pitt&sherry

Flood and Stormwater Assessment

Appendix F

pitt&sherry

Flood and Stormwater Assessment

Montagu Street Commercial Development

Prepared for

LPD Developments Pty Ltd

Client representative

Rowan Larissey

Date

25 January 2023

Rev01

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1. Introduction

pitt&sherry have been commissioned to prepare a Flood and Stormwater Assessment relating to a proposed combined amendment to the Local Provisions Schedule (LPS) of the Tasmanian Planning Scheme – Launceston (the planning scheme), and a planning permit application for a proposed light industrial development. LPD Developments Pty Ltd are the proponents.

As shown in Figure 1, the proposal is to:

- Rezone the following land from General Residential Zone to Light Industrial Zone:
    - Southern portion of 69A Mayne Street, Invermay
    - 28, 26, 18, 16 and 14 Montagu Street, Invermay
- Rezone the northern portion of 30 Montagu Street from Light Industrial to General Residential; and
- Seek a planning permit for a light industrial development (with the Storage land use) on 14, 16 & 18 Howard Street, 26, 28 & 30 Montagu Street and 69A Mayne Street.

The requirement for this Flood Assessment is derived from the Northern Regional Land Use Strategy 2010-2035 (NRLUS), as amended on 23 June 2021 and the planning scheme.

Under the NRLUS, the land to be rezoned is contiguous with an Urban Growth area. Before such land can be rezoned, Part D.2.1.1 of the NRLUS requires that the land should exclude areas with unacceptable risk of flood hazards, including predicted impact of climate change. This must be demonstrated by way of an assessment of flood hazards. This report provides a flood hazard for the rezoning in section 4.2 below.

As part of the rezoning proposal a planning permit application for a proposed new light industrial development. This development will be located in the existing and the proposed Light Industrial Zone (see Figure 1). The proposed land use is Storage, and this proposal must comply with the applicable requirements of the planning scheme, including the Invermay/Inveresk Flood Inundation Specific Area Plan (SAP). This report provides an assessment of the SAP's Clause LAU-S10.7.2 Flood impact in section 4.3 below. The planning report which supports the rezoning and permit application addresses the SAP's other applicable standards.

In section 3 below, this report also provides information regarding stormwater disposal to assist with the rezoning and planning permit application (section 3 below).

The overview of the proposal is shown in Figure 1 demonstrates that no development is proposed on the land which is be rezoned to General Residential. While 1½ 'potential dwelling' footprints are shown in this, along with another potential 3½ 'potential dwellings' on the adjoining property to the south, all of these potential dwellings are part of a future staged development accessed from Mayne Street and are not proposed as part of this rezoning or permit application. The purpose of showing the potential dwellings is to demonstrate that it is feasible for residential development to be staged and consolidated from the Mayne Street access point.

The current application does not propose any changes to current titles. Future subdivision may be proposed depending on the outcome of rezoning approval.

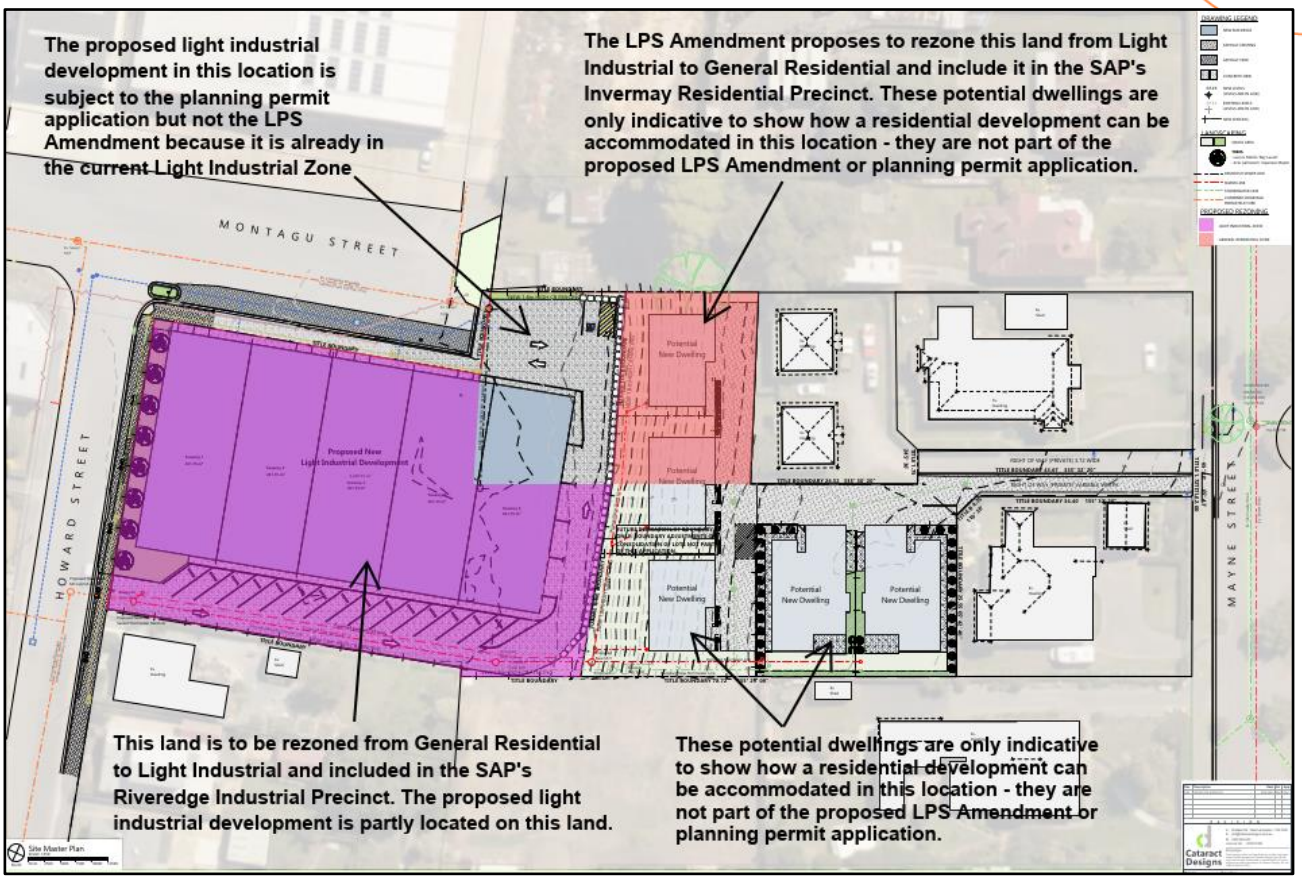

Figure 1: Overview of the proposal

2. Flood assessment

2.1 Relevant provisions

As the proposed development is located within an inundation prone area, it must respond to relevant flood related planning criteria. The proposed building is not residential and therefore, *LAU-S10.7.2 Flood Impact, A1 P1 and A2 P2* are not relevant. As such, the only criteria relevant to this development are presented below in Table 1.

Table 1: LAU-S10.7.2 – flood impact (Tasmania Planning Scheme - Launceston)

Objective	
That new buildings and infrastructure are sited and designed to avoid or mitigate the risk and minimise the impact of flooding	
Acceptable Solution	**Performance Criteria**
A1 Floor levels of all habitable rooms within the Residential Use Class must be not less than 3.7m AHD.	**P1** No performance Criteria
A3	**P3**

All buildings not in the Residential use class must have a: a. Floor level of at least 3.4m AHD b. Gross floor area of not more than: i 400m^2; or ii 10% more than that existing or approved on the 1st January 2008.	Buildings not in the Residential use class must be sited and designed in accordance with a hydrological report and an emergency management plan prepared by a suitably qualified engineer. The report and plan must: a. Detail i The risks to life ii The likely impact on the use or development iii How the use or development will manage the risk to tolerable levels; during either an overtopping of the levee or a levee breach at the closest point in the levee during a 5% AEP; 2% AEP or a 1% AEP flood event b. Consider the following: i The likely velocity and depth of flood waters ii The need to locate electrical equipment and other fittings above the 1% AEP flood level iii The likely effect of the use or development on flood characteristics iv The development and incorporation of evacuation plans into emergency management procedures for the precinct; and v The ability of the use or development to withstand flood inundation and debris damage and the necessity for the incorporation of any flood proofing measures in the development.

Although not explicitly stated within the Planning Scheme, City of Launceston have previously stated that 1% AEP event should be the 1% AEP + **Climate Change (2090 Scenario)**. As such, the assessment will be based on this event unless noted otherwise.

As this proposed development includes to distinct uses, they will be defined as the “The Residential Area” and “The Light Industrial Area” in this report. The elevation of the varies considerable between Howard and Mayne Street. The southern portion of the site is elevated between 1.3 and 1.6m AHD, whereas the northern portion of the site is elevation at approximately 9m AHD.

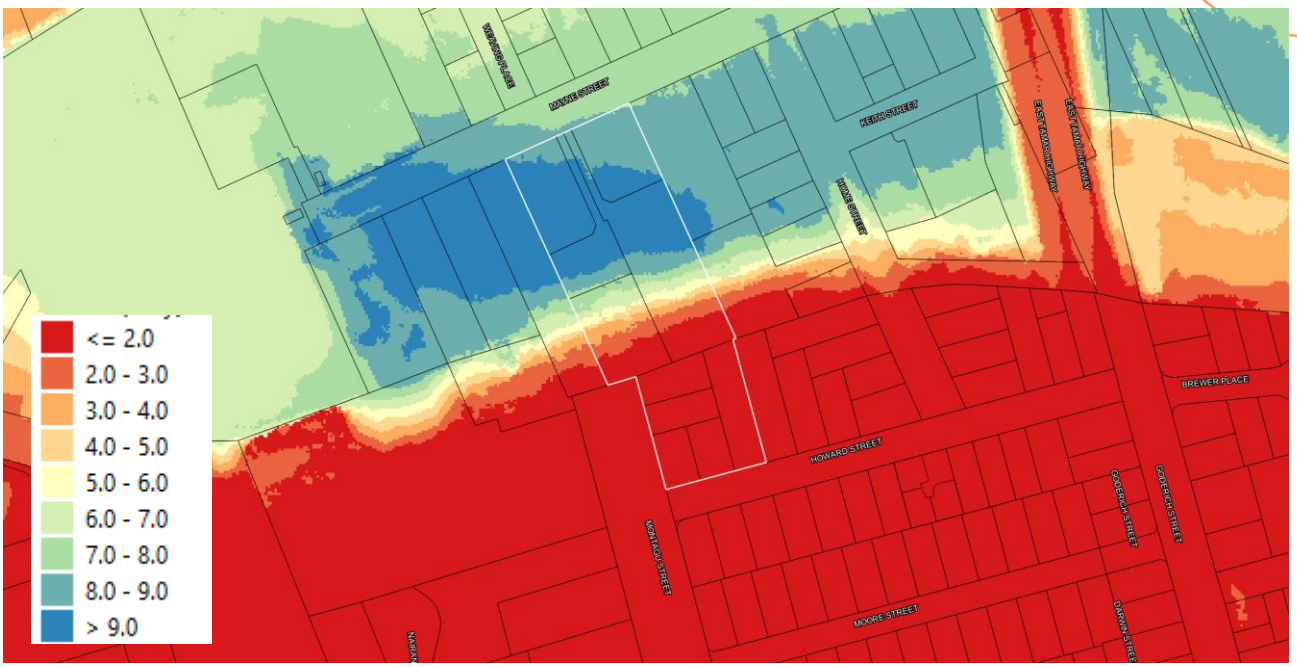

Figure 2: Site Topography

2.2 Risk to life

The proposed use is for both residential and light industrial. The light industrial area is to be a storage facility.

Risk to life will be present in either a flood levee over topping event or a flood levee breach. Both scenarios likely require a substantial depth of water to build up within the river area to instigate a failure.

Lead times (i.e., time between rainfall being recorded in the catchments and significant flooding occurring at Launceston) on peak flood levels within the North Esk and South Esk Rivers at Launceston are generally between 12 hours and 3 days respectively. The primary risk to life is persons present within the Invermay flood plain during a flood event. As such, Launceston Municipal Emergency Management Plan recognises this risk and manages it through several methods. One being evacuation. The *Launceston Evacuation Plan Issue – 2 2011* provides for the following triggers that activate the plan.

The circumstances under which activation would normally occur are:

- *In the event that predicted flooding in the South Esk are expected to reach 2000 m^3/s, (the trigger point for placing Invermay residents on evacuation standby)*
- *In the event that rising flood waters in the South Esk are expected to breach the Launceston levee system causing significant inundation to the Invermay and Inveresk areas (a flood approaching 1:50 ARI / 2330 m^3/s); and*
- *In the event that the combined discharge values in the South and North Esk rivers approach a 1:50 ARI / 2330 m^3/s flood.*

The proposed uses must adhere to evacuation requirements. This means:

- In the lead up to a flood event, a responsible person at the facility must monitor advice from TasPolice; and
- If an evacuation order is issued, persons are to promptly leave the facility and not re-enter until TasPolice advise it is safe to do so. This will be in accordance with the Site Flood Emergency Response Plan (Attached).

Given the long lead time of flooding, it will be possible to implement emergency management measures such as notifying residents through the established evacuation procedure.

It is not envisaged that the proposed use will have a significant impact on the ability of the city to effectively evacuate Invermay, nor are there any factors as part of the proposed development which would preclude it complying with flood evacuation requirements.

2.2.1 Flood emergency response classifications

Floodplain areas can be classified according to isolation and access in a way that informs emergency response management, as per the *Australian Disaster Resilience Guideline 7-2 Flood Emergency Response Classification of the Floodplain (Australia 2017c).*Table 2 describes the flood emergency response classifications that relate to land subject to flooding in the event of the Probable Maximum Flood (PMF):

Table 2: Australian Disaster Resilience Guideline 7-2 Flood Emergency Response Classification of the Floodplain

Primary Classification	Secondary Classification	Tertiary Classification	Description
Flooded (F) – The area is flooded in the PMF	Isolated (I)	Submerged (FIS)	Where all land in the isolated area will be fully submerged in a PMF after becoming isolated.
		Elevated (FIE)	Where there is a substantial amount of land in isolated areas elevated above the PMF.
	Exit Route (E)	Overland Escape (FEO)	Evacuation from the area relies upon overland escape routes that rise out of the floodplain.
		Rising Road (FER)	Evacuation routes from the area follows roads that rise out of the floodplain
Not Flooded (N) - The area is not flooded in the PMF		Indirect Consequence (NIC)	Areas that are not flooded but may lose electricity, gas, water, sewerage, telecommunications and transport links due to flooding.
		Flood free	Areas that are not affected flood affected and are not affected by indirect consequences of flooding.

The subject site is in the FIS Category, as illustrated in Figure 3. This is considered as the most dangerous isolation scenario. If members of the community were to wait to observe flooding before acting, there will be no option for evacuation other than rescue.

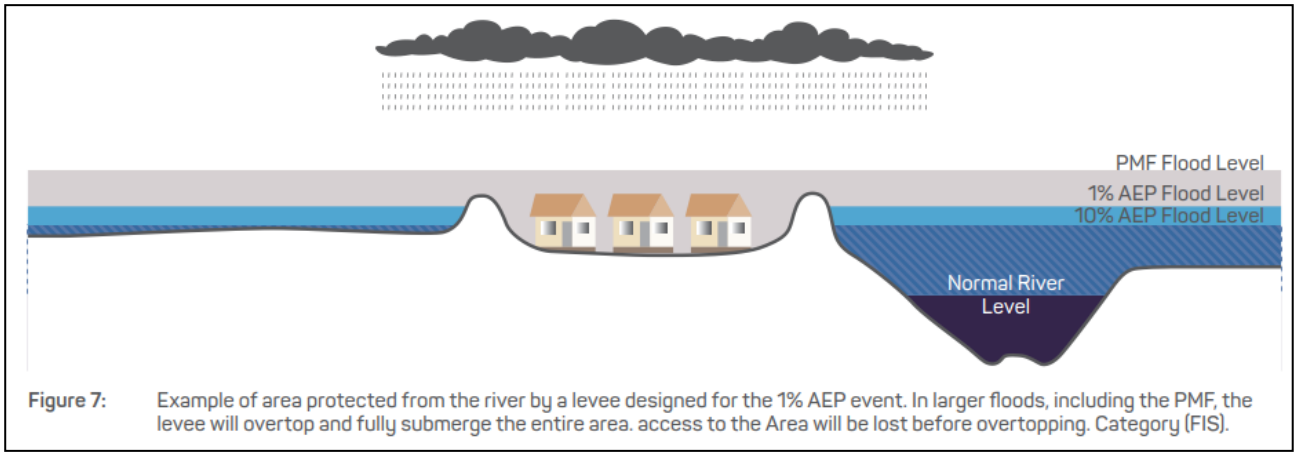

Figure 7: Example of area protected from the river by a levee designed for the 1% AEP event. In larger floods, including the PMF, the levee will overtop and fully submerge the entire area. access to the Area will be lost before overtopping. Category (FIS).

Figure 3: Example of FIS (Flood - Isolated – Submerged) category (AIDR, 2017)1

[1] Australian Disaster Resilience Guideline 7-2 Flood Emergency Response Classification of the Floodplain.

This further enforces the importance of regional evacuation as the primary measure to manage risk to life.

2.3 Impact on the use or development / levee overtopping or breach

A flood levee overtopping or breach event will impact the proposed site. The regional evacuation system currently in place will serve the development appropriately, ensuring no persons are present at the facility during the peak of a flood event.

The facility itself will be subject to flood inundation, with damage to the structure and loss of stock likely. The analysis below details the likely flood impact at the site.

Flood modelling results from the *North and South Esk Rivers Flood Modelling and Mapping Update Volume 1: Technical Report (BMT, 2018)*, and *North and South Esk Rivers Flood Modelling and Mapping Update, Levee Breach Assessment (BMT,2018*) are used to quantify the flood impact at the subject site.

2.3.1 Flood levee breach assessment

This assessment analysed several flood levee breach scenarios and reported flood behaviour at several locations within the Invermay/Inveresk area. The figure below (Figure 4) shows the relevant reporting locations for this assessment.

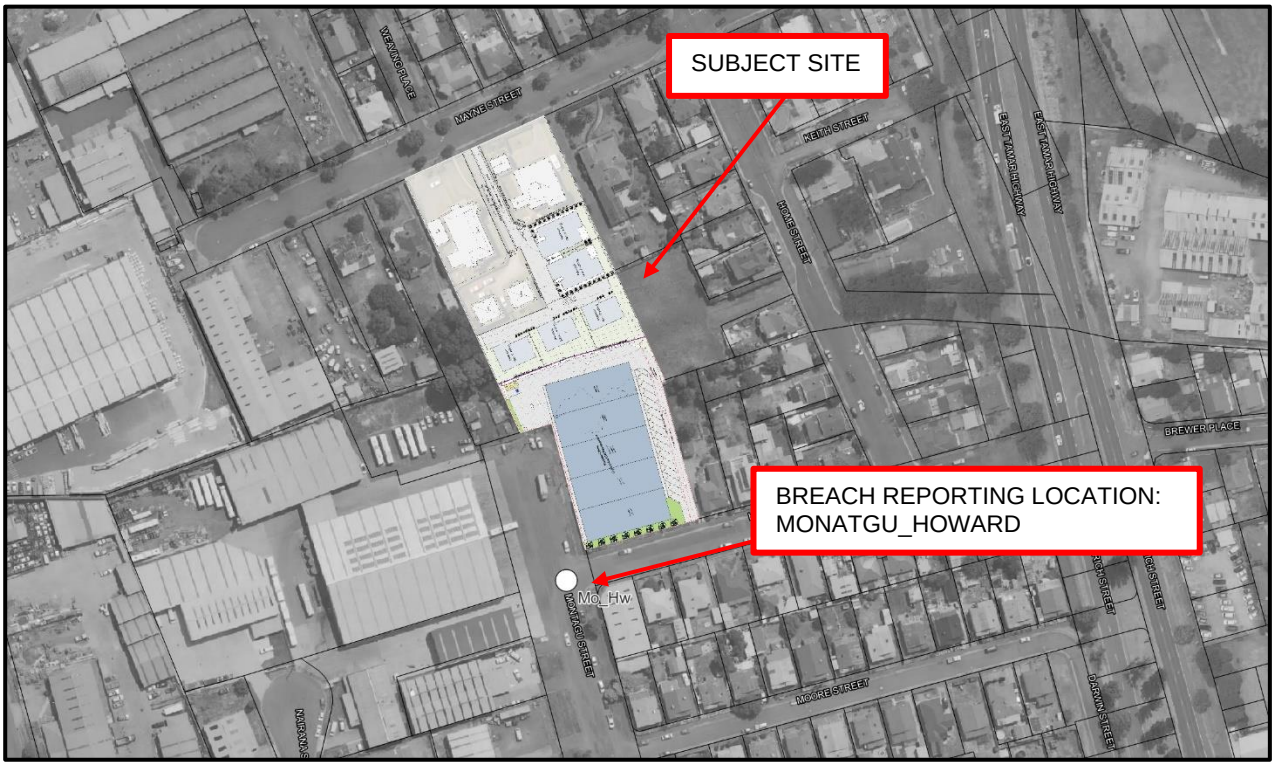

Figure 4: Levee Breach reporting locations (white dot)

There is one relevant reporting location for a flood levee breach. This is ‘MN_HO’ and is highlighted in white above at the corner of Montagu and Howard Street.

Flood levee breach behaviour for three design flood events (no climate change considered) is presented below in Table 3. Of particular note, in the case of any flood levee breach or overtopping for an event greater than the 5% AEP, the Light industrial area site is expected to be inundated for over a week. It is noted that the residential area is elevated such that there is not expected to be any direct impact based on the events assessed.

Table 3: Flood behaviour – Levee Breach In_Fo

Event	5% AEP	2% AEP	1% AEP
Time to Inundate (min)	360	150	80
Time to 300mm (min)	640	170	90
Time above 300mm (hrs)	> 1 week	> 1 week	> 1 week
Time to 2m/s (min)	N/A	N/A	N/A
Time above 2m/s (hrs)	N/A	N/A	N/A

2.3.2 Flood levee overtopping

This assessment considers what events and scenarios are likely to affect the site and to what degree. The following events have been assessed:

- 1% AEP (present day)
- 1% AEP (2050 climate scenario)
- 1% AEP (2090 climate scenario); and
- 1% AEP (present day, flood levee breach).

The figures below present how flood behavior varies with climate change at the subject site.

Figure 5: 1% AEP (present day)

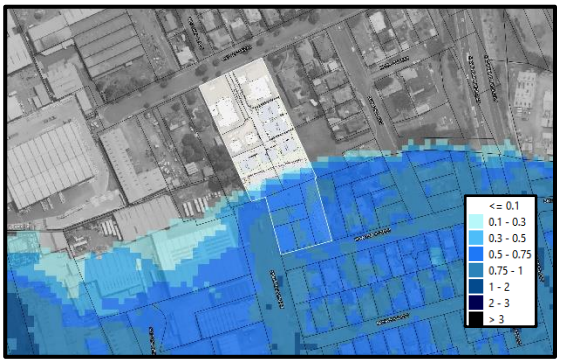

Figure 6: 1% AEP (2050 Climate Scenario)

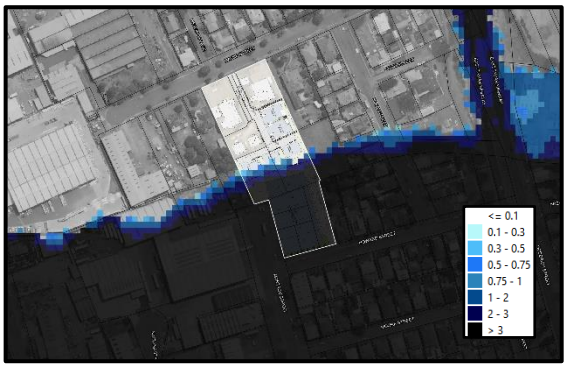

Figure 7: 1% AEP (2090 Climate Scenario)

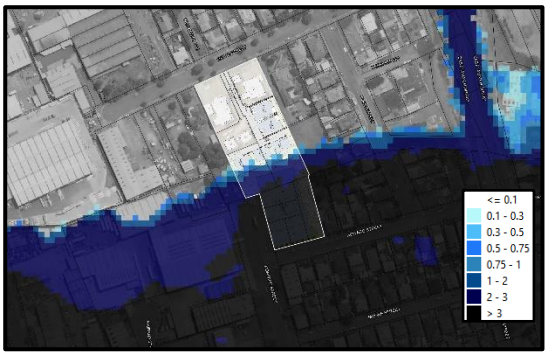

Figure 8: 1% AEP (Present Day, Flood Levee Breach)

Table 4: Flood behaviour – 1% AEP Flood behaviour -Light Industrial

Event	Flood Level (m AHD)	Peak Depth (m)	Peak Hazard	Peak Velocity (m/s)
1% AEP (existing condition)	NA	NA	NA	NA

1% AEP (2050 Climate Scenario)	2.15m AHD	0.7m	H3	< 0.5 m/s
1% AEP (2090 Climate Scenario)	5.35m AHD	3.9m	H5	< 0.5 m/s
1% AEP (Levee Breach Scenario)	4.60 AHD	3.2m	H5	1.0 m/s

Table 5: Flood behaviour – 1% AEP Flood behaviour - Residential

Event	Flood Level (m AHD)	Peak Depth (m)	Peak Hazard	Peak Velocity (m/s)
1% AEP (existing condition)	NA	NA	NA	NA
1% AEP (2050 Climate Scenario)	2.15m AHD	NA	NA	NA
1% AEP (2090 Climate Scenario)	5.35m AHD	~ 1.5m*1	H3*1	< 0.5 m/s
1% AEP (Levee Breach Scenario)	4.60m AHD	~ 1.0m*1	H3*1	< 0.5 m/s

**1 Southern portion of Residential area slightly impacted based on existing terrain*

The combined hazard curves are shown in Figure 9.

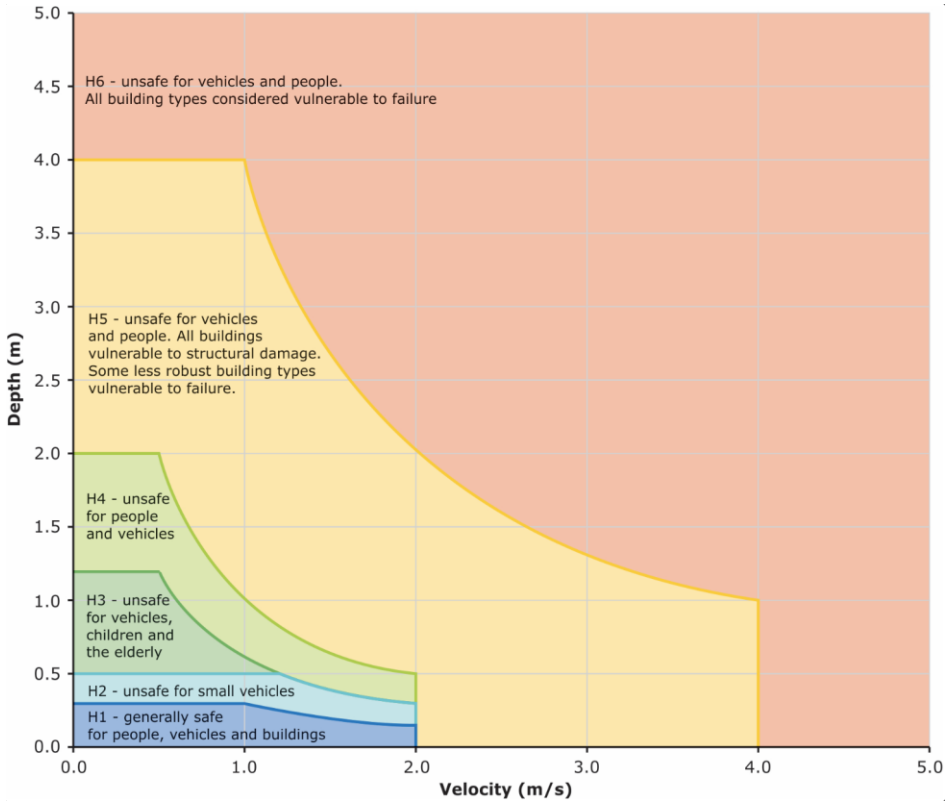

Figure 9: Combined Hazard Curves - Source: ARR, Book 6, Chapter 7, Figure 6.7.9

For the Light Industrial Area, flood water will impact the site and the primary source of damage will be attributed to flood depth and the associated hydraulic forces. The flood model results indicate an overtopping or flood levee breach will fill the low-lying area slowly. Localised impacts based on where an overtopping occurs cannot be easily represented in a flood model. Therefore, it is recommended that the structure consider hydrodynamic loading up to a velocity of 1.5m/s.

There is great variability in peak flood levels based on climate impacts, with flood levels varying from 0m AHD to 5.35m AHD. A conservative approach is to design the structure withstand hydrostatic loading up to 5.35m AHD. It is not

recommended to attempt to flood proof the structure (i.e., prevent ingress of flood water). For the peak depth of approximately 3.9m, it would be expected that the doors and windows would fail. This is preferred as it will equalise the flood level on either side of the wall, hence reducing the net force on walls and likelihood of structure failure.

For the General Residential Zone, much of the land is elevated at 8-9m AHD. The elevation rapidly falls at the southern portion of the lot. The cross section presented in Figure 10 shows how the elevation varies across the site. The orange line indicates the front of the proposed residential buildings. It is recommended habitable floor levels of the residential buildings do not fall below 6.0m AHD. It is likely that the most practical design irrespective of flood criteria will have habitable floor levels above this level/

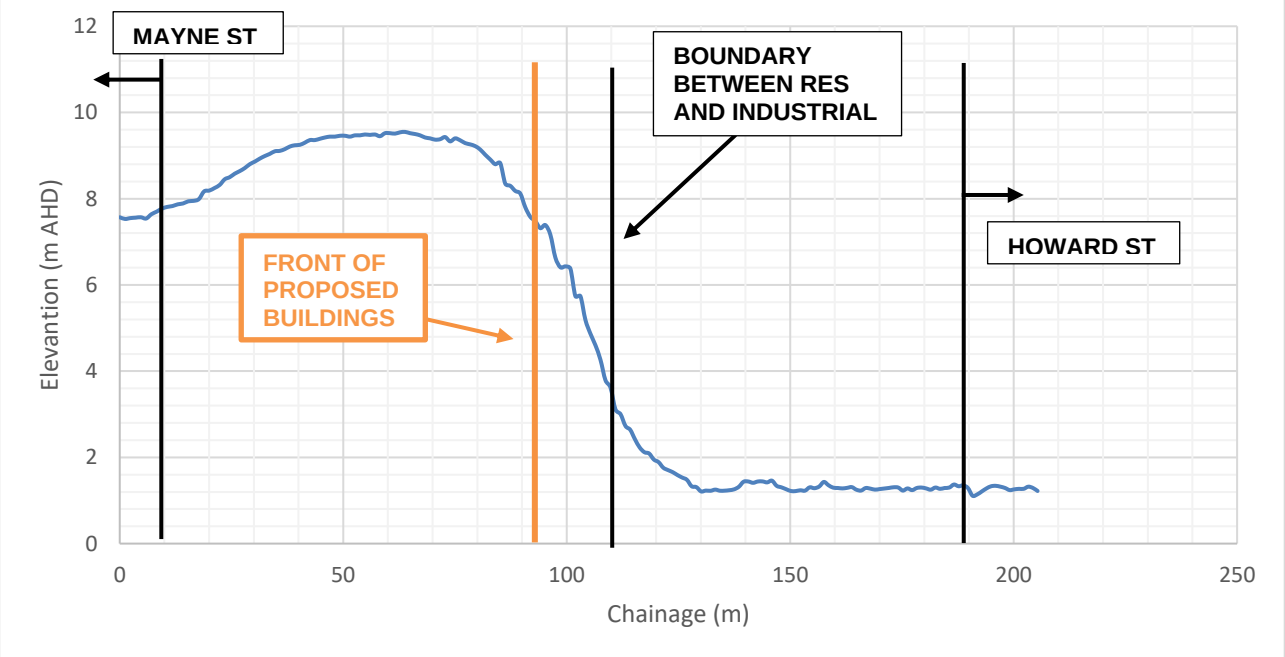

Figure 10: Long section through proposed development site

Flood maps which describe flood behavior (depth, velocity and hazard) are provided in Appendix A.

2.4 Impact on surrounding development

A flood levee breach will slowly fill the Invermay/Inveresk precinct and/or the City floodplain, excluding the land adjacent to the location of the levee failure (where flood conditions will be more volatile). The flood function within Invermay and the City is considered 'flood storage'.

Any proposed development may locally increase flood levels against adjacent development, although the impact of any level increase is likely to be insignificant compared to the overall impact of a flood levee overtopping event.

The BMT flood model represents the site within the Invermay Road/ Forster Street area as a blockage with a high roughness value ('n' = 0.4). Figure 11 illustrates the roughness layer descriptions, which are assigned the roughness values in Table 6.

Figure 11: BMT Flood model roughness layer

Table 6: Roughness layer information

Material ID	Description	Manning's 'n'
2	Roads	0.020
3	Residential	0.200
4	Commercial, Industrial	0.400
5	School, Hospital, other public building	0.300

As such the future development has been considered in the existing case flood model.

3. Stormwater Assessment

A stormwater assessment has been undertaken for the light industrial zone. As the development is located within the combined drainage zone, stormwater will ultimately discharge to the sewer system.

A review has been undertaken of the likely drainage solution for the future residential development and there is sufficient grade and access via the proposed stormwater and sewer easement, which is to be located in the proposed light industrial site with lines connecting to the proposed general residential zone (Appendix B) to provide a stormwater connection onto Howard Street.

The NRLUS does not detail any stormwater management controls. For future subdivision (not currently proposed), each lot must be capable of connecting to a public stormwater system (18.5.2, A3). Both the proposed light industrial zone and the general residential zone are able to comply with this.

In lieu of any planning direction relating to drainage performance, the approach of post development flows must not exceed pre-development flows has been adopted.

3.1 Hydrologic / Hydraulic Assessment

A hydrologic / hydraulic assessment has been undertaken to suitably size stormwater infrastructure within the proposed development, ensure overland flows are appropriately managed and to size a suitable stormwater detention system. The hydrologic / hydraulic assessment has been carried out in the software package DRAINS. The following decisions / assumptions were made for the development of the model.

- Analysis undertaken in accordance with guidance and principles outlines in *Australian Rainfall and Runoff 2019*, most notably, the assessment has included an assessment of temporal variation which is considered to be the best practice approach for hydrologic assessment
- Rainfall IFDs and rainfall losses extracted from the following coordinates:
    - Latitude: -41.310
    - Longitude:147.131
- Median pre-burst depths have been adopted
- An Initial Loss/Continuing Loss model is adopted. The following vales have been adopted from ARR Data HUB:
    - Pervious Area Initial Loss: 19mm
    - Pervious Area Continuing Loss: 4.8mm/hr
    - Impervious Area Initial Loss: 1mm
    - Impervious Area Continuing Loss: 0mm/hr
- Southern Slopes (Tas) Temporal Patterns were adopted
- Both an existing condition and proposed development case have been assessed
- Catchment delineation for the developed case is based on the development concept design
- Existing condition percentage impervious has been measured using aerial imagery and GIS measuring tools
- The existing impervious areas are assumed to be indirectly connected to a drainage system; and
- The 5% AEP storm has been assessed for the minor drainage system (including detention basin) and the 1% AEP event for the major system and overland flows.

Table 7: Catchment Areas

Scenario	Impervious Area	Pervious Area	Total Area	% Impervious
Existing Condition	0.09Ha	0.29 Ha	0.38 Ha	24%
Developed Condition	0.22 Ha (Roof) 0.14 Ha (Paved)	0.02 Ha	0.38 Ha	95%

3.1.1 Stormwater Connection

As the development is located within the 'Combined Drainage Area', the stormwater must connect to the TasWater Sewer Network. The proposed stormwater connection location is presented in Figure 12. It is noted that the stormwater connection will be completely separated from the internal sewer.

Furthermore, the light industrial development has allowed for a drainage easement (sewer and stormwater) such that any future residential development can effectively drain.

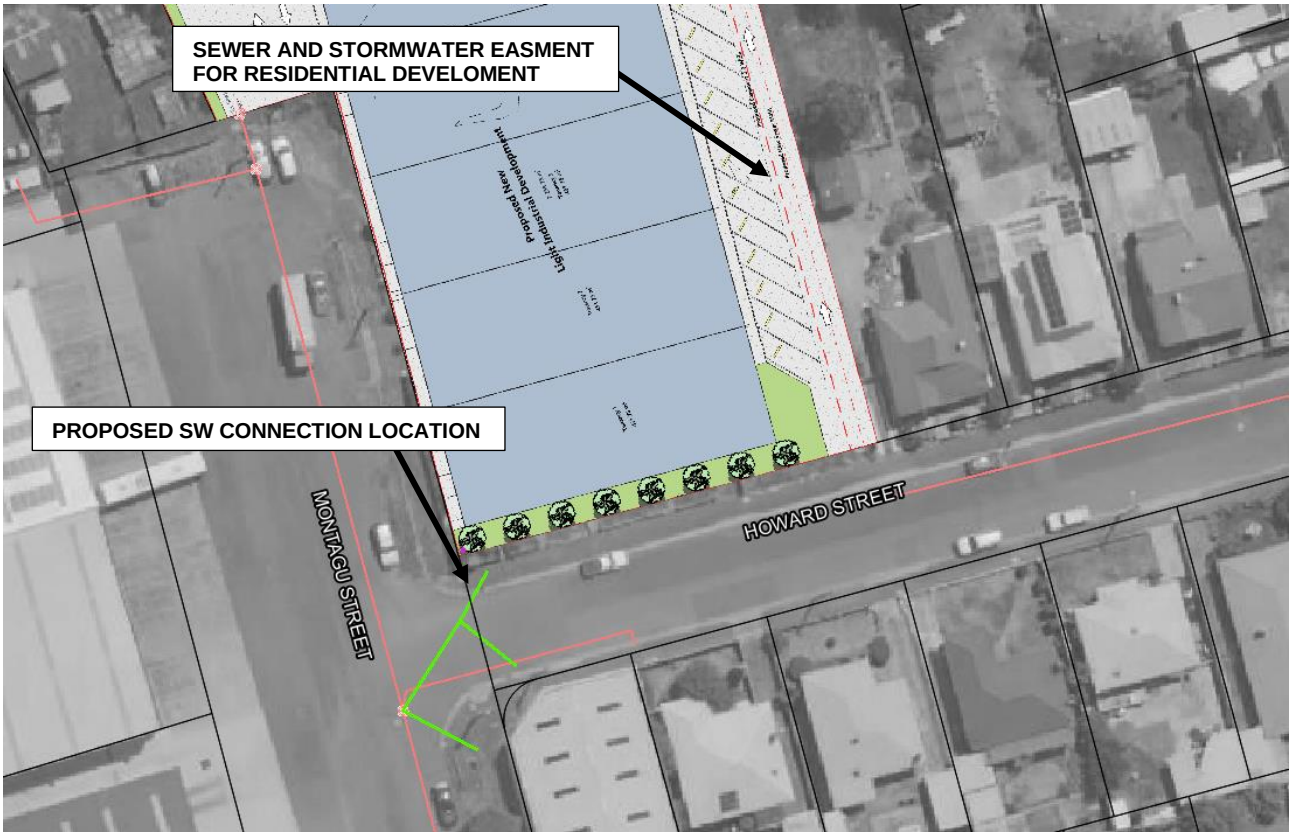

Figure 12: Stormwater Connection

3.1.2 Sewer and Water Connections

The proposed sewer and water plan (concept) is presented in Figure 13. The location of existing TasWater services was obtained from theLIST. Further information is depicted on the site plans attached in Appendix B.

A 3m-wide drainage easement is proposed along the property driveway off Howard Street to accommodate a new sewer line to service the site. The new sewer line will run under the driveway (through said easement) and connect into the existing sewer main on Howard Street via a new sewer manhole. The existing sewer main on Howard Street lies approximately 7m from the proposed sewer connection point within the property boundary.

Existing water connections along Howard Street will be made redundant, and existing water connections along Montagu Street will be retained to service the site.

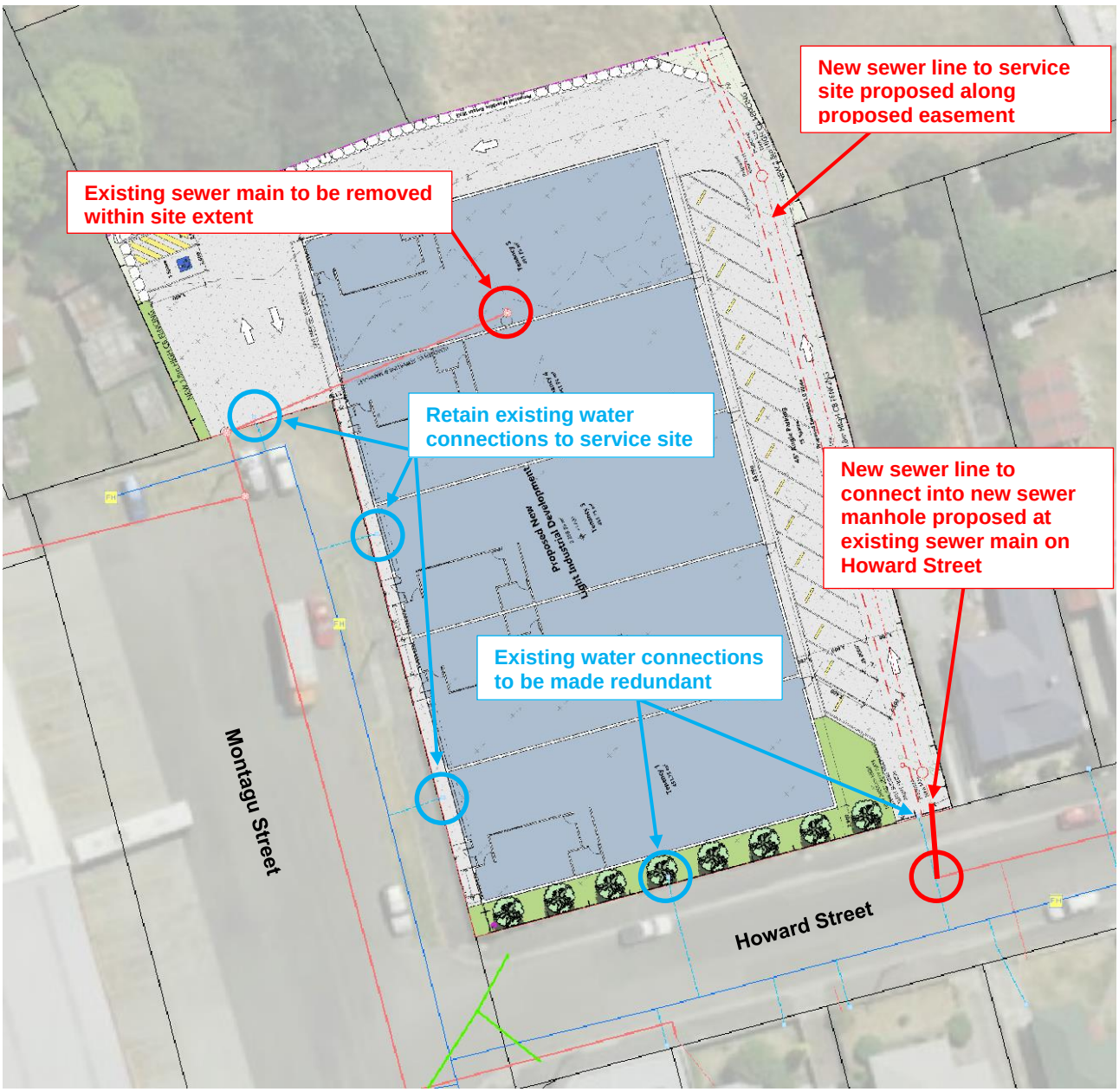

Figure 13: Concept sewer and water plan

3.1.3 Flows

The hydrologic / hydraulic model has been assessed for both an existing and developed condition. The peak flows generated from the site are presented in Table 8.

Table 8: Flows

Scenario	5% AEP	1% AEP
Existing Condition	0.038 m^3/s	0.074 m^3/s
Developed Condition	0.102 m^3/s	0.131 m^3/s
Developed Condition w/ det	0.035 m^3/s	0.036 m^3/s + 0.058 m^3/s overland flow

Given the site is withing proximity to the Ti-Tree Bend pump station, Taswater should give consideration to omit stormwater detention. If detention is included at this location, the flow from the site could be attenuated to such that the peak may align with the peak of the wider catchment, possibly producing an adverse impact on the downstream system.

As an assessment of the wider system is beyond the scope of this site-based assessment, and not possible without detail of complex pumping system within Invermay, it is not possible to definitively state what impact detention will have.

For the purpose of this application, a suitably detention system has been sized, although it is recommended that Taswater review this and provide advice as to whether it should be included or omitted.

The detention system comprises the following:

- A manhole with an orifice plate. The opening of the orifice plate should be DN150; and
- Upstream of the main hole, either ran underground detention tank of oversized stormwater pipe. The analysis has suggested a DN750 for a length of approximately 60m can provided detention, alternately a tank with an area 60m^2 @600mm deep.

A schematic of the stormwater system with detention included is provided in Figure 14, if detention is to be omitted, orifice place should be removed from the manhole and the oversized pipe can be reduced to a nominal DN150 connection or whatever is required to effectively drain impervious areas.

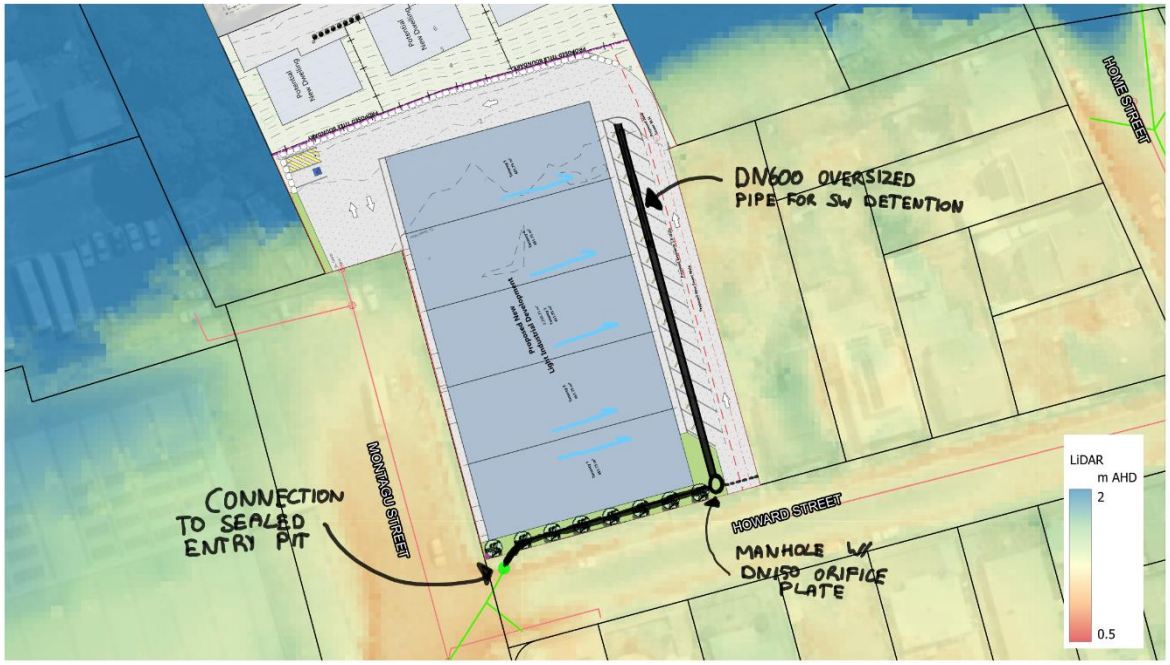

Figure 14: Proposed Detention Arrangement

4. Discussion

4.1 Recommendation

Based upon the 2090 climate scenario, the peak flood level for the 1% AEP event is 5.35 m AHD. Typically, for riverine flooding, a freeboard is applied to the peak flood level to determine minimum floor heights. This is typically 0.5m and is intended to account for modelling uncertainties, local hydraulic anomalies and actions such as wind driven waves.

Therefore, the based on typical floodplain management measures, the recommended minimum floor height should be 5.85m AHD.

It is noted that the land proposed for general residential is above this level and it is practical to have habitable floor levels above the recommended minimum floor height.

It is noted that for lower lying area, this is not practical for most development, and for area proposed for light industrial development, it is proposed to design the development to be flood compatible and flood resilient for the ground floor. The following is recommended:

- The structure is to be designed to withstand hydrodynamic loading up to 1.5m/s. Flow may originate from any direction so all faces of the structure should consider this load
- The structure is to be designed to withstand hydrostatic loading up to 5.35m AHD. A conservative approach of assuming the inside of the building is dry and the outside wet should be adopted
- Where practical, all critical infrastructure such as critical electrical components, HVAC, etc. should be installed at a level of 5.85 m AHD (5.35m AHD plus 0.5m freeboard). It is noted that opportunity may be limited given that this development is primarily an extension and fit out
- Consider an elevated storage area where critical items can be stored; and
- Prepare and update the flood emergency management plan (a draft plan has been provided in Appendix C) to firstly; manage risk to life and secondly, to minimise economic loss.

Furthermore, the proposed development aims to rezone a flood liable residential area to light industrial and place the residential development at a more appropriate location. This development approach is considered to be a positive outcome within the limitations presented for flood compatible development in Invermay.

With regard to stormwater drainage from the proposed development, given the close proximity to the ti-tree bend treatment plant, it is not recommended to adopt stormwater detention as it is possible any attenuation could align the peak flow from this development with that of the wider catchment, potentially worsening the impact at ti-tree bend.

4.2 Flood Hazard Assessment for the Rezoning

4.2.1 Land to be Rezoned to Light Industrial

The proposed light industrial development will be located on the land which is proposed to be rezoned from General Residential to Light Industrial. Based on the flood assessment in Section 2 above, which includes consideration of the predicted impact of climate change, section 4.3 below demonstrates that this proposed light industrial development complies with the SAP's Clause LAU-S10.7.2 Flood impact. Given these matters, the proposed rezoning to Light Industrial will not result in an unacceptable risk of flood hazards, which is consistent with the requirements of Part D2.1.1 of the NRLUS.

4.2.2 Land to be Rezoned to General Residential

With regard to flood hazards for the land which is proposed to be rezoned from Light Industrial to General Residential, this land is located at a sufficiently elevated level (greater than 4m AHD). It is recommended that any residential development consider flooding and the impact of climate change. At this location of this potential residential development the peak flood level is estimated to be 5.35m AHD (1% AEP + CC). For riverine type flooding, a freeboard of 0.5m is recommended. This means the recommended minimum floor level should be 5.85m AHD. Given the slope of the land will allow for a building to be construct with habitable level greater than 5.85m AHD, a residential development can be constructed without flood related conflicts. This would assist future residential development to comply with the floor level requirements of Clause LAU-S10.7.2 Flood impact, under the planning scheme's Invermay/Inveresk Flood Inundation Specific Area Plan.

Furthermore, the proposed general residential isn't anticipated to have an impact on the ability for the city to evacuate Invermay in the event of a flood. As there was already residential development here and it is essentially being relocated to a more flood compatible location, the will be no change to loading on evacuation.

Given these matters, the proposed rezoning to General Residential will not result in an unacceptable risk of flood hazards, which is consistent with the requirements of Part D2.1.1 of the NRLUS.

4.2.3 Flood Assessment for the Planning Permit Application

This section demonstrates that the proposed light industrial development complies with Clause LAU-S10.7.2 of the planning scheme's Invermay/Inveresk Flood Inundation Specific Area Plan.

Table 9: Response to planning criteria

LAU-S10.7.2 Flood impact	
Objective	
To ensure that new buildings and infrastructure are sited and designed to avoid or mitigate the risk and minimise the impact of flooding	
Acceptable Solution	**Performance Criteria**
A3 All buildings not in the Residential use class must have a: a. Floor level of at least 3.4m AHD b. Gross floor area of not more than: i 400m^2; or	**P3** Buildings not in the Residential use class must be sited and designed in accordance with a hydrological report and an emergency management plan prepared by a suitably qualified engineer. The report and plan must: a. Detail i The risks to life ii The likely impact on the use or development; and

ii 10% more than that existing or approved on the 1st January 2008.	iii How the use or development will manage the risk to tolerable levels; during either an overtopping of the levee or a levee breach at the closest point in the levee during a 5% AEP; 2% AEP or a 1% AEP flood event b. Consider the following: i The likely velocity and depth of flood waters ii The need to locate electrical equipment and other fittings above the 1% AEP flood level iii The likely effect of the use or development on flood characteristics iv The development and incorporation of evacuation plans into emergency management procedures for the precinct; and v The ability of the use or development to withstand flood inundation and debris damage and the necessity for the incorporation of any flood proofing measures in the development.

A3 / P3 Response

The ground floor level for the proposed light industrial development is less than 3.4m AHD (current ground level approx. 1.3m AHD). The proposed development does not achieve the acceptable solution and hence performance criteria is relied upon. A response to each item of the performance criteria is provided below:

a (i): Detail of risk to life is presented in Section 2.2 of this report

a (ii): The likely impact on the use is detailed in Section 2.3 of this report

a (iii): The approach to how the proposed use manages risk is described in Section 2.2 (risk to life) and the recommended detailed in Section 3.1 (design requirements for the structure)

b (i): Likely velocity, depths and hazard for various scenarios is presented in map form in Appendix A, furthermore, detailed information of flood behaviour is provided in Section 2.3.1.

b (ii): A recommendation has been provided in Section 3.1 stating where possible, all critical infrastructure such as critical electrical components, HVAC, etc. should be installed at a level of 5.85 m AHD (5.35m AHD plus 0.5m freeboard). It is noted that this development is an extension and fit out so opportunity raise all components may be limited

b (iii): A discussion on the likely impacts on surrounding development is provided in Section 2.4 of this report

b (iv): The proposed development must rely on regional evacuation. A draft site-specific emergency management plan has been prepared which aligns to regional evacuation. The plan can be finalised and approved by the planning authority prior to occupation of the building. Refer to Appendix C

b (v): Flood loading parameters have been provided in Section 3.1 of this report. The design must consider this loading.

Important information about your report

In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints. The Report may only be used and relied on by the Client for the purpose set out in the Report. Any use which a third party makes of this document, or any reliance on or decisions to be made based on it, is the responsibility of the Client or such third parties.

The services undertaken by pitt&sherry in connection with preparing the Report were limited to those specifically detailed in the report and are subject to the restrictions, limitations and exclusions set out in the Report. The Report's accuracy is limited to the time period and circumstances existing at the time the Report was prepared. The opinions, conclusions and any recommendations in the Report are based on conditions encountered and information reviewed at the date of preparation of the Report. pitt&sherry has no responsibility or obligation to update the Report to account for events or changes occurring after the date that the report was prepared. If such events or changes occurred after the date that the report was prepared render the Report inaccurate, in whole or in part, pitt&sherry accepts no responsibility, and disclaims any liability whatsoever for any injury, loss or damage suffered by anyone arising from or in connection with their use of, reliance upon, or decisions or actions based on the Report, in whole or in part, for whatever purpose.

Flood Maps

Appendix A

pitt&sherry

Figure A01: Existing Condition - 1% AEP - Peak Flood Depth

LEGEND Subject Site

Flood Hazard Assessment
Montagu Street

pitt&sherry

MAP REF:	LauncestonFlooding_Workspace.qgz	**DATA SOURCES:**	TheLIST Orthophoto
AUTHOR:	Joshua Coates		
REVISION:	A		
DATE:	2023-01-18T09:27:49.453		

N

0 30 60 90 120 m

COORDINATE SYSTEM: EPSG:28355
SCALE @ A3: 1:1,500

Figure A06: 2050 Climate Scenario - 1% AEP - Peak Flood Velocity

LEGEND Subject Site

Flood Hazard Assessment
Montagu Street

pitt&sherry

MAP REF:	LauncestonFlooding_Workspace.qgz	**DATA SOURCES:**	TheLIST Orthophoto
AUTHOR:	Joshua Coates		
REVISION:	A		
DATE:	2023-01-18T09:29:21.648		

N

0 30 60 90 120 m

COORDINATE SYSTEM: EPSG:28355
SCALE @ A3: 1:1,500

Figure A07: 2090 Climate Scenario - 1% AEP - Peak Flood Depth

LEGEND Subject Site

Flood Hazard Assessment
Montagu Street

pitt&sherry

MAP REF:	LauncestonFlooding_Workspace.qgz	**DATA SOURCES:**	TheLIST Orthophoto
AUTHOR:	Joshua Coates		
REVISION:	A		
DATE:	2023-01-18T09:29:46.759		

N

0 30 60 90 120 m

COORDINATE SYSTEM: EPSG:28355
SCALE @ A3: 1:1,500

Figure A08: 2090 Climate Scenario - 1% AEP - Peak Flood Hazard

LEGEND Subject Site

Flood Hazard Assessment
Montagu Street

pitt&sherry

MAP REF:	LauncestonFlooding_Workspace.qgz	**DATA SOURCES:**	TheLIST Orthophoto
AUTHOR:	Joshua Coates		
REVISION:	A		
DATE:	2023-01-18T09:30:07.461	Refer to: ARR209, Bk 6, Ch 7: Safety Design Criteria	

N

0 30 60 90 120 m

COORDINATE SYSTEM: EPSG:28355
SCALE @ A3: 1:1,500

Figure A09: 2090 Climate Scenario - 1% AEP - Peak Flood Velocity

LEGEND Subject Site

Flood Hazard Assessment
Montagu Street

pitt&sherry

MAP REF:	LauncestonFlooding_Workspace.qgz	**DATA SOURCES:**	TheLIST Orthophoto
AUTHOR:	Joshua Coates		
REVISION:	A		
DATE:	2023-01-18T09:30:42.603		

N

0 30 60 90 120 m

COORDINATE SYSTEM: EPSG:28355
SCALE @ A3: 1:1,500

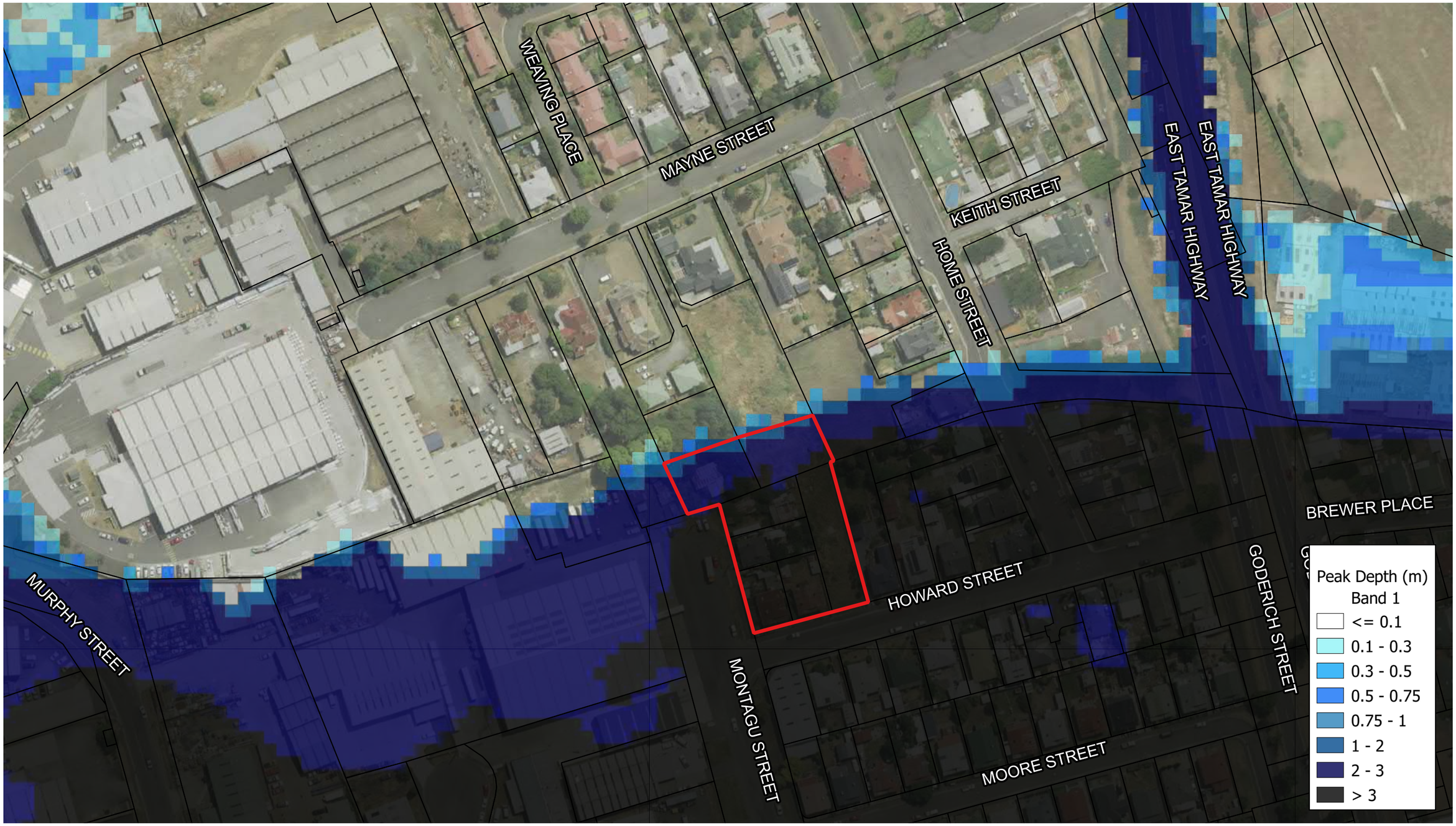

Figure A10: Levee Breach Scenario - 1% AEP - Peak Flood Depth

LEGEND Subject Site

Flood Hazard Assessment
Montagu Street

pitt&sherry

MAP REF:	LauncestonFlooding_Workspace.qgz	**DATA SOURCES:**	TheLIST Orthophoto
AUTHOR:	Joshua Coates		
REVISION:	A		
DATE:	2023-01-18T09:30:59.691	Refer to: ARR209, Bk 6, Ch 7: Safety Design Criteria	

N

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COORDINATE SYSTEM: EPSG:28355
SCALE @ A3: 1:1,500

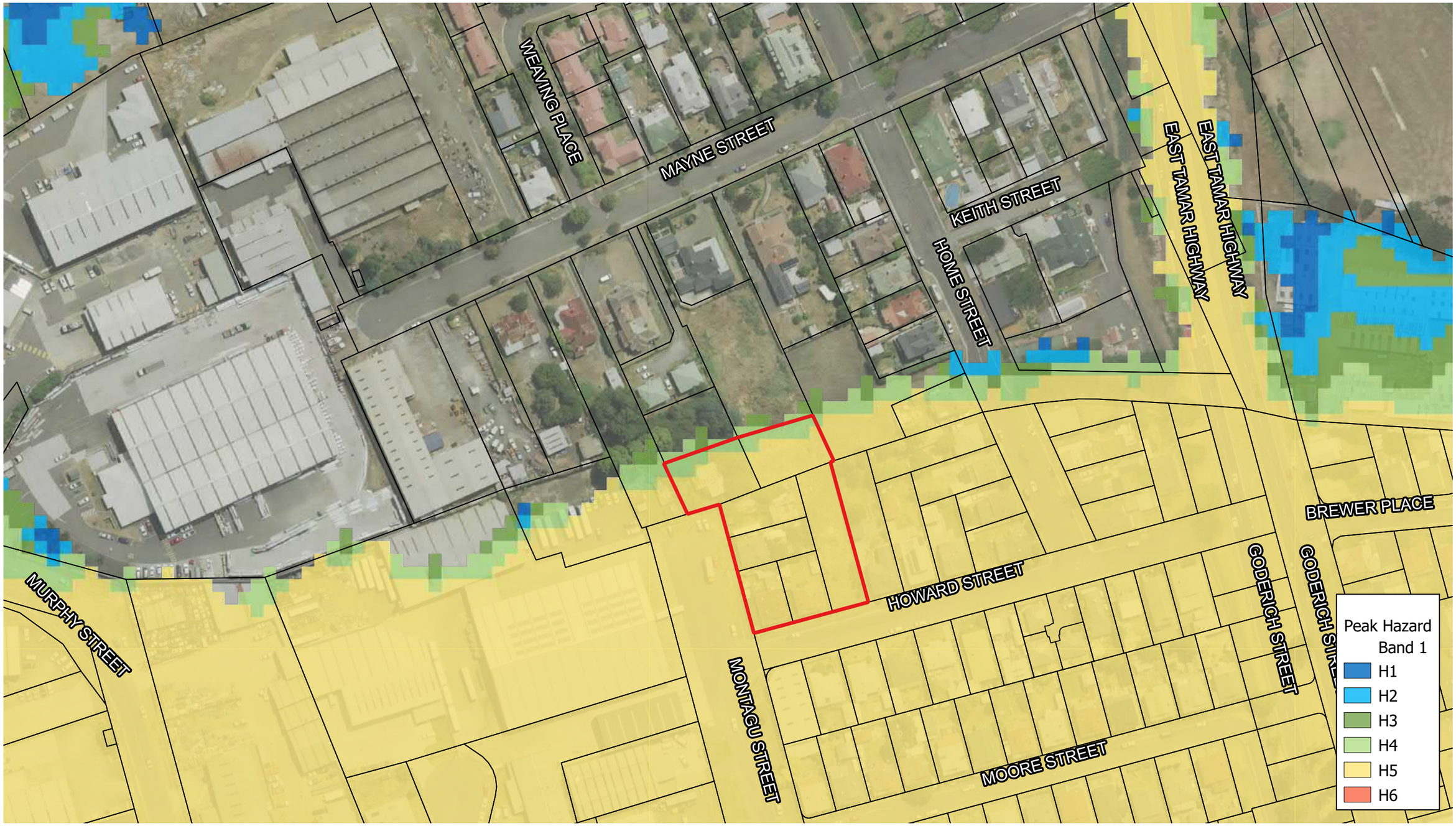

Figure A11: Levee Breach Scenario - 1% AEP - Peak Flood Hazard

Flood Hazard Assessment
Montagu Street

pitt&sherry

LEGEND Subject Site

MAP REF:	LauncestonFlooding_Workspace.qgz	**DATA SOURCES:**	TheLIST Orthophoto
AUTHOR:	Joshua Coates		
REVISION:	A		
DATE:	2023-01-18T09:31:22.875		Refer to: ARR209, Bk 6, Ch 7: Safety Design Criteria

N

0 30 60 90 120 m

COORDINATE SYSTEM: EPSG:28355
SCALE @ A3: 1:1,500

Figure A12: Levee Breach Scenario - 1% AEP - Peak Flood Velocity

LEGEND Subject Site

Flood Hazard Assessment
Montagu Street

pitt&sherry

MAP REF:	LauncestonFlooding_Workspace.qgz	**DATA SOURCES:**	TheLIST Orthophoto
AUTHOR:	Joshua Coates		
REVISION:	A		
DATE:	2023-01-18T09:31:38.706		Refer to: ARR209, Bk 6, Ch 7: Safety Design Criteria

N

0 30 60 90 120 m

COORDINATE SYSTEM: EPSG:28355
SCALE @ A3: 1:1,500

Figure A02: Existing Condition - 1% AEP - Peak Flood Hazard

LEGEND Subject Site

Flood Hazard Assessment
Montagu Street

pitt&sherry

MAP REF:	LauncestonFlooding_Workspace.qgz	**DATA SOURCES:**	TheLIST Orthophoto
AUTHOR:	Joshua Coates		
REVISION:	A		
DATE:	2023-01-18T09:28:10.011		Refer to: ARR209, Bk 6, Ch 7: Safety Design Criteria

N

0 30 60 90 120 m

COORDINATE SYSTEM: EPSG:28355
SCALE @ A3: 1:1,500

Figure A03: Existing Condition - 1% AEP - Peak Flood Velocity

LEGEND Subject Site

Flood Hazard Assessment
Montagu Street

pitt&sherry

MAP REF:	LauncestonFlooding_Workspace.qgz	**DATA SOURCES:**	TheLIST Orthophoto
AUTHOR:	Joshua Coates		
REVISION:	A		
DATE:	2023-01-18T09:28:28.272		

N

0 30 60 90 120 m

COORDINATE SYSTEM: EPSG:28355
SCALE @ A3: 1:1,500

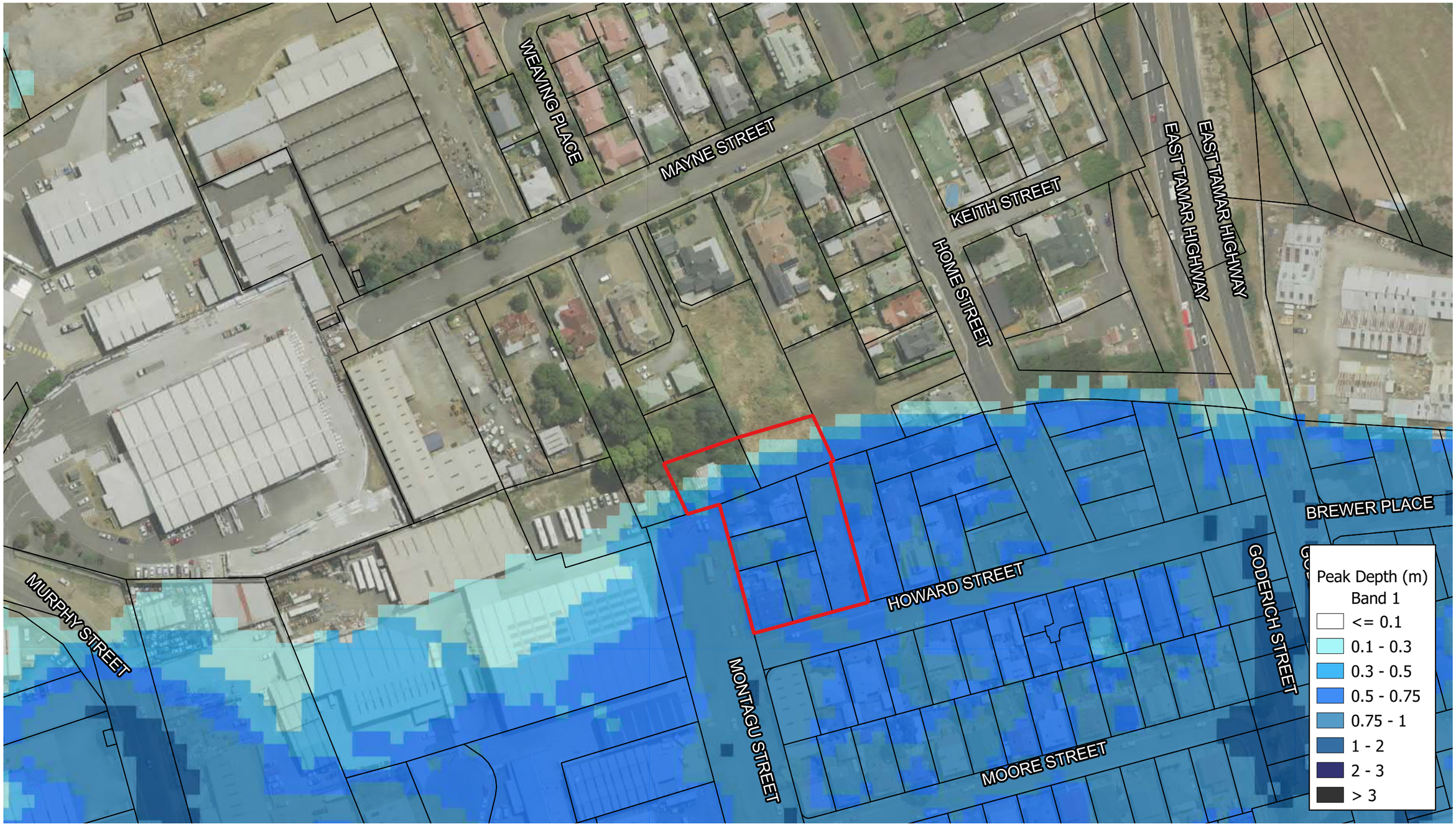

Figure A04: 2050 Climate Scenario - 1% AEP - Peak Flood Depth

LEGEND Subject Site

Flood Hazard Assessment
Montagu Street

pitt&sherry

MAP REF:	LauncestonFlooding_Workspace.qgz	**DATA SOURCES:**	TheLIST Orthophoto
AUTHOR:	Joshua Coates		
REVISION:	A		
DATE:	2023-01-18T09:28:44.737		

N

0 30 60 90 120 m

COORDINATE SYSTEM: EPSG:28355
SCALE @ A3: 1:1,500

Figure A05: 2050 Climate Scenario - 1% AEP - Peak Flood Hazard

LEGEND Subject Site

Flood Hazard Assessment
Montagu Street

pitt&sherry

MAP REF:	LauncestonFlooding_Workspace.qgz	**DATA SOURCES:**	TheLIST Orthophoto
AUTHOR:	Joshua Coates		
REVISION:	A		
DATE:	2023-01-18T09:28:59.263	Refer to: ARR209, Bk 6, Ch 7: Safety Design Criteria	

N

0 30 60 90 120 m

COORDINATE SYSTEM: EPSG:28355
SCALE @ A3: 1:1,500

Proposed Plans

Appendix B

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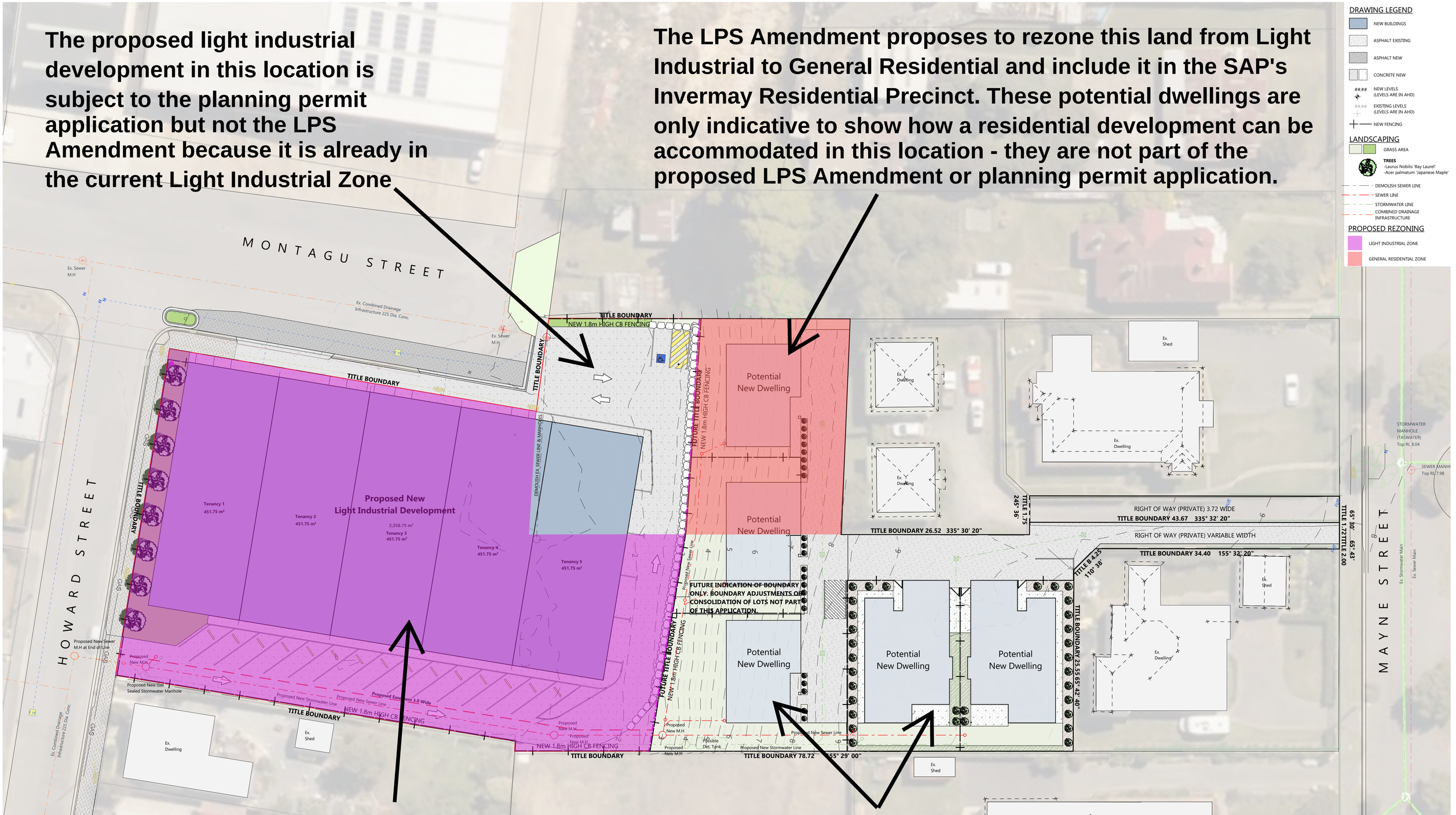
The proposed light industrial development in this location is subject to the planning permit application but not the LPS Amendment because it is already in the current Light Industrial Zone

The LPS Amendment proposes to rezone this land from Light Industrial to General Residential and include it in the SAP's Invermay Residential Precinct. These potential dwellings are only indicative to show how a residential development can be accommodated in this location - they are not part of the proposed LPS Amendment or planning permit application.



DRAWING LEGEND

- NEW BUILDINGS
- ASPHALT EXISTING
- ASPHALT NEW
- CONCRETE NEW
- #### NEW LEVELS (LEVELS ARE IN AHD)
- #### EXISTING LEVELS (LEVELS ARE IN AHD)
- NEW FENCING

LANDSCAPING

- GRASS AREA
- TREES -Laurus Nobilis 'Bay Laurel' -Acer palmatum 'Japanese Maple'
- DEMOLISH SEWER LINE
- SEWER LINE
- STORMWATER LINE
- COMBINED DRAINAGE INFRASTRUCTURE

PROPOSED REZONING

- LIGHT INDUSTRIAL ZONE
- GENERAL RESIDENTIAL ZONE

This land is to be rezoned from General Residential to Light Industrial and included in the SAP's Riveredge Industrial Precinct. The proposed light industrial development is partly located on this land.

These potential dwellings are only indicative to show how a residential development can be accommodated in this location - they are not part of the proposed LPS Amendment or planning permit application.

Site Master Plan
SCALE 1:250
North
0mm 2500 5000 7500 10000 12500

Rev	Description	Date	Int	App
DA2	ISSUED FOR APPROVAL	9/03/2023	DA2	DA2

REVISION

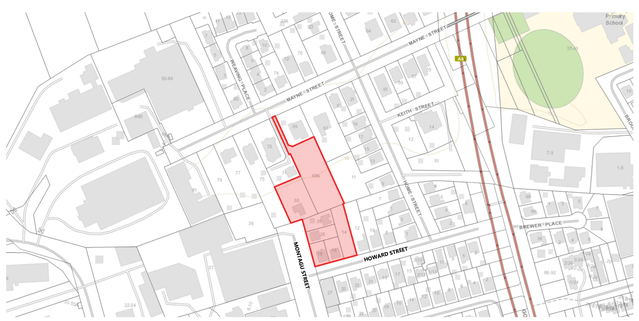
Cataract Designs
A | 65 Basin Rd | West Launceston | TAS 7250
E | phil@cataractdesigns.com.au
M | 0400 094 643
Licence No. | 870617396

Drawn | P Ludbey
Approved | P Ludbey
Status | APPROVAL
Original size | A2 (Landscape)
Drawing No. /Revision | SK 001-DA2

New Light Industrial Development & Layout of Potential Residential Development
Montagu, Howard & Mayne Street, Invermay

Project No. 22019

New Light Industrial Development
Montagu & Howard Street, Invermay



Drawing Schedule

SK030	Cover Page
SK031	Site Survey
SK032	Existing & Proposed Zoning
SK033	Existing/Demolition Plan
SK034	Site Plan
SK035	Building Floor Plan
SK036	Building Elevations

Project details

Council	Launceston City Council
Zone	General Residential, Light Industrial
Planning Overlay	Landslip Hazard Low, Invermay/Inveresk Flood Inundation Specific Area Plan Local Area Objective: Invermay Residential Precinct
PID	Multiple
Title Folio	Multiple
Title Volume	Multiple
Climate Zone	7
Design Wind Speed	-
Soil Class	-
BAL Rating	-
Energy Rating	-
Corrosive Environment	-
Other	-

Area Schedule

Name	Area m²
Site Area (Propsed New Lot 1)	3842m²
Building Floor Area:	2258m²
Permeable Area	208m²
Impervious Surfaces Area	1,376m²

Rev	Description	Date	Int	App
DA1	ISSUED FOR APPROVAL	12/01/2023	DA1	DA1

REVISION

Cataract Designs
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Licence No. | 870617396

Drawn	P Ludbey
Approved	P Ludbey
Status	DEVELOPMENT APPLICATION
Original size	A1 (Landscape)
Drawing No. /Revision	SK030-DA1

Project No. 22019


MONTAGU STREET
HOWARD STREET
MAYNE STREET
SEWER MANHOLE
Top RL 1.12
STOP VALVE
KERB ADAPTOR
IL 1.20
FIRE PLUG
ELECTRICITY - POLE
UTILITY VALVE -UNKNOWN?
WATER - METER
TITLE BOUNDARY
165° 10' 40"
13.72
13.64
248° 55'
0.13
No 18
Howard Street
Invermay Tas 7248
Property ID - 6562581
Title Ref - 62242/10
No 26
Montagu Street
Invermay Tas 7248
Property ID - 6570725
Title Ref - 62242/11
No 16
Howard Street
Invermay Tas 7248
Property ID - 6562602
Title Ref - 62242/9
No 28
Montagu Street
Invermay Tas 7248
Property ID - 6570733
Title Ref - 62242/12
No 14
Howard Street
Invermay Tas 7248
Property ID - 6562610
Title Ref - 62242/8
25.09
164° 52' 40"
15.90
31.92
16.02
254° 52' 00"
74° 52' 00"
31.84
164° 51' 40"
16.86
17.39
248° 55' 00"
14.54
16.09
249° 16' 40"
30.63
DRAINAGE EASEMENT 3.00 WIDE
dn150 Sewer main
SEWER MANHOLE
Top RL 1.48
Invert IL 0.49
dn150 Connection?
57.10
344° 50' 20"
No 30
Montagu Street
Invermay Tas 7248
Property ID - 6570741
Title Ref - 54767/2
No 69A
Mayne Street
Invermay Tas 7248
Property ID - 3594473
Title Ref - 175261/2
335° 37' 00"
42.46
67° 49' 20"
30.42
335° 30' 20"
44.02
26.52
78.72
135° 29' 00"
RIGHT OF WAY (PRIVATE) 3.72 WIDE
RIGHT OF WAY (PRIVATE) VARIABLE WIDTH
43.67
335° 32' 20"
34.40
GATE
WIND
BM nail in driveway
Adjoining Property
75 Mayne Street
Invermay Tas 7248
Property ID - 6569986
Title Ref - 220703/15
Adjoining Property
71 Mayne Street
Invermay Tas 7248
Property ID - 3594465
Title Ref - 175261/1
Adjoining Property
69 Mayne Street
Invermay Tas 7248
Property ID - 2784347
Title Ref - 146038/2
Adjoining Property
12 Howard Street
Invermay Tas 7248
Property ID - 6562629
Title Ref - 223976/7
Adjoining Property
11 Home Street
Invermay Tas 7248
Property ID - 3156721
Title Ref - 163347/2
Adjoining Property
67 Mayne Street
Invermay Tas 7248
Property ID - 3156713
Title Ref - 163347/1
North

All of Site Survey
SCALE 1:250
0mm 2500 5000 7500 10000 12500

Rev	Description	Date	Int	App
DA1	ISSUED FOR APPROVAL	12/01/2023	DA1	DA1

R E V I S I O N

Cataract Designs
A | 65 Basin Rd | West Launceston | TAS 7250
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M | 0400 094 643
Licence No. | 870617396

New Light Industrial Development
Montagu & Howard Street, Invermay

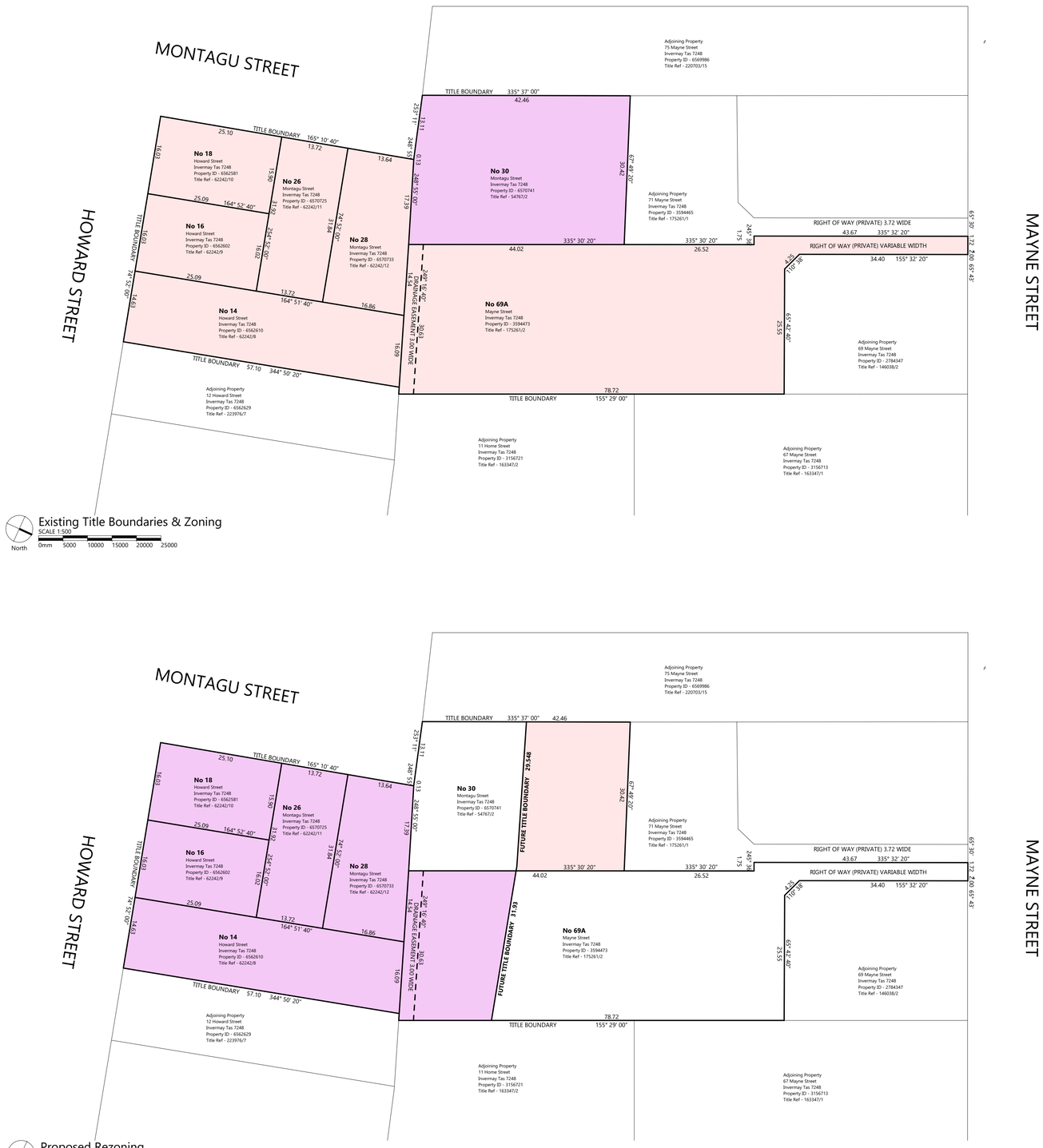
Project No. 22019

Drawn | P Ludbey
Approved | P Ludbey
Status | DEVELOPMENT APPLICATION
Original size | A2 (Landscape)
Drawing No. /Revision
SK031-DA1

Legend

General Residensial Zone

Light Industrial Zone



Existing Title Boundaries & Zoning
SCALE 1:500

Proposed Rezoning
SCALE 1:500

Rev	Description	Date	Int	App
DA2	ISSUED FOR APPROVAL	9/03/2023	DA2	DA2

REVISION

Cataract Designs
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M | 0400 094 643
Licence No. | 870617396

New Light Industrial Development
Montagu & Howard Street, Invermay

Project No. 22019

Drawn	P Ludbey
Approved	P Ludbey
Status	APPROVAL
Original size	A2 (Landscape)
Drawing No. /Revision	SK032-DA2

Demolition Plan
SCALE 1:200
North
0mm 2000 4000 6000 8000 10000

DEMOLITION NOTES

THE CONTRACTOR SHALL CARRY OUT THE REQUIRED DEMOLITON OF NOMINATED ON THIS PLAN IN STRICT ACCORDANCE WITH THE DOCUMENTATION & AS2601 - THE DEMOLITION OF STRUCTURES.

DEMOLITION WORKS SHALL BE UNDERTAKEN IN A SAFE & ENVIRONMENTALLY ACCEPTABLE MANNER.

CONTRACTOR SHALL MAKE ALL ALLOWANCES AS REQUIRED FOR DEMOLITION, REMOVALS & RELOCATIONS TO SUIT THE NEW WORKS. ALL ITEMS TO BE DEMOLISHED SHOWN DOTTED RED TYPICALLY.

REMOVE & DISCONNECT ALL REDUNDANT MECHANICAL, ELECTRICAL, HYDRAULIC SERVICES & THE LIKE AS REQUIRED WITHIN THE NEW WORKS. ALLOW TO CAP & SEAL EXISTING CONNECTIONS BELOW/ BEHIND FINISHED SURFACE LEVELS. ALLOW TO RELOCATE & MAKE GOOD WHERE REQUIRED.

MAKE GOOD TO ALL PENETRATONS WHERE ITEMS REMOVED. INFILL SHALL MATCH EXISTING SURFACE.

ASBESTOS MAY BE LOCATED IN AREAS OF EXISTING BUILDINGS. ASBESTOS IS TO BE REMOVED IN ACCORDANCE WITH WORK SAFE TASMANIA 'HOW TO SAFELY REMOVE ASBESTOS' CODE OF PRACTICE & STATUTORY REGULATIONS.

DEMOLITION PLAN SHALL BE READ IN CONJUNCTION WITH SITE PLAN AND NEW WORKS PLANS. CONTRACTOR TO ENSURE DIAL BEFORE YOU DIG IS COMPLETED & RECIEVED PRIOR TO COMMENCEMENT OF ANY EARTH WORKS

DIAL BEFORE YOU DIG www.1100.com.au

Rev	Description	Date	Int	App
DA1	ISSUED FOR APPROVAL	12/07/2023	DA1	DA1

REVISION

Cataract Designs
A : 65 Basin Rd : West Launceston : TAS 7250
E : phil@cataractdesigns.com.au
M : 0400 094 643
Licence No. : 870617396

New Light Industrial Development
Montagu & Howard Street, Invermay

Project No. 22019

Drawn	P Ludbey
Approved	P Ludbey
Status	DEVELOPMENT APPLICATION
Original size	A2 (Landscape)
Drawing No. /Revision	SK033-DA1

MONTAGU STREET

HOWARD STREET

Ex. Sewer M.H

EX. STREET SIGN

KC's KERB

NEW OUTSTAND

Ex. Combined Drainage Infrastructure 225 Dia. Conc.

EXISTING POWER POLES AND CONNECTIONS TO BE REMOVED.

EX. PIT

EX. POLE

Ex. Sewer M.H

PROPOSED NEW PRIVATE POWER POLE.

EX. S/E PIT

EX. KC KERB

KC CROSS OVER

NEW ON-STREET PARKING SPACE

EX. KC KERB

EX. POLE

KC CROSS OVER

TITLE BOUNDARY

NEW 1.8m HIGH CB FENCING

TITLE BOUNDARY

NEW 2400mm HIGH STEEL SECURITY FENCE PAINT FINISH.

LINE MARKED WALKWAY

DEMOLISH EX. SEWER LINE & MANHOLES

FUTURE TITLE BOUNDARY

NEW 1.8m HIGH CB FENCING

Proposed Masonry Retain Wall

1 Space

2,600

2,500

5,400

Ex. Dwelling

No 71

Ex. Dwelling

No 30

No 69a

TITLE BOUNDARY 26.52

335° 30' 20"

TITLE 21.75

245° 36'

STAGE 2
(NOT PART OF THIS DA)

FUTURE INDICATION OF BOUNDARY ONLY. BOUNDARY ADJUSTMENTS OR CONSOLIDATION OF LOTS NOT PART OF THIS APPLICATION.

STAGE 1
(NOT PART OF THIS DA)

Tenancy 1
451.75 m²

Tenancy 2
451.75 m²

Proposed New
Light Industrial Development
2,258.75 m²
+1,600

Tenancy 3
451.75 m²

Tenancy 4
451.75 m²

Tenancy 5
451.75 m²

34,750

10,500

2,900

NEW 2400mm HIGH STEEL SECURITY GATE. WITH SLIDING MECHANISM PAINT FINISH.

Proposed New Sewer M.H at End of Line

Proposed New M.H

Proposed New Gas Sealed Stormwater Manhole
REFER DD.01 DETAIL.

3,400

5,600

3,600

3,700

2,200

65,000

45.0000°

45° Angle Parking
15 Spaces

Proposed Easement 3.0 Wide

Proposed New Stormwater Line

Proposed New Sewer Line

NEW 1.8m HIGH CB FENCING

TITLE BOUNDARY

Parallel Parking
4 Spaces

6,000

5,000

5,200

2,400

4,500

Proposed New M.H

Proposed New M.H

NEW 1.8m HIGH CB FENCING

TITLE BOUNDARY

Proposed New M.H

Possible Dirt. Tank

Proposed New Sewer Line

Proposed New Stormwater Line

TITLE BOUNDARY 78.72

155° 29' 00"

Ex. Shed

Ex. Dwelling

Ex. Shed

Ex. Combined Drainage Infrastructure 225 Dia. Conc.

DRAWING LEGEND

- NEW BUILDINGS
- ASPHALT EXISTING
- ASPHALT NEW
- CONCRETE NEW
- #### NEW LEVELS (LEVELS ARE IN AHD)
- #### EXISTING LEVELS (LEVELS ARE IN AHD)
- NEW FENCING

LANDSCAPING

- GRASS AREA
- TREES -Laurus Nobilis 'Bay Laurel' -Acer palmatum 'Japanese Maple'
- DEMOLISH SEWER LINE
- SEWER LINE
- STORMWATER LINE
- COMBINED DRAINAGE INFRASTRUCTURE

Site Plan Stage 3
SCALE 1:200

North

0mm 2000 4000 6000 8000 10000

Rev	Description	Date	Int	App
DA2	ISSUED FOR APPROVAL	9/03/2023	DA2	DA2

REVISION

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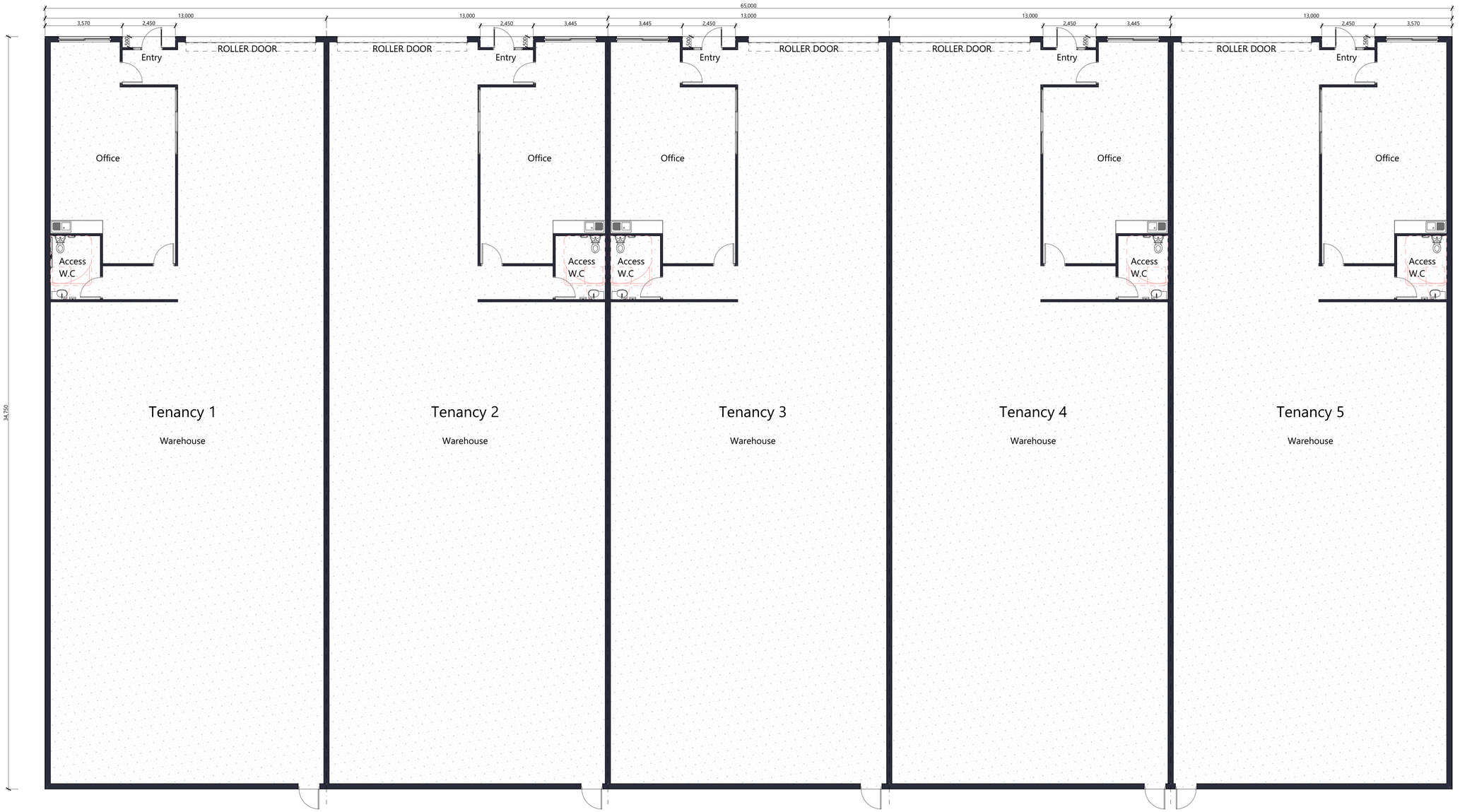
Drawn	P Ludbey
Approved	P Ludbey
Status	APPROVAL
Original size	A2 (Landscape)
Drawing No. /Revision	SK034-DA2

New Light Industrial Development
Montagu & Howard Street, Invermay

Project No. 22019



Light Industrial Building Floor Plan
SCALE 1:100

Project North 0mm 1000 2000 3000 4000 5000

Rev	Description	Date	Int	App
DA1	ISSUED FOR APPROVAL	12/01/2023	DA1	DA1

REVISION

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New Light Industrial Development
Montagu & Howard Street, Invermay

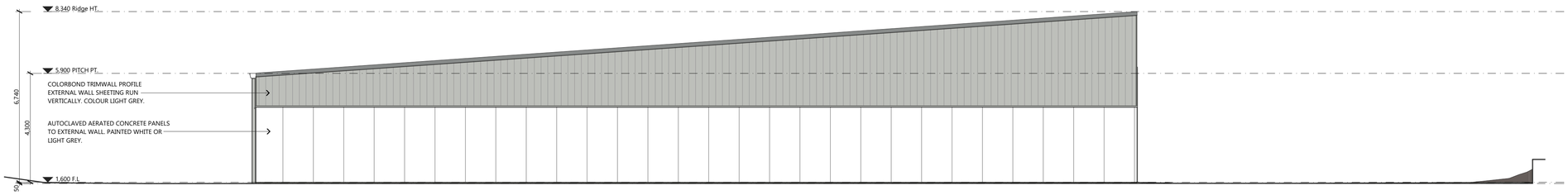
Project No. 22019

Drawn	P Ludbey
Approved	P Ludbey
Status	DEVELOPMENT APPLICATION
Original size	A2 (Landscape)
Drawing No. /Revision	SK035-DA1

E1 SK035 **Western Elevation (Montagu St)**

SCALE 1:100

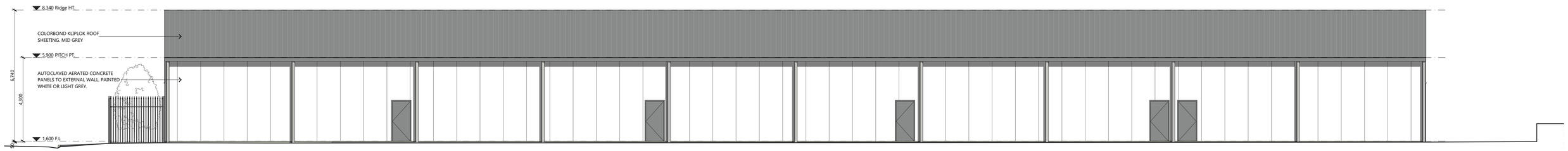
0mm 1000 2000 3000 4000 5000



E2 SK035 **Northern Elevation**

SCALE 1:100

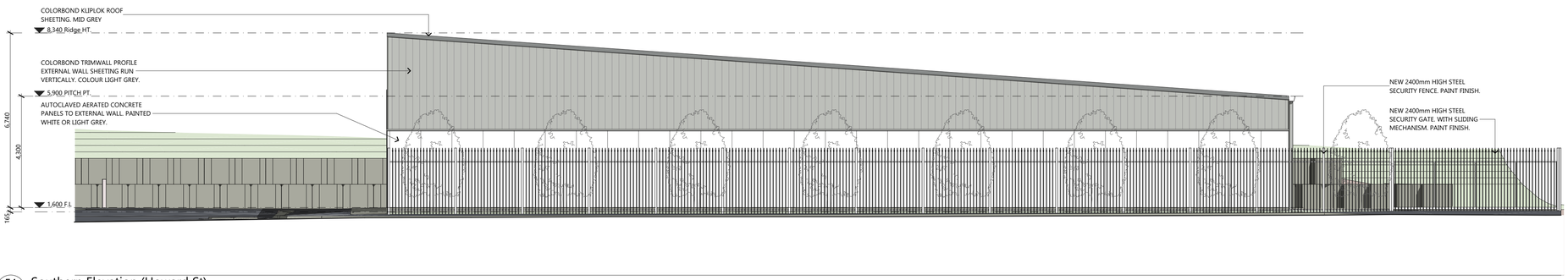
0mm 1000 2000 3000 4000 5000



E3 SK035 **Eastern Elevation**

SCALE 1:100

0mm 1000 2000 3000 4000 5000



E4 SK035 **Southern Elevation (Howard St)**

SCALE 1:100

0mm 1000 2000 3000 4000 5000

Rev	Description	Date	Int	App
DA1	ISSUED FOR APPROVAL	12/01/2023	DA1	DA1

REVISION

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New Light Industrial Development
Montagu & Howard Street, Invermay

Project No. 22019

Drawn	P Ludbey
Approved	P Ludbey
Status	DEVELOPMENT APPLICATION
Original size	A2 (Landscape)
Drawing No. /Revision	SK036-DA1

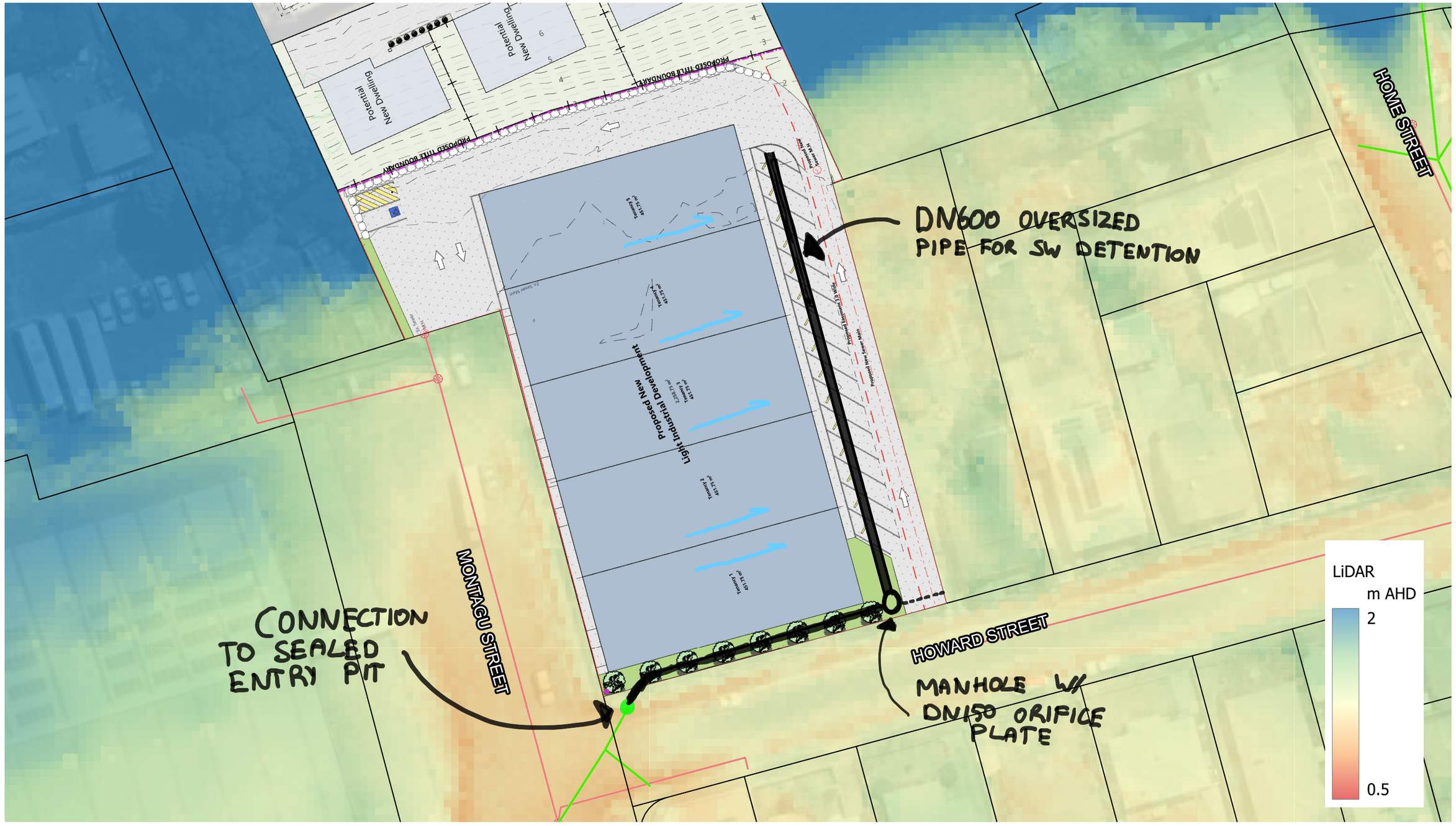

Figure B1: Stormwater Connection

LEGEND

Stormwater Assessment
Montagu Street

pitt&sherry

MAP REF:	LauncestonFlooding_Workspace.qgz	**DATA SOURCES:**	TheLIST Orthophoto LiDAR 2013
AUTHOR:	Joshua Coates		
REVISION:	A		
DATE:	2023-01-19T10:49:49.435		

N

0 10 20 30 40 m

COORDINATE SYSTEM: EPSG:28355
SCALE @ A3: 1:1,500