note: • Uncoloured or unshaded areas in Figures 2.3 & 2-4 have been modelled as Open Pervious Areas (Grassed).	



Title:

Existing Land Use Delineation - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

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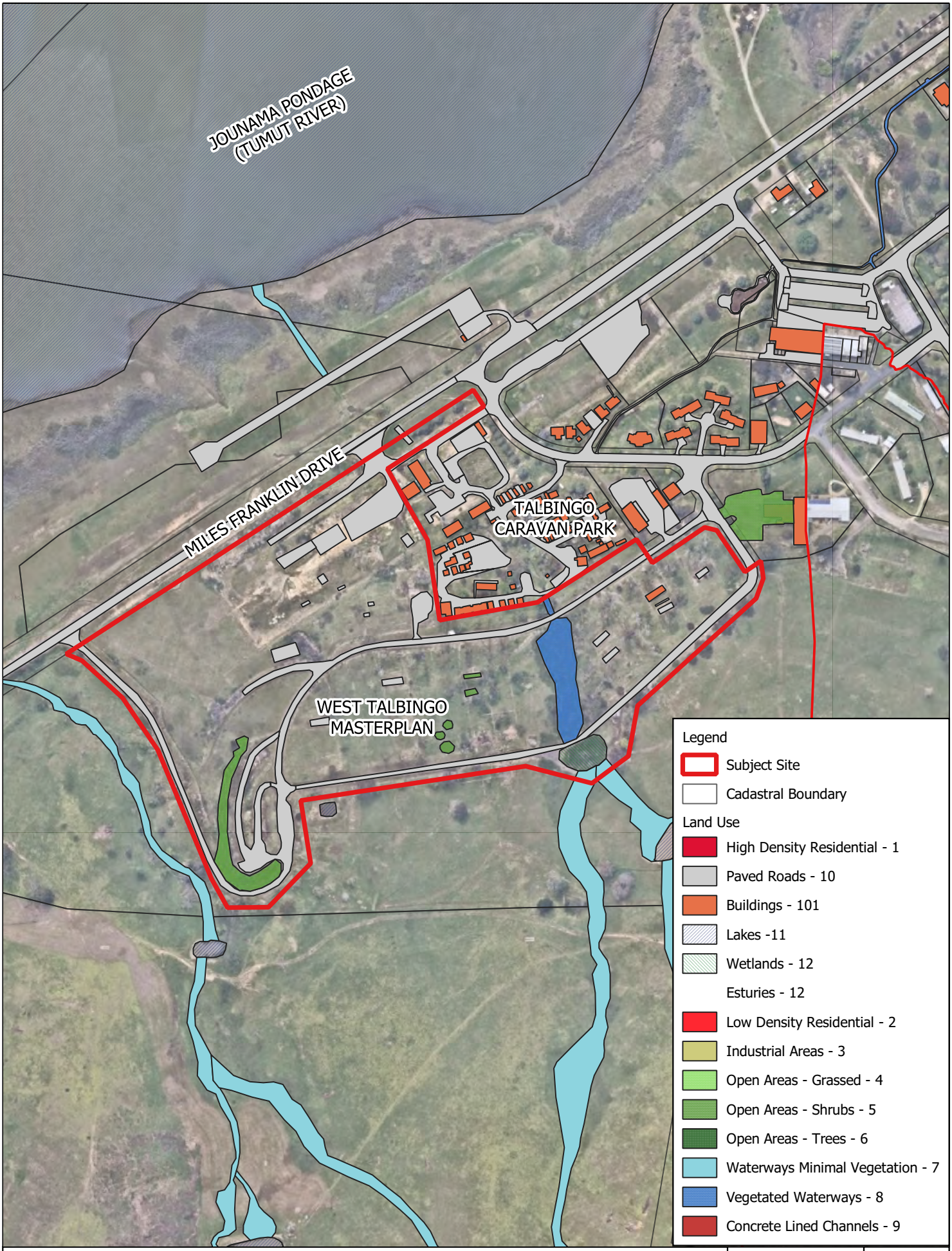

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Existing Land Use Delineation Detail - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

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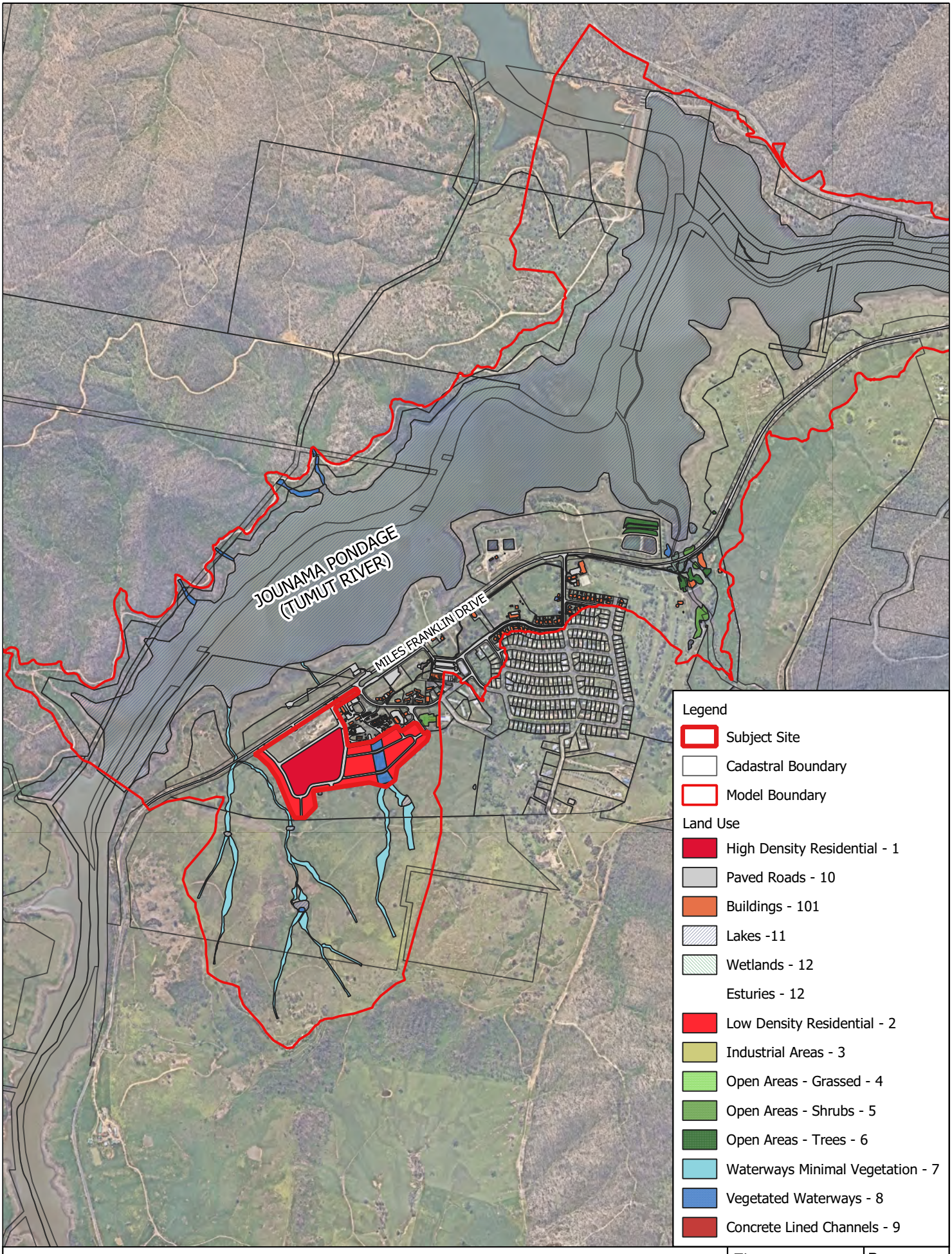

Title:

Proposed Land Use Delineation - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

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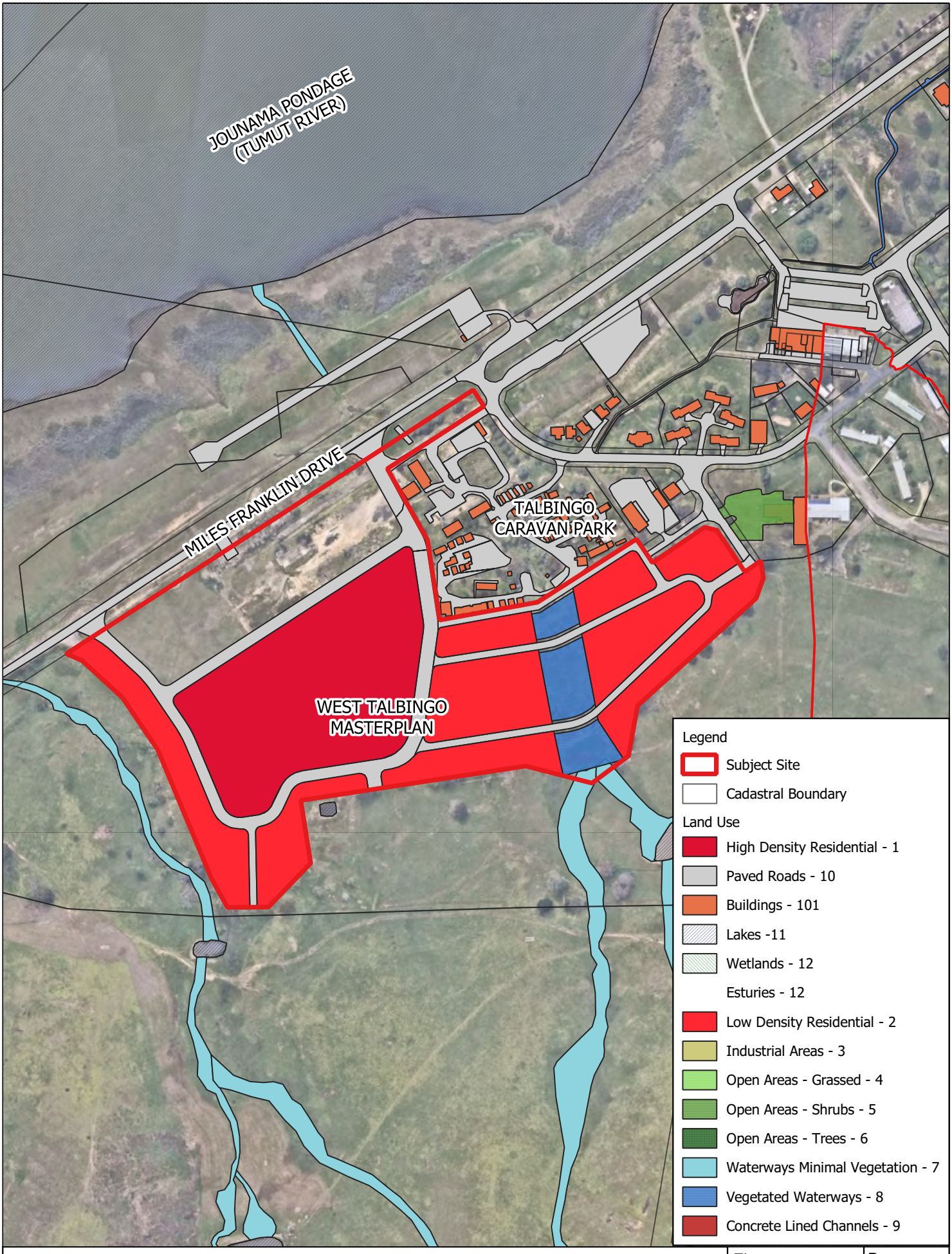

Title:

Proposed Land Use Delineation Detail - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

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3.2.4. Soil Losses

A standard soil loss parameter was applied using the Green-Ampt approach. This approach varies the rate of infiltration over time based on the soil's hydraulic conductivity, suction, porosity and initial moisture content.

The soil type chosen for the study was Silty Clay based on geotechnical investigation carried out by Douglas Partners for Lot 35 DP878862, Talbingo dated 28 April 2023.

Variables applied by TUFLOW for the chosen soil type are listed below in Table 3-5.

Table 3-5 Soil Loss Table

Soil Type	Suction (mm)	Hydraulic Conductivity (mm/hr)	Porosity (Fraction)
Clay	292.2	0.5	0.423

For Paved Roads, Residential Areas Lakes and Waterways, no soil losses are applied. Soil losses were only applied to areas within the direct rainfall region.

3.2.5. Hydraulic Structures

Stormwater networks were added for all drainage structures within the study area of the West Talbingo Village Development. Stormwater assets were modelled as 1D networks with automatic connectors (SX) to the 2D model.

Pipes are shown in the developed case only for Culvert road crossings. As part of future development applications, detailed stormwater infrastructure would be input into the model.

Blockage has been applied to open culvert inlets in line with industry best practise is outlined in Table 3-5 below.

Table 3-6 Blockage Hydraulic Structure

Hydraulic Structure Type	Percentage (%) Blocked			
	20% AEP	5% AEP	1% AEP	PMF
Class 1 - Diagonal Opening less than 1.0m.	25	25	50	100

The drainage network for both the existing and proposed scenarios are shown in Figure 3-10, and **Error! Reference source not found.**. The Jounama Pondage dam wall control gate is located within the model. For a conservative modelling approach, the control gate has been assumed inoperable. Therefore, the controlling weir has been taken as the dam wall embankment.

3.2.6. Boundary Conditions

Inflow and outflow boundary conditions are required to allow water to flow through the TUFLOW model.

The TUFLOW model created for the subject site include three boundary conditions, which are:

1. Direct Rainfall
2. Flow vs Time Upstream Inflow Hydrograph; and
3. Water level vs Time Downstream Outflow Boundary.

2.3.6.1 Direct Rainfall Inflow Region

Rainfall hyetographs have been applied through direct rainfall regions in locations were watercourses and overland flow paths could not be accurate defined. This approach avoids making routing assumptions in the hydrological model and uses the 2D hydraulic model to determine the flood regime.

The design rainfall hyetographs were derived from the raw data provided as described in Section 3.1.1. The PMF hyetograph was developed in the hydrological XP-RAFTS model. For the PMF hyetographs, the Bulletin 53 method was adopted and applied for the PMF direct rainfall.

2.3.6.2 Inflow Boundary Condition

Inflow hydrographs for the Tumut River (Jounama Pondage) have been determined by the ARR Regional Flood Frequency Model as this is the best data source available. The 95% Upper Confidence Limit has been adopted for all modelled storm events for a conservative approach. The RFFE outputs are included in Appendix B.

Sub catchment hydrographs produced in the XP-RAFTS model have been input as SA regions at catchment centroids.

2.3.6.3 Downstream Boundary Condition

The outflow boundary condition has been set downstream of the Jounama Pondage dam wall to ensure accurate modelling of the controlling hydraulic structure. The boundary condition in this location uses water level vs time (type HT). Due to its location downstream of the controlling weir, the water level at the downstream boundary has no impact on flooding upstream of the dam wall and hence has been set to 0.

The boundary conditions for both scenarios are shown in Figure 3-12 and Figure 3-13.

Title:

Existing Drainage Network - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

Figure: **3.7**

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Title:

Proposed Drainage Network - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

Figure: **3.8**

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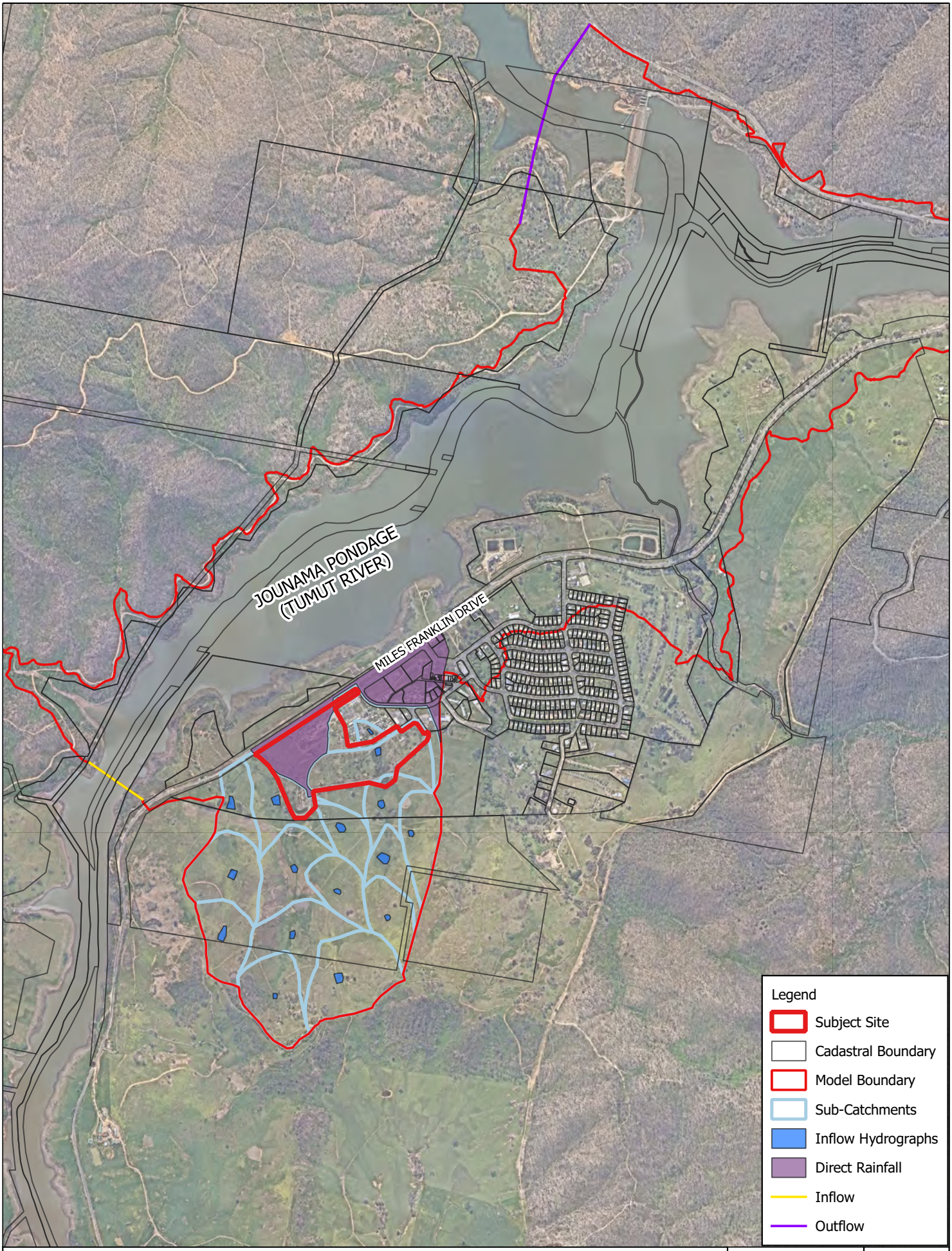


Title:

Existing Boundary Conditions - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

Figure: **3.9**

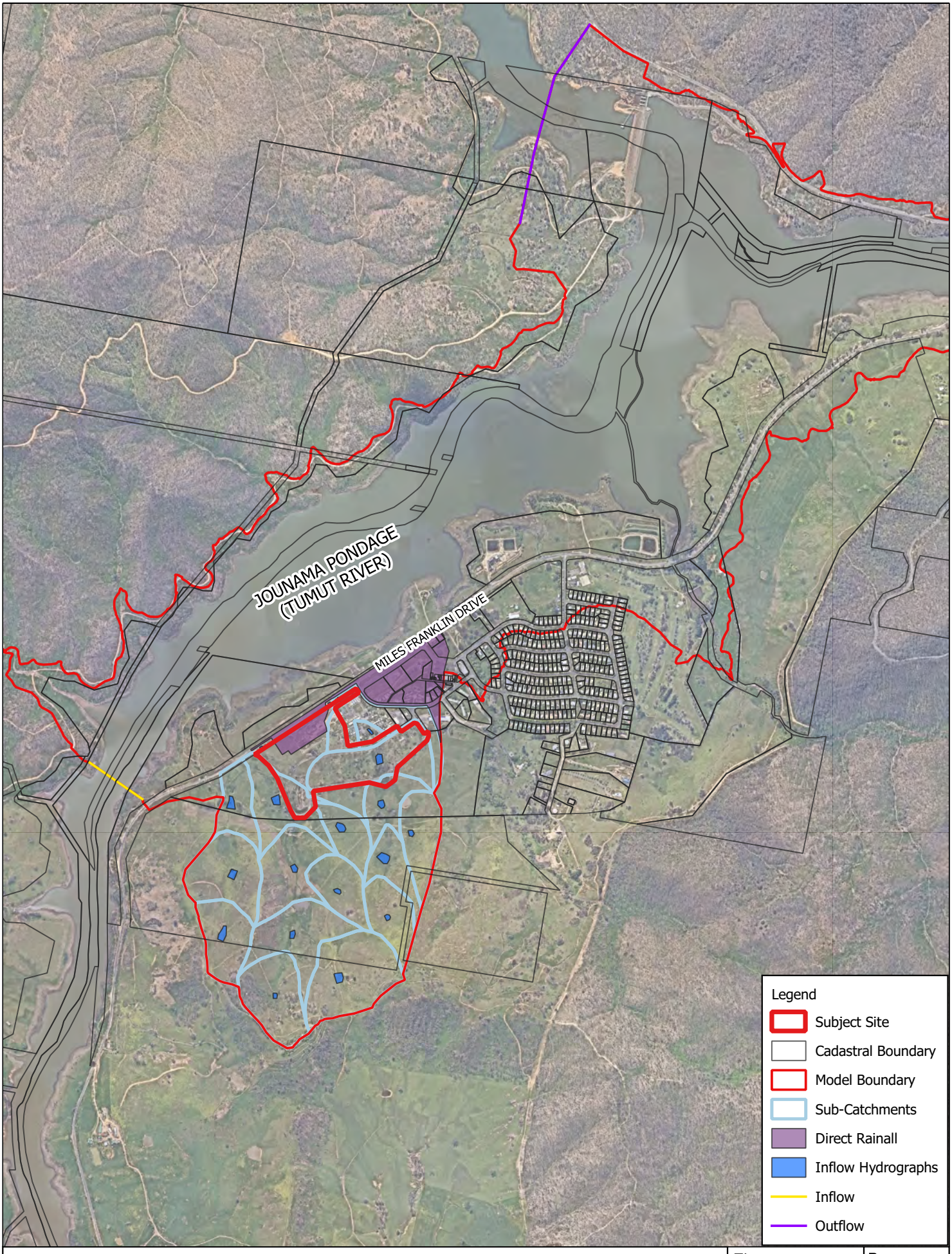
Rev: **A**

N

0 200 400 600 800 1,000 m

Scale 1:20000 @ A4

siteplus



Title:

Proposed Boundary Conditions - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

Figure: **3.10**

Rev: **A**

N

0 200 400 600 800 1,000 m

Scale 1:20000 @ A4

siteplus

3.3. Stormwater Quality Model Development

A stormwater quality model has been developed using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) as this is widely accepted in NSW for assessing urban development against set water quality targets.

The West Talbingo Village development will be assessed in accordance with the industry standard targets in lieu of a lack of detailed information specified in the Snowy Valleys Council DCP and Design Manual.

3.3.1. General

MUSIC requires historical rainfall data to determine the pollutant loadings leaving the site. It is best practice to use a sample which consists of higher-than-average rainfall or wet years.

3.3.2. Bureau of Meteorology Data

The Historical rainfall data used within the MUSIC model was attained from eWater pluviograph rainfall database. The Tooma (Station No. 072163) rain gauge was used as it is the closest with the most recent available. Rainfall data consisted of 5 minute recordings from the year 2004 to 2006. Figure 2-8 illustrates the recorded historical rainfall during this period.

3.3.3. Evapo-transpiration Data

The evaporation data used for the subject model was also attained for the Canberra region. A monthly average was used within the model and is shown through the red line in Figure 2-8.

3.3.4. Meteorological Template

The meteorological template combines both the evapo-transpiration and historical rainfall data. The meteorological template is shown in Figure 2-8 for the year of 2004 to 2006.

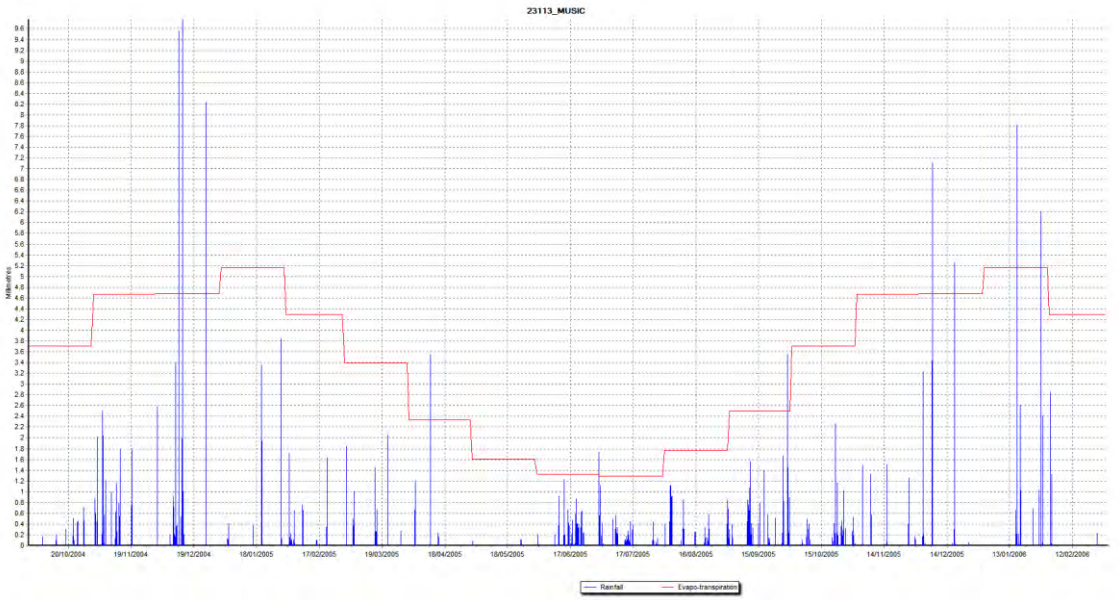


Figure 3-14 Meteorological Template

3.3.5. Proposed Development Sources

The West Talbingo Village MUSIC Model catchments have been split into various source nodes (i.e. roof, road, urban etc.) and defined using guidance from the Using MUSIC in Sydney's Drinking Water Catchment Manual. Details of catchment areas and land use assumptions are provided in …. A schematic of the MUSIC model is provided in Figure 3-15.

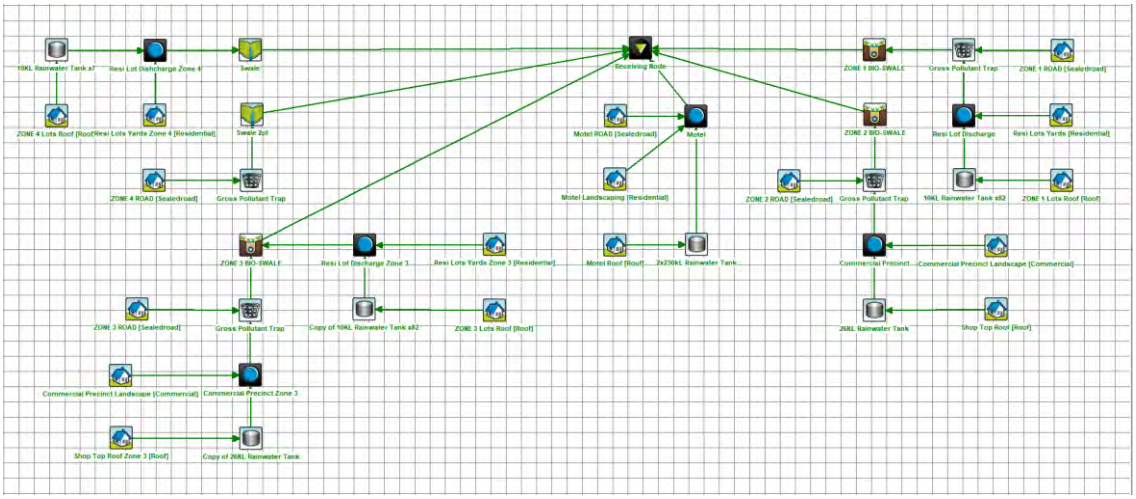


Figure 3-15 MUSIC Schematic

3.3.6. Treatment Train Proposed

The treatment train developed for the site consists of a number of treatment measures to remove pollutants whilst conveying the stormwater offsite.

Gross Pollutant Trap

Gross Pollutant Trap's (GPT) have been proposed to treat all stormwater prior to discharge to a watercourse or water quality basin. The parameters for the proposed treatment unit are as provided by the manufacturer and are as listed below.

- 90% removal of Gross pollutants
- 80% removal of suspended solids
- 45% removal of Phosphorus
- 45% removal of Nitrogen

The proposed GPT's are a propriety system and any replacement shall meet the same targets.

Bio-Retention Basin

The bio retention basins/swales have been proposed across the subject site. The basins are an end of line treatment, removing nutrients from the stormwater, ensuring that it meets the appropriate pollutant load reduction objectives. They are to be planted out with plants specifically chosen to be effective at nutrient removal.

Bio-retention systems filter stormwater using the natural infiltration process. The stormwater enters the swale/basin and infiltrates through the filter media where a number of natural processes occur to remove the nutrients within the stormwater. The surface planting prevents fine sediment clogging the surface of the system, while the plant root mass aids in the nutrient uptake.

The bottom two sand and gravel transition layers direct the treated water into the perforated pipe and then to the downstream pipe network. Figure 3-16 outlines the proposed design of the bio-retention system within the proposed treatment train.

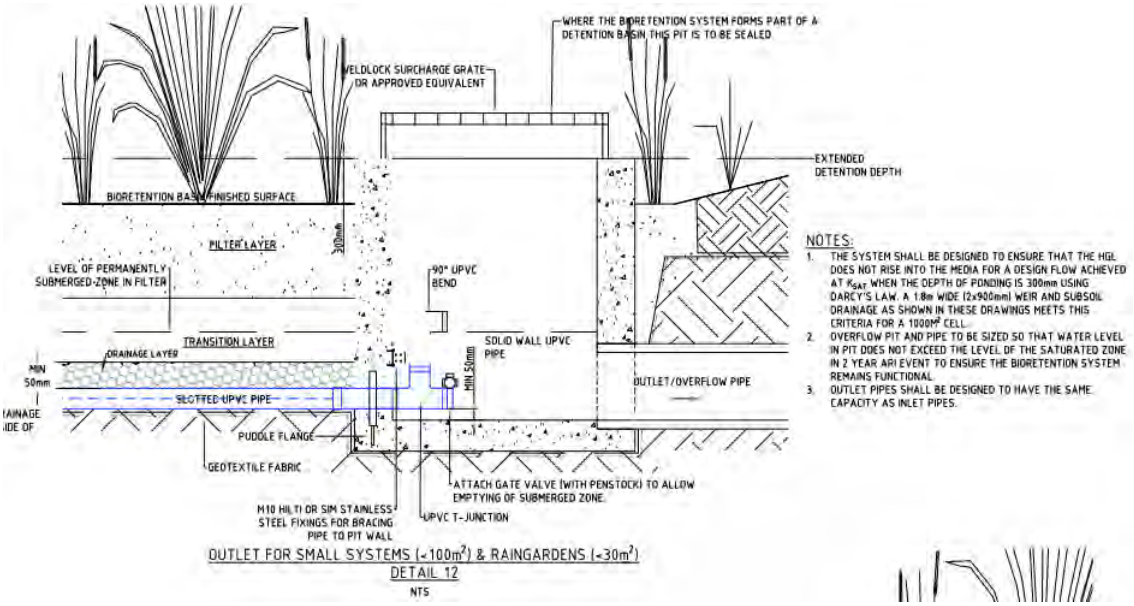


Figure 3-16 Bio Basin Typical Section

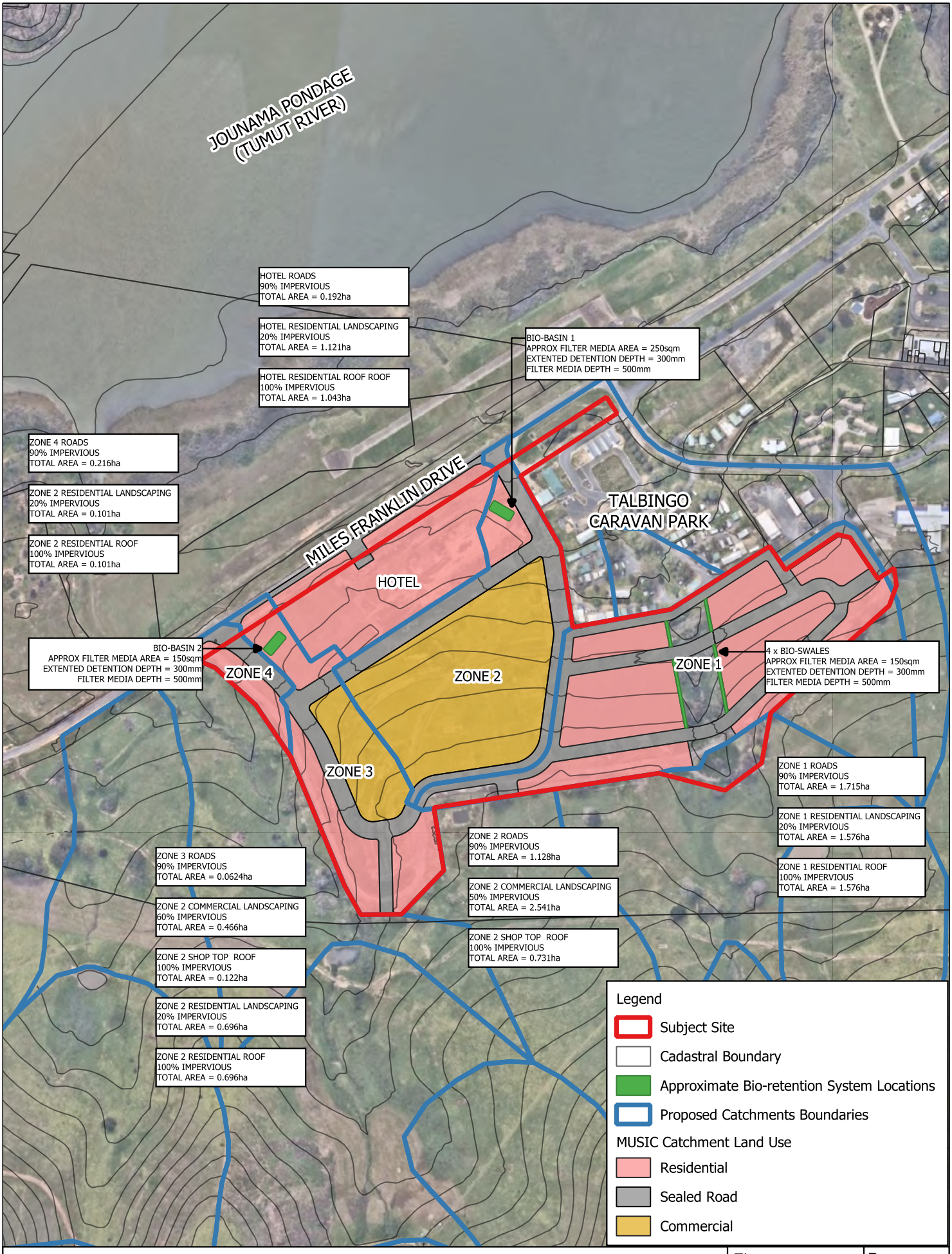
A bio-retention basin/swale has been proposed within the three major catchments. Bio-retention system details locations are provided in Figure 3-17.

Rainwater Tank

Rainwater tanks have been provided throughout the West Talbingo Village development to treat runoff from the proposed roof areas. The provision of rainwater tanks allows for the effective treatment and removal of nitrogen contained in rainfall and dry fallout (dust). Rainwater re-use can be modelled to simulate the internal and external use (i.e. laundry, gardening, etc.) of captured water. Rainwater re-use demands have been applied in accordance with the Using MUSIC in Sydney's Drinking Water Catchment Manual.

On-lot rainwater tanks were modelled for developments based on the following assumptions:

- All residential dwellings are assumed to have 10kL rainwater tanks capturing 100% of the roof areas. A rainwater re-use of 0.36kL/day internal use and 20kL/yr external use have been applied.
- Two 26kL Rainwater tanks have been proposed to capture 100% of roof runoff from the commercial precinct and shop top housing. Rainwater reuse has been applied at a rate of 0.36kL/day/dwelling (residential) and 0.2kL/day/dwelling (commercial) for internal use and 0.4kL/yr/m^2 for external use.
- 100% of the hotel roof area is to be captured by two 230kL rainwater tanks. Rainwater re-use of 3.8kL/day (0.025kL/day/room) for internal use and 4485kL/yr (0.4kL/yr/m^2) for external use has been applied.
- All rainwater tanks have been sized to achieve 100% of the load reduction for non-potable uses or 80% re-use supply, which ever is reached first.



Title:

Proposed Bio-retention System Location - Miles Franklin Drive, Talbingo
West Talbingo Masterplan - Mixed-Use Development

Figure: **3.14**

Rev: **A**

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0 100 200 300 m

Scale 1:5000 @ A4

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3.3.7. Monitoring and Maintenance Procedures

Monitoring and maintenance of water sensitive urban design control is critical to ensure their performance is retained throughout its life cycle. Unmaintained stormwater quality controls can fail leading to an increase of pollutant loads on receiving waters. The following section provides a guide into the monitoring and maintenance of both the gross pollutant traps and bio-retention swale proposed within the development.

Appendix C contains a sample maintenance and inspection checklist for all Gross Pollutant traps (GPT's) and Bio-retention Basins. The checklist should be used by the maintenance authority to ensure that the stormwater treatment devices are retained and function at the desired level.

Gross Pollutant Traps (GPT's)

GPT's should be cleaned every 3 months or after major storm events that exceed 35mm in total as per manufactures standards and specifications. The Ecosol RF100 gross pollutant traps specified can be easily cleaned as the basket unit can be removed from the pit. The following actions should be carried out every 3 month period:

- Remove litter and gross pollutants from basket via either material grab or suction means.
- Remove debris from inlet and outlet to ensure free flow through unit.
- Unblock screen and basket ensure that the basket has not compromised the function of the system.

Bio-retention Basins

Predictive and regular inspections should be carried out on a regular basis for each bio-retention system. The predictive inspection is based on a storm event that enables sediment transport roughly 35mm of rainfall in a single event.

The performance of the bio-retention basin can be based on the following performance indicators:

- Ponding Time, a maximum of 12 hours.
- Even flow distribution across the filter area. No concentrated flow paths should be present.

During the vegetation establishment period a Bio-retention systems should be inspected every 3 months or after a major rainfall event. During the establishment period the following should be monitored:

- Pounding, clogging or blockage of filter media. Untreated water should not be pooling on the surface of the system for extended periods of time.
- Vegetation and density of plants should be at the desired level. No bare patches or sand filter media should be visible on the surface of the system.
- Outlet should be free of debris and free flowing.
- Structures such as pits and weirs should be clear of debris and functioning correctly.
- Any litter should be removed from the filter area.
- Remove all weeds from both the batter slope and filter area. This should be carried out by hand or with targeted herbicide.

- All sedges and native grasses should be maintained or trimmed at an approximately 200mm high to ensure that both fuel load requirements and water treatment is constant.

After the Bio-retention basin has been established correctly the monitoring and maintenance of the system can be reduced to a 6 monthly interval. During these inspections the following activities should be recorded and documented:

- Maintain free flow through the system.
- Maintain the surface vegetation as vigorous plant growth is important for treatment. This includes scheduled watering in dry periods.
- Prevent undesired growth of weeds and vegetation.
- Removal of debris and sediment.
- Any litter should be removed from the filter area.
- Remove all weeds from both the batter slope and filter area. This should be carried out by hand or with targeted herbicide.
- Remove excess or dead plant material which will increase the nutrient load on the system.

(Upper Parramatta River Trust, 2004)

4. MODEL RESULTS

4.1. Results of Hydrological Modelling

Numerous durations were modelling ranging from 10min to 9hrs for the 20% - 1% AEP events with durations of 15min and 30min for the PMF event.

Based on ARR16 and Bulletin 53 procedures the median storm from each sub catchment was selected and hydrograph exported into the TUFLOW Model. The results of key sub catchments are summaries in Table 4-1 below.

Table 4-1 Peak Flow Summary

Sub Catchment	XP RAFTS Peak 1% AEP Flowrate (m^3/s)			XP RAFTS Peak 5% AEP Flowrate (m^3/s)			XP RAFTS Peak 20% Flowrate (m^3/s)		
	EXS	PROP	+/-	EXS	PROP	+/-	EXS	PROP	+/-
E/5	3.71	2.45	-1.26	2.23	1.26	-0.97	1.46	0.93	-0.53
E/6	4.32	3.48	-0.84	2.64	2.64	0	1.74	1.73	-0.01
A/4	8.79	9.05	0.26	5.18	5.36	0.18	3.36	3.49	0.13

The critical storm durations for each event are summarised in Table 4-2.

Table 4-2 Critical Storm Durations

1% AEP	5% AEP	20% AEP
45min Storm 4	2hr Storm 1	45min Storm 7
1hr Storm 5	2hr Storm 5	1.5hr Storm 1
1hr Storm 6	2hr Storm 7	3hr Storm 1
2hr Storm 8	2hr Storm 9	3hr Storm 6
3Hr Storm 9	3hr Storm 9	3Hr Storm 10

Table 4-1 shows the difference in peak flow between pre-development and post development scenarios at three key discharge points downstream of the development. The reduction in peak flow observed at sub catchment E/5, upstream of the Talbingo Tourist Park is a result of the two OSD basins located along the existing watercourse bisecting the eastern residential precinct (Zone 1). The peak flow rate is also reduced at the north-eastern discharge point, sub catchment E/6.

The motel site is required to provide its own on lot OSD to reduce peak flow to the Miles Franklin Drive culverts adjacent to the site from post developed levels to pre-developed.

A slight increase in the peak flow is observed at the north-western discharge point, sub catchment A/4. The hydraulic modelling results in the subsequent section of this report (Section 4.2) indicates the minor increase in peak flow is acceptable for the following reasons:

- No flood level impacts are observed in this location do to the location of the trapped low point.
- The hydraulic hazard category across Miles Franklin Drive is not increased.

4.2. Results of Hydraulic Modelling

4.2.1. Flood Extents/Depths

In the existing scenario, flooding within the development extents is primarily contained within the eastern watercourse during the 1% AEP event. Flows through the channel are shallow with maximum depths varying between 200mm and 300mm. At the northern discharge point to the Talbingo Caravan Park, flows are restricted by the existing culvert crossing, resulting in increased depths (maximum of 2.0m) and sheeting over Wilkinson Street. Minor areas of ponding with depths below 200mm are observed as a result of trap low points. Outside of the development footprint, channelised flooding is observed through the Talbingo Caravan Park to the north-east with flows exceeding the pipe capacity being forced overland. Channelised flows within the neighbouring watercourse to the west are also observed with a large amount of ponding at Miles Franklin Drive where flows are restricted by culvert capacity. Flows downstream of the site are restricted by the capacity of numerous culverts underneath Miles Franklin Drive.

In the PMF event, flooding in the eastern watercourse remains largely confined within the chancel with increased extents where flows exceed the capacity of road culverts and overtops both Yan and Wilkinson Street. Maximum depths within the channel increase to between 1.0 – 2.0m. In the north-eastern section of the site, ponding is again observed where trap low points are unrelieved. Flooding through the west of the site occurs within the Wilkinson Street pavement extents. Outside of the development, flooding within Talbingo Caravan Park has exceeded the main channel and spread throughout the development. Downstream of the Caravan Park, flows overtop Miles Franklin Drive with depths below 350mm. Flooding extents have increased in the western watercourse, however, remains mostly contained to the main channel. Ponding upstream of the western Miles Franklin Drive culvert crossing reaches maximum depths of 5.2m with depths ranging between 0.5 – 1.0m across the road. The majority of Miles Franklin Drive fronting the development is impacted by flooding in the PMF.

In the proposed scenario, preliminary site grading in the eastern residential precinct (Zone 1) has maintained the existing watercourse where possible. The proposed local access roads through this precinct have shifted slightly from the existing alignment of Yan and Wilkinson, relocating the culvert crossing and associated areas of ponding. Two online basins are proposed along this watercourse to ensure post development flow rates do not exceed the existing conditions. Areas of ponding are observed at multiple road intersections as a result of undrained sag points. These areas will be removed as during the future design of a road stormwater network.

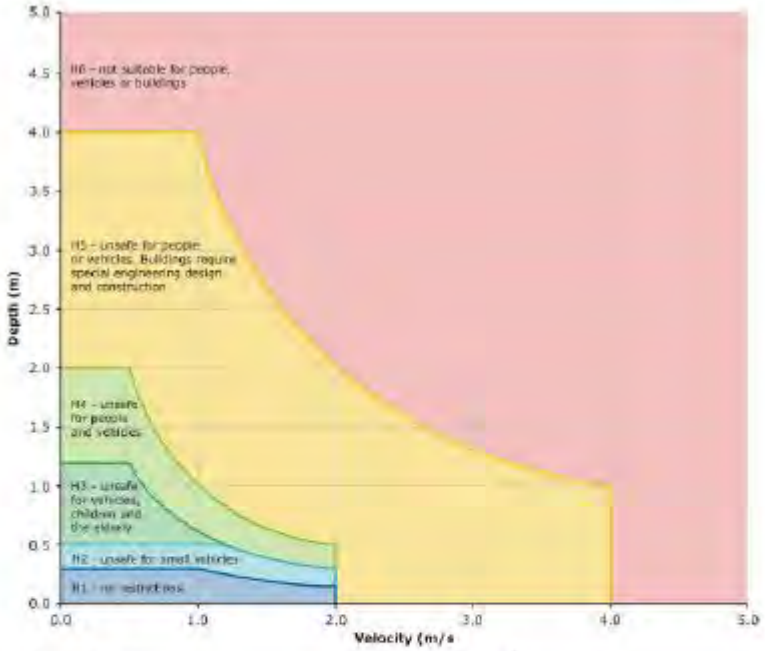
In the 1% AEP event, flooding in the eastern watercourse continues to be primarily contained within the channel. Ponding is observed upstream of the proposed culvert crossing and wholly contained within the proposed online basins with maximum depths below 3.5m. The proposed access road off Wilkinson Street in the south-western multi-unit residential precinct (Zone 2) is inundated by shallow flooding (<100mm). Flows entering this area from the upstream catchment have been diverted around the development, causing increased flooding in a trapped low point. Ponding is observed in the location of the proposed hotel due to an existing trap low point which will be filled as part of the future design stage. A detailed design of the online basins and road stormwater network will be conducted in future stages of the development application

to address these areas and ensure accordance with the appropriate design requirements.

During the PMF event, there is little change to the flooding in the eastern portion of the site except the previously mentioned modifications resulting in changes in road alignments. Flooding in the western section of the site is mostly contained within the proposed Wilkinson Street road reserve. Flooding extents have increased in the south-western multi-unit residential precinct (Zone 2). As previously outlined, these … will be addressed in the future design of a site stormwater network.

4.2.2. Flood Hazards

Figure 4-1 outlines the hazard categories that were used to produce the hazard mapping for the site. They are as outlined by the Australian Emergency Management Institute and are in line with the NSW Floodplain Development Manual.



Hazard Classification	Description
H1	Relatively benign flow conditions. No vulnerability constraints.
H2	Unsafe for small vehicles.
H3	Unsafe for all vehicles, children and the elderly.
H4	Unsafe for all people and all vehicles.
H5	Unsafe for all people and all vehicles. Buildings require special engineering design and construction.
H6	Unconditionally dangerous. Not suitable for any type of development or evacuation access. All building types considered vulnerable to failure.

Figure 4-1 Flood Hazard Category – Australian Emergency Management Institute

No proposed lot is affected by mainstream flooding in any event up to and including the 1% AEP. Where they are impacted by minor overland flow routes in the proposed scenario, these will be managed by formalising overland flow routes in the future detailed design.

Hydraulic hazards within the proposed road reserves are generally limited to H2 in the 1% AEP event. At this stage, a road stormwater network has not been included in the model and the road network is the only thing conveying stormwater flow. As such, as

part of future work for a Development Application, stormwater pits and pipes will be included in the modelling and the hazard will be managed to meet council controls.

4.2.3. Flood Impacts

Flood impact plans have been prepared for the catchment surrounding the proposed development for all events up to and including the 1% AEP.

In the 20%, areas of increased extents are observed along the section of Miles Franklin Drive fronting the development. This is a result of proposed sag points at the intersection between Miles Franklin Drive and the proposed road network. These areas will be removed once a detailed road stormwater network is included in the model. An area of increased flood level (>50mm) is also observed in the centre of the Talbingo Caravan Park at a pipe inlet. This is contained within the existing watercourse and does not impact the surrounding development. This can be refined and removed during the future detailed design stage.

In the 5% AEP event, flood level impacts are again observed along the site frontage of Miles Franklin Drive. These will be addressed as previously discussed. The area of previously increased flood levels within the Talbingo Caravan Park has been reduced with a positive impact of - 50mm.

During the 1% AEP event, flooding outside of the development follows the trend outlined of the previous storm events. However, flood levels within the Talbingo Caravan Park have been reduced by more than 50mm across the majority of the site. Increases in flood levels are observed along boundary of the south-western multi-unit residential precinct at the inflow of sub catchment D/1. This is a result of diverting the catchment around the development without a detailed design of the overland flow route. Further detailed modelling of overland flow routes in subsequent Development Applications will address these issues.

4.3. Results of Water Quality Modelling

To determine the effectiveness of the treatment train, the historical metrological template was simulated through the proposed treatment measures. The table below outlines the annual percentage reduction of pollutants when the proposed water treatment controls have been implemented.

	Sources	Residual Load	% Reduction
Flow (ML/yr)	68	43.7	35.8
Total Suspended Solids (kg/yr)	11300	1630	85.6
Total Phosphorus (kg/yr)	22.2	6.42	71.1
Total Nitrogen (kg/yr)	151	54.4	64
Gross Pollutants (kg/yr)	2490	125	95

Figure 4-1 Treatment Train Effectiveness

The MUSIC model results indicate the proposed water sensitive design is in accordance with the requirements of industry best practise (outlined in Table 4-3) in lieu of council's own requirements.

Table 4-3 Industry Standard Pollutant Load Reduction Targets

Pollutant	Average Annual Pollutant Load Reduction Objective (%)
Total Suspended Solids	85
Total Phosphorous	60
Total Nitrogen	45
Gross Pollutants (>5mm)	90

4. FLOOD PLANNING

4.1. Snowy Valleys Council DCP Controls

In lieu of detailed controls outlined in the Snowy Valley DCP, the NSW Floodplain Development Manual will be referenced as per the DCP.

4.3.1. Floor Levels

All lots proposed as part of the West Talbingo Village Masterplan are above the 1 in 100-year (1% AEP) flood level and therefore the Flood Planning Level. Minimum flood level controls will therefore not be required for any future dwelling.

4.3.2. Building Components/Structural Soundness

There are no residential lots within the Flood Planning Extents so therefore no residential lots will be burdened by flood compatible building material requirements. Any structures such as retaining walls within the Flood Planning Extents will be designed and certified at the Subdivision Works Stage to withstand the forces of flood water. All materials used for walls will be of flood compatible materials.

4.3.3. Flood Affectation

Flood impact mapping shows that there is generally no increase in flood level in all events up to and including the 1% AEP on neighbouring properties. Where there are increases, they are within existing floodway's or will be design out in future stages and therefore have no impact on developable land for neighbouring properties.

4.3.4. Evacuation

Flood mapping shows reliable evacuation from all areas of the development to the neighbouring Talbingo Village Centre via Thomas Street in events up to and including the 1% AEP. Safe refugee within the development is provided for rarer events, such as the PMF. Referring to the NSW Draft Shelter-in-place Guideline, Shelter-in-place (SIP) is an appropriate emergency management response when flood warning time and flood duration are both less than 6 hours. As the PMF event duration is less than 6 hours, this is deemed appropriate.

Flood mapping indicates the evacuation route for the entire Talbingo Village, Miles Franklin Drive, is inundated by floodwaters east of the existing sewage treatment facility. This is a result of the conservative modelling approach taken, assuming complete malfunction of the Jounama Pondage control gate. For the purpose of assessing regional evacuation, it is acceptable to assume that the Jounama Pondage control gate is functional and was design to adequately convey flow in all events up to and including the PMF. Resulting in a dramatically reduced maximum water level in Jounama Pondage compared to that shown in the Siteplus results.

The approach taken by Siteplus was designed to provide a conservative flood model of the development site, not the entire catchment of Jounama Pondage. For this reason the Siteplus Flood Study should no be used as a means to assess evacuation of the entire Talbingo Village.

4.2. Tumut Shire Council LEP Part 5.21 Controls

Under Part 5.21 of the Tumut Shire Council Local Environmental Plan (LEP) 2012, all development should be compliant with the listed controls. Table 4-1 summarises these controls and how these have been addressed in the proposed development.

Table 4-1 Summary of LEP Controls

LEP Control – Development Consent must not be granted unless the development -	How this is Addressed
is compatible with the flood function and behaviour on the land, and	The proposed development maintains the function of the flow path through the site. Where the development proposes filling of the floodplain, compensatory earthworks have been undertaken to maintain the capacity of the natural watercourse.
will not adversely affect flood behaviour in a way that results in detrimental increases in the potential flood affectation of other development or properties, and	The flood impact mapping provided as part of this report demonstrates that the development will not adversely affect flood behaviour on other development or properties. All identified negative impacts will be removed during the follow detailed design stage as previously outlined.
will not adversely affect the safe occupation and efficient evacuation of people or exceed the capacity of existing evacuation routes for the surrounding area in the event of a flood, and	The development will not negatively impact existing evacuation routes from a flooding perspective.
incorporates appropriate measures to manage risk to life in the event of a flood, and	All development is in accordance with the development controls outlined in Section 4.1, ensuring all appropriate measure have been taken to manage risk to life in the event of a flood.
will not adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.	Stormwater quantity and quality devices have been proposed as part of the development to ensure environmental impacts have been adequately managed. Existing watercourses have been maintained where possible and the future detailed design will be performed to ensure avoidable erosion, siltation and destruction of riparian areas will not occur.
The consent authority must consider the following matters -	
the impact of the development on projected changes to flood behaviour as a result of climate change,	Changes to flood behaviour as a result of climate change has not been modelled at the masterplan development application stage. Additional climate change scenarios will be modelled as part of a future, more detailed, development application.

5. CONCLUSION

Ironstone Development Group Pty is seeking a Masterplan Development Approval for the proposed mixed-use West Talbingo Village development at Miles Franklin Drive, Talbingo.

The following conclusions can be made regarding the Water Cycle Management Study:

- Two online OSD basins are proposed to reduce post development flow rates to existing conditions;
- On lot OSD is required for the Hotel site to attenuate flow so as to reduce post development flow rates to pre-developed flow rates at the culverts within Miles Franklin Drive;
- Water quality treatment measures proposed achieve the industry standard best practise pollutant reduction targets. The proposed treatment train includes three bio-retention systems and the use of several GPT's.
- The proposed development is in accordance with flood planning controls outlined in Section 4.

Based on the results of the West Talbingo Village Water Cycle Management Study, the proposed Masterplan Development Application can be looked upon favourability in term of flooding.

APPENDIX A

Site Survey

LEGEND

- SEALED ROAD
- TREE
- BUILDING LINE
- FENCE
- TELSTRA CABLE
- TELSTRA PIT
- SEWER
- SEWER PIT
- DRAINAGE
- DRAINAGE PIT
- U/GROUND ELECTRICITY
- OVERHEAD ELECTRICITY
- BATTER
- WATER HYDRANT
- WATER METER
- WATER VALVE
- WATER MAIN
- FIRE SERVICE
- TITLE BOUNDARY (APPROX)
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- SURVEY MARK

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NOTE:
BURIED SERVICE LOCATIONS BASED ON RESPONSES FROM DBYD ENQUIRY AND ARE INDICATIVE ONLY.
ACTUAL SERVICE LOCATIONS TO BE VERIFIED ON-SITE PRIOR TO COMMENCING EXCAVATION WORKS.

REVISIONS

REV	DETAILS	DRN	CHK	APP	DATE
A	ISSUED FOR REVIEW	TG	JP	SP	29/03/23

NOTES:

NO WATER, GAS OR SEWER SERVICE INFORMATION RESPONSES WERE RECEIVED FROM BYDA ENQUIRIES

Foresight
9/2 STAR ROAD BRIGHT VIC 3741
email : info@foresightengineering.com.au
Phone: 03 5755 5175
A.B.N. 32 619 099 142

DESIGNED	FES	15/03/23
DRAWN	TG	25/03/23
CHECKED	JP	28/03/23
APPROVED		

1:2000 (A1) 1:4000 (A3) 0 50 100m SCALEBAR (m)

PROJECT No. IRON01

DRAWING No. IRON01-101

DATUM AHD | GRID MGA 2020 (55)

IRONSTONE DEVELOPMENT GROUP

TALBINGO MASTER PLAN
FEATURE SURVEY
EXISTING CONDITIONS

REVISIONS

REV	DETAILS	DRN	CHK	APP	DATE
A	ISSUED FOR REVIEW	TG	JP	SP	29/03/23

NOTES:

CONTOUR INTERVAL 0.250m

Foresight

9/2 STAR ROAD BRIGHT VIC 3741
email : info@foresightengineering.com.au
Phone: 03 5755 5175
A.B.N. 32 619 099 142 © 2020

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DRAWN	TG	25/03/23
CHECKED	JP	28/03/23
APPROVED		

1:1000 (A1)
1:2000 (A3)
0 25 50m
SCALEBAR (m)

PROJECT No.
IRON01

DRAWING No.
IRON01-102

DATUM AHD
GRID MGA 2020 (55)

IRONSTONE DEVELOPMENT GROUP

TALBINGO MASTER PLAN
FEATURE SURVEY
EXISTING CONDITIONS

NOTE:
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ACTUAL SERVICE LOCATIONS TO BE VERIFIED ON-SITE PRIOR TO COMMENCING EXCAVATION WORKS.

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Ø450 PIPE
Ø400 PIPE
900 PIPE OUTLET
Ø1200 PIPE
OH
PP

LEGEND

- SEALED ROAD
- TREE
- BUILDING LINE
- FENCE
- RETAINING WALL
- BATTER
- TELSTRA CABLE
- TELSTRA PIT
- SEWER
- SEWER PIT
- DRAINAGE
- DRAINAGE PIT
- U/GROUND ELECTRICITY
- OVERHEAD ELECTRICITY
- WATER HYDRANT
- WATER METER
- WATER VALVE
- WATER MAIN
- FIRE SERVICE
- TITLE BOUNDARY (APPROX)
- POWER POLE
- SURVEY MARK

REVISIONS

REV	DETAILS	DRN	CHK	APP	DATE
A	ISSUED FOR REVIEW	TG	JP	SP	29/03/23

NOTES:

CONTOUR INTERVAL 0.250m

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email : info@foresightengineering.com.au
Phone: 03 5755 5175
A.B.N. 32 619 099 142

DESIGNED	FES	15/03/23
DRAWN	TG	25/03/23
CHECKED	JP	28/03/23
APPROVED		

1:1000 (A1) 1:2000 (A3) SCALEBAR (m) 0 25 50m

PROJECT No. IRON01

DRAWING No. IRON01-103

DATUM AHD | GRID MGA 2020 (55)

IRONSTONE DEVELOPMENT GROUP

TALBINGO MASTER PLAN
FEATURE SURVEY
EXISTING CONDITIONS

IRON01-105

IRON01-106

IRON01-107

IRON01-108

MILES FRANKLIN DRIVE

WHITTY STREET

WILKINSON STREET

THOMAS STREET

YAN STREET

Ø600 PIPE

Ø600 PIPE

Ø600 PIPE

Ø450 PIPE

900 PIPE OUTLET

Ø4100 PIPE

Ø600 PIPE

Ø400 PIPE

Ø600 PIPE

UNKNOWN PIPE DIAMETER

Ø1200 PIPE

450 PIPE INVERT OUTLET 417.30

450 PIPE INVERT 417.30

450 PIPE INVERT 417.80

450 PIPE INVERT 419.50

O/H

FP

REVISIONS					
REV	DETAILS	DRN	CHK	APP	DATE
A	ISSUED FOR REVIEW	TG	JP	SP	29/03/23

NOTES:

CONTOUR INTERVAL 0.250m

Foresight

9/2 STAR ROAD BRIGHT VIC 3741

email : info@foresightengineering.com.au

Phone: 03 5755 5175

A.B.N. 32 619 099 142

DESIGNED	FES	15/03/23
DRAWN	TG	25/03/23
CHECKED	JP	28/03/23
APPROVED		

PROJECT No.
IRON01

DRAWING No.
IRON01-104

DATUM AHD

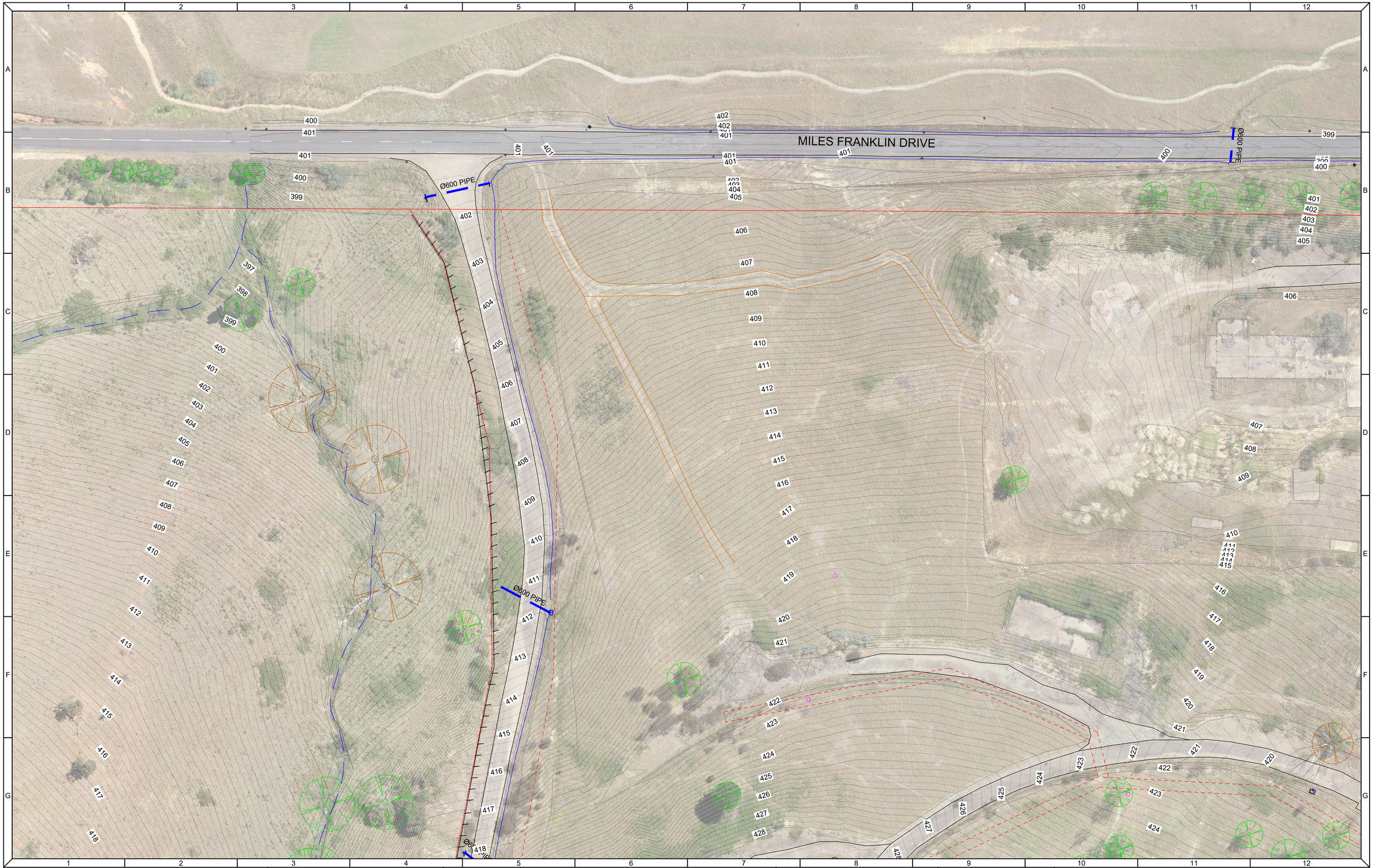
GRID MGA 2020 (55)

IRONSTONE DEVELOPMENT GROUP

TALBINGO MASTER PLAN

FEATURE SURVEY

PAGE LAYOUT



REVISIONS					
REV	DETAILS	DRN	CHK	APP	DATE
A	ISSUED FOR REVIEW	TG	JP	SP	29/03/23

NOTES:

CONTOUR INTERVAL 0.250m

Foresight
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Phone: 03 5755 5175
A.B.N. 32 619 099 142

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CHECKED	JP	28/03/23
APPROVED		

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PROJECT No. IRON01

DRAWING No. IRON01-105

DATUM AHD | GRID MGA 2020 (55)

IRONSTONE DEVELOPMENT GROUP

TALBINGO MASTER PLAN
FEATURE SURVEY
EXISTING CONDITIONS - ENLARGEMENT

REVISIONS					
REV	DETAILS	DRN	CHK	APP	DATE
A	ISSUED FOR REVIEW	TG	JP	SP	29/03/23

NOTES:

CONTOUR INTERVAL 0.250m

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CHECKED	JP	28/03/23
APPROVED		

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1:1000 (A3)
0 10 20m
SCALEBAR (m)

PROJECT No.
IRON01

DRAWING No.
IRON01-106

DATUM AHD
GRID MGA 2020 (55)

IRONSTONE DEVELOPMENT GROUP

TALBINGO MASTER PLAN
FEATURE SURVEY
EXISTING CONDITIONS - ENLARGEMENT

REVISIONS					
REV	DETAILS	DRN	CHK	APP	DATE
A	ISSUED FOR REVIEW	TG	JP	SP	29/03/23

NOTES:

CONTOUR INTERVAL 0.250m

Foresight

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Phone: 03 5755 5175

email : info@foresightengineering.com.au

A.B.N. 32 619 099 142

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DRAWN	TG	25/03/23
CHECKED	JP	28/03/23
APPROVED		

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1:1000 (A3)

SCALEBAR (m) 0 10 20m

PROJECT No. IRON01

DRAWING No. IRON01-107

DATUM AHD

GRID MGA 2020 (55)

IRONSTONE DEVELOPMENT GROUP

TALBINGO MASTER PLAN

FEATURE SURVEY

EXISTING CONDITIONS - ENLARGEMENT

REVISIONS

REV	DETAILS	DRN	CHK	APP	DATE
A	ISSUED FOR REVIEW	TG	JP	SP	29/03/23

NOTES:

CONTOUR INTERVAL 0.250m

Foresight
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Phone: 03 5755 5175
A.B.N. 32 619 099 142

DESIGNED	FES	15/03/23
DRAWN	TG	25/03/23
CHECKED	JP	28/03/23
APPROVED		

1:500 (A1)
1:1000 (A3)
SCALEBAR (m) 0 10 20m

PROJECT No. IRON01

DRAWING No. IRON01-108

DATUM AHD

GRID MGA 2020 (55)

IRONSTONE DEVELOPMENT GROUP

TALBINGO MASTER PLAN
FEATURE SURVEY
EXISTING CONDITIONS - ENLARGEMENT

APPENDIX B

West Talbingo Village Masterplan

VIEW OF SHOPTOP HOUSING

ARCHITECTURAL DRAWINGS FOR WEST TALBINGO VILLAGE MASTERPLAN CONCEPT

LOT 35 DP 878862 MILES FRANKLIN DRIVE TALBINGO NSW

At West Talbingo Village, we've developed a masterplan for urban living that blends convenient amenity with beautiful native habitat.

Talbingo West has been designed to be sensitive to the architectural style of the existing Talbingo township. This community focused project to be established over time aims to create a positive context for the future, bringing amenity and economic benefit to the local area.

The low density, medium and mixed-use precints offer residents a place to live comfortably - with everything they need in close proximity.

The township design merges into the fabric of the existing street layout, reconnecting precints of the town and providing a greater amenity for the community.

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

COVER PAGE

DRAWING NUMBER

CP

SCALE

NTS

SERVICES PROVIDED BY

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SUITE 303, 61 MARLBOROUGH ST
SURRY HILLS NSW 2010

18 BAY RD SANDRINGHAM VIC 3191

REGISTERED ARCHITECT:
VICTORIA 14450
NSW 8367
UK 072397E

ABN 96 630 851 930

SITE ANALYSIS PLAN
NTS

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION
LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE
04 APR 23

DRAWING STAGE
MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION
SITE ANALYSIS PLAN

DRAWING NUMBER
PL 01

SCALE
NTS

N

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VICTORIA 14450
NSW 8367
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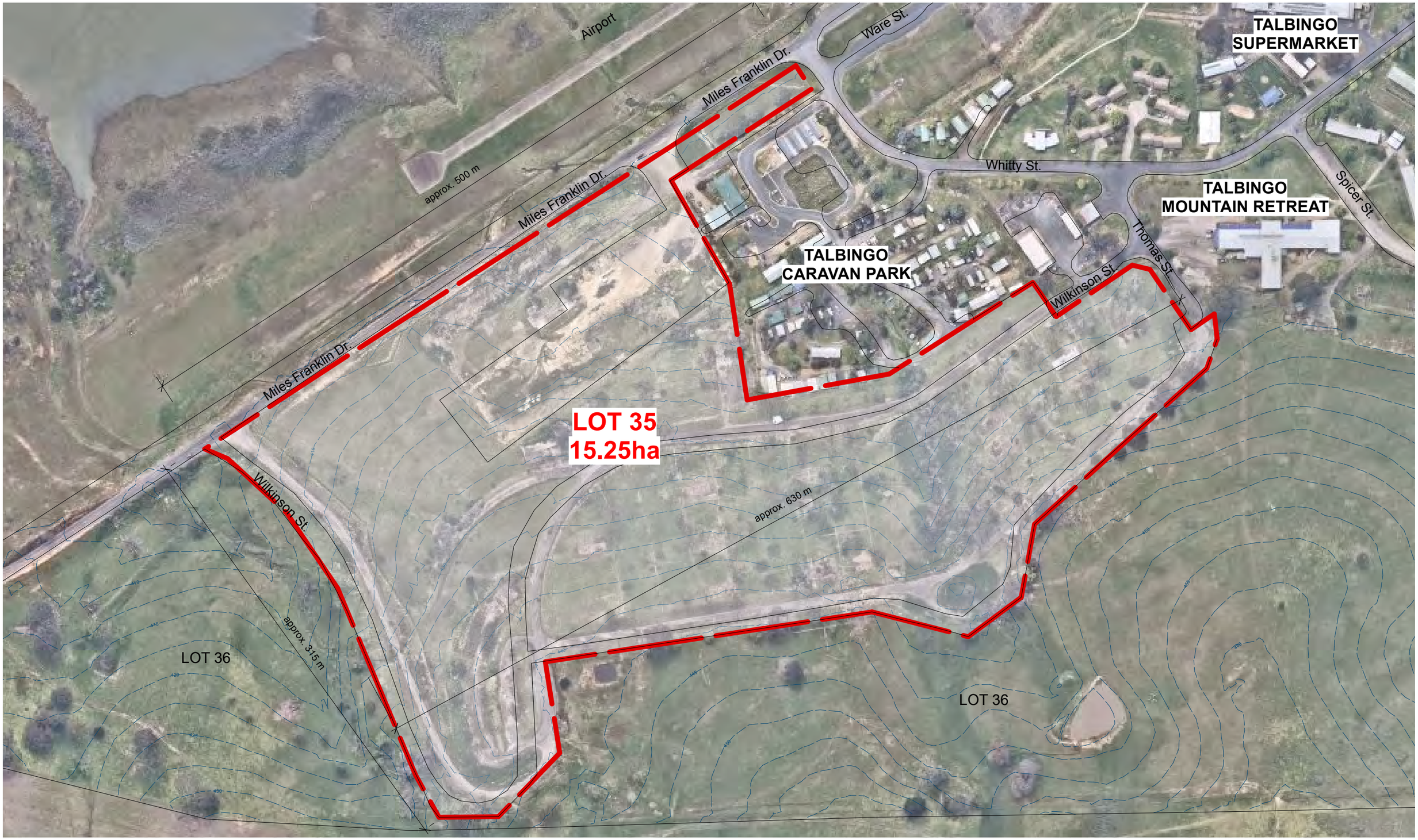
ABN 96 630 851 930



PROPOSED LOT DEVELOPMENT PLAN
1.2500

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION
LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE
04 APR 23

DRAWING STAGE
MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION
PROPOSED LOT DEVELOPMENT PLAN

DRAWING NUMBER
PL 02

SCALE
1.2500

N

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NSW 8367
UK 072397E

ABN 96 630 851 930

JOUNAMA PONDAGE

Airport

Miles Franklin Dr.

Ware St.

TALBINGO SUPERMARKET

Parking

Trailer boat parking

Whitty St.

TALBINGO MOUNTAIN RETREAT

Spicer St.

Thomas St.

TALBINGO CARAVAN PARK

10 LOTS approx 320 s.qm

7 LOTS approx 370 s.qm

Wilkinson St.

7 LOTS approx 370 s.qm

15 LOTS approx 325 s.qm

12 LOTS approx 360 s.qm

19 LOTS approx 400s.qm

S1

S2

HOTEL

Parking

Corso

LOT 35

Wilkinson St

Parking

Corso

LOT 36

S3

S3

S1

Future road to Lot 36

Parking

12 LOTS approx 380 s.qm

LOT 36

Existing grassed field

PROPOSED MASTERPLAN CONCEPT SITE PLAN
1.2500

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED MASTERPLAN CONCEPT SITE PLAN

DRAWING NUMBER

PL 03

SCALE

1.2500

N

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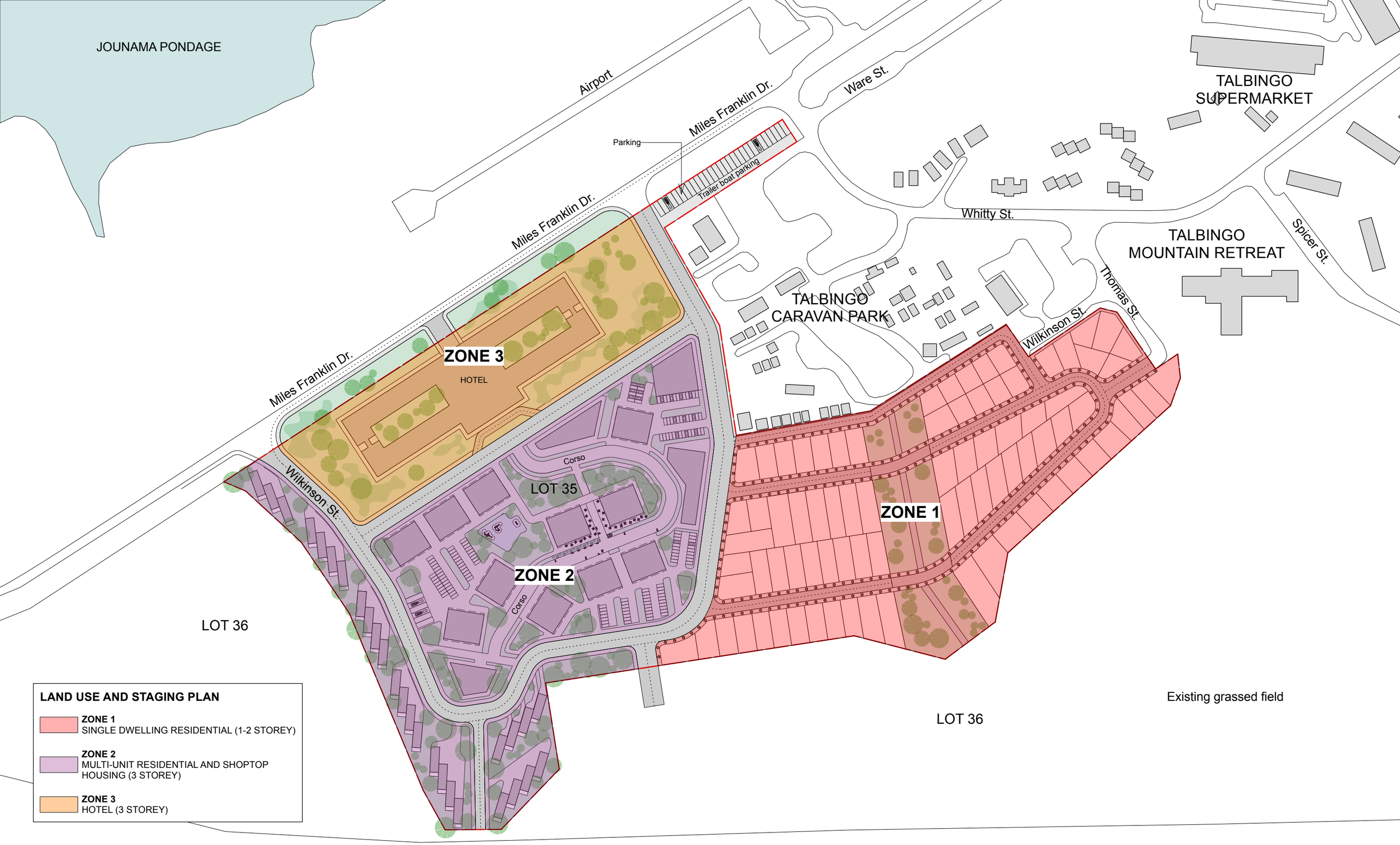

LAND USE AND STAGING PLAN

ZONE 1
SINGLE DWELLING RESIDENTIAL (1-2 STOREY)

ZONE 2
MULTI-UNIT RESIDENTIAL AND SHOPTOP HOUSING (3 STOREY)

ZONE 3
HOTEL (3 STOREY)

PROPOSED MASTERPLAN CONCEPT LAND USE AND ZONE PLAN

1.2500

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION
LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE
04 APR 23

DRAWING STAGE
MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION
PROPOSED MASTERPLAN CONCEPT LAND USE AND ZONE PLAN

DRAWING NUMBER
PL 04

SCALE
1.2500

N

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PROPOSED MASTERPLAN CONCEPT
LOT AREAS PLAN
1.2500

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION
LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE
04 APR 23

DRAWING STAGE
MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION
PROPOSED MASTERPLAN CONCEPT LOT AREAS PLAN

DRAWING NUMBER
PL 05

SCALE
1.2500

N

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NSW 8367
UK 072397E

ABN 96 630 851 930

JOUNAMA PONDAGE

Airport

Miles Franklin Dr.

Ware St.

TALBINGO SUPERMARKET

Whitty St.

TALBINGO MOUNTAIN RETREAT

Spicer St.

TALBINGO CARAVAN PARK

Thomas St.

Wilkinson St.

LOT 36

Existing grassed field

LOT 36

BUILDING HEIGHTS AND FSR

- FSR 2.0 Maximum height 18.0m
- FSR 2.0 Maximum height 11.5m
- FSR 1.5 Maximum height 11.5m
- NO FSR Maximum height 8.5m

PROPOSED MASTERPLAN CONCEPT FSR AND HEIGHT LIMITS PLAN

1.2500

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED MASTERPLAN CONCEPT FSR AND HEIGHT LIMITS PLAN

DRAWING NUMBER

PL 06

SCALE

1.2500

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NSW 8367
UK 072397E

ABN 96 630 851 930

JOUNAMA PONDAGE

Airport

Miles Franklin Dr.

Ware St.

TALBINGO SUPERMARKET

Whitty St.

TALBINGO MOUNTAIN RETREAT

Spicer St.

TALBINGO CARAVAN PARK

Thomas St.

Wilkinson St.

Connection to existing street plan

Parking Under

Drop off zone

LOT 35

LOT 36

Connection to Future Lot 36 development

LOT 36

Existing grassed field

VEHICLE ACCESS

- Main Road
- Access Road
- Local Access
- Parking Access
- Parking

PROPOSED MASTERPLAN CONCEPT VEHICLE ACCESS PLAN

1.2500

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED MASTERPLAN CONCEPT VEHICLE ACCESS PLAN

DRAWING NUMBER

PL 07

SCALE

1.2500

N

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UK 072397E

ABN 96 630 851 930

PROPOSED MASTERPLAN CONCEPT PEDESTRIAN ACCESS AND BICYCLE PATH PLAN

1.2500

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION
LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE
04 APR 23

DRAWING STAGE
MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION
PROPOSED MASTERPLAN CONCEPT PEDESTRIAN ACCESS AND BICYCLE PATH PLAN

DRAWING NUMBER
PL 08

SCALE
1.2500

N

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REGISTERED ARCHITECT:
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NSW 8367
UK 072397E

ABN 96 630 851 930

PROPOSED MASTERPLAN CONCEPT LANDSCAPE PLAN

1.2500

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED MASTERPLAN CONCEPT LANDSCAPE PLAN

DRAWING NUMBER

PL 09

SCALE

1.2500

N

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REGISTERED ARCHITECT:
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NSW 8367
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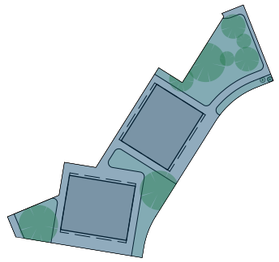
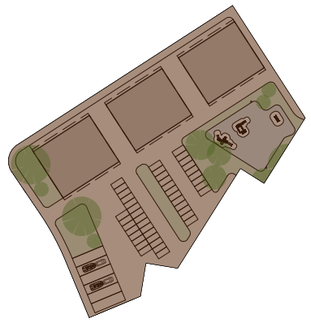
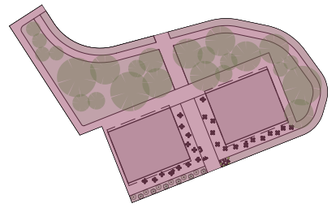
ABN 96 630 851 930



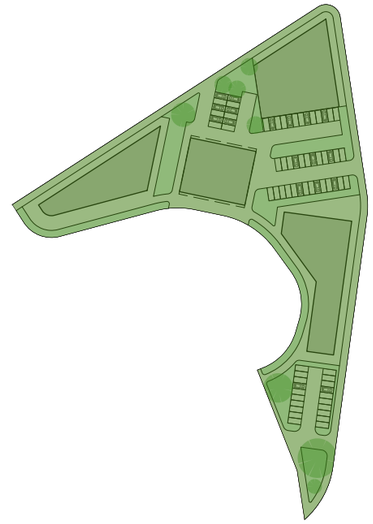
LOT 1
SITE AREA = 3760.00 sq.m COMMERCIAL AREA = 505.20 sq.m RESIDENTIAL AREA = 1765.60 sq.m TOTAL FLOOR AREA = 2270.80 sq.m FSR = 0.6:1 CAR SPACES = 40



LOT 2
SITE AREA = 7775.00 sq.m COMMERCIAL AREA = 757.80 sq.m RESIDENTIAL AREA = 2648.40 sq.m TOTAL FLOOR AREA = 3406.20 sq.m FSR = 0.43:1 CAR SPACES = 104

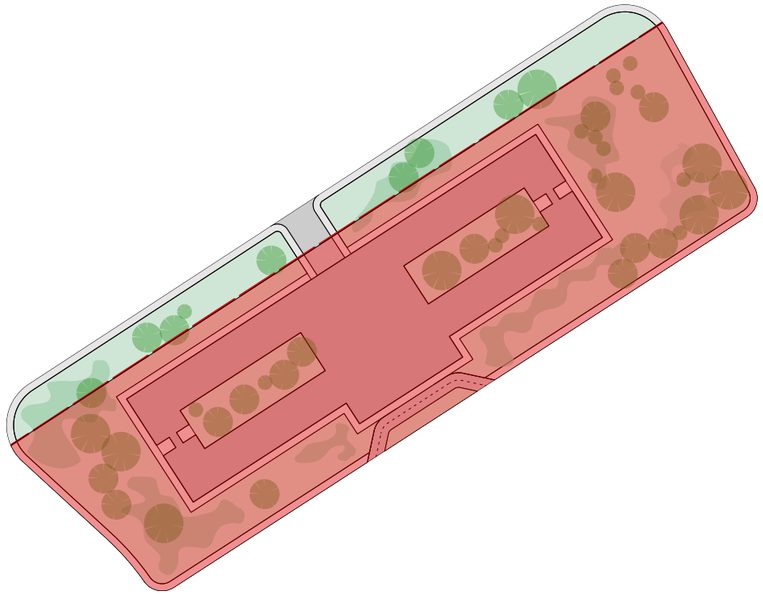


LOT 3
SITE AREA = 5837.00 sq.m COMMERCIAL AREA = 505.20 sq.m RESIDENTIAL AREA = 1765.60 sq.m TOTAL FLOOR AREA = 2260.80 sq.m FSR = 0.38:1 CAR SPACES = 40



LOT 4
SITE AREA = 10155.00 sq.m COMMERCIAL AREA = 1910.80 sq.m RESIDENTIAL AREA = 4199.20 sq.m TOTAL FLOOR AREA = 6110.00 sq.m FSR = 0.60:1 CAR SPACES = 104

LOT 5
SITE AREA = 8633.00 sq.m COMMERCIAL AREA = 1108.45 sq.m RESIDENTIAL AREA = 3349.65 sq.m TOTAL FLOOR AREA = 4458.10 sq.m FSR = 0.52:1 CAR SPACES = 95



LOT 13
SITE AREA = 25929.00 sq.m TOTAL FLOOR AREA = 12517.00 sq.m sq.m FSR = 0.48:1 CAR SPACES = 264

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

AREAS SCHEDULE
SHOPTOP HOUSING AND HOTEL

DRAWING NUMBER

PL 10

SCALE

NTS

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REGISTERED ARCHITECT:
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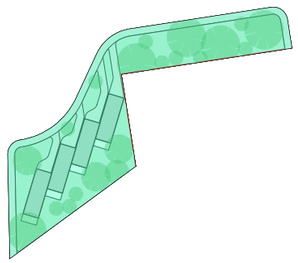
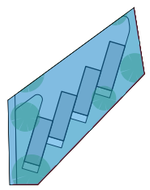
NSW 8367
UK 072397E

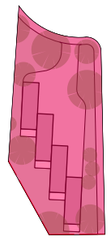
ABN 96 630 851 930



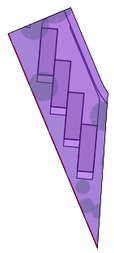
LOT 6
SITE AREA = 3594.00 sq.m TOTAL FLOOR AREA = 746.20 sq.m FSR = 0.2:1 CAR SPACES = 16



LOT 7
SITE AREA = 2016.00 sq.m TOTAL FLOOR AREA = 746.20 sq.m FSR = 0.37:1 CAR SPACES = 16



LOT 8
SITE AREA = 2873.00 sq.m TOTAL FLOOR AREA = 746.20 sq.m FSR = 0.26:1 CAR SPACES = 16



LOT 9
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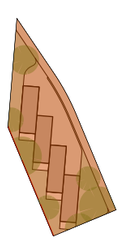
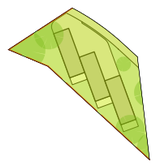


LOT 10
SITE AREA = 1904.00 sq.m TOTAL FLOOR AREA = 746.20 sq.m FSR = 0.39:1 CAR SPACES = 16

LOT 11
SITE AREA = 1855.00 sq.m TOTAL FLOOR AREA = 746.20 sq.m FSR = 0.40:1 CAR SPACES = 16



LOT 12
SITE AREA = 1455.00 sq.m TOTAL FLOOR AREA = 559.65 sq.m FSR = 0.38:1 CAR SPACES = 12

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

AREAS SCHEDULE TOWNHOUSES

DRAWING NUMBER

PL 11

SCALE

NTS

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UK 072397E

ABN 96 630 851 930

Village Centre area comprising Lots 1 - 5

PROPOSED SHOPTOP HOUSING

Typical view with commercial tenancies on ground floor and residential apartments on level 1 and level 2

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED SHOPTOP HOUSING

DRAWING NUMBER

PL 12

SCALE

NTS

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REGISTERED ARCHITECT:
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NSW 8367
UK 072397E

ABN 96 630 851 930

PROPOSED SHOPTOP HOUSING
TYPICAL GROUND FLOOR PLAN
1.150

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED SHOPTOP HOUSING TYPICAL GROUND FLOOR PLAN

DRAWING NUMBER

PL 18

SCALE

1.150

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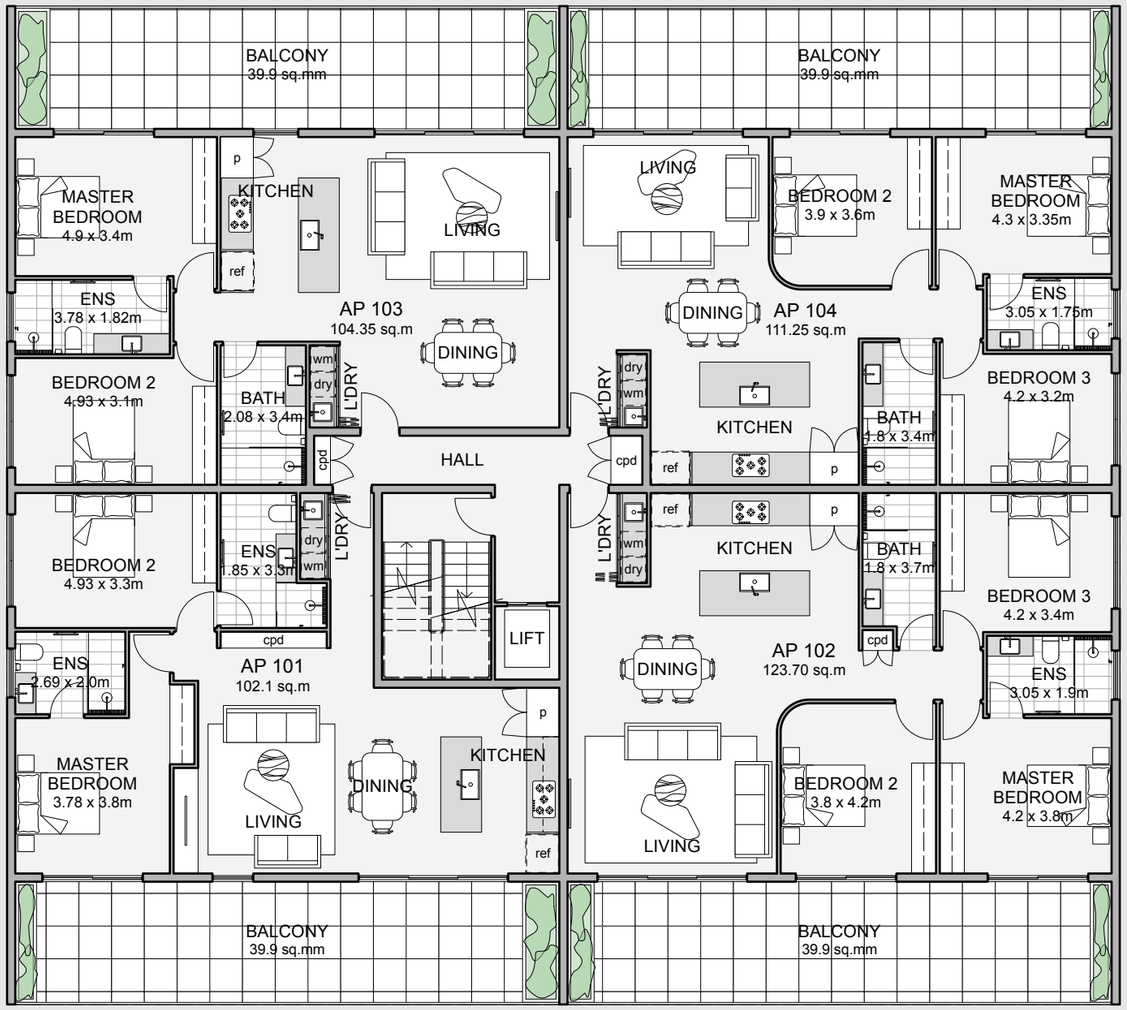
ABN 96 630 851 930



CORSO

PROPOSED SHOPTOP HOUSING
TYPICAL FIRST FLOOR PLAN
1.150

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PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED SHOPTOP HOUSING TYPICAL FIRST FLOOR PLAN

DRAWING NUMBER

PL 19

SCALE

1.150

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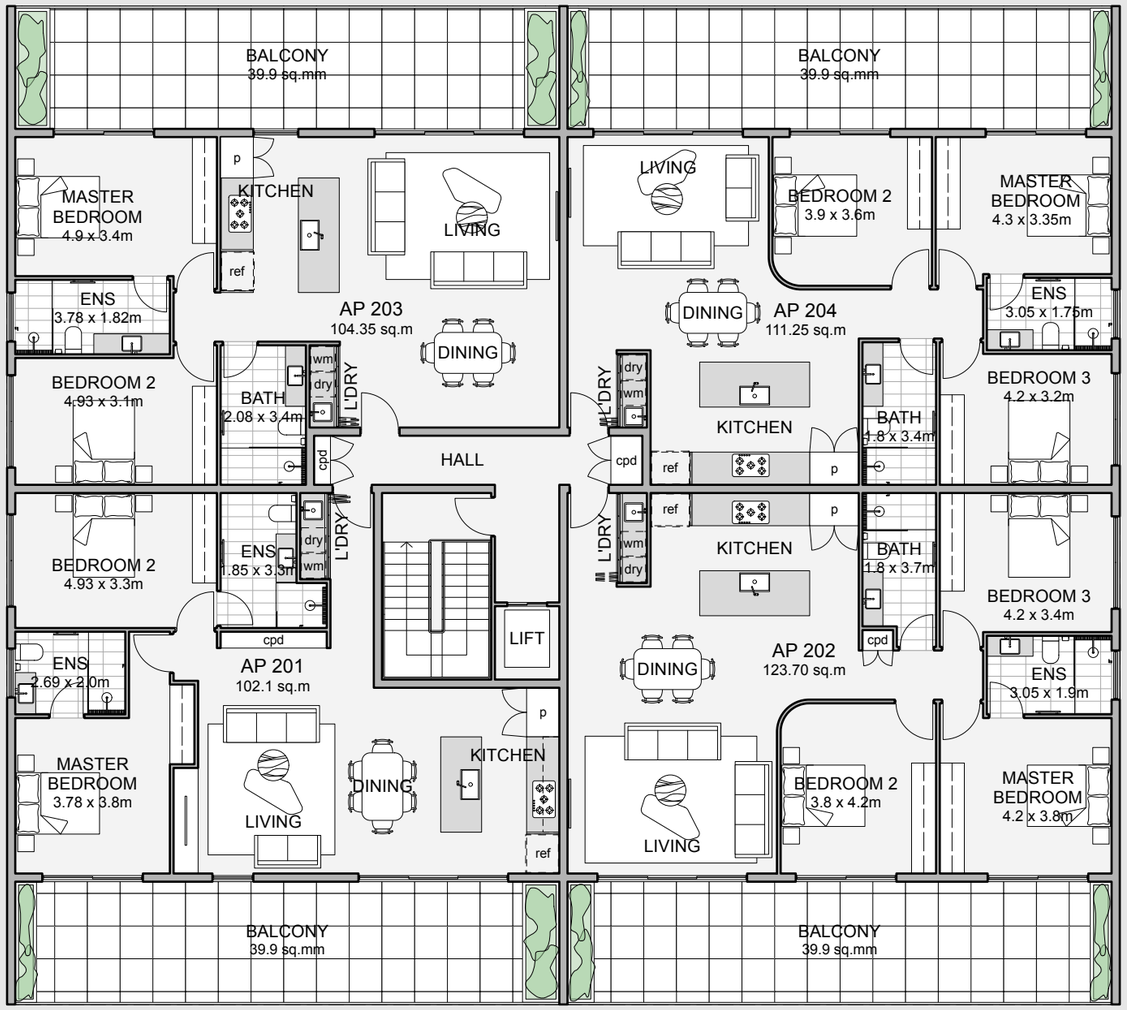

CORSO

PROPOSED SHOPTOP HOUSING
TYPICAL SECOND FLOOR PLAN
1.150

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PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED SHOPTOP HOUSING TYPICAL SECOND FLOOR PLAN

DRAWING NUMBER

PL 20

SCALE

1.150

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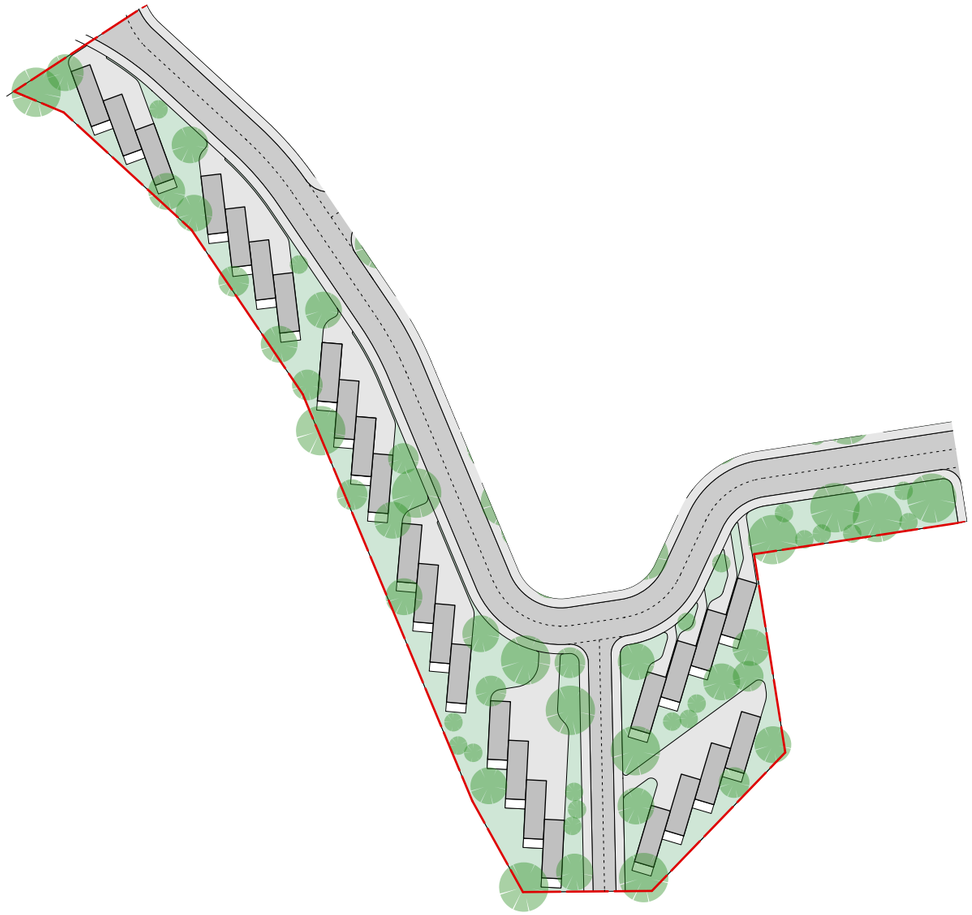

Western side of Wilkinson Street comprising Lots 6 - 12

PROPOSED MULTI-UNIT DWELLING (TOWNHOUSES)

Typical view with clusters of 4 attached terrace house units with carpark on ground level and two level dwelling above

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PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED MULTI-UNIT DWELLING (TOWNHOUSES)

DRAWING NUMBER

PL 21

SCALE

NTS

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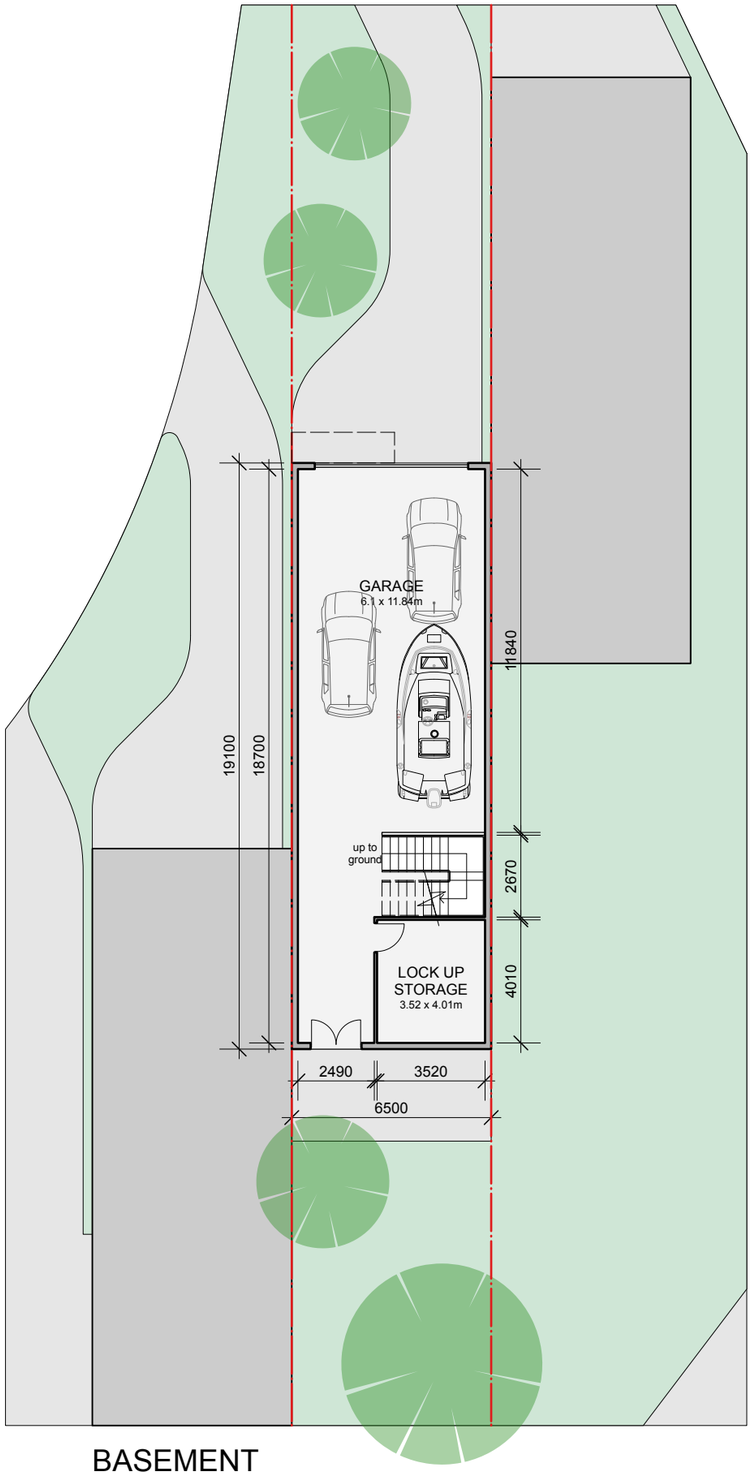
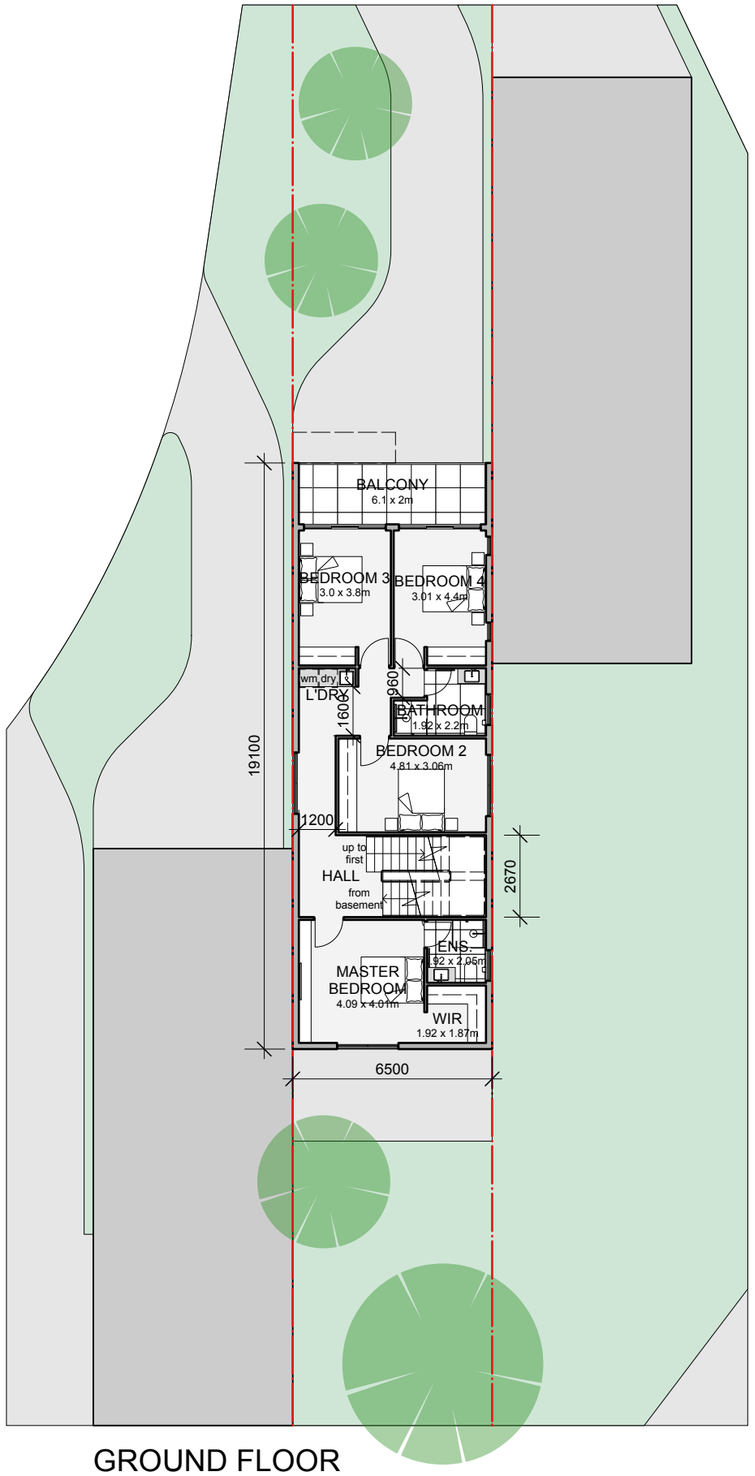
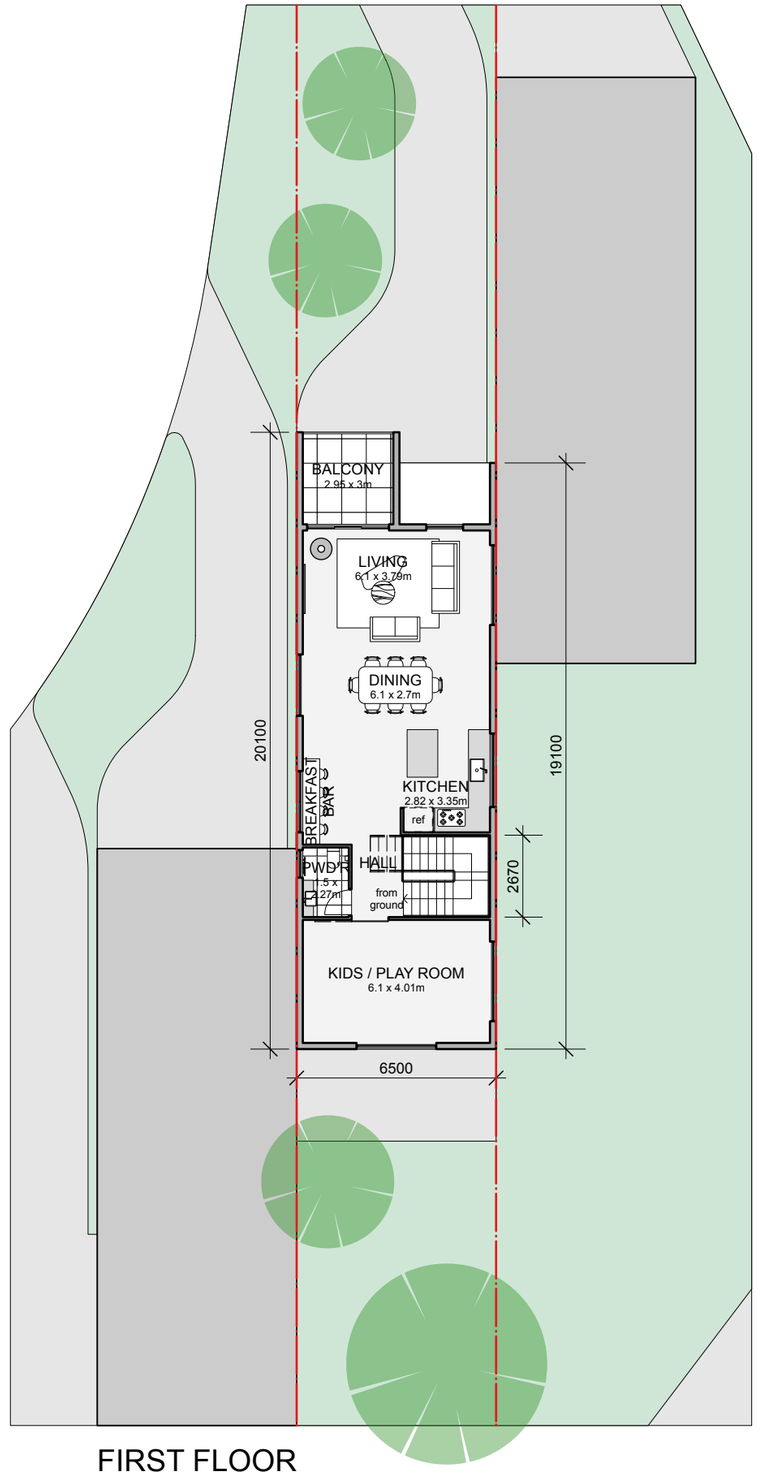


BASEMENT



GROUND FLOOR



FIRST FLOOR

PROPOSED MULTI-UNIT DWELLING (TOWNHOUSES) FLOOR PLANS
1.200

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION
LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE
04 APR 23

DRAWING STAGE
MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION
PROPOSED MULTI-UNIT DWELLING (TOWNHOUSES) FLOOR PLANS

DRAWING NUMBER
PL 23

SCALE
1.200

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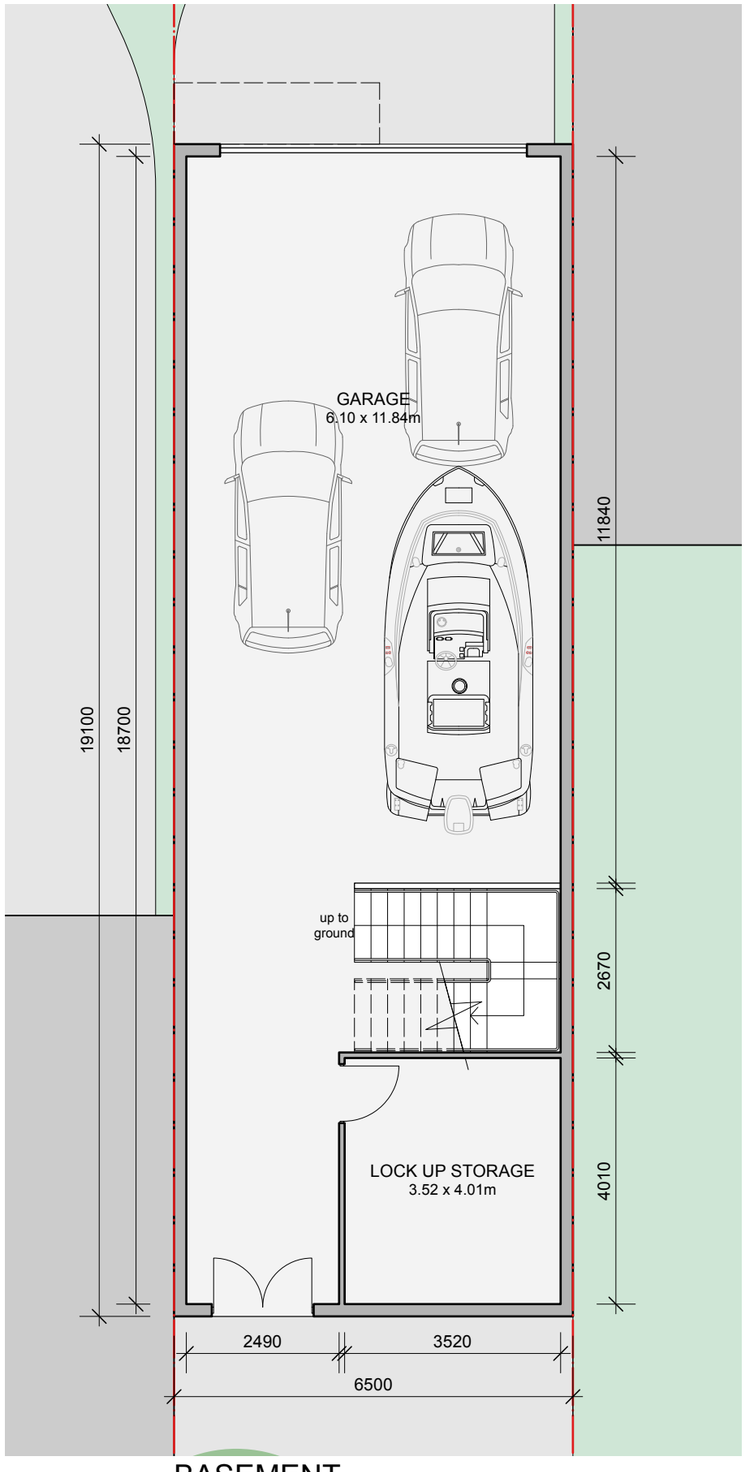

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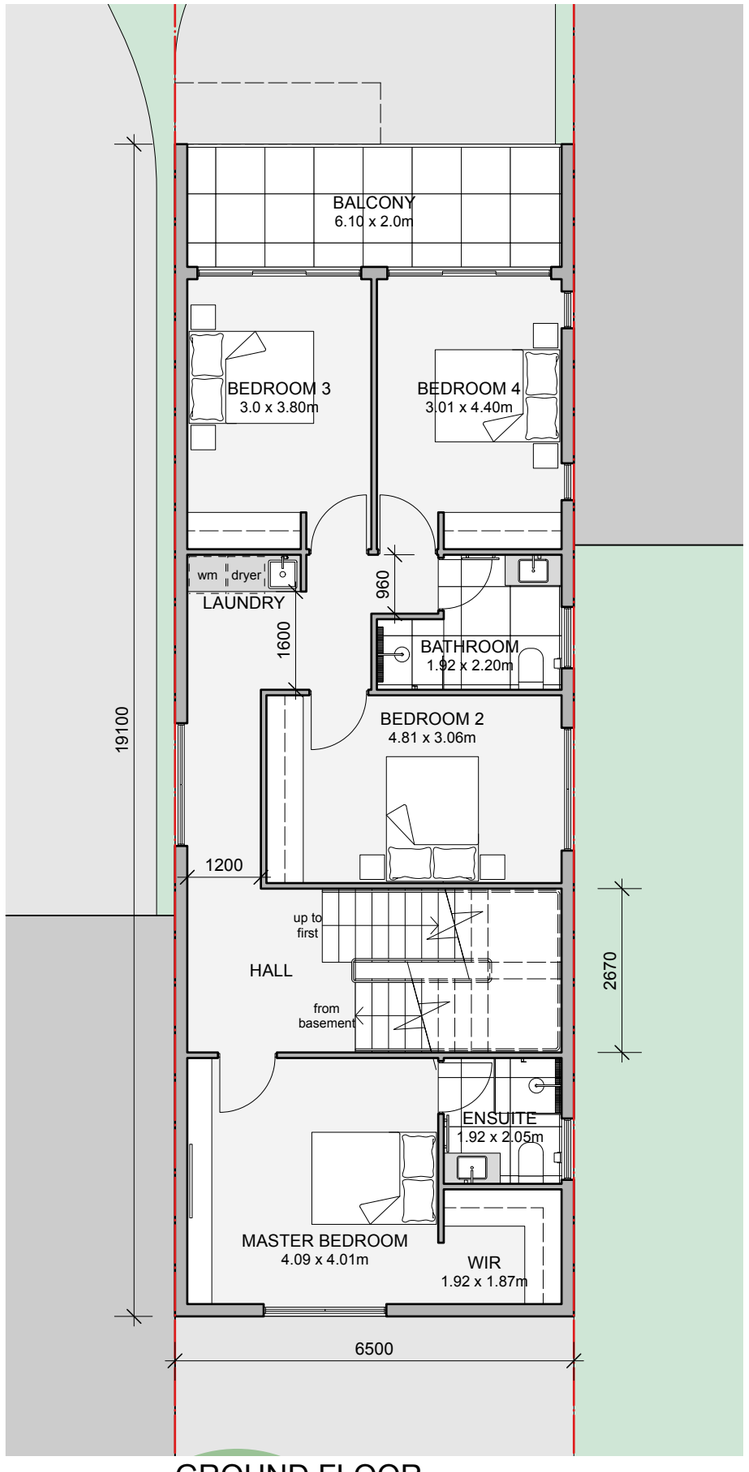
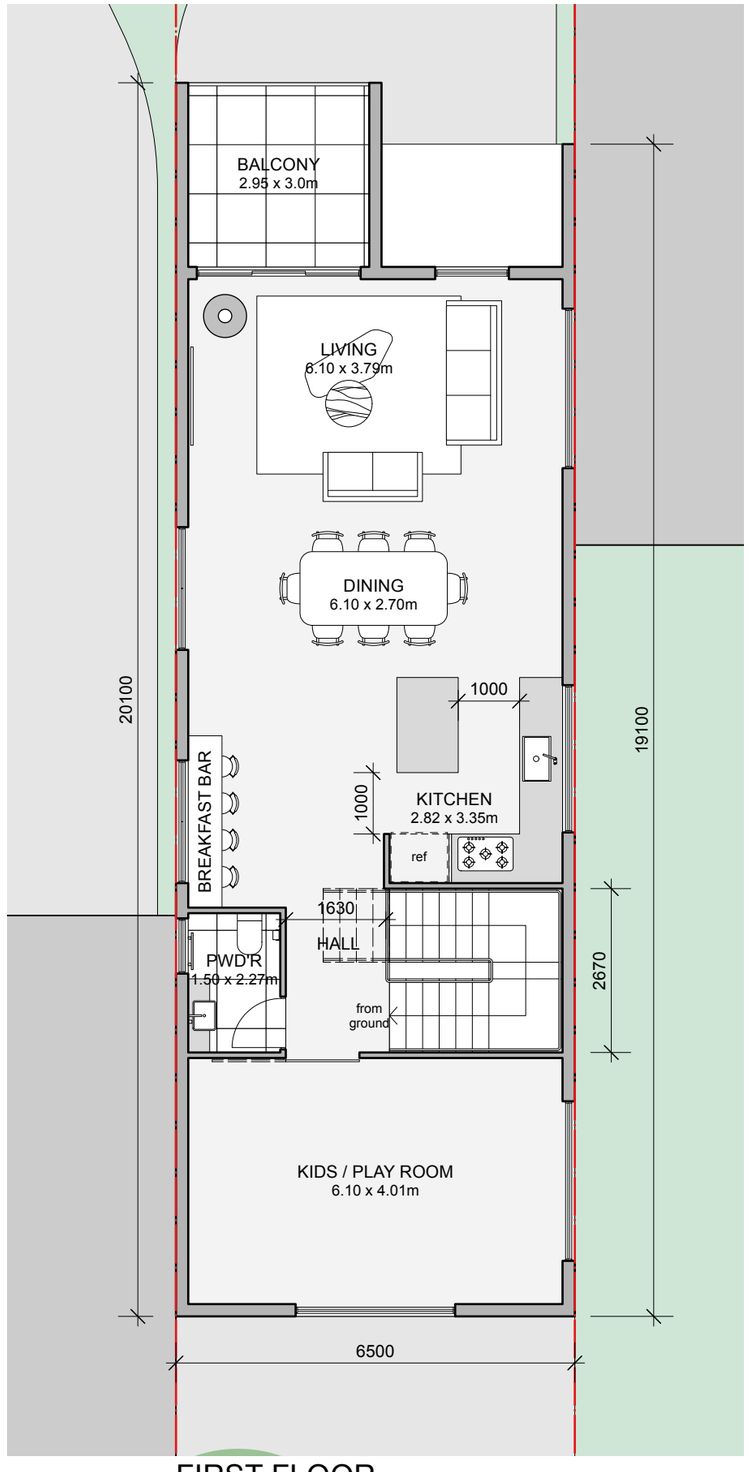


GROUND FLOOR



FIRST FLOOR

PROPOSED MULTI-UNIT DWELLING (TOWNHOUSES) FLOOR PLANS
1.100

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED MULTI-UNIT DWELLING (TOWNHOUSES) FLOOR PLANS

DRAWING NUMBER

PL 24

SCALE

1.100

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REGISTERED ARCHITECT:
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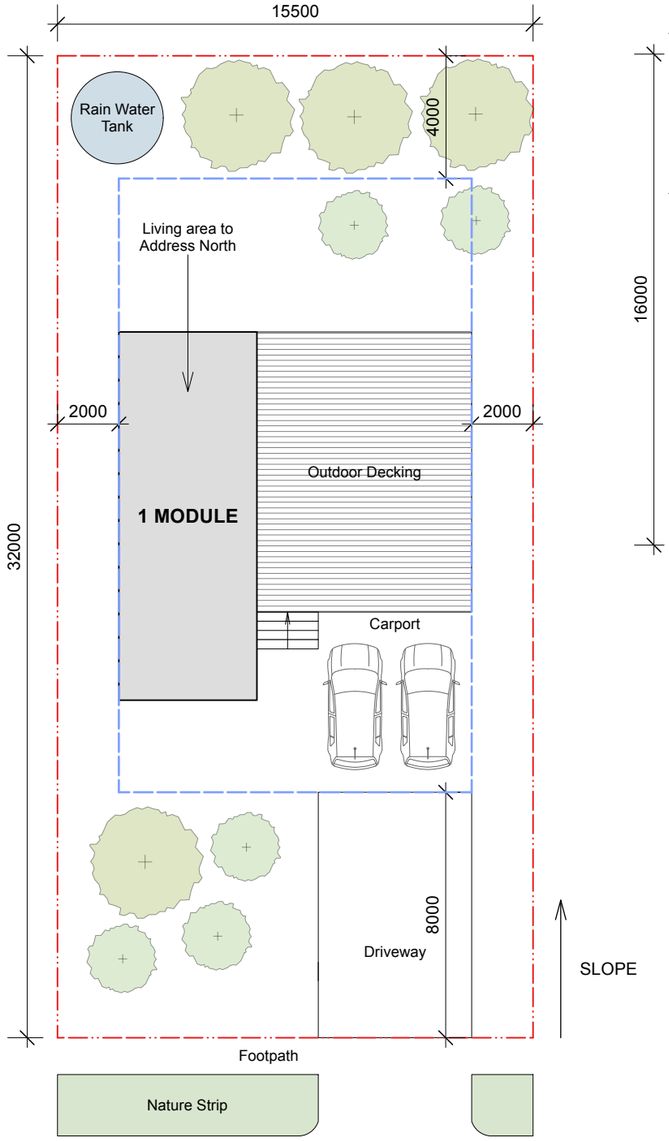
NSW 8367
UK 072397E

ABN 96 630 851 930

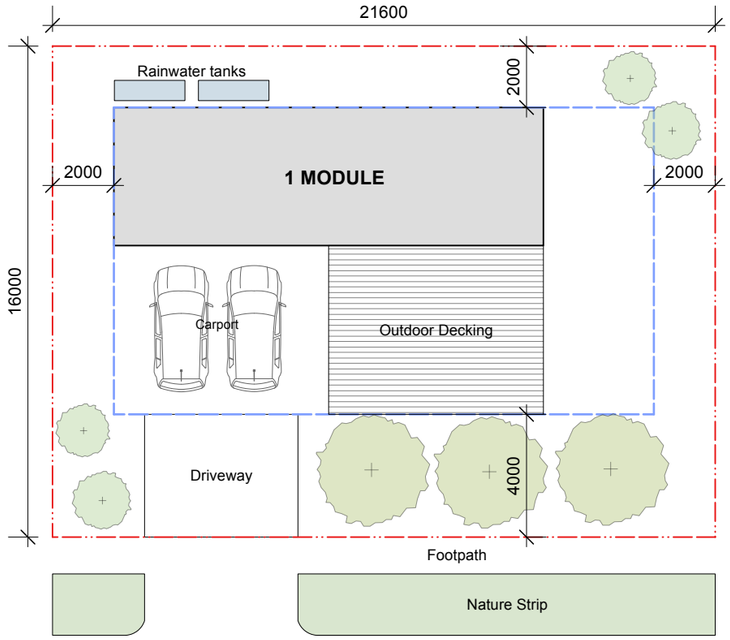
LOT SIZE 500 sqm



FOR LARGER SIZED LOTS

MAX. BUILDING HEIGHT 8.5m
MIN. FRONT SETBACK 8.0m
MIN. REAR SETBACK 4.0m
MIN. SIDE SETBACK 2.0m
CEILING HEIGHT MIN. 2.7m

LOT SIZE 350 sqm

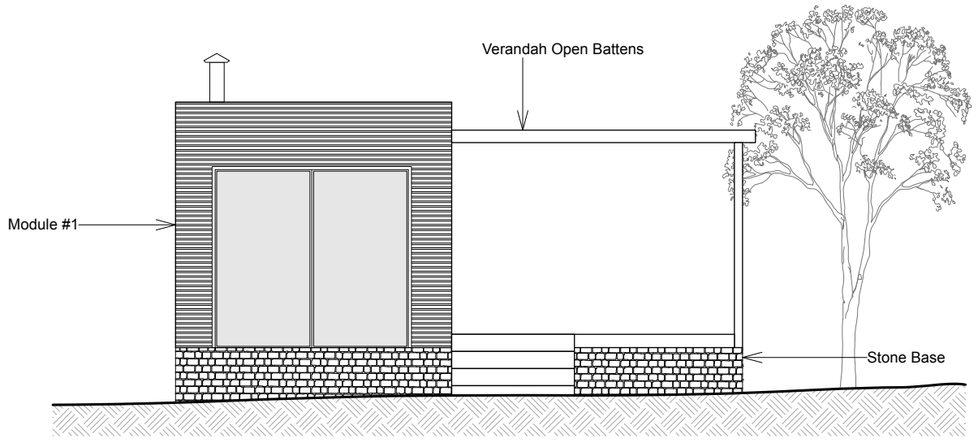


FOR SMALL SIZED LOTS

MAX. BUILDING HEIGHT 8.5m
MIN. FRONT SETBACK 4.0m
MIN. REAR SETBACK 2.0m
MIN. SIDE SETBACK 2.0m
CEILING HEIGHT MIN. 2.7m

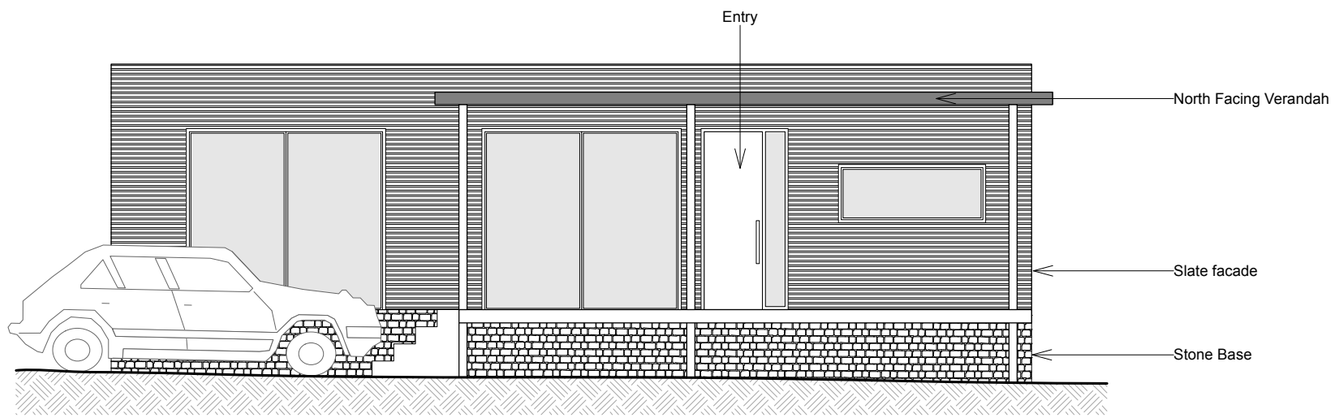
FLOOR PLAN
1.200

1 - 2 MODULE REFERENCE



ELEVATION
1.100

FLOOR PLAN
1.200



ELEVATION
1.100

PROPOSED SINGLE DWELLING
DESIGN GUIDELINES
SMALL MODULE OPTION (1 MODULE)

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED SINGLE DWELLING DESIGN GUIDELINES SMALL MODULE OPTION (1 MODULE)

DRAWING NUMBER

PL 28

SCALE

1.200 | 1.100

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REGISTERED ARCHITECT:
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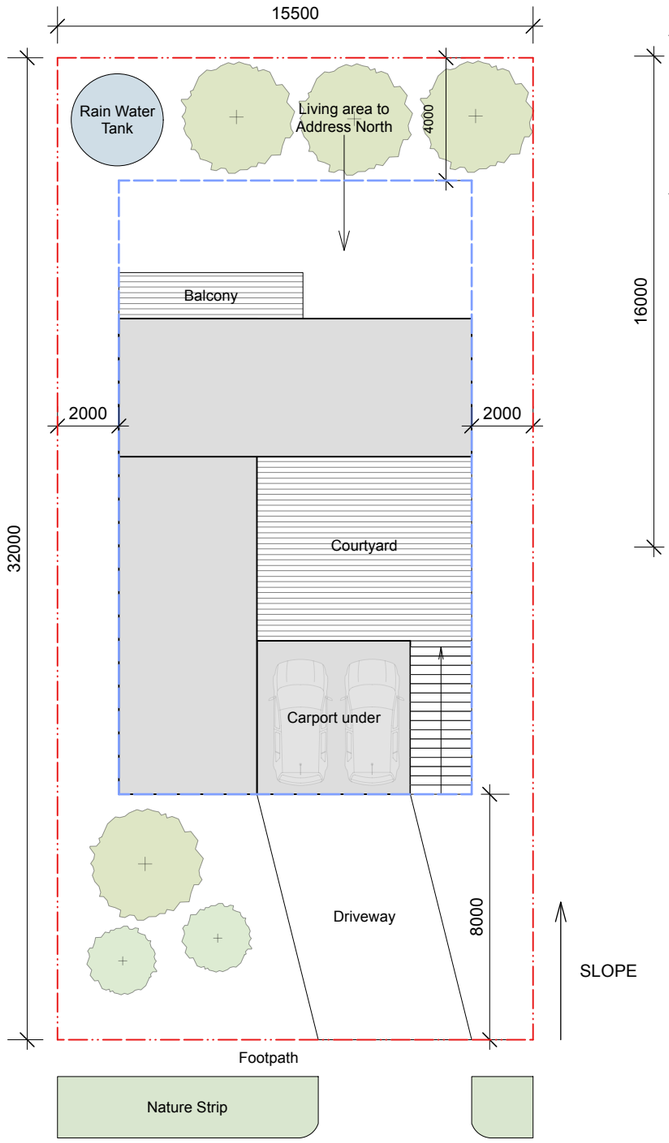
NSW 8367
UK 072397E

ABN 96 630 851 930

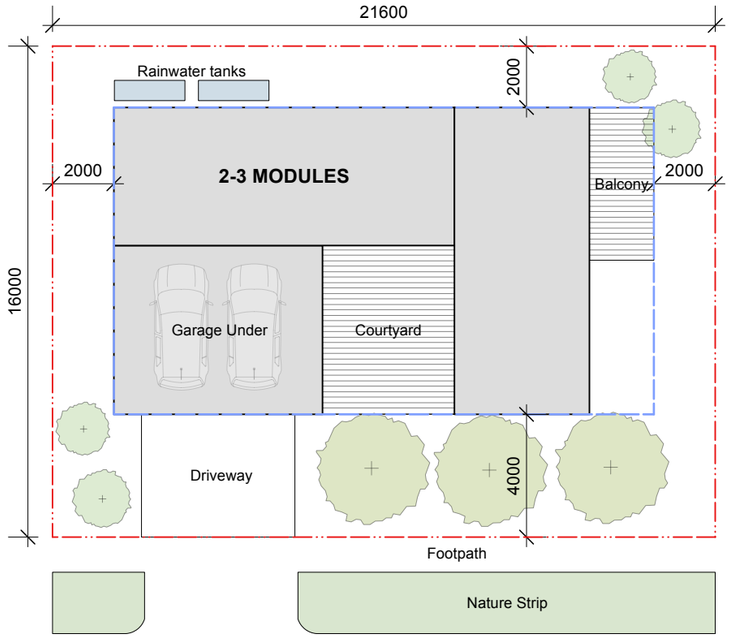
LOT SIZE 500 sqm



FOR LARGER SIZED LOTS

MAX. BUILDING HEIGHT 8.5m
MIN. FRONT SETBACK 8.0m
MIN. REAR SETBACK 4.0m
MIN. SIDE SETBACK 2.0m
CEILING HEIGHT MIN. 2.7m

LOT SIZE 350 sqm

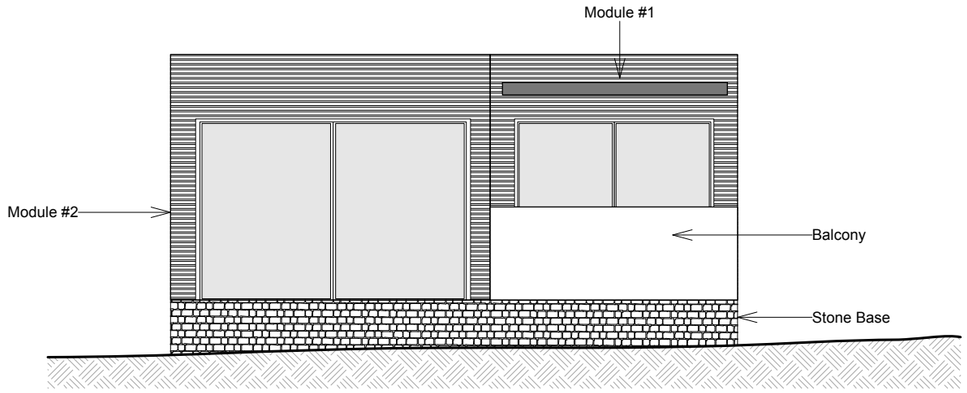


FOR SMALL SIZED LOTS

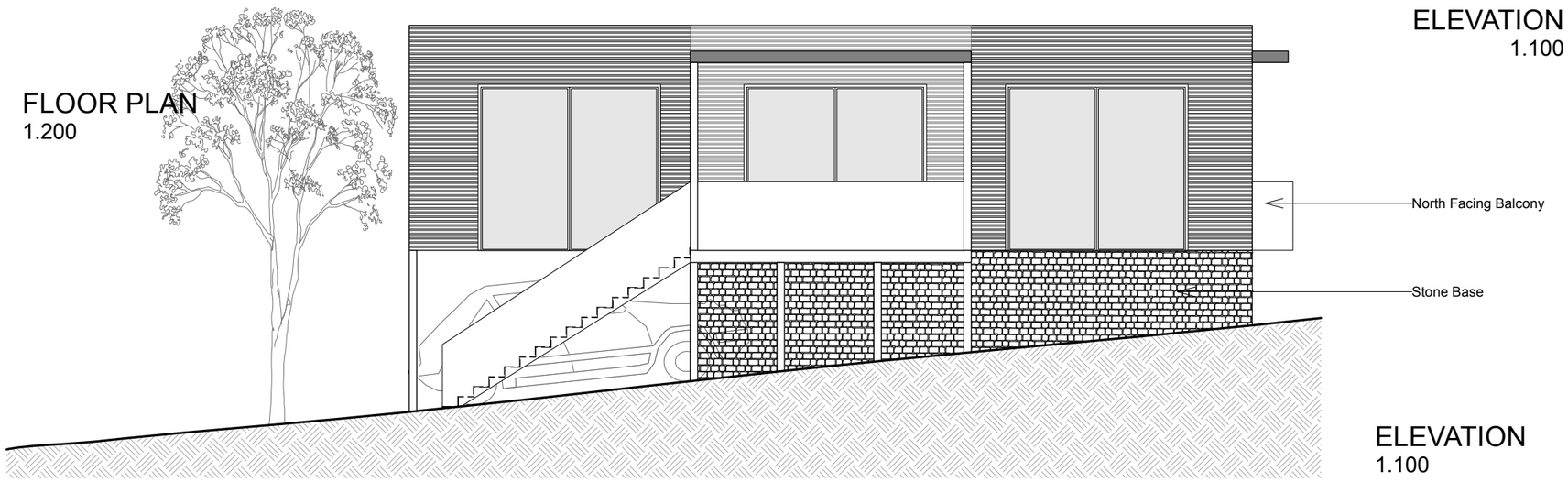
MAX. BUILDING HEIGHT 8.5m
MIN. FRONT SETBACK 4.0m
MIN. REAR SETBACK 2.0m
MIN. SIDE SETBACK 2.0m
CEILING HEIGHT MIN. 2.7m

FLOOR PLAN
1.200

2 - 3 MODULE REFERENCE



FLOOR PLAN
1.200



ELEVATION
1.100

ELEVATION
1.100

PROPOSED SINGLE DWELLING
DESIGN GUIDELINES
MEDIUM MODULE OPTION (2 - 3 MODULES)

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION
LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE
04 APR 23

DRAWING STAGE
MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION
PROPOSED SINGLE DWELLING DESIGN GUIDELINES MEDIUM MODULE OPTION (2 - 3 MODULES)

DRAWING NUMBER
PL 29

SCALE
1.200 | 1.100

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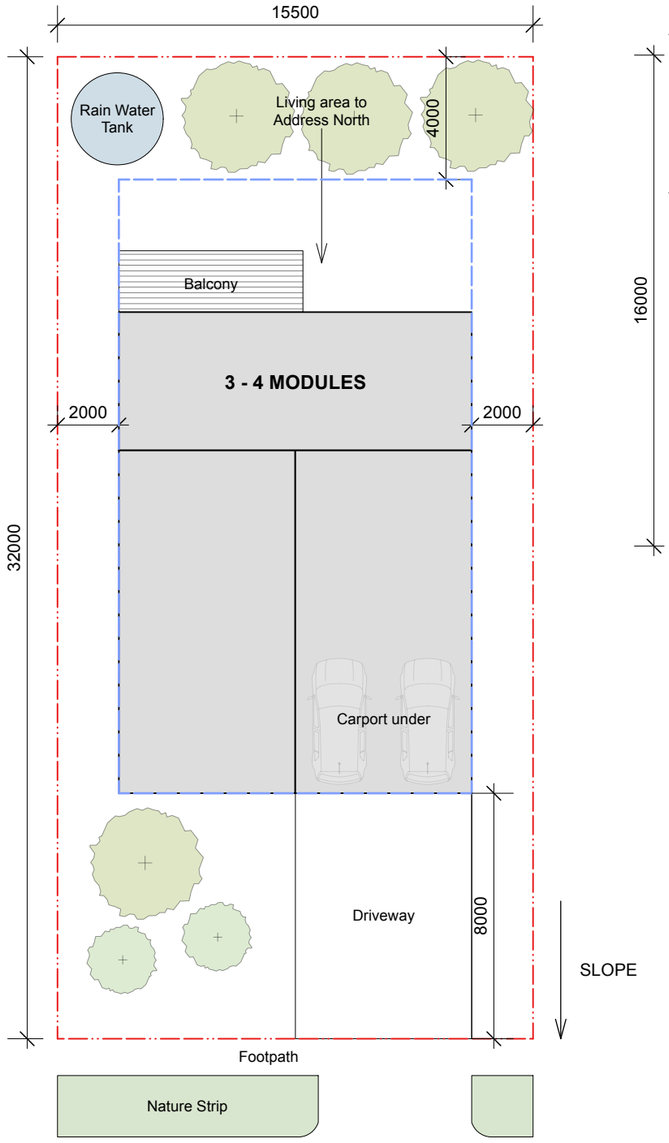
REGISTERED ARCHITECT:
VICTORIA 14450
NSW 8367
UK 072397E

ABN 96 630 851 930

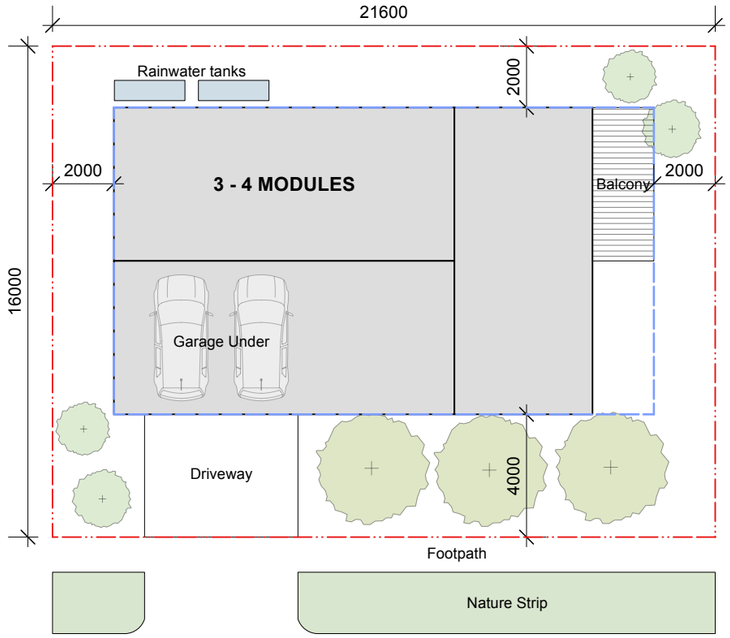
LOT SIZE 500 sqm



FOR LARGER SIZED LOTS

MAX. BUILDING HEIGHT 8.5m
MIN. FRONT SETBACK 8.0m
MIN. REAR SETBACK 4.0m
MIN. SIDE SETBACK 2.0m
CEILING HEIGHT MIN. 2.7m

LOT SIZE 350 sqm



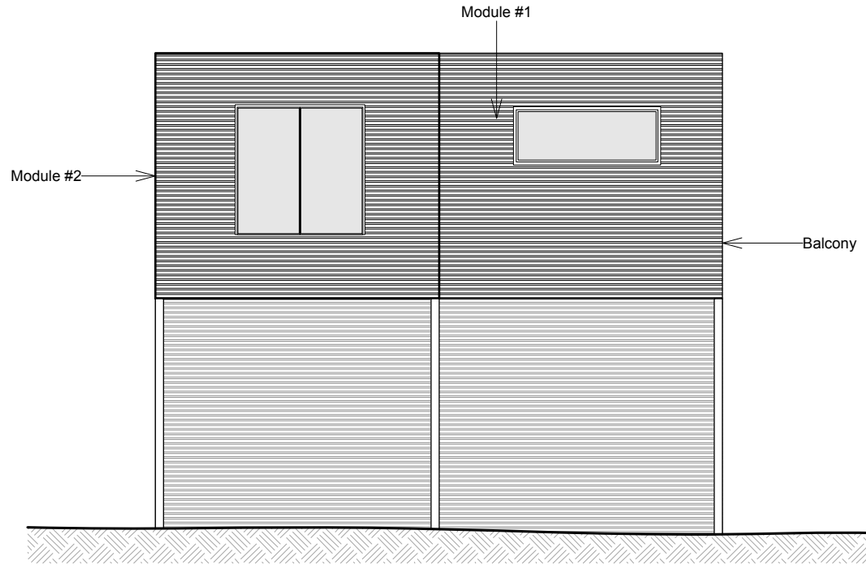
FOR SMALL SIZED LOTS

MAX. BUILDING HEIGHT 8.5m
MIN. FRONT SETBACK 4.0m
MIN. REAR SETBACK 2.0m
MIN. SIDE SETBACK 2.0m
CEILING HEIGHT MIN. 2.7m

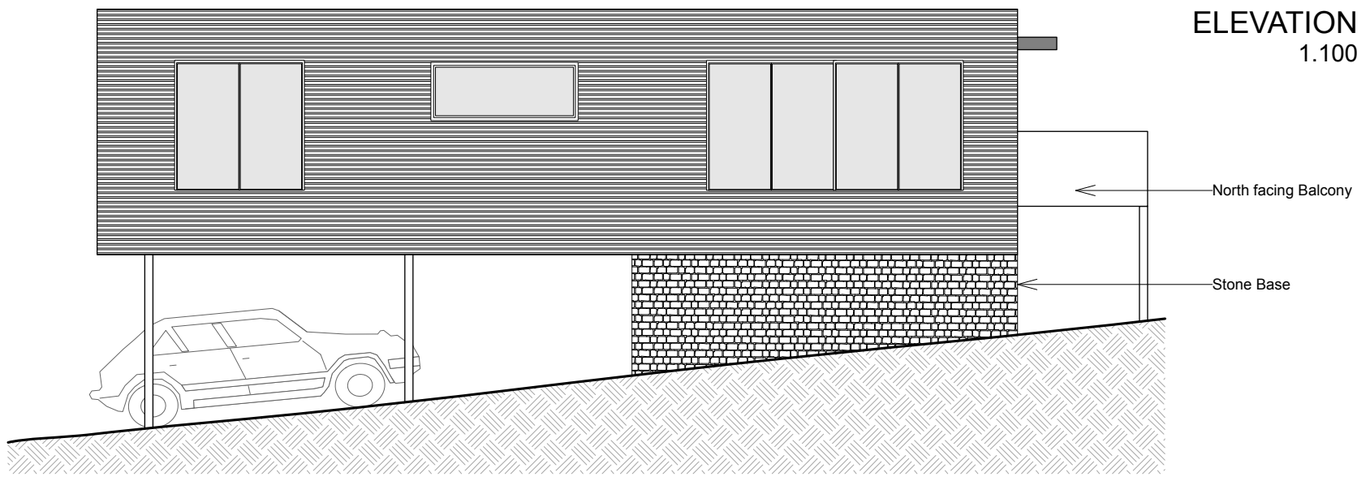
FLOOR PLAN
1.200

FLOOR PLAN
1.200

3 - 4 MODULE REFERENCE



ELEVATION
1.100



ELEVATION
1.100

PROPOSED SINGLE DWELLING DESIGN GUIDELINES MEDIUM MODULE OPTION (3 - 4 MODULES)

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION
LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE
04 APR 23

DRAWING STAGE
MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION
PROPOSED SINGLE DWELLING DESIGN GUIDELINES MEDIUM MODULE OPTION (3 - 4 MODULES)

DRAWING NUMBER
PL 30

SCALE
1.200 | 1.100

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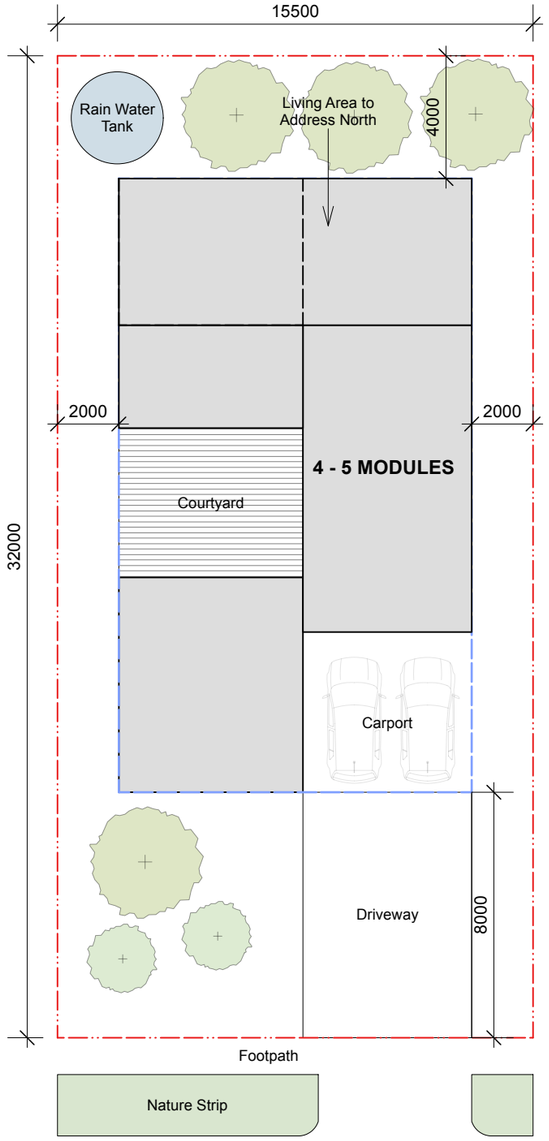
NSW 8367
UK 072397E

ABN 96 630 851 930

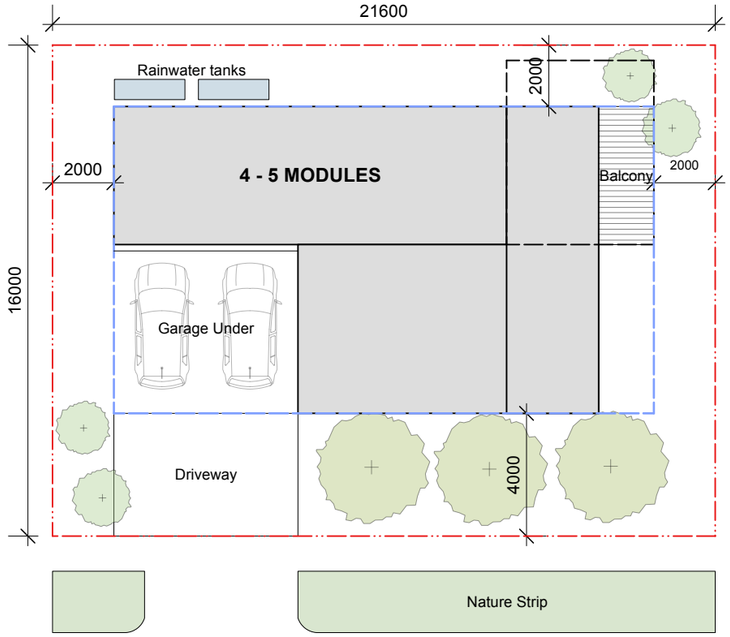
LOT SIZE 500 sqm



FOR LARGER SIZED LOTS

MAX. BUILDING HEIGHT 8.5m
MIN. FRONT SETBACK 8.0m
MIN. REAR SETBACK 4.0m
MIN. SIDE SETBACK 2.0m
CEILING HEIGHT MIN. 2.7m

LOT SIZE 350 sqm

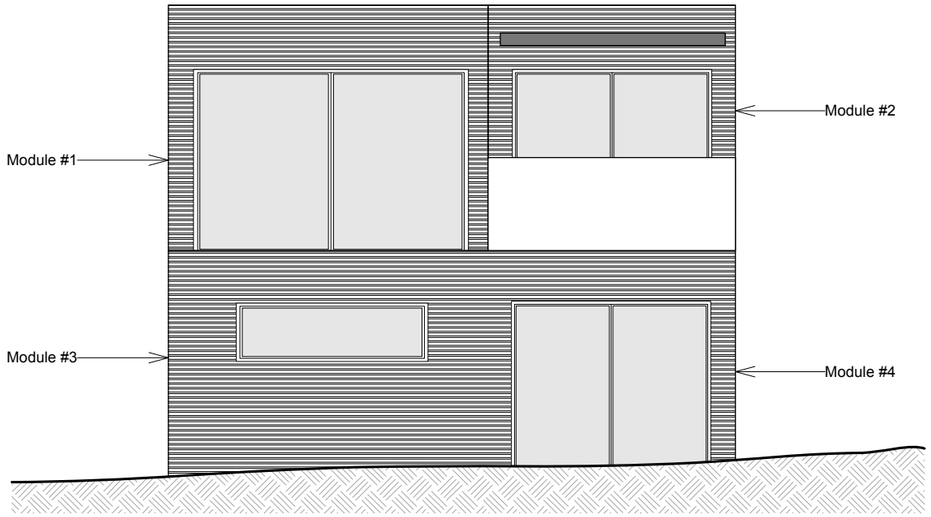


FOR SMALL SIZED LOTS

MAX. BUILDING HEIGHT 8.5m
MIN. FRONT SETBACK 4.0m
MIN. REAR SETBACK 2.0m
MIN. SIDE SETBACK 2.0m
CEILING HEIGHT MIN. 2.7m

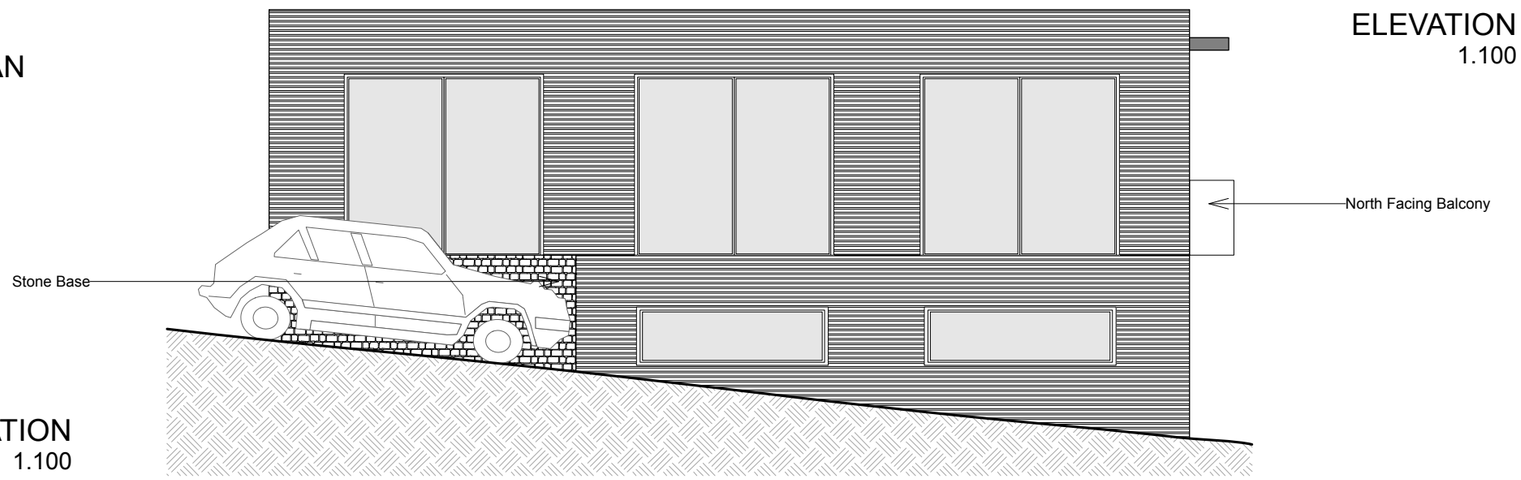
FLOOR PLAN
1.200

4 - 5 MODULE REFERENCE



ELEVATION
1.100

FLOOR PLAN
1.200



ELEVATION
1.100

PROPOSED SINGLE DWELLING
DESIGN GUIDELINES
MEDIUM MODULE OPTION (4 - 5 MODULES)

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED SINGLE DWELLING DESIGN GUIDELINES MEDIUM MODULE OPTION (4 - 5 MODULES)

DRAWING NUMBER

PL 31

SCALE

1.200 | 1.100

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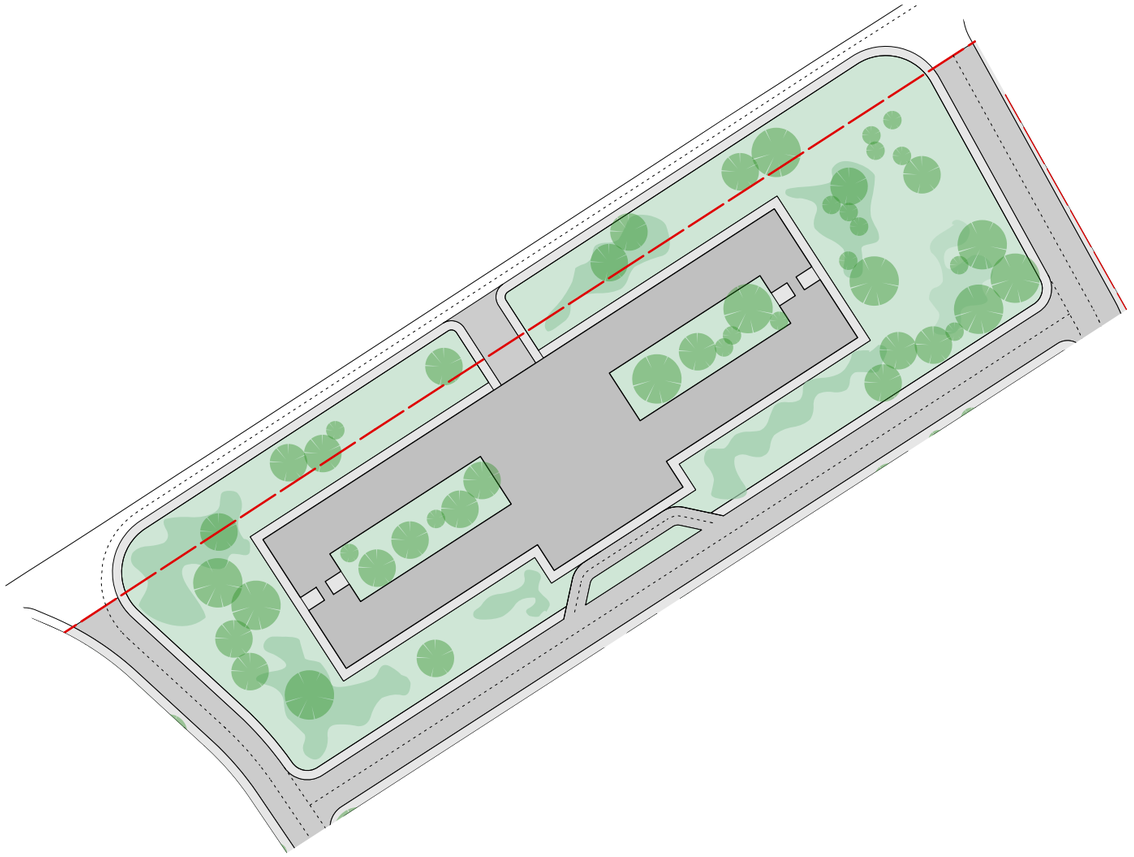
ABN 96 630 851 930



PROPOSED HOTEL

View from Lake and Landing Strip

Lot 13 is the designated Hotel site, comprising 25,929 sq.m fronting Miles Franklin Drive and the Jounama Pondage.
The site is accessible from both front and rear roads.
The site will support a three level hotel with sub-basement carparking.

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PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED HOTEL

DRAWING NUMBER

PL 32

SCALE

NTS

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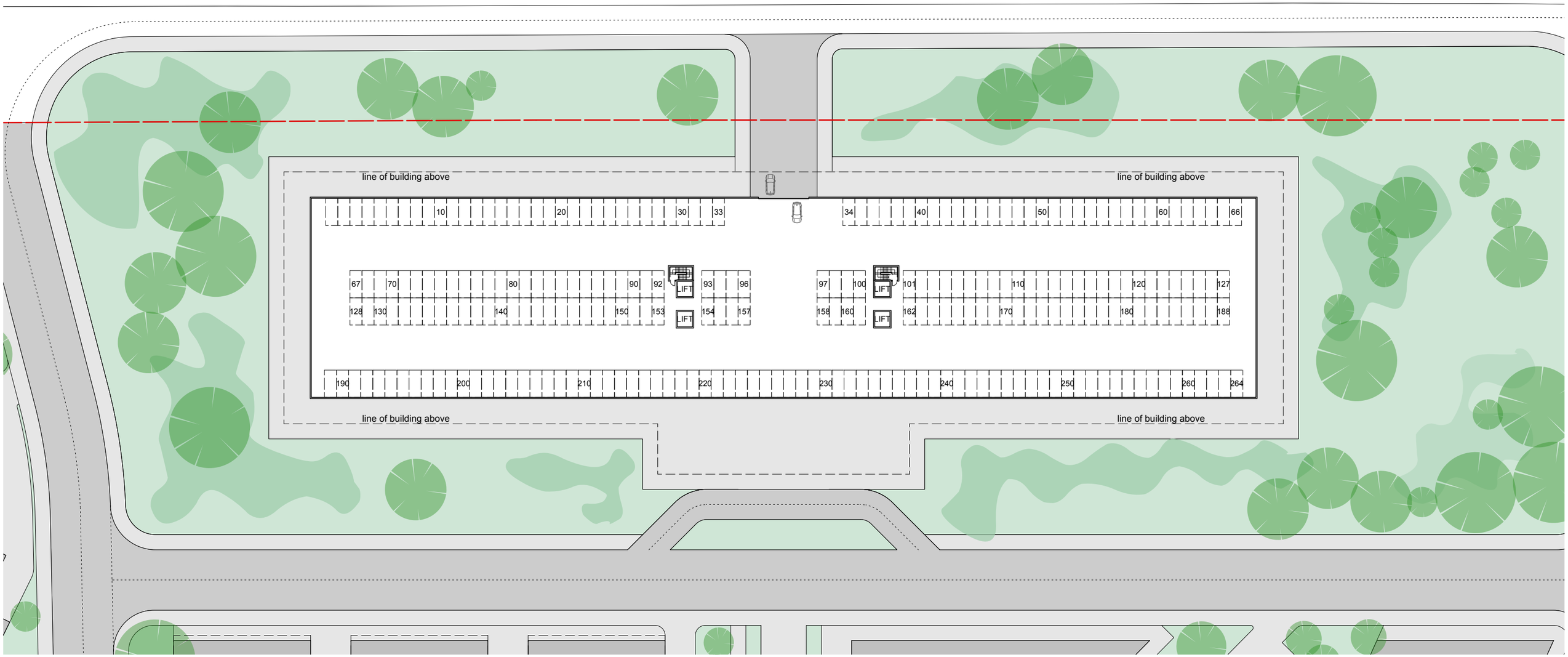

PROPOSED HOTEL GARAGE
BASEMENT FLOOR PLAN
1.750

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED HOTEL GARAGE BASEMENT FLOOR PLAN

DRAWING NUMBER

PL 37

SCALE

1.750

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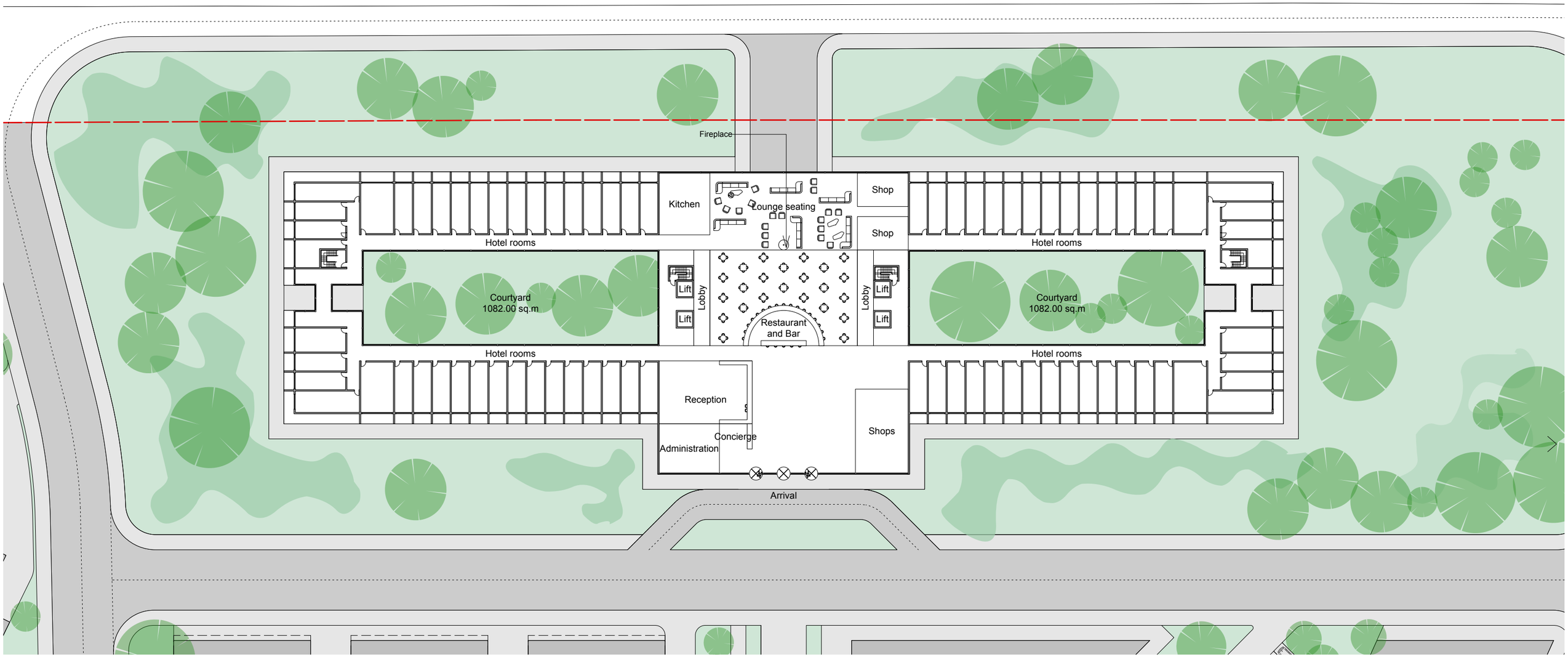
UK 072397E

ABN 96 630 851 930



PROPOSED HOTEL GROUND FLOOR PLAN
1.750

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED HOTEL GROUND FLOOR PLAN

DRAWING NUMBER

PL 38

SCALE

1.750

SERVICES PROVIDED BY

ROBERT HARWOOD ARCHITECTS
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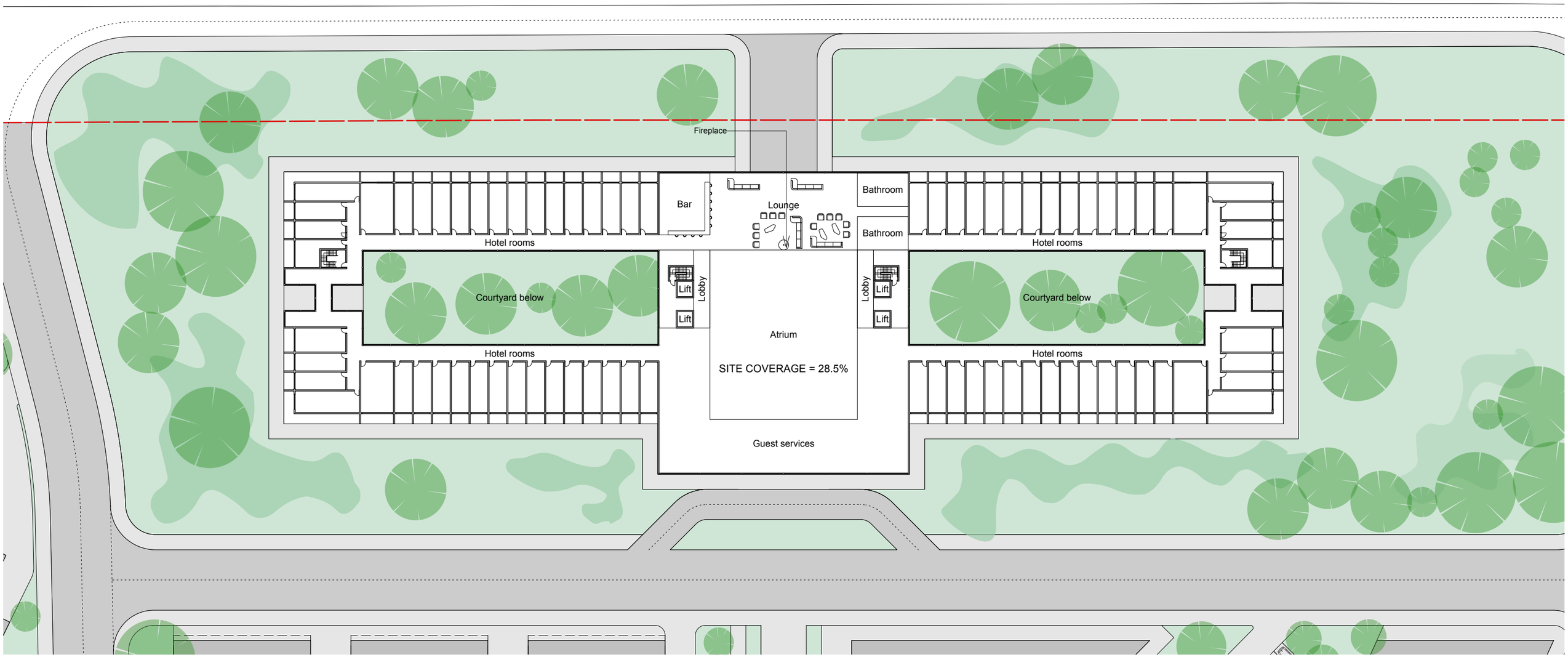
REGISTERED ARCHITECT:
VICTORIA 14450
NSW 8367
UK 072397E

ABN 96 630 851 930

Miles Franklin Drive

Miles Franklin Drive



PROPOSED HOTEL FIRST AND SECOND FLOOR PLANS

1.750

ROBERT HARWOOD ARCHITECTS

PROJECT AND LOCATION

LOT 35 DP 878862 Miles Franklin Drive Talbingo NSW

DATE

04 APR 23

DRAWING STAGE

MASTERPLAN CONCEPT DRAWINGS

DRAWING DESCRIPTION

PROPOSED HOTEL FIRST AND SECOND FLOOR PLANS

DRAWING NUMBER

PL 39

SCALE

1.750

SERVICES PROVIDED BY

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NSW 8367
UK 072397E

ABN 96 630 851 930

APPENDIX C

RFFE Data

RESULTS FROM ARR RFFE 2015 MODEL

Datetime: 2023-05-03 13:28
Region name: East Coast
Region code: 1
Site name: Jounama Pondage
Latitude at catchment outlet (degree) = -35.562
Longitude at catchment outlet (degree) = 148.307
Latitude at catchment centroid (degree) = -35.858
Longitude at catchment centroid (degree) = 148.357
Distance of the nearest gauged catchment in the database (km) = 26.09
Catchment area (sq km) = 1355.0
Design rainfall intensity, 1 in 2 AEP and 6 hr duration (mm/h): 5.792157
Design rainfall intensity, 1 in 50 AEP and 6 hr duration (mm/h): 10.9797
Shape factor of the ungauged catchment: 0.9

ESTIMATED FLOOD QUANTILES:

AEP (%)	Expected quantiles (m^3/s)	5% CL m^3/s	95% CL m^3/s
50	76.3	25.9	225
20	156	55.5	439
10	229	81.9	640
5	315	112	885
2	452	159	1290
1	578	200	1680

DATA FOR FITTING MULTI-NORMAL DISTRIBUTION FOR BUILDING CONFIDENCE LIMITS:

1 Mean (loge flow) = 4.431
2 St dev (loge flow) = 0.901
3 Skew (loge flow) = 0.082

Moments and correlations:

No	Most probable	Std dev	Correlation		
1	4.431	0.695	1.000		
2	0.901	0.129	-0.330	1.000	
3	0.082	0.026	0.170	-0.280	1.000

APPENDIX D

Water Quality Maintenance Manual

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Bio-retention Basin Inspection and Maintenance Checklist

Location: **Date:**

Maintenance Officer:

Signature:

Item Inspected	Checked		Maintenance Needed		Inspection Frequency
	Y	N	Y	N	
DEBRIS CLEANOUT					6 monthly
Surface clear of debris					
Inlet area clear of debris					
Overflow area clear of debris					
TRENCH SURFACE VEGETATION					6 monthly
Vegetation condition					
Vegetation maintenance					
Weed infestation					
Evidence of erosion					
Surface grass to be cut at 50mm blade					1 monthly
DEWATERING					6 monthly
Trench surface dewatering between storms					
Top soil layer require replacing					
Entire planting surface require replacing					
OUTLET CHANNEL & PIT					Yearly
Pit Condition					
Evidence of concrete failing					
Evidence of erosion downstream					

Source: Water Sensitive Urban Design Technical Guidelines for Western Sydney

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Gross Pollutant Trap Inspection and Maintenance Checklist

Location: **Date:**

Maintenance Officer:

Signature:

Item Inspected	Checked		Maintenance Needed		Inspection Frequency
	Y	N	Y	N	
DEBRIS CLEANOUT					3 monthly
Surface clear of debris					
Inlet pipe clear of debris					
Clear sump of debris					
Clear sump of sediment					
INTERNAL FUNCTION					6 monthly
Basket and screens compromised					
Signs of rust or deterioration					
Pipes connections sealed and functioning					
DEWATERING					6 monthly
Correct drop through pit					
High amounts of pooling water					
PIT CONDITION					Yearly
Pit Condition					
Evidence of concrete failing					
Evidence of seepage					

Source: Water Sensitive Urban Design Technical Guidelines for Western Sydney

APPENDIX E

Flood Mapping

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Peak Flood Depth
20% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F01**

Rev: **B**

Date: **25/07/2023**

siteplus

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Peak Flood Depth
5% AEP Event

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F02**

Rev: **B**

Date: **25/07/2023**

siteplus

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Peak Flood Depth
1% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F03**

Rev: **B**

Date: **25/07/2023**

siteplus

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Peak Flood Depth
PMF Event

Fig: **23113.DA.F04**

Rev: **B**

Date: **25/07/2023**

siteplus

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Peak Flood Velocity
20% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F05**

Rev: **A**

Date: **25/07/2023**

siteplus

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Peak Flood Velocity
5% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F06**

Rev: **A**

Date: **25/07/2023**

siteplus

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Peak Flood Velocity
1% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F07**

Rev: **B**

Date: **25/07/2023**

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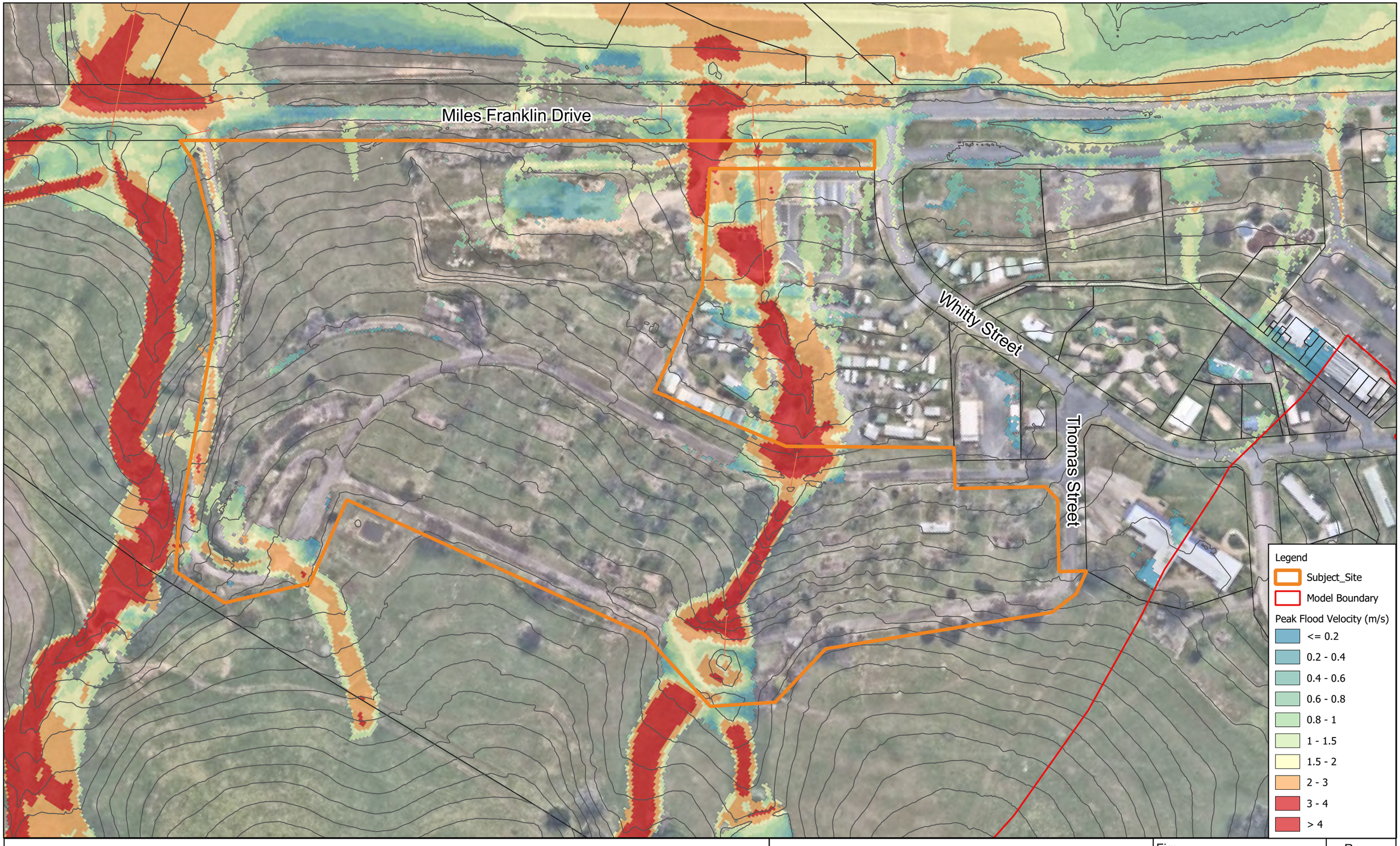

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Peak Flood Velocity
PMF Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F08**

Rev: **A**

Date: **25/07/2023**

siteplus

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Peak Flood Hazard
20% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F09**

Rev: **B**

Date: **25/07/2023**

siteplus

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Peak Flood Hazard
5% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: 23113.DA.F10

Rev: B

Date: 25/07/2023

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Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Peak Flood Hazard
1% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: 23113.DA.F11

Rev: B

Date: 25/07/2023

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Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Peak Flood Hazard
PMF Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F12**

Rev: **B**

Date: **25/07/2023**

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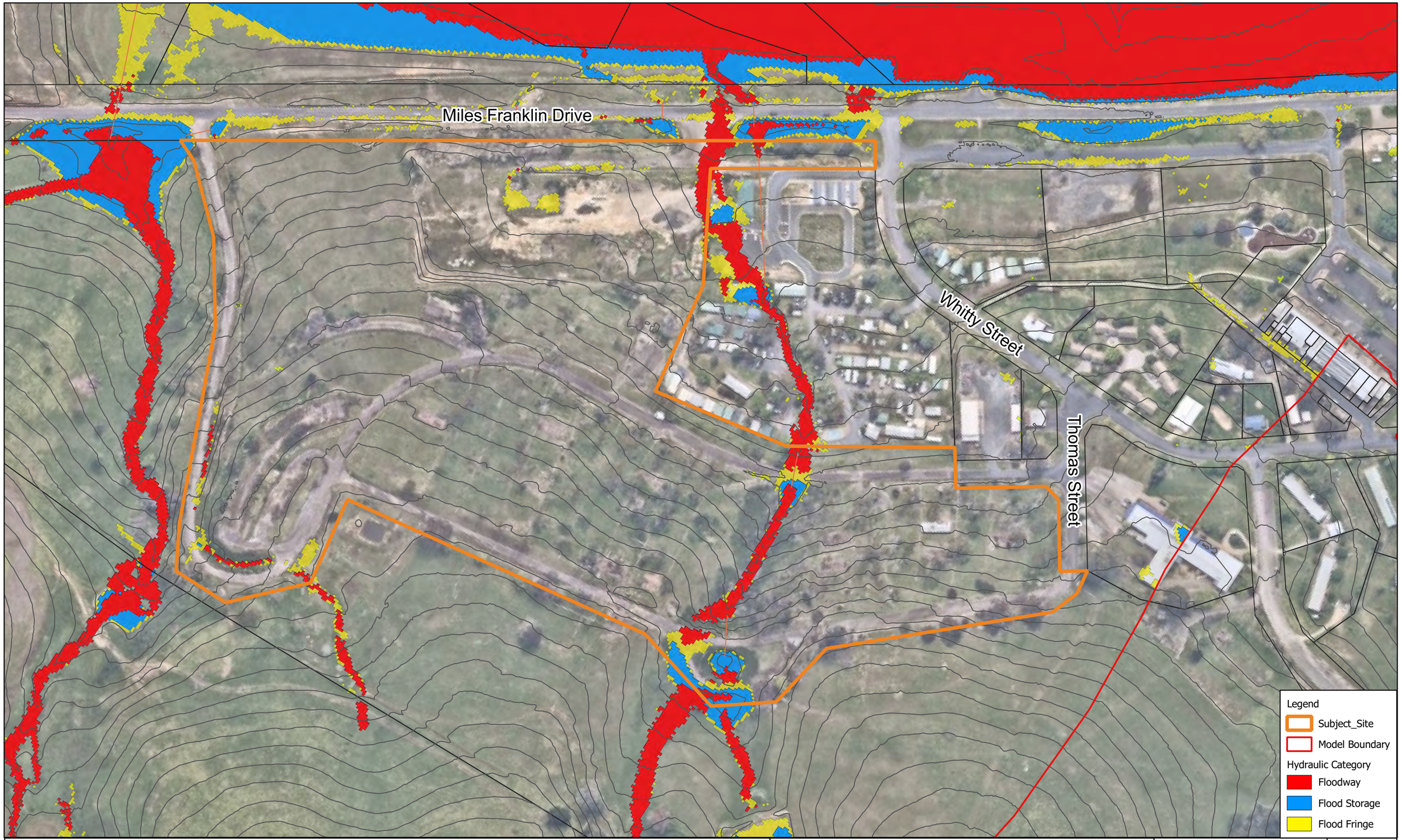

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Hydraulic Categories
1% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: 23113.DA.F13

Rev: B

Date: 25/07/2023

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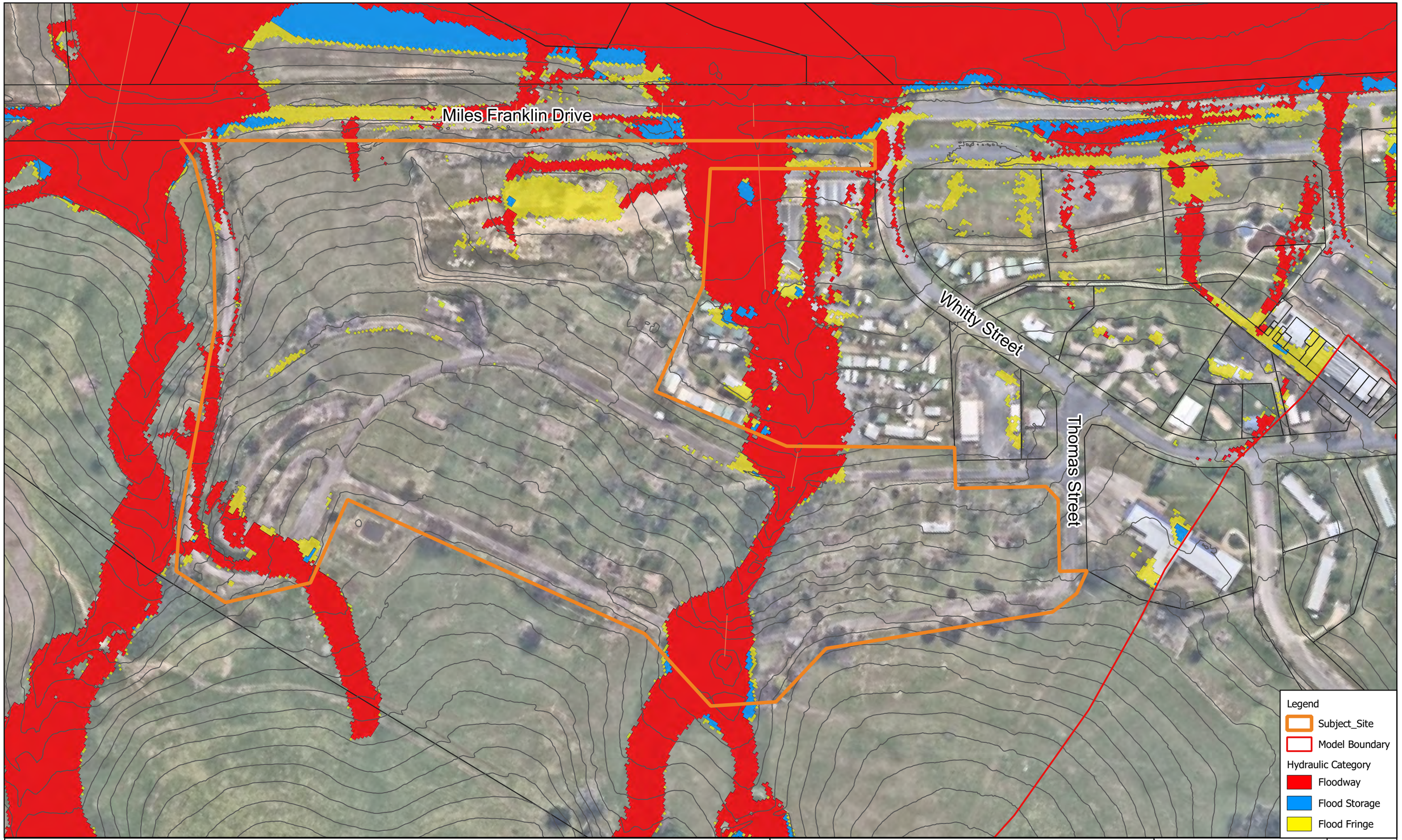

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Existing Scenario - Hydraulic Categories
PMF Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: 23113.DA.F14

Rev: B

Date: 25/07/2023

siteplus

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Depth
20% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F15**

Rev: **B**

Date: **26/07/2023**

siteplus

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Depth
5% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F16**

Rev: **B**

Date: **26/07/2023**

siteplus

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Depth
1% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F17**

Rev: **B**

Date: **26/07/2023**

siteplus

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Depth
PMF Event

Fig: 23113.DA.F18

Rev: B

Date: 26/07/2023

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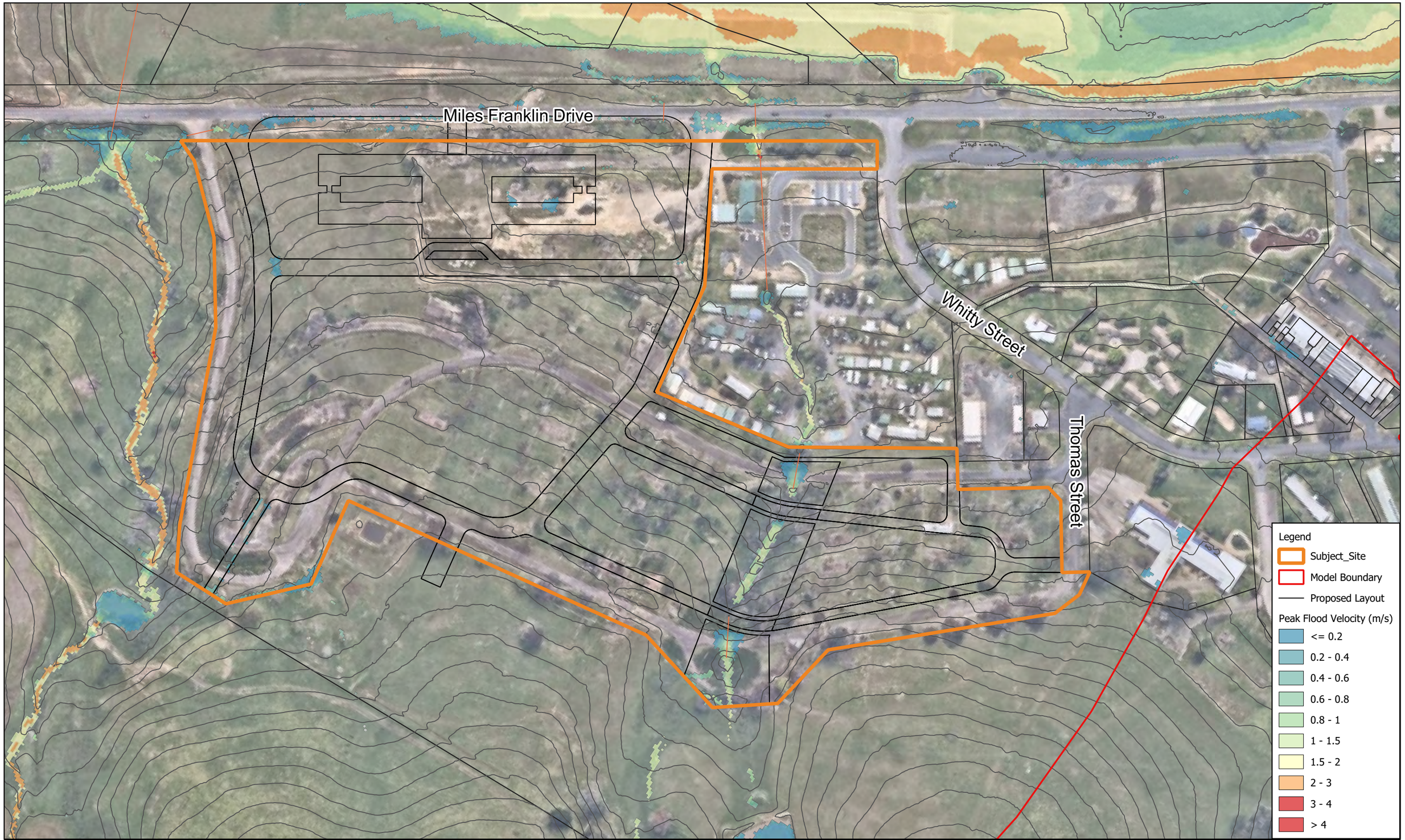


Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Velocity
20% AEP Event

N

0 50 100 150 200 m

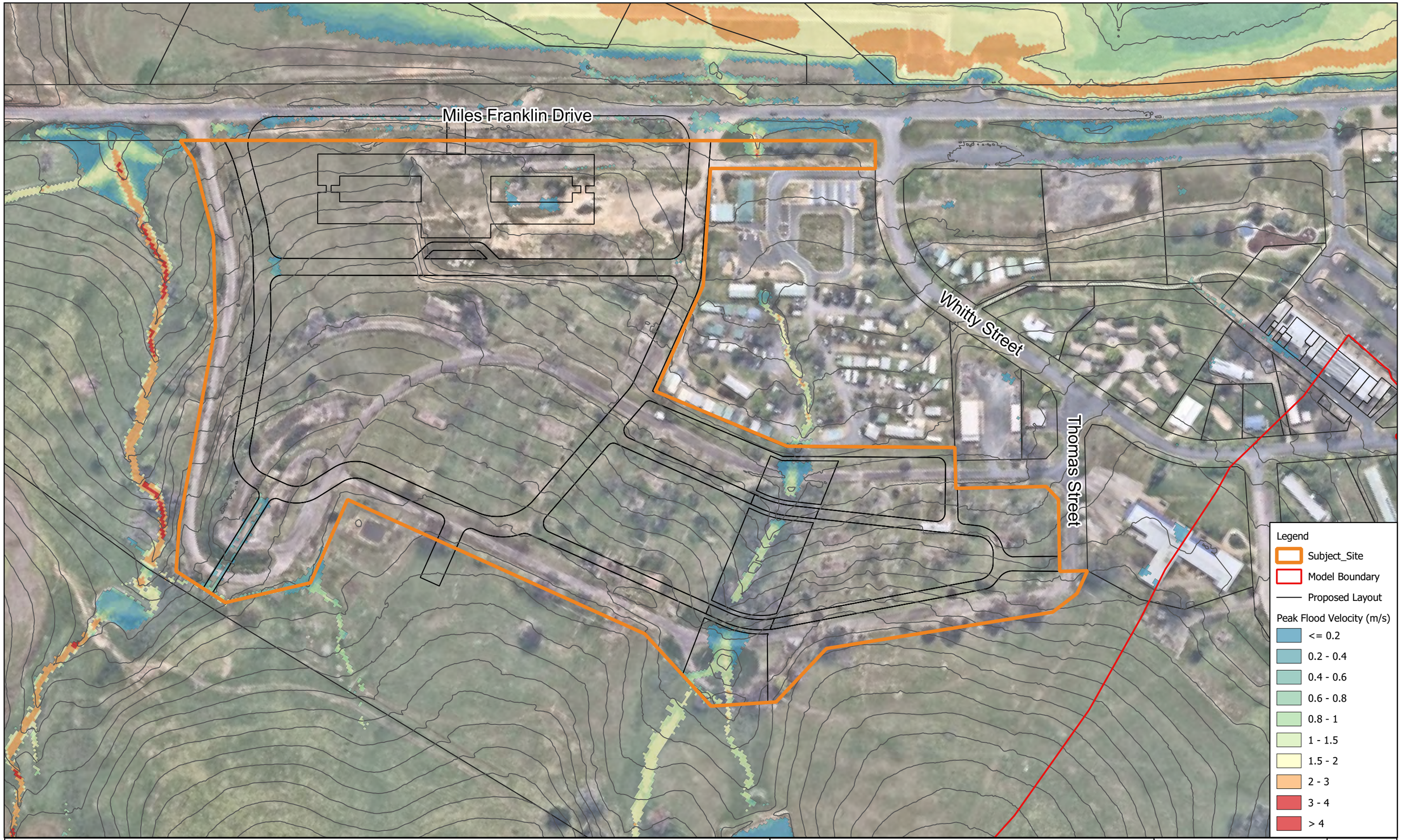
Scale: 1:2500 @ A3

Fig: **23113.DA.F19**

Rev: **B**

Date: **26/07/2023**

siteplus



Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Velocity
5% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: 23113.DA.F20

Rev: B

Date: 26/07/2023

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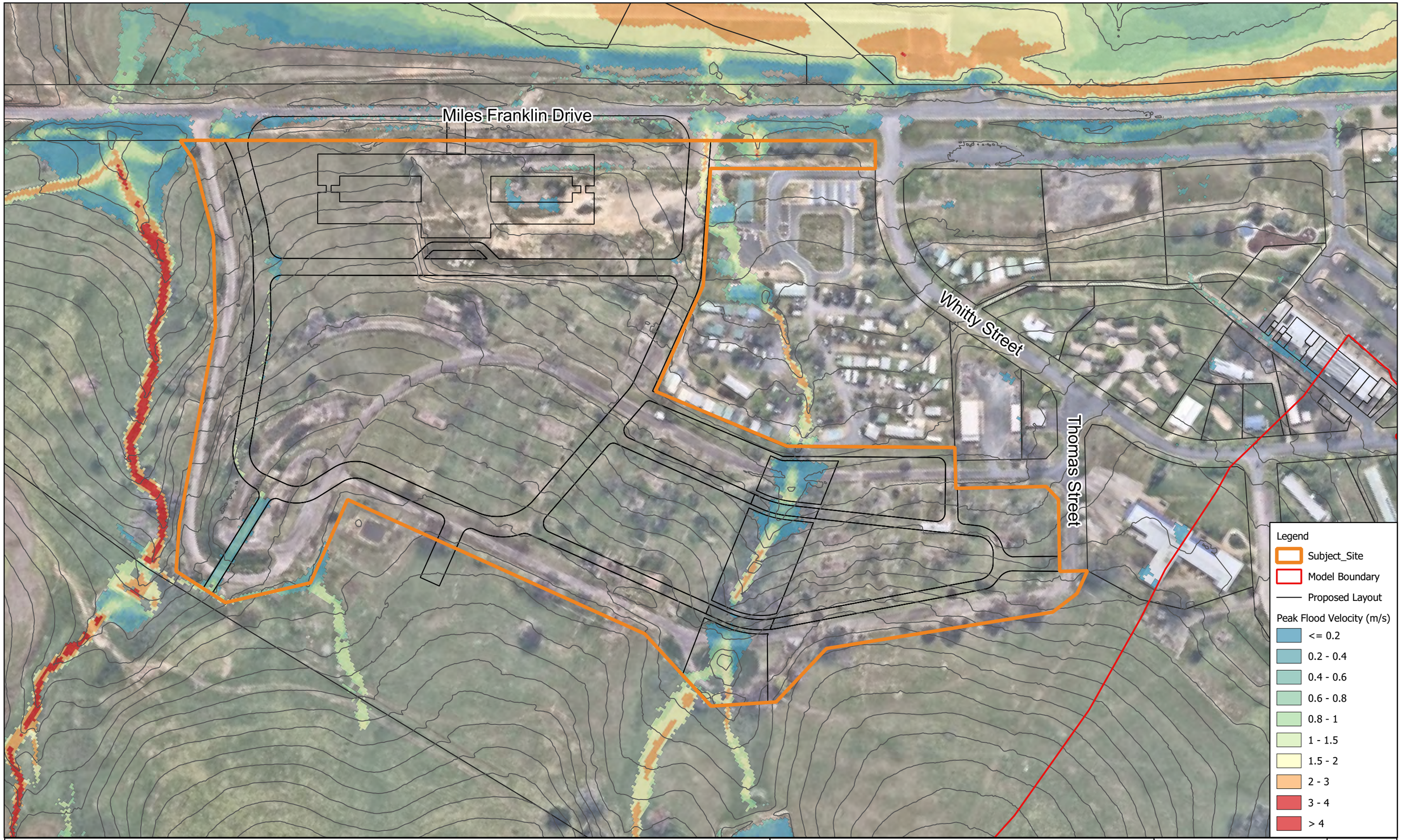


Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Velocity
1% AEP Event

N

0 50 100 150 200 m

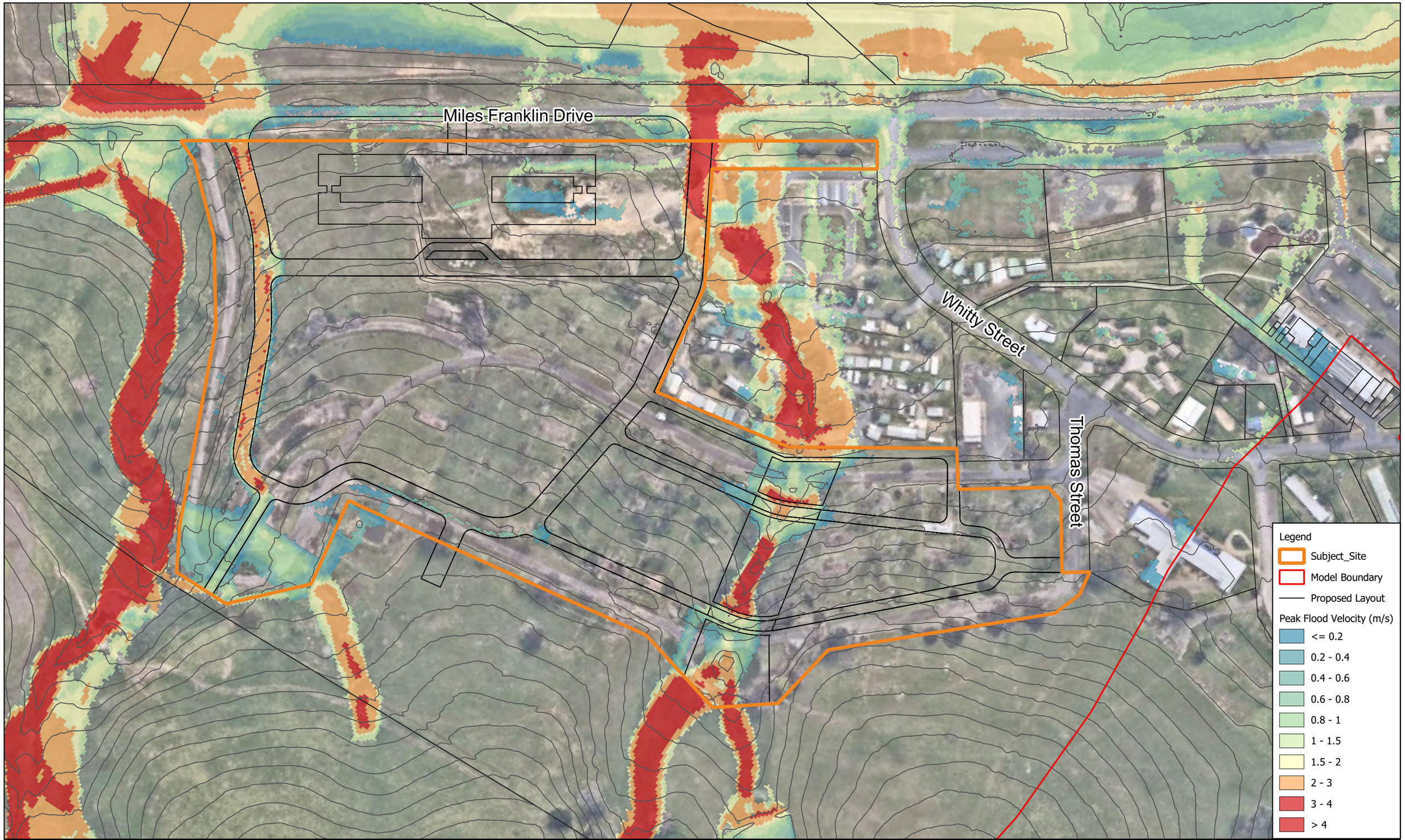
Scale: 1:2500 @ A3

Fig: 23113.DA.F21

Rev: B

Date: 26/07/2023

siteplus



Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Velocity
PMF Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F22**

Rev: **B**

Date: **26/07/2023**

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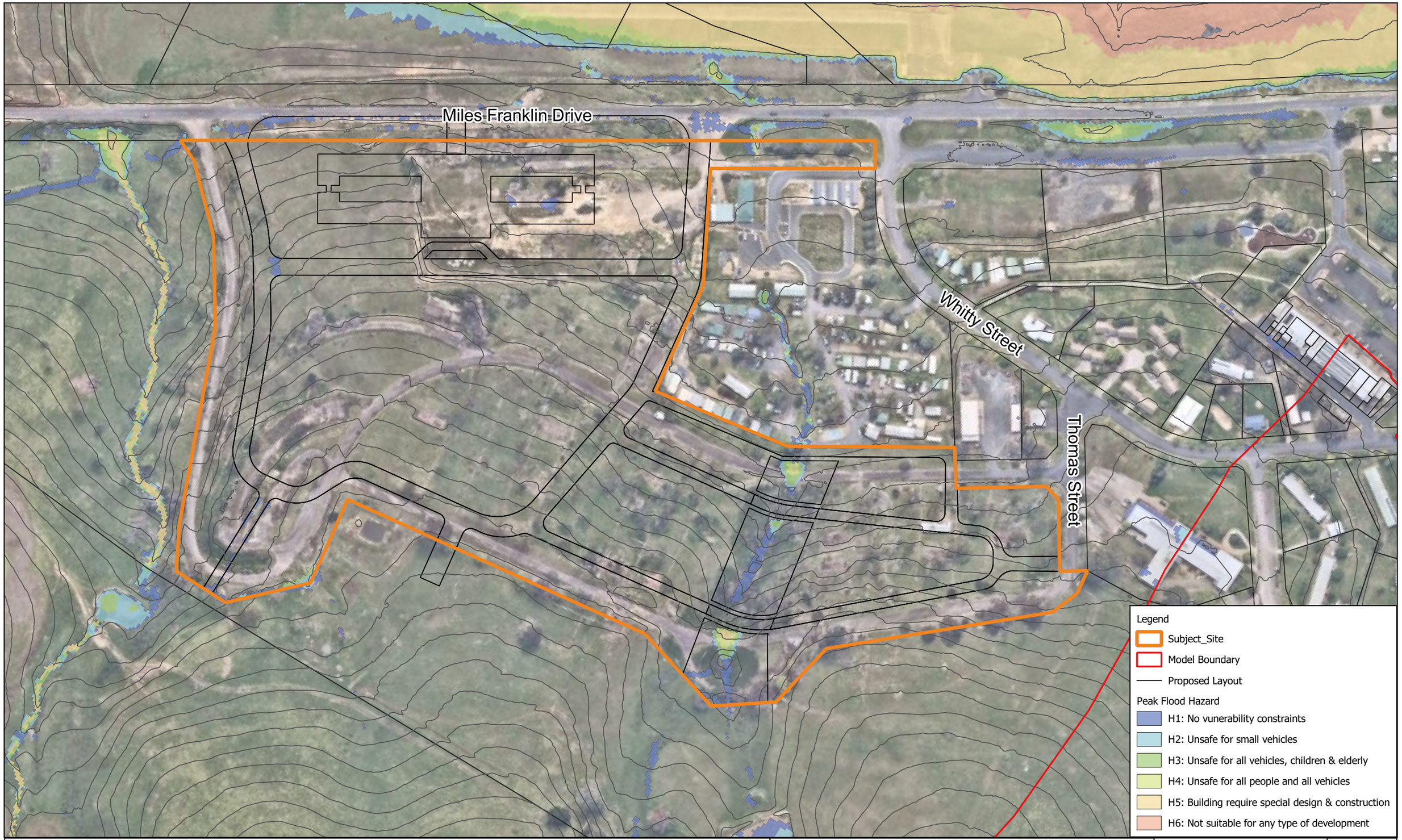

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Hazard
20% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F23**

Rev: **B**

Date: **26/07/2023**

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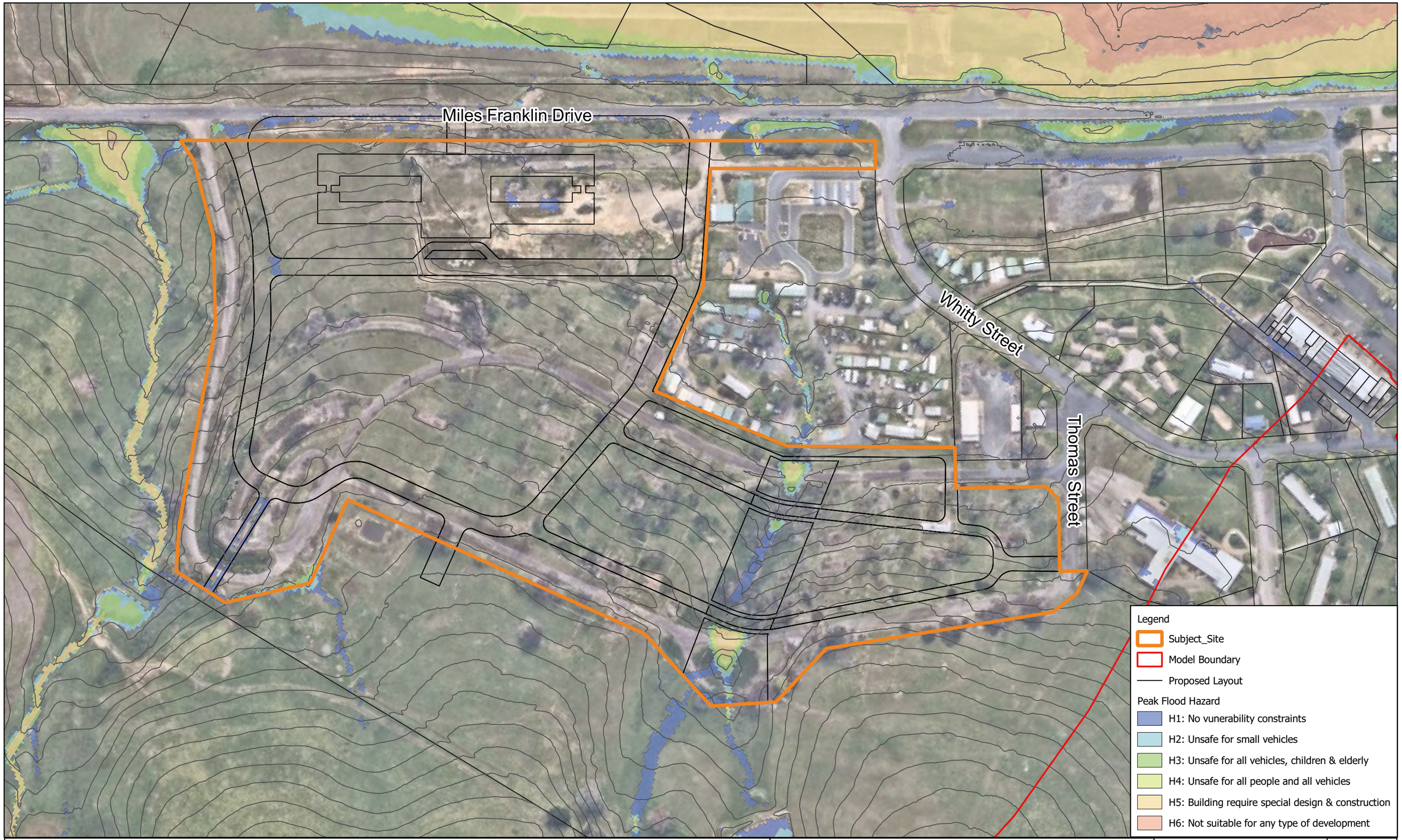

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Hazard
5% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F24**

Rev: **B**

Date: **26/07/2023**

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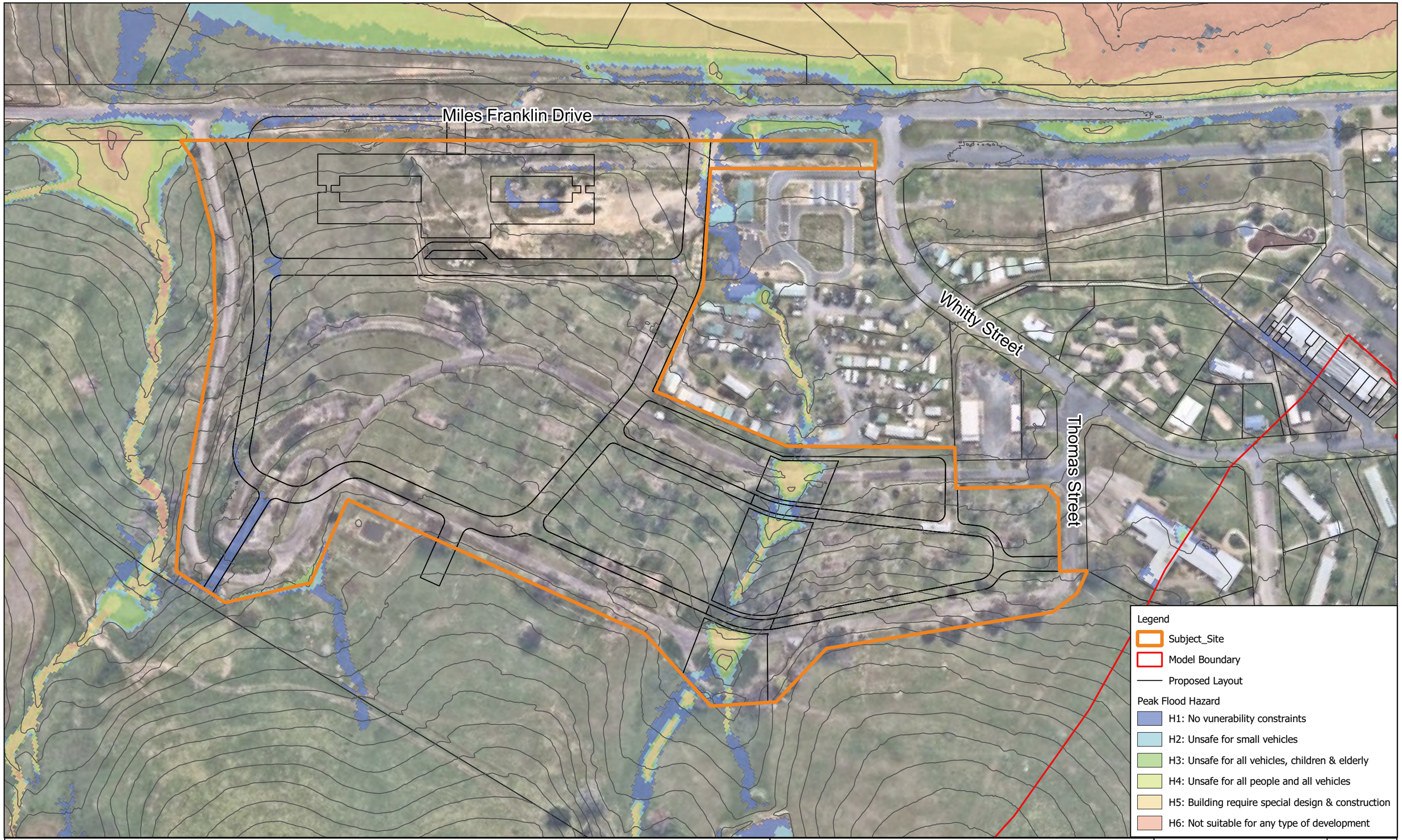

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Hazard
1% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: 23113.DA.F25

Rev: B

Date: 26/07/2023

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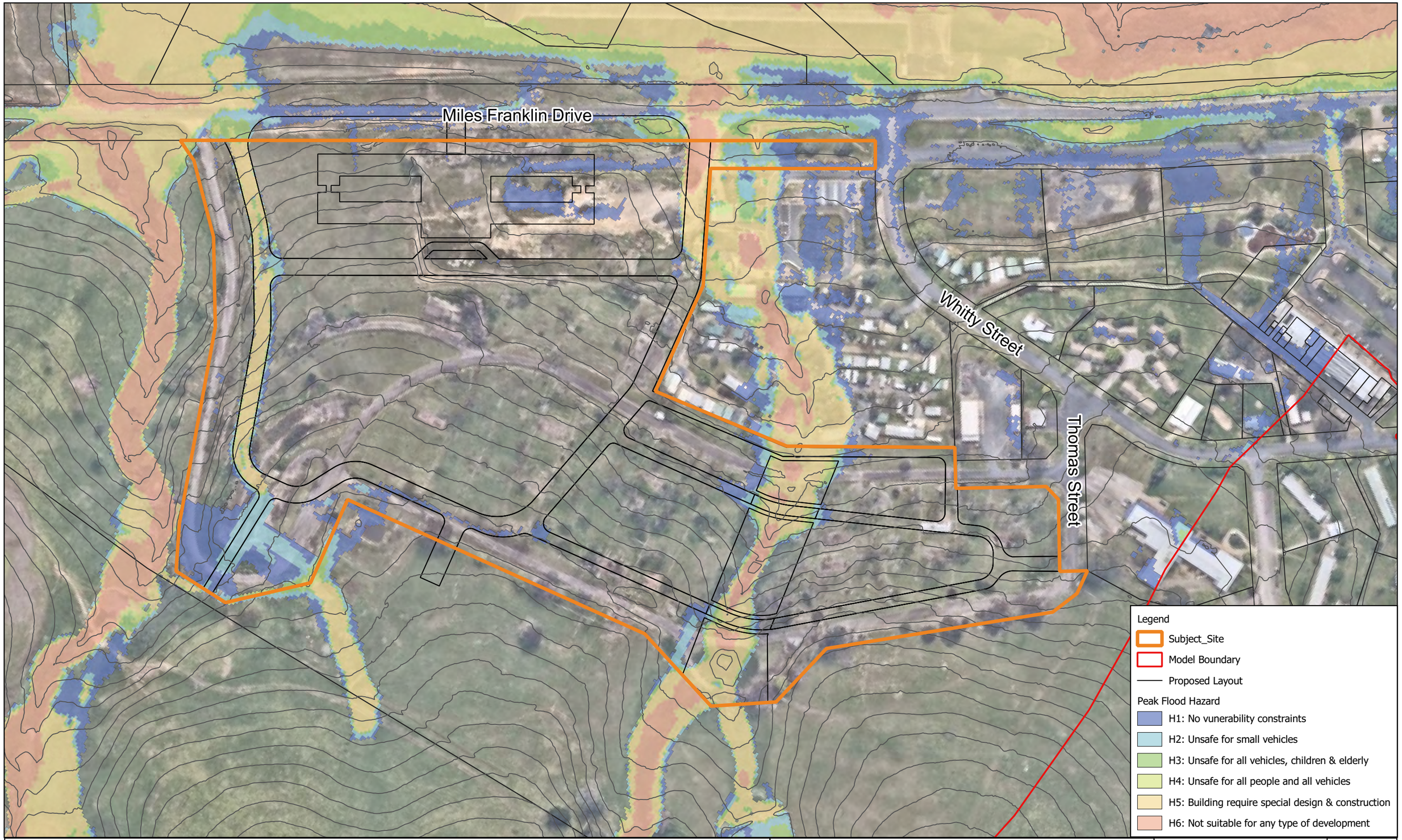


Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Hazard
PMF Event

N

0 50 100 150 200 m

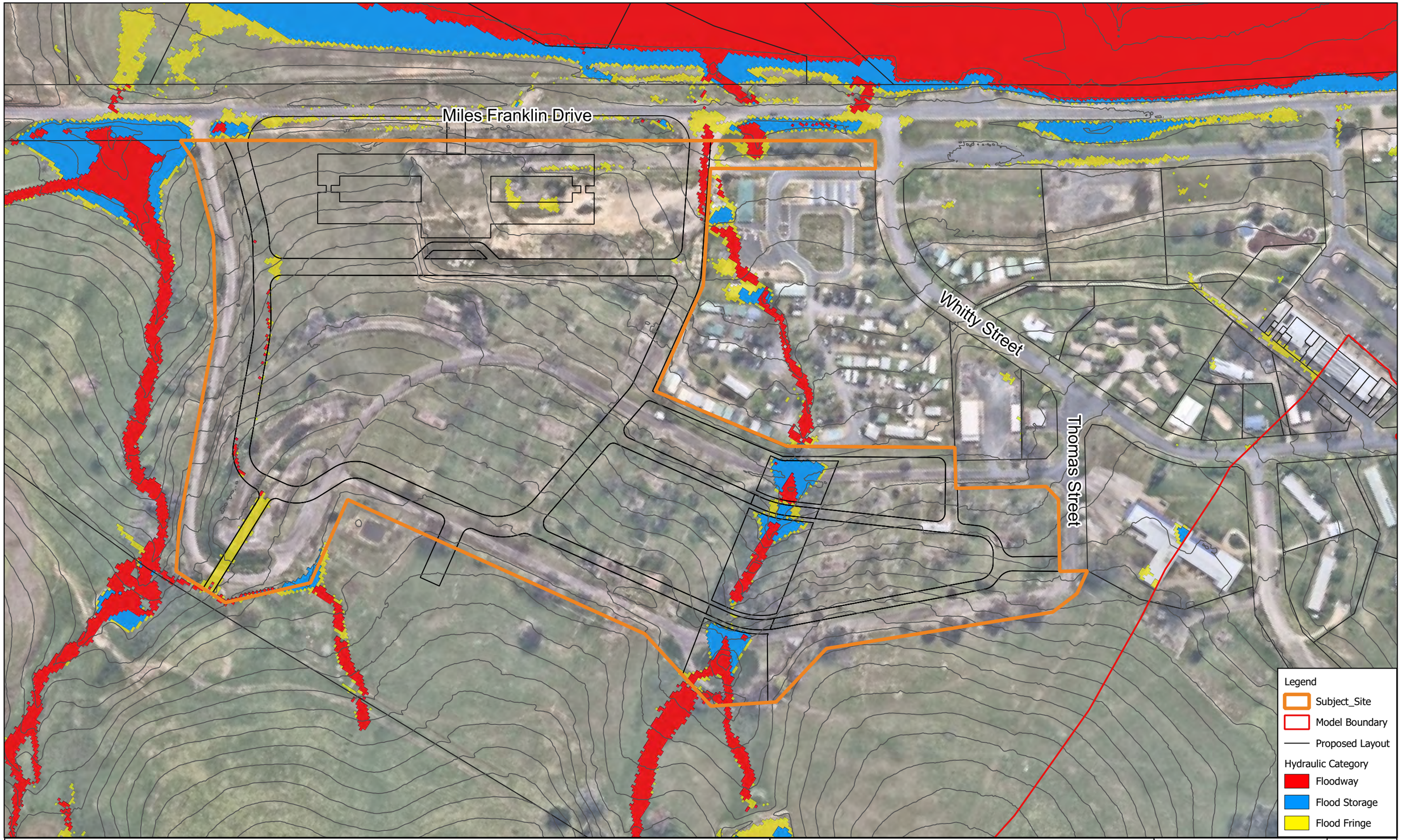
Scale: 1:2500 @ A3

Fig: **23113.DA.F26**

Rev: **B**

Date: **26/07/2023**

siteplus



Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Hydraulic Categories
1% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: 23113.DA.F27

Rev: B

Date: 26/07/2023

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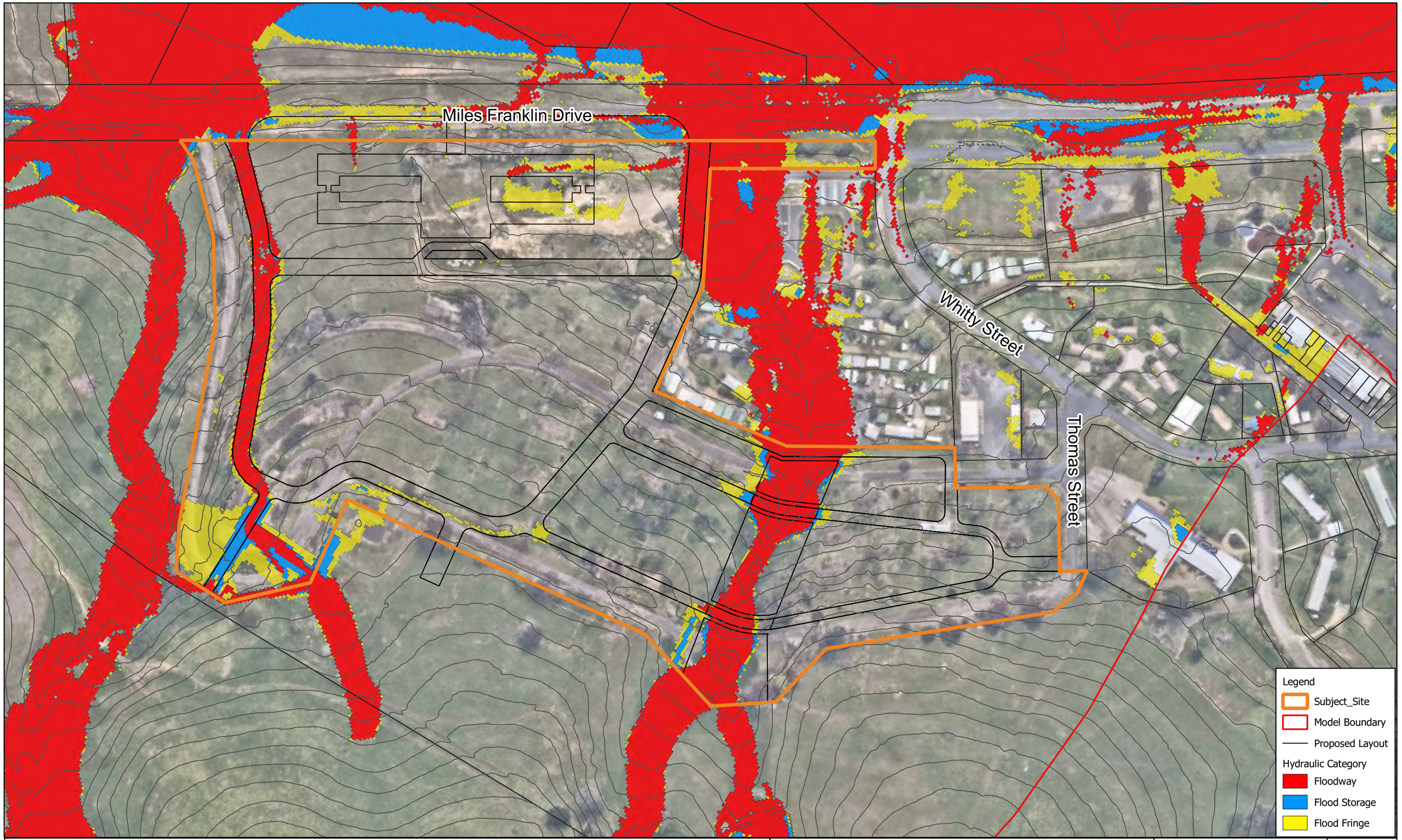

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Hydraulic Categories
PMF Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F28**

Rev: **B**

Date: **26/07/2023**

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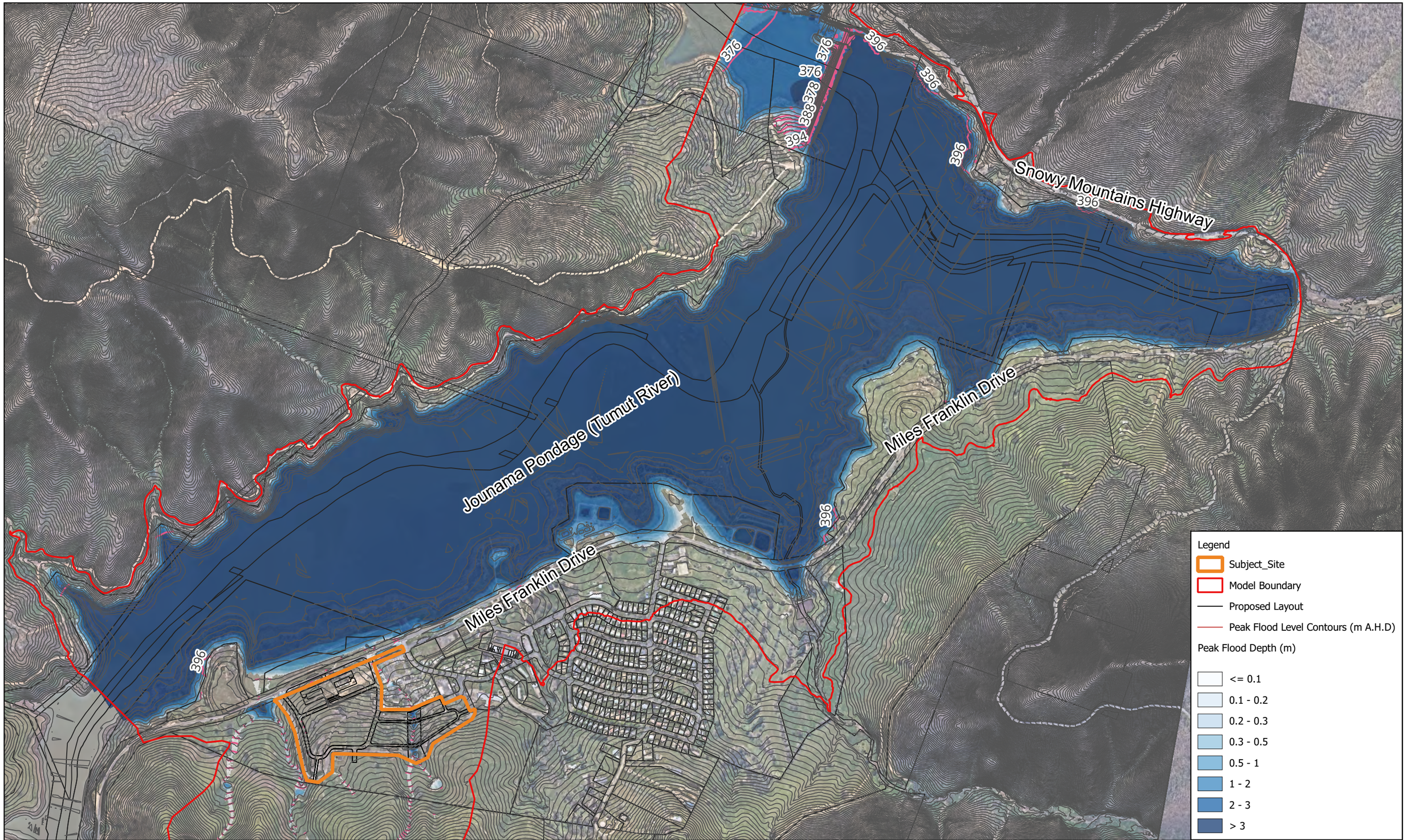


Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Depth
1% AEP Event

N

0 250 500 750 1,000 m

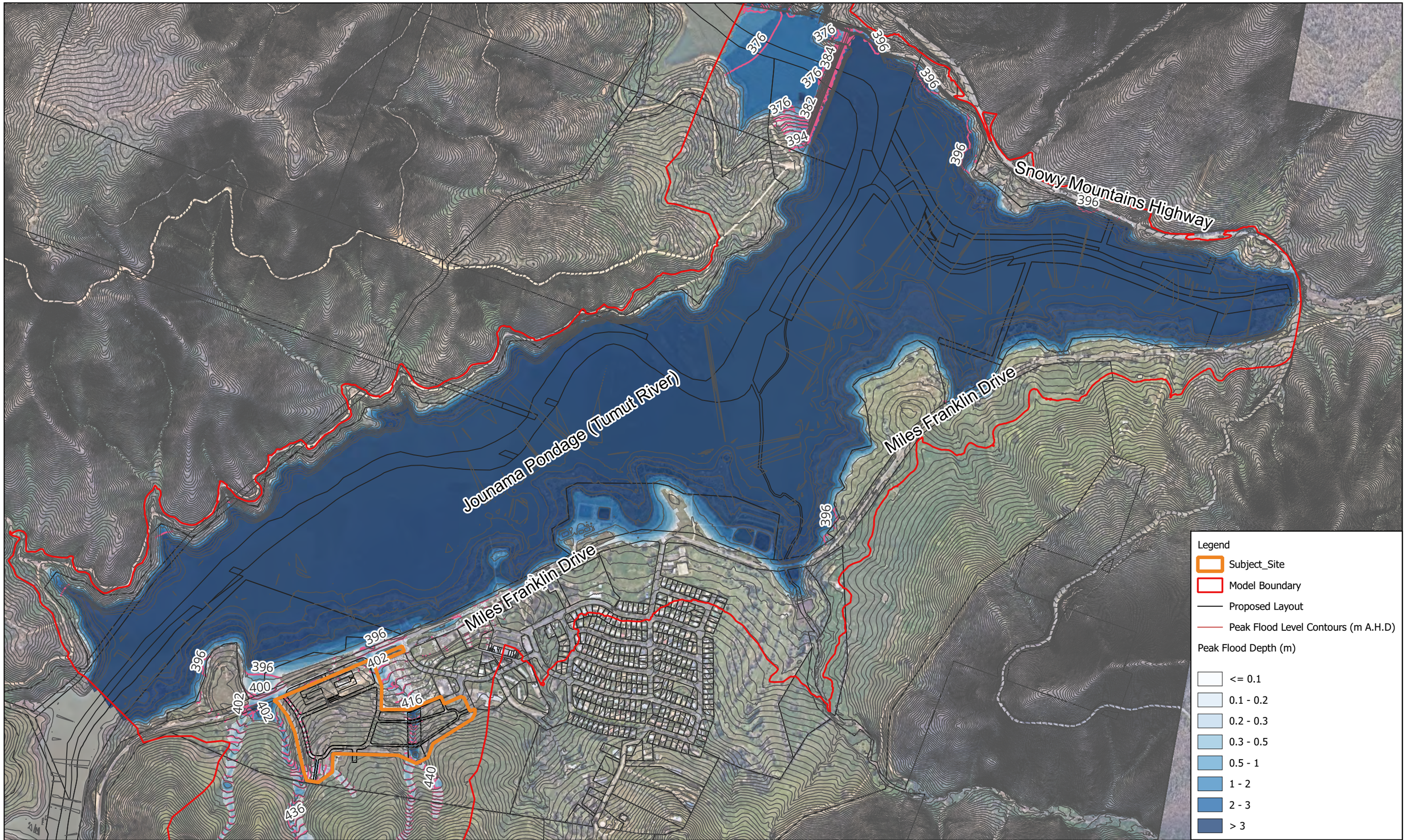
Scale: 1:12,500 @ A3

Fig: 23113.DA.F32

Rev: B

Date: 26/07/2023

siteplus



Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Depth
PMF Event Local Catchment, 1% AEP Tumut River

N

0 250 500 750 1,000 m

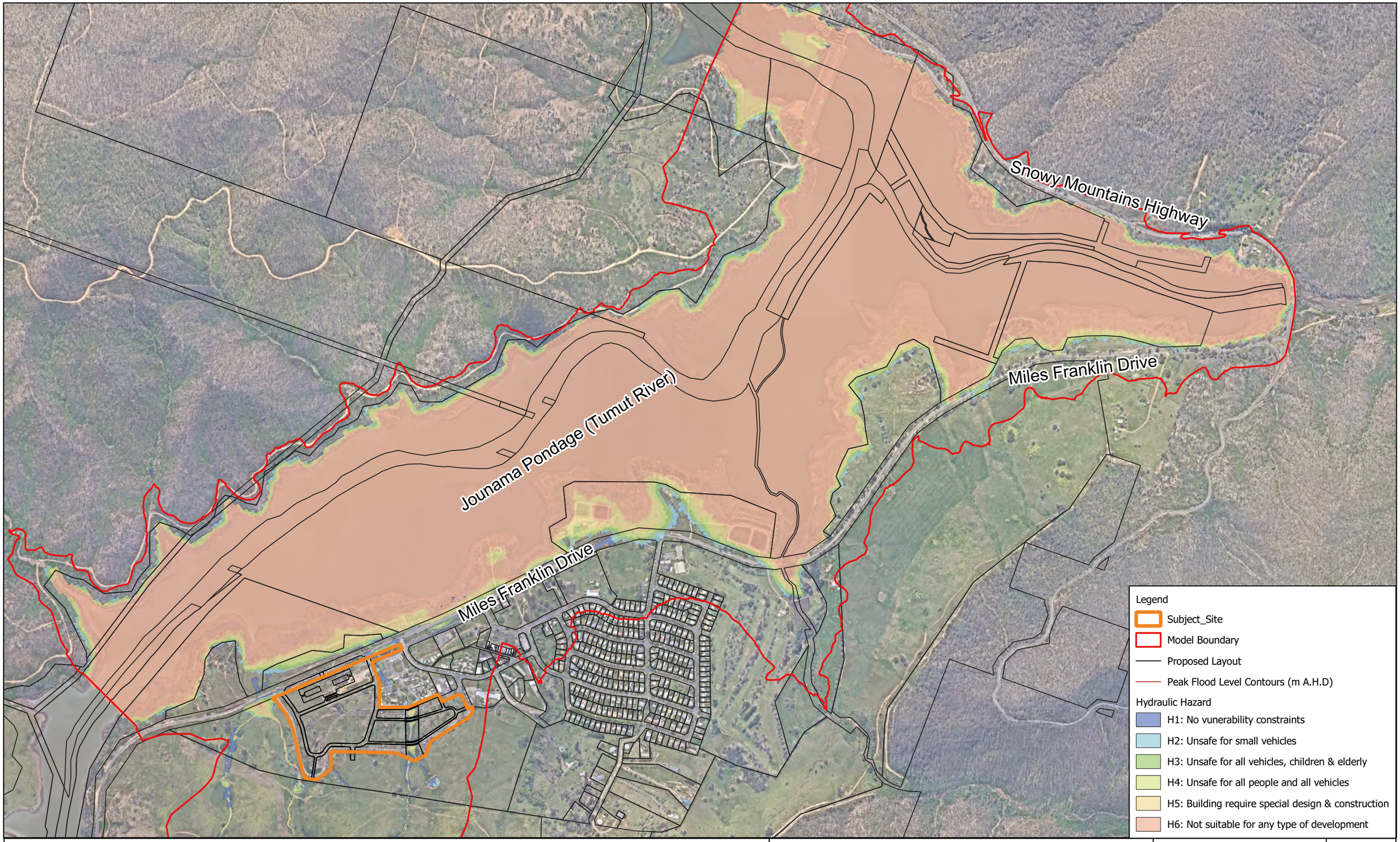
Scale: 1:12,500 @ A3

Fig: 23113.DA.F32

Rev: B

Date: 26/07/2023

siteplus



Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Peak Flood Hazard
1% AEP Event

N

0 250 500 750 1,000 m

Scale: 1:12,500 @ A3

Fig: **23113.DA.F34**

Rev: **B**

Date: **26/07/2023**

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APPENDIX F

Flood Impact Mapping

Miles Franklin Drive

Whitty Street

Thomas Street

Legend

Subject_Site

Model Boundary

Proposed Layout

Proposed Impact
Band 1 (Gray)

-0.5

-0.3

-0.05

No Impact

+0.05

+0.3

+0.5

Wet Dry Comparrison
Band 1 (Gray)

Was Wet now Dry

Was Dry Now Wet

Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Impact Mapping
20% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F29**

Rev: **B**

Date: **26/07/2023**

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Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Impact Mapping
5% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F30**

Rev: **B**

Date: **26/07/2023**

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Title:

Talbingo West Masterplan - Miles Franklin Drive, Talbingo
Proposed Scenario - Impact Mapping
1% AEP Event

N

0 50 100 150 200 m

Scale: 1:2500 @ A3

Fig: **23113.DA.F31**

Rev: **B**

Date: **26/07/2023**

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